VALUATION OF TESLA MOTORS, INC.

Master Thesis, Copenhagen Business School, 12th of May 2016

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Number of Pages: 118

Number of Characters (with spaces): 193.336

Executive Summary

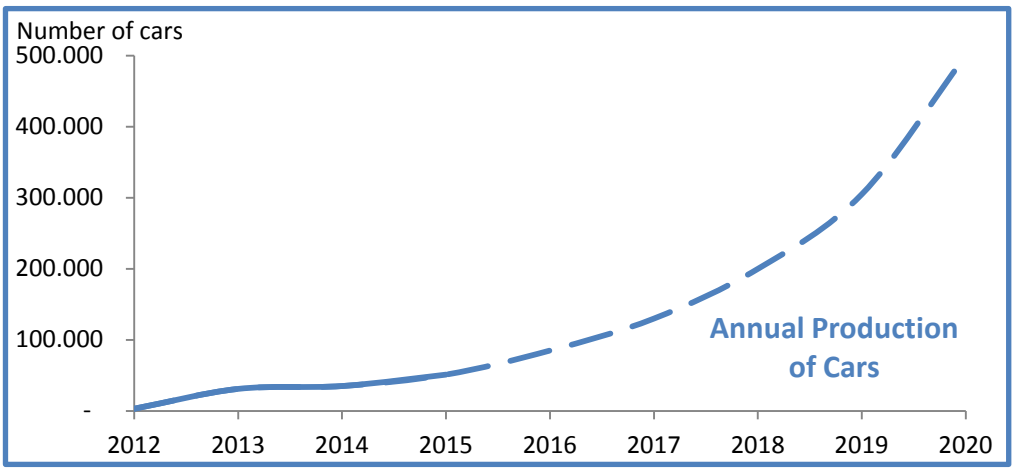
The purpose of this thesis is to find the value of the US premium electric automotive company Tesla Motors, Inc. based on a strategic and financial analysis.

- *Strategic analysis:* Government support schemes play a key role in the electric vehicle (EV) market. However, due to declining battery costs, EVs are set to challenge gasoline vehicles in the near future. The premium vehicle segment is highly competitive, dominated by the major brands BMW, Mercedes and Audi. The competition in the EV market is expected to increase after Tesla's Model 3 launch in 2017. We believe Tesla posits several sustainable competitive advantages, providing confidence in strong future earning capabilities. This includes their upcoming Gigafactory, Supercharger network, demand for Model 3 and CEO Elon Musk.

- *Financial analysis*: Tesla has never been profitable, due to its low economies of scale and high investments aimed to fuel future growth. However, this is about to change, as we expect a continued strong revenue growth while operational margins improve. We expect Tesla to become highly profitable after the launch of Model 3. In the near future we define Tesla´s main bottleneck to production capacity, not demand. Their guided annual production is 500.000 vehicles by 2020, representing a tenfold increase in just five years.

- *Valuation*: Per 1st of May 2016, one Tesla share traded at $ 240 on the Nasdaq Stock Exchange. By using the Economic Value Added-model, we estimate a price per share of $ 350 per 1st of May 2016. This 45 percent upside potential indicates that Tesla´s future earnings potential is not fully priced into the share.

Highlights	2015	E2016	E2017	E2018	E2019	E2020	E2021	E2022	E2023	E2024	E2025
Cars sold in 1000´s	51	73	113	156	259	400	510	631	788	993	1.260
Revenue bUSD	4,0	7,1	10,8	12,8	16,9	22,3	26,3	30,8	37,4	46,2	57,7
NOPAT bUSD	-0,7	0,2	0,5	1,5	2,3	3,0	3,8	4,3	5,5	7,1	9,2
Revenue growth	27%	75%	52%	19%	32%	32%	18%	17%	22%	23%	25%
EBITDA-margin	-7%	12%	14%	21%	25%	26%	27%	26%	27%	27%	27%
ROIC	-36%	6%	9%	16%	18%	17%	18%	17%	18%	20%	22%



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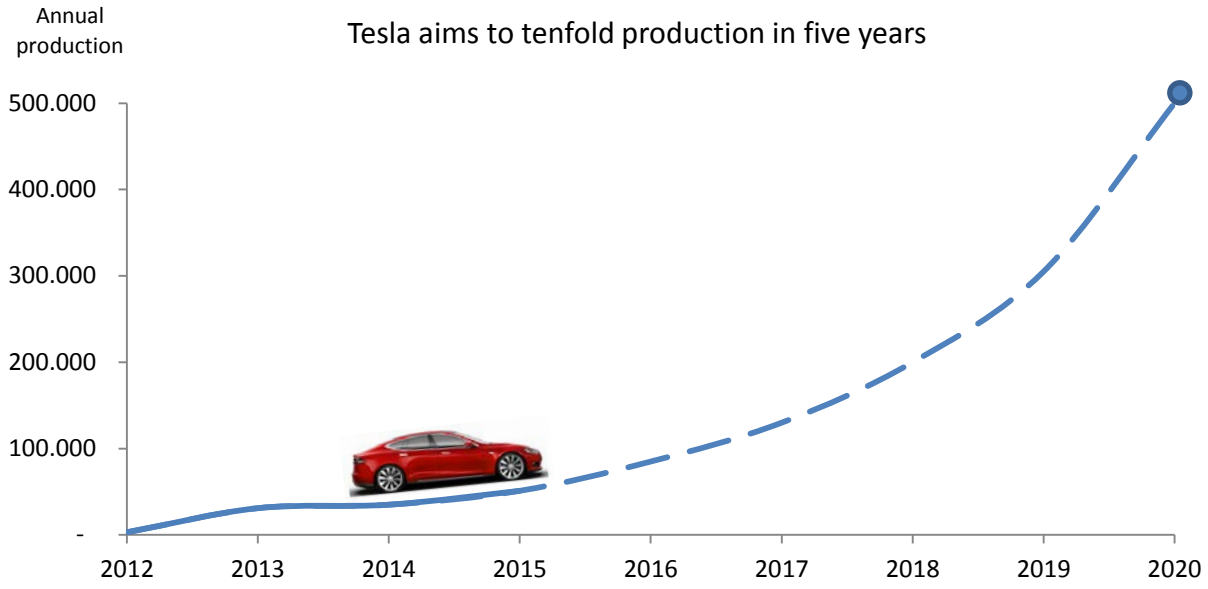
1 Introduction

1.1 Motivation

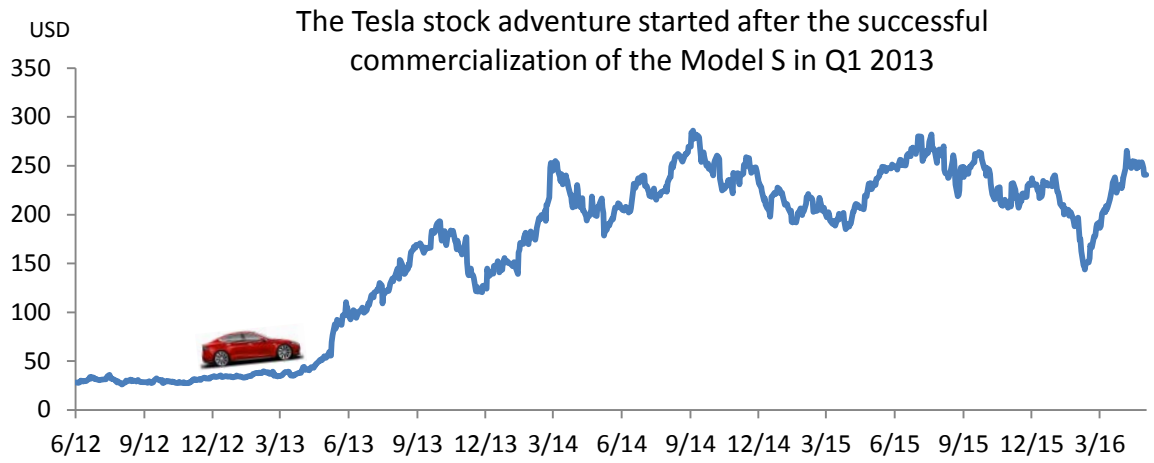
- *Disruptive innovation in a mature industry:* Tesla's mission is to accelerate the world's transition to sustainable energy[1]. This transition is doomed inevitable by Tesla CEO Elon Musk, due to the exhaustive nature of fossil fuels and the technological advances of E-mobility. After decades of failed attempts to commercialize alternative fuel vehicles, Tesla successfully proved the revenge of the electric car with the Model S in 2012. Today´s gasoline fuel automotive industry was created by the Ford Model T when reaching an annual production rate of 500.000 in 1916[2], despite starting just seven years earlier. Now in the 21st century Tesla Motors aims to follow the same ambitious timeline when converting the industry over to electricity. Tesla has announced their plans of producing 500.000 vehicles by 2020[3], representing a tenfold increase in five years. Now aimed aiming for the mass-market with their Model 3, the establishment of automotive giants is forced to take a look in the rear view. The Model 3 vehicle, first revealed to the public 31st of March 2016, has ranked up more than 400.000 reservations in one week, making it the most successful launch of any product ever[4].



- *High risk company:* Despite Tesla's great product reception, the company has yet to post a full year profit. From being on the brink of bankruptcy in 2013 shortly after the Model S launch, Tesla has managed to survive due to the sudden demand spike and Tesla´s unprecedented ability to raise capital. The industry

[1] Teslamotors.com: *www.teslamotors.com/about*
[2] Ford Motors Historical Production: *www.mtfca.com/encyclo/fdprod.htm*
[3] Teslamotors.com: *www.teslamotors.com/gigafactory*
[4] Teslamotors: *www.teslamotors.com/blog/the-week-electric-vehicles-went-mainstream*

is known for its fierce capital intensity, and this is part why the last successful automotive start-up was Chrysler in 1925.[5] Tesla´s high cash burn rate has therefore been of a great concern for investors, due to the huge capital expenditures required in developing and producing a mass-market vehicle. Still, Tesla is a financial light-weight[6] compared to its current and possible future industry rivals. Therefore, we believe the risk to being whipped out of existence by automotive giants such as BMW or Daimler, still is present. However, assessing Tesla´s current market value reveals widespread beliefs of an upcoming financial turnaround, assuming Tesla´s growth rate would continue into the future.



Challenging valuation case: Tesla's grand vision for an eco-friendly automotive revolution has spiked enthusiasm among consumers, governments and financial markets. As the stock market widely agrees that Tesla possess strong future earning capacities, its fluctuating nature reveals a low consensus of its perceived true market value. Observing such electrifying times in the automotive industry, we believe it would be of great interest to provide a greater understanding of how realistic Tesla´s goal of converting all transport to electricity, actually is. As this should be assessed both from a strategic and financial standpoint, we believe a company valuation is the best suited framework for this thesis.

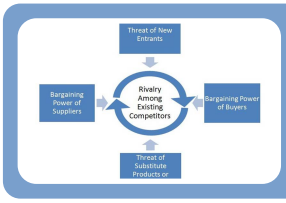
[5] Vance, A. (2015): *Elon Musk: Tesla, SpaceX, and the Quest for a Fantastic Future p. 151*
[6] See Section 3.1 "Historical Financial Analysis"

1.2 Problem formulation

The main aim of this thesis is to estimate the fair market value of one Tesla Motors share per 1st of May 2016 We will answer this research question through a series of sub-questions, divided into a strategic and financial analysis as described in the table below.

Reseach question

- What is the true market value of one share per 1st of May 2016?



Part 1: Strategic analysis

- Q1: How do environmental factors affect the share price?
- Q2: How do industry specific factors affect the share price?
- Q3: How do internal factors affect the share price?

Part 2: Financial analysis

- Q4: How does historical performance predict future performance?
- Q5: How will key financial value drivers develop within the budget period?
- Q6: What is appropriate cost of capital?

Part 3: Valuation

- Q7: What is the market value per share using revelant valuation models?
- Q8: How is the valuation affected by changes in key estimates?

All these eight sub-questions will be reintroduced though-out the thesis in the beginning of each relevant section. Subsequently, they will be discussed in the respective sub-conclusion completing each of the eight sections.

1.2.1 Structure of thesis

Main sections	Main parts of each section	Main purpose of each part
1.0 Introduction	1.1 Motivation 1.2 Problem formulation 1.3 Case company presentation	Present research question Present context of the thesis
2.0 Strategic analysis	2.1 Environmental analysis 2.2 Industry analysis 2.3 Internal analysis	Answer sub-questions 1 – 3 Sub-conclusions are provided
3.0 Financial analysis	3.1 Historical financial analysis 3.2 Financial forecasting 3.3 Cost of capital	Answer sub-questions 4 – 6 Sub-conclusions are provided
4.0 Valuation	4.1 Valuation models 4.2 Sensitivity analysis	Answer sub-questions 7 – 8 Sub-conclusions are provided
5.0 Conclusion	5.1 Overview sub-conclusions 5.2 Final conclusion 5.3 Discussion	Answer research question based on all 8 sub-questions

1.2.2 Delimitation

Time limit of data: The data collection with purpose of supporting analyses and conclusions will end 1st of May 2016. We will use company information from Fiscal Year (FY) 2009 to 2015. The Q1 2016 Report released 4th of May 2016 is not included. We classify the years 2009 to 2012 as less relevant, as Tesla´s commercial success with the Model S came in 2013. Tesla´s financials from 2013 to 2016 are much better suited to forecast the development of income and balance sheet statement items. However, given the short timeframe with relevant explanatory financial statements and Tesla´s high growth phase, historical data provide little ground in forecasting future fundamentals. Therefore, a forecast of the Tesla´s share price solely based on the development of fundamentals, gives little validity. The strategic analysis is therefore be given substantial weight.

Analysis scope: Our main focus will be the supply and demand for Tesla´s current three models: Model S, X and 3. As we will explain in the strategic analysis, we believe Tesla´s main bottleneck has been and will continue to be its production. We will therefore devote substantial focus to Tesla´s production capacity for their current models. As Tesla has not announced plans for any new model, we will not speculate in any new upcoming models within the budget period. Tesla Energy (energy storage products) are assumed to remain a small revenue source within the budget period, and will not be devoted any in-depth analysis. Our budget period is from 2016 to 2025.

1.2.3 Methodology

Data: Our research is only based upon publically available information and literature. Due to the company´s secretive information policy, most of the relevant product-, segment- or financial data is obtained through official company reports or announcements from CEO Elon Musk.

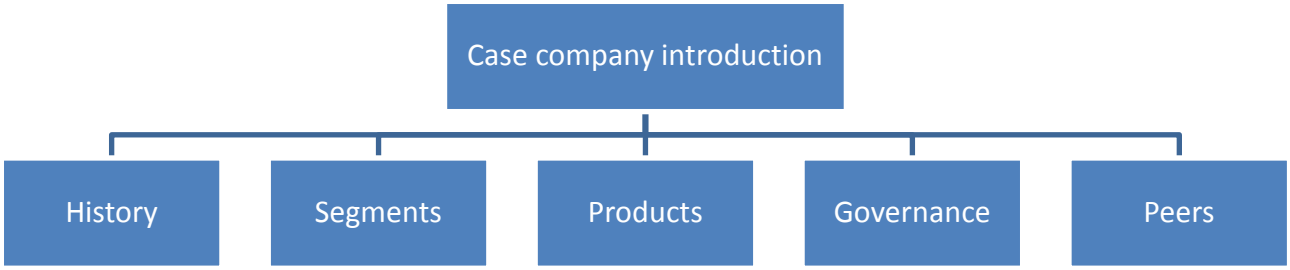
Theory: To answer the problem formulation we have used a broad range of economic and strategic models. We will not explain these models, as we assume the readers to have sufficient background knowledge about them. Standard theoretical frameworks have been applied on the following sub-questions: Q1: A modified *PESTEL*[7]-framework is used in analyzing macro-economic factors. Q2: *Porter´s 5 forces* are used to analyze industry-specific factors. Q3: The *Value Chain Analysis Model* is used to analyze internal strengths and weaknesses. This forms the foundation for a final *VRIO*[8]-analysis. The *SWOT*[9]-analysis gives a summary picture of the conclusions from all strategic analyses. Q4: The *DuPont-model is used* analyze the historical financial statements. This chapter is highly grounded in the literature of Petersen & Plenborg (2012)[10]. Q5: In the forecasting we have applied a *bottom-up analysis* of production capacity and cost of goods sold. Other forecasting strategies build on the literature of Petersen & Plenborg (2012) and McKinsey (2010)[11]. Q6: The *CAPM*[12]-model and *WACC*[13]*-model* are used to calculate the

[7] PESTEL = Political, Economic, Social, Technological, Environmental and Legal
[8] VRIO = Value, Rarity, Imitability, Organization
[9] SWOT = Strengths, Weaknesses, Opportunities and Threats
[10] Petersen, C. & Plenborg, T. (2012): *Financial Statement Analysis & Valuation*
[11] McKinsey & Company (2010): *Valuation*
[12] CAPM = Capital Asset Pricing Model
[13] WACC = Weighted Average Cost of Capital

appropriate cost of capital. Q7: The valuation is based on the *EVA*[14] model, supplemented with the *FCFF*[15]-model and a multiple analysis. Q8: Our valuation estimates are discussed through a *sensitivity analysis*.

1.3 Case company introduction: Tesla Motors, Inc.

A presentation of the case company Tesla Motors, Inc. (hereafter only called Tesla) is provided in order to improve the reader's comprehension of the strategic analysis. We believe greater knowledge of Tesla´s history, segments, products, governance and peers would be highly beneficial for this purpose.



1.3.1 History of Tesla Motors

The revenge of the electric car: Tesla Motors was started in 2003 in Palo Alto (California, USA) by a group of engineers in Silicon Valley who wanted to prove that electric cars could be better than gasoline-powered cars[16]. Based on the head-start discovery of how far lithium-ion technology had progressed in recent years[17], Tesla started designing a pure electric powertrain [18] using a lithium-ion battery from scratch. In 2005 Tesla produced their first driving car by supergluing hundreds of lithium-ion batteries and replacing it with the gasoline engine in a Lotus Elise-car. The Tesla Roadster was presented to the public in July 2006 with great feedback. A gorgeous two-seater convertible that could go from 0 – 100 km/h in approx. 4 seconds made the public rethink their perception of what an electric vehicle could be. Even though the last successful automotive start-up was Chrysler in 1925, Tesla had raised $ 189 million in equity by January 2009. $ 70 million came from Musk himself[19]. This happened in the midst of the post-financial crisis recession and at a time where car sales had dropped approx. 28 % from 2007 to 2009[20]. Tesla had at that time only delivered 147 vehicles of the Tesla Roadster. In June, Tesla received a loan of $ 465 million from the US Department of Energy[21]. This enabled the engineering and production of the Model S, and the development of commercial powertrain technology. In need of greater infrastructure, Tesla struck a

[14] EVA = Economic Value Added
[15] FCFF = Free Cash Flow to Firm
[16] Teslamotors.com: *www.teslamotors.com/about*
[17] Vance, A. (2015): *Elon Musk: Tesla, SpaceX, and the Quest for a Fantastic Future p. 148*
[18] Powertrains: The main components generating power to the wheels. See part: 2.3.1.2.1 *"Powertrains.*
[19] Crunchbase.com: *www.crunchbase.com/organization/tesla-motors#/entity*
[20] Statistica.com: *www.statista.com/statistics/199974/us-car-sales-since-1951/*
[21] Bizjournals.com: *www.bizjournals.com/pacific/stories/2009/06/22/daily33.html*

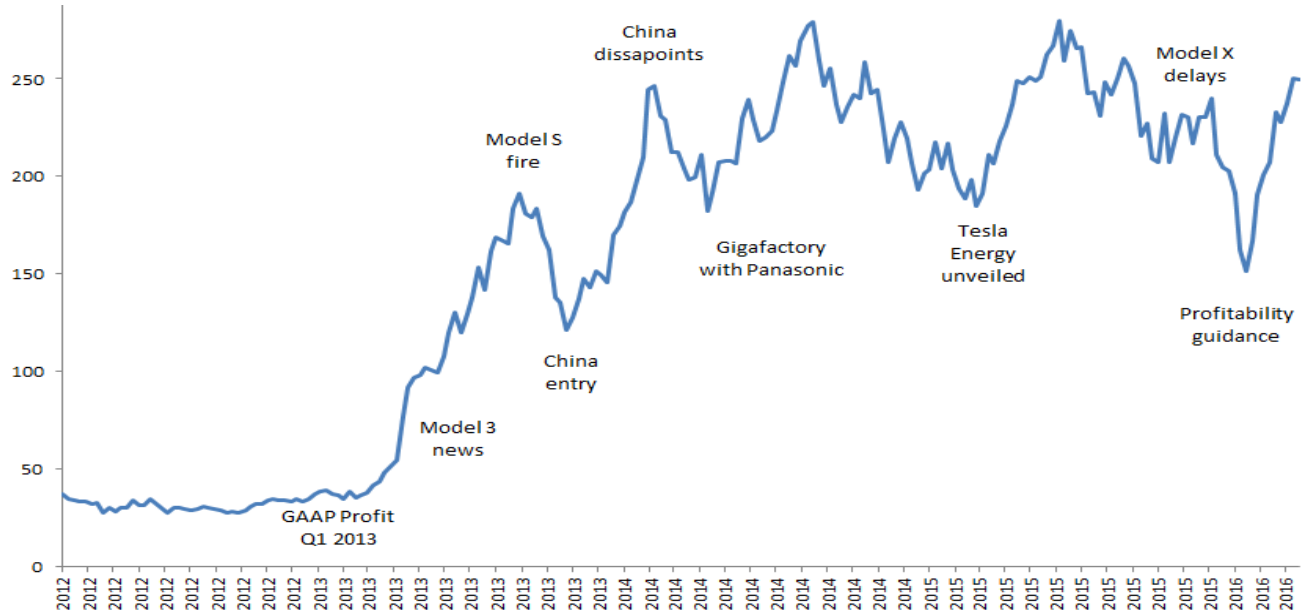
bargain in buying their current Fremont Factory with a capacity of 500.000 vehicles from Toyota. Due to Toyota's hard blow during the recession, Tesla got the factory once worth $1 billion, for only $51 million[22]. Tesla was now ready to start their mass-market manufacturing. The company went public on NASDAQ in June 2010 under the ticker TSLA, raising $226 million.

- *Making the world's greatest car:* According to Musk, car ads have for decades competed on the exact same thing: a bit more room, a few extra miles per gallon, better handling or an extra cup holder.[23] Innovation was incremental and competition was based on details. When Tesla started shipping the Model S in late 2012, they stunned their peers in the automotive industry. With the car's unprecedented performance, comfort and design, compared to other alternative fuel vehicles, it was truly a disruptive innovation. It has won several awards such as the prestigious Motor Trend´s "Car of the year" in 2012 and highest car rating in history from Consumer Reports in 2013[24]. This was an important victory for Tesla. After decades of criticism against the electric car, Tesla had managed to not only produce the best electric vehicle, but the best vehicle even when compared to its gasoline fuel rivals.

- *Financial trouble:* On the financial side, Tesla was close to bankruptcy entering 2013. Tesla had accumulated a large number of reservations since the Model S launch in 2009, but struggled to make these reservations into actual sales with the car's price tag of $100.000. In order to prevent bankruptcy, the CEO ordered approximately 500 employees from all areas of the company to quit all their current projects and get on the phone to sell cars[25]. This improvised sales force quickly sold 4900 vehicles in Q1 2013. Not only preventing bankruptcy, the company actually posted its first ever profit as a public company, with $11 million in net profit of the $562 million[26] in revenue. As seen below, this started the Wall Street adventure.

[22] Vance, A. (2015): *Elon Musk: Tesla, SpaceX, and the Quest for a Fantastic Future p. 289*
[23] Vance, A. (2015): *Elon Musk: Tesla, SpaceX, and the Quest for a Fantastic Future p. 264*
[24] Teslamotors.com: *www.teslamotors.com/en_MO/press*
[25] Vance, A. (2015): *Elon Musk: Tesla, SpaceX, and the Quest for a Fantastic Future p. 306*

[26] Tesla Motors: Q1 2013 Report

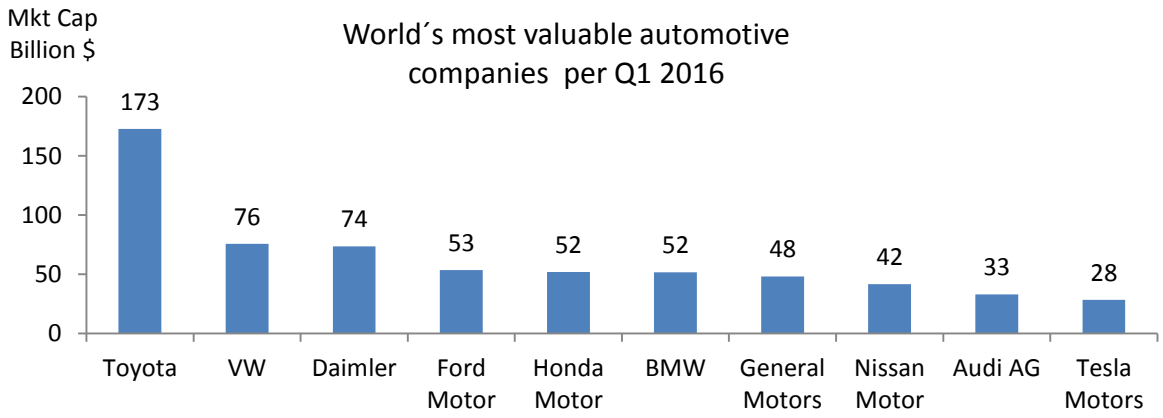


Tesla stock price development with explanations

The quest for a profitable electric future: When Q1 numbers was announced in July 2013 the share price soared 500 percent, from $ 30 to $ 130 per share. Tesla successfully entered the European market in 2013 boosted optimism further. This was followed by a sharp decline as vehicle fires[27] made headlines. The security issues regarding the batteries flammable nature were quickly fixed. The stock price rose again after Tesla entered the world's largest car market; China. As the Chinese entry seemed harder than expected, their plans to build a $ 5 billion "Gigafactory 1" was needed to stimulate optimism again in 2014. The factory was supposed to produce batteries for the long-range mass-market electrical vehicles (EV). It was later revealed in 2015 to also support their production of Tesla Energy batteries. With Tesla's growing infrastructure of charging stations and retail stores, Model S sales have reached accumulated sales of 120.000 vehicles by Q1 2016.[28] Tesla's second mass-market vehicle, the Model X, has suffered to meet deadlines. Five years after their Initial Public Offering (IPO), the market cap fluctuates around $ 30 billion[29]. Despite never delivering a positive full year result, Tesla ranks as the 10th most valuable automotive company in the world [30](chart below). Since Tesla´s unexpected General Accepted Accounting Principles

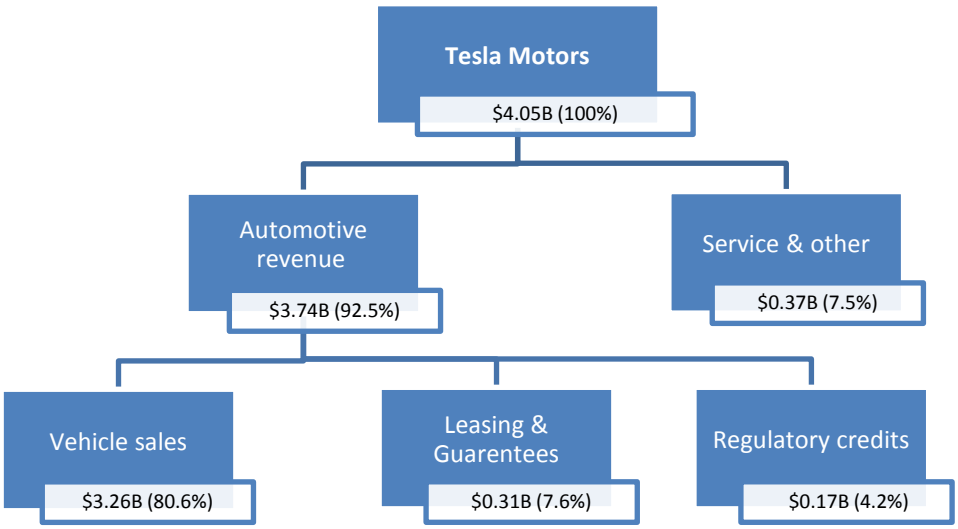
[27] New York Times: *www.nytimes.com/2013/10/04/business/car-fire-a-test-for-high-flying-tesla.html?_r=0*
[28] Teslamotors.com: *ir.teslamotors.com/releasedetail.cfm?releaseid=963460*
[29] Thomsonone.com Database (10.05.16)
[30] Googlefinance.com (10.05.16)

(GAAP) profitability announcement of Q1 2013, the Tesla stock has been a highly volatile. In February 2016, Tesla announced that they predict to be cash flow positive in FY 2016 and be GAAP profitable in Q4 2016[31].



1.3.2 Segments

Definition of core operations: Tesla designs, develops, manufacture and sell high-performance fully electric vehicles and energy storage products. In 2015 this resulted in the following revenue presented below[32]:



[31] Teslamotors.com: *ir.teslamotors.com/events.cfm*
[32] Tesla Motors: *Annual Report 2015*

Automotive revenue

- This is the first of two revenue lines of Tesla Motors
- In 2015 this constituded of 92,5% of Total revenues

This revenue segment will be the key focus in our forecasting estimation revenue as it accounts for 92.5 % of total revenues. We subsequently automotive revenue into three revenue lines:

- *Vehicle sales:* Tesla is focused on three car models; Model S, X and 3. These will be sufficiently introduced in the next part "Products". Vehicles sales also include revenue from vehicle options[33].
- *Leasing and guarantees:* Leasing is offered in the US, Canada and Germany with contracts of 3 to 4 years, with the option of buying the vehicle for its residual value after the lease term. Further, a resale value guarantee provides customer the same flexibility as a lease. Customers who finance their vehicles through one of Tesla´s banking partners have the option of selling the vehicle back to Tesla during the guarantee period for a predetermined resale value.[34]
- *Regulatory credits:* Certain US states require that car manufacturers produce a certain number of zero-emission vehicles. If car manufacturers are not able to reach this benchmark, they can buy emission credits from a manufacturer that surpasses this mark. Being a pure electric manufacturer, Tesla greatly benefits from this requirement.

Service and other revenue

- This is the second revenue line of Tesla
- It only constituded of 7,5 % of total revenues in 2015.

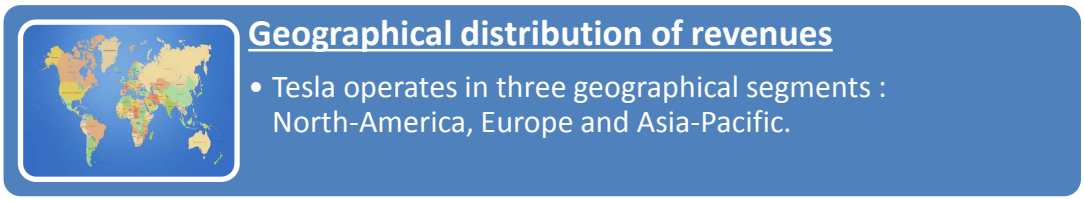
This revenue segment will only be briefly described in this valuation and forecasted indirectly as a percentage of total revenue for three reasons. First, Tesla does not report a financial overview of their revenue segment service & other. Second, this segment only constituted of 7.5 % of total revenue. Third, this revenue segment is assumed to be correlated with vehicle sales. We subsequently service and other revenue into four revenue lines:

- *Tesla Energy:* The Tesla Powerwall and PowerPack were unveiled in Q2 2015 with the purpose of maximizing the usefulness of solar panels, offering backup electricity supply solutions. It provides solar electricity at night, making the homes a net-zero consumer of energy and provides emergency backup.

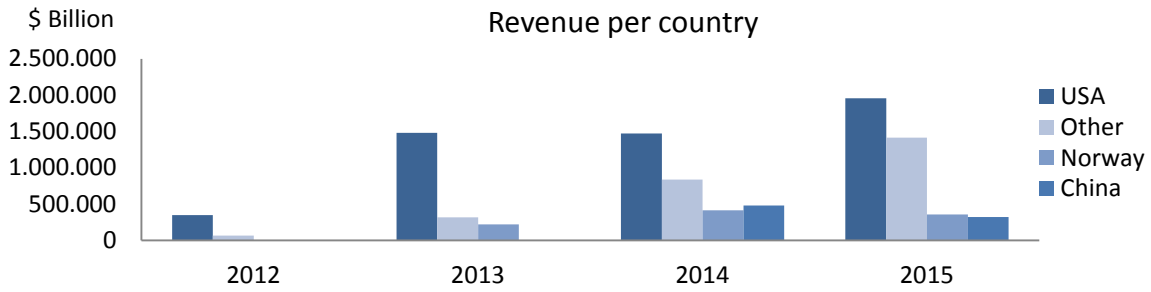
[33] Price list of vehicle options: Appendix 1

Tesla Energy products are charged with solar cell panels; however not provided by Tesla. Tesla did not quantify any revenues from these products in their 2015 annual report.

- *Powertrain & development services:* Tesla develops, manufacture and sell EV´s powertrain components to other EV-manufacturers. Previously this included both the Research and Development (R&D) and production behind Daimler´s EV and Toyota's RAV4 EV. Tesla still records revenue from the sales of electric powertrains, however at a diminishing scale.
- *Repair, maintenance and service:* The standard prepaid maintenance program for Model S, includes maintenance for a maximum eight years or 100.000 miles. This includes annual inspections and replacements of wear and tear parts, but tires and the battery.
- *Sales of pre-owned car:* In addition to reselling pre-owned Tesla´s through the resale value guarantee, Tesla also records net sales of non-Tesla vehicle trade-ins.



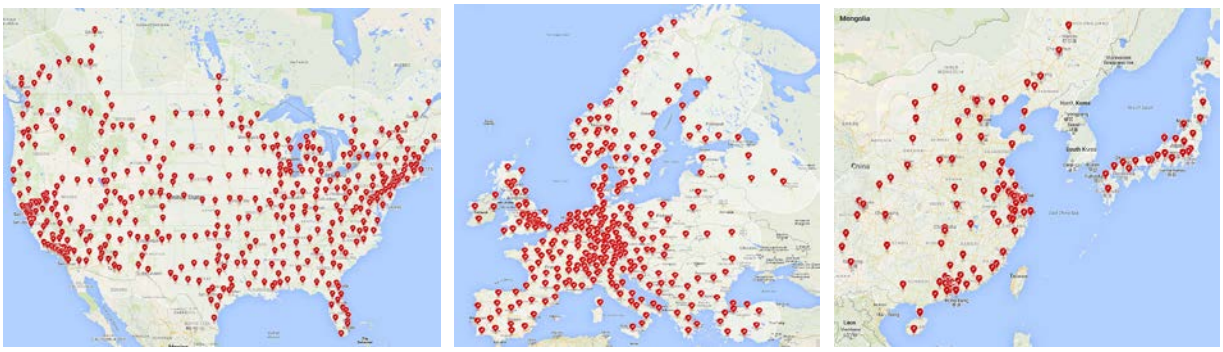
In order to predict growth prospects for Tesla, reviewing their ability to extend market shares across borders is important. As represented by the map of Supercharger expansion, Tesla operates in three geographical segments: North America, European and the Asia Pacific. However, the official sales numbers per geographic region is limited to top three countries in the annual report.



By Q1 2016, Tesla has sold 120.000 vehicles worldwide with their flagship vehicle; the Model S. Tesla is currently launching the Model X, before their first mass-market vehicle starts delivery in 2017.

- *North-America:* Currently, Tesla´s country of origin has most of their sales, approximately 50 percent. The North-American market still has unmet demand, providing an important home market also in the future.

- *Europe*: After the United States, Norway is second largest market in the world with an average of 11 percent of sales the past three years. This is the result of powerful government incentives favoring electric cars and early development of Supercharger infrastructure.[35]
- *Asia-Pacific:* In third place comes China with 8 percent of total revenues, a decline from 15 percent in 2014. The world's most important automotive market in the years to come is China, with the increasing number of wealthy consumers with a growing appetite for luxury vehicles[36]. Electric vehicles might also be a solution for the air pollution in major cities. Tesla´s entry into China has been severely complicated, resulting in disappointing sales numbers. The target for 2015 of 10.000 car sales, but only 4000 was realized. Tesla´s target for 2016 is adjusted to 5000 cars[37].



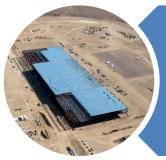
Supercharger Network Forecast of 2016: North-America, Europe, Asia Pacific

Tesla's successful growth is supported by their high investments in infrastructure. The most important drivers of Capital Expenditures (CAPEX) are the Tesla Fremont Factory and the Gigafactory 1. When finished, it will be the world´s largest building by physical area and the second largest building by usable space, only being beaten by the Boing Everett Factory.[38] Tesla has stated that there will be built several Gigafactories in the future battery demand of their growing vehicle production. Tesla leases a large number of properties in North America, Europe and Asia for retail and service locations as well as Supercharger sites.[39] Superchargers and Tesla stores are recording in "Sales, General & Administrative" costs[40], not in CAPEX. The four components are presented below.

[35] See PESTEL analysis
[36] See Industry Analysis
[37] Cleantechnica.com: *www.cleantechnica.com/2016/01/30/teslas-2016-china-sales-target-is-50-the-2015-target/*
[38] https://www.inverse.com/article/13633-tesla-s-model-3-gigafactory-will-have-the-largest-footprint-of-any-building-in-the-world
[39] Tesla Motors: Annual report 2015, p. 28
[40] See Section 3.1 "Historical Financial Analysis"

Assembly: Tesla Factory in Fremont, California

- Max capacity (2020): 500.000 vehicles, Current capacity: 100.000
- Require substantial CAPEX related to tooling and machinery



Batteries: Gigafactory 1 near Reno, Nevada

- Capacity equal to the entire global lithium-ion production in 2013
- World´s largest building when finished. Total cost $ 5 Billion USD.

Sales: 212 Tesla stores globally

- Sell cars directly through company-owned high-end stores
- In 2016, 80 new retail stores are expected.

Charging: 585 Supercharger stations globally

- Charging infrastructure in the US, Europe and Asia. 300 new in 2016
- Provide free charging to long range distances

Appendix 1: The complete list of owned & leased facilities is found in Appendix 1.

1.3.3 Products

Tesla uses a three stage strategy. Each step is needed to provide sufficient capital funds to finance the next. The chronological presentation of each stage in the sections below is combined with the relevant presentation of Tesla´s products.

Stage 1: Low volume, high price

- Tesla Roadster (2008-2012)
- Sold 2450 vehicles
- Purpose: fund stage 1

Stage 2: Mid volume, less-high price

- Tesla Model S (2012 -) & Model X (2015 -)
- Sold 120.000 vehicles
- Purpose: fund stage 2

Stage 3: Low price, high volume

- Tesla Model 3 (Exp. 2017)
- 400.000 reservations
- Purpose: accelerate the world's transition to sustainable energy

Stage 1: The low volume, high price product vehicle came in 2008 with the Tesla Roadster. The vehicle came with a $ 109.000 USD base price and sold 2450 vehicles in over 30 countries[41]. It gained a lot of attention from the automotive community, as it was the first fully electric sports car with an acceleration of 0 – 100 km/h of 3.2 seconds. The vehicle can drive 320 km per change of its lithium-ion batteries[42], longer than any other all-electric vehicle ever produced. The production was terminated in 2012 in order to focus production on stage 2.

Stage 2: The mid volume, less high price Model S was launched in late 2012. To this date this vehicle has sold over 120.000 models worldwide, making it the second most sold plug-in[43] electric car in history. Its "lesshigh" base price has fluctuated a lot over time after starting at $ 92.000 USD, rising to $ 109.000 USD, before recently coming in at $ 70.000 USD. The Model X was launched in 2015 with the intention of broaden Tesla´s addressable market by appealing more to families and female customers. Building on the

[41] Tesla Motors: Annual Report 2012
[42] Same battery as used in lap-tops. It was the first production vehicle to use this battery type.
[43] Plug-in: Recharged with an electric hose and not by regenerative breaking such as electric hybrids.

platform of its predecessor, the Model X is a high-performance seven seat SUV[44]. By also being a mid-volume, less high price product, the vehicle is later named "the stage 2.5". The base price is $ 92.000 USD with a backlog 35.000 reservations. The vehicle has suffered from substantial production delays with only 507 produced and 208 sold vehicles in 2015. Critics claim the delays stem from having over-engineered the vehicle with its signature "falcon wing" doors. Still the production is anticipated to fully start in Q2 2016.

Stage 3: Tesla´s high volume, affordable price product was unveiled 31 March 2016. In the long-run, the high-end luxury segment is too small for Tesla´s grand volume ambitions. In order to create a mass-market car, Tesla needs a mass market price. Tesla´s model 3 will therefore compete in the small premium market with the price tag of $ 35.000. The average price of a new car is $ 31.000 USD and therefore serves as a benchmark for a mass market product. Model 3 starts shipping in late 2017 according to Tesla's guided production schedule. The vehicle had a staggering 115.000 reservations before anyone had seen it. A week after it's unveiling the list had grown to 325.000 reservations. According to Tesla this is "the single biggest one-week launch of any product ever", beating both the company´s and the stock market's expectations.

Model	Model S			Model X			Model 3
Battery pack	P90D	90D	70D	P90D	90D	70D	N/A
Range (Km)	505	550	442	450	470	400	> 345
Acceleration (0-100)	3,1	4,2	5,2	4,0	5,0	6,2	< 6,0
Top speed (Km/h)	250	250	225	250	250	225	N/A
Motor power (HP)	772	524	524	N/A	N/A	N/A	N/A
Torque (Nm)	967	660	525	N/A	N/A	N/A	N/A
Cash price (USD)							
Base	108.000	88.000	75.000	113.000	93.000	80.000	35.000
Fully loaded	144.500	113.500	100.500	149.500	118.500	105.500	N/A

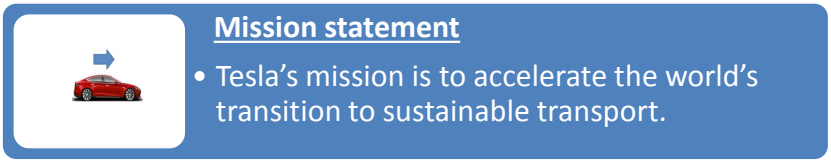
Price and performance: Pricing varies greatly depending on country, choice of battery pack, options and year. Country specific price differences comes from taxes, EV-incentives and transportation costs.[45] These details are determined when the customs design their vehicle online prior to ordering. Over 50.000 Model S were delivered in 2015, but Tesla does not foreclose any information relating the product-mix or average transactional price. However, it seems as the average customer is demanding lower priced vehicles as delivery numbers are increasing. Tesla´s revenue per unit declined from $ 85.000 in 2014 to $ 65.000 in 2015[46].Tesla has started selling a Model S 70D with a base price of $ 70 000.

[44] SUV = Sports Utility Vehicle. Characteristic: usually a larger sized and higher priced vehicle.
[45] See the strategic analysis
[46] Average Revenue per Unit = Vehicle Sales Revenue / Vehicles Delivered

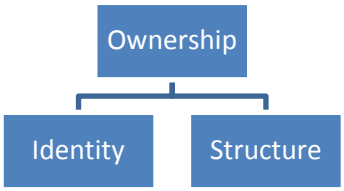
- *Appendix 2 & 3*: Comments to numbers presented in the table above is found in Appendix 2. The complete list of standard equipment and options are found in Appendix 3.

1.3.4 Governance

The most interesting valuation aspect of the Tesla stock is the company's governance. Therefore, understanding Tesla´s vision, strategy and leadership is of high importance in understanding their current market value.

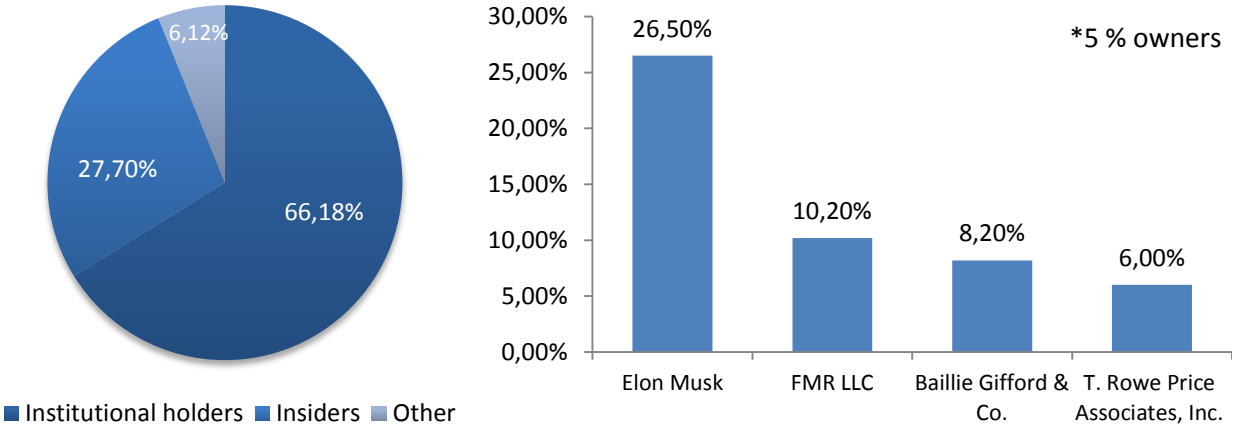


This mission is strongly supported by Elon Musk. At the same time Tesla intends to make profit for its owners. The separation of ownership and control[47] in companies creates a demand for corporate governance mechanisms in order to preserve the shareholders' interests. Therefore we will analyze the ownership identify and structure.



- Identity: Institutional investors consist of 66.18 percent of Tesla´s total ownership.[48] They invest large amounts of money on the behalf of others and their performance is often measured in terms of financial success. Their objectives in Tesla are subsequently most likely shareholder value and liquidity[49], not protecting the environment. This provides confidence in the future profitability of Tesla.

[47] Berle & Means (1932): *The Modern Corporation and Private Property*
[48] Nasdaq.com Database
[49] Conyon & Thomson (2012): *Corporate Governance Mechanism*



Graph: Ownership Identity and structure 1-1, Source: Morningstar.com Database[50]

Structure: Elon Musk has a highest individual ownership stake with 26.50 percent. Tesla has 609 institutional owners of which the five largest in combination own 30.58 percent. In combination these block shareholders can have considerable influence in the election of directors, takeover battles or board representation[51]. However, if the coordination fails, then each individual ownership stake in Tesla is not particularly powerful. This highlights Elon Musk´s major influence of the company. Understanding his background, track-record and motives serves a highly valuable foundation in forecasting the future performance of Tesla.

The importance of Elon Musk

- CEO, Chairman, Co-founder & Largest owner
- CEO & Co-founder of SpaceX
- Chairman & Co-counder of SolarCity

The story of Tesla starts with their co-founder Elon Musk, an already famed dot-com millionaire, space explorer and alternative energy investor. This self-thought software programmer from South Africa had prior to Tesla already gained investors' confidence during the 2000 technology-bubble by selling his two Internet start-ups. He had sold his first company Zip2 in 1999 for $ 307 million to Compaq and PayPal to eBay in 2001 for $ 1.5 billion[52]. Adjusting for Musk´s shares in the company, he earned $ 22 and $ 165 million respectively from these deals. At age 31, in 2002, he was capable of approaching his life-long desire to:

[50] Morningstar.com Database
[51] Larcker & Tayan (2011): *Corporate Governance Matters*
[52] Vance, A. (2015): *Elon Musk: Tesla, SpaceX, and the Quest for a Fantastic Future p. 14*

"Make all transportation electric in order to protect the planet Earth."

"Make humans a planetary species in case of a mass extinction on Earth."

He used all of his capital to start the companies Space Exploration Technology (SpaceX), Solar City and Tesla. SpaceX was aimed to become NASA´s preceded after NASA shut down their space program. After learning how to design and manufacture space rockets from scratch, SpaceX was incorporated in 2002. One year later he decided to simultaneously manufacture electric vehicles through Tesla Motors. Solar City was founded in year 2006 to produce solar cell panels. Thereby, Musk was simultaneously running three companies in three doomed dead-end industries; private space exploration (Space X), electric vehicles (Tesla Motors) and solar cell panels (Solar City). SpaceX is now profitable as governments and company out-source their space program to SpaceX´s cheaper reusable rockets, while SolarCity is one of the largest solar power companies in the US. For valuation purposes, the current confidence in Tesla can be explained by Musk´s parallel success with all three companies, despite their humble beginnings. He is currently the first person to start and run three billion dollar companies at the same time. Also, the performance of SpaceX and Solar City has a tendency of affecting the share price of Tesla[53], despite being separate companies.

Board of Directors			Executive Officers		
Name	Age	Position	Name	Age	Position
Elon Musk	44	Chairman	Elon Musk	44	Chief Executive Officer
Brad W. Buss	52	Director	Jason Wheeler	42	Chief Financial Officer
Robyn M. Denholm	52	Director	Jeffrey B. Straubel	40	Chief Technological Officer
Ira Ehrenpreis	47	Director	Jon McNeill	48	President, Global S&S
Antonio J. Gracias	45	Director	Doug Field	50	Vice President, Engineering
Stephen T. Jurvetson	49	Director	Greg Reichow	46	Vice President, Production
Kimbal Musk	43	Director			

- *Board composition:* Tesla´s performance can also be linked to the boards' vast CEO-experiences and contact network in the automotive-, technology, retail- and venture capital industry.
- *Director independence:* Along most other US corporations, Tesla follows a one-tier board structure, as the CEO Elon Musk is also the Chairman. In addition, Musk also is the CEO of SpaceX and Chairman of SolarCity. It serves as a concern that he is not able to fully devote his time and energy on operating and managing Tesla.

[53] Vance, A. (2015): *Elon Musk: Tesla, SpaceX, and the Quest for a Fantastic Future p. 320*

1.3.5 Peers and peer group definition

To find suitable peers for Tesla, we have to identify what kind of company Tesla is. A perfect peer would be a company that operates in the same industry, same geographic area and deliver comparable products. It is also benefit that a peer is at the same maturity stage as the selected company and has a similar outlook for long-term growth and return on invested capital.[54] There is two ways to view Tesla; the premium car company and the technology company.[55] However, as Tesla's revenue is generated by automotive sales, we will mainly consider Tesla as a premium car company, rather than a technology company.

1.3.5.1 Premium automakers peers

BMW, Audi and MB are the world's three largest premium car manufacturers, respectively.[5657] BMW is a part of BMW Group together with MINI and Rolls-Royce, Audi is one of Volkswagen's many brands, and MB is under the Daimler umbrella.[5859]

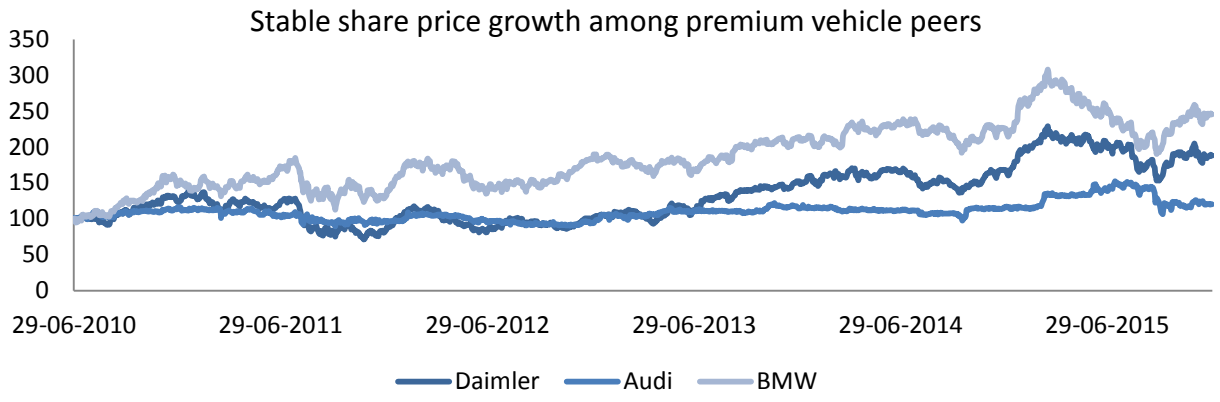
They all target the premium car market on a global scale.[6061] Currently these brands do not offer electric vehicles comparable with the Model S. Tesla therefore compete with the ICE [62]vehicles presented below. And Tesla will in 2017 with the Model S meet direct competition from the wide range of vehicles they offer. The table below shows some of the cars that are considered similar to that of the Tesla-models.

[54] McKinsey & Company (2010): *Valuation*, p. 315
[55] Teslamotors.com: *www.teslamotors.com/about*
[56] Statistica.com Database: *www.statista.com/statistics/262921/global-production-of-luxury-cars-by-make/*
[57] Bloomberg.com: *www.bloomberg.com/news/articles/2015-09-10/mercedes-beats-audi-to-take-second-place-in-luxury-car-sales*
[58] BMW.com: *www.bmw.com/com/en/insights/corporation/bmwgroup/content.html*
[59] Wolkswagnenag.com: *www.volkswagenag.com/content/vwcorp/content/en/brands_and_products.html*
[60] Audi.com: *www.audi.com/corporate/en/company/corporate-strategy.html*
[61] Securitystocks.net: *www.securitiesstocks.net/article/276458861/audi-vs-mercedes-who-is-winning-/*
[62] ICE = Internal Combustion Engine. These vehicles are fueled by gasoline not electricity.

TESLA	Model 3	Model X	Model S
BMW	3-Series	X6	7-series
			
Audi	A3	Q7	A7
			
Mercedes-Benz	C-class	GLC	S-Class
			

Model Comparison Tesla, BMW, Audi, Mercedes-Benz, Authors

Looking at product, industry and geographic area, BMW, Audi and MB are suitable peers to Tesla. The minimum of what is expected of a peer is therefore covered. However, looking at maturity and financial aspects, the equality stops. The automobile industry is very mature and grows with a rate approximately equal to the long-run aggregate growth.[63] This also goes for BMW, Audi and MB, in contrast to Tesla.



Premium manufacturer stock development, Authors/Datastream

1.3.5.2 Maturity & financial peers

To match Tesla regarding maturity, financial state and products, the peers chosen in the multiple valuations are very much diversified. Combined they will serve as an industry benchmark. In the category high growth automaker, we have found the two Chinese companies: Build Your Dream (BYD) and Great Wall Motors

[63] Damodaran, A. (2014): *Tesla: Anatomy of a Run-up*

(GWM). These are mainly selected as peers as they are all heavily present in areas where Tesla has and wants to have their main markets. They also deliver cars in the premium class and fully electric cars, making them direct competitors. These would be highly beneficial to benchmark on an operational level with Tesla, long with BMW, Daimler & Audi. However, we are unable to find data on their operational performance, just their stock market performance. These among other maturity and financial peers are presented in the Cost of Capital section. A diversified peer portfolio is necessary, because there are no companies that match the definition of a perfect peer. This is easily exemplified by looking at the automotive industry. The automotive industry is very mature and settled and is therefore, standing alone, not that good of a benchmark for Tesla, being a young company, in aspects such as return on invested capital and expected growth rate. All of the peer groups are comparable to Tesla in different ways. Combined, they make a complete peer group for estimation purposes.

1.3.5.3 Electric vehicle peers

Currently Tesla does not have any pure electric premium peers. The currently most sold EVs: Nissan Leaf and Chevrolet Volt are too different regarding battery capacity, physical appearance and price. However, they may become more important in the future when Model 3 reach the market in late 2017.

Premium compact EV´s Sorted after range	**Model 3** 	**Chevy Bolt** 	**BMWi3** 	**Nissan Leaf SV** 
Price	$35.000	$ 37.500	42.400	34.200
Availability	Global	US	Global	Global
Range	215+ miles	200+ miles	80-100 miles	107 miles
Battery	TBC	60 kWh lithium-ion	22 kWh lithium-ion	30 kWh lithium-ion
Charging	TBC	9 hours full (1 hour to 80 %)	3.5 hours full (30 mins to 80 %)	6 hours full (30 mins to 80 %)
Delivery	Late 2017	Late 2016	Available now	Available now

Company data, Evercore ISI Research[64], Authors

Currently Tesla Model S is the most sold vehicle model in both the luxury vehicle segment and pure electric segment.

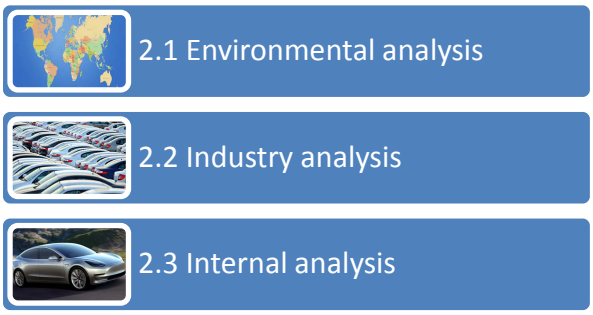
[64] Evercore Research ISI (2016): *Analytics Report of Tesla Motors*

US Automotive Sales 2015			
Luxury vehicle peers	Units	Pure Electric	Units
Tesla Model S	25.202	Tesla Model S	25.700
Mercedes-Benz S-Class	21.934	Nissan Leaf (Nissan)	17.269
BMW 7-Series	9.292	BMW i3 (BMW)	11.024
BMW 6-Series	8.146	Fiat 500e (FCA)	6.194
Audi A7	7.721	VW e-Golf (Volkswagen)	4.232
Lexus LS	7.165	Chevrolet Spark EV (GM)	2.629
Mercedes-Benz CLS-Class	6.152	BMW i8 (BMW)	2.265
Audi A8	4.990	Mercedes-Benz B-Class ED (Daimler)	1.906
Porsche Panamera	4.985	Ford Focus Electric (Ford)	1.582
Jaguar XJ	3.611	Smart ED (Daimler)	1.387

US market leading vehicle models, luxury segment & pure electric

2 Strategic Analysis

The strategic analysis is divided into three parts, environmental analysis, industry analysis and internal analysis. The two first mentioned are external analysis, focusing on macro factors affecting the valuation of Tesla Motors.



2.1 Environmental analysis

In this section we aim to analyze the following question (Q1): "How do environmental factors affect the share price?"

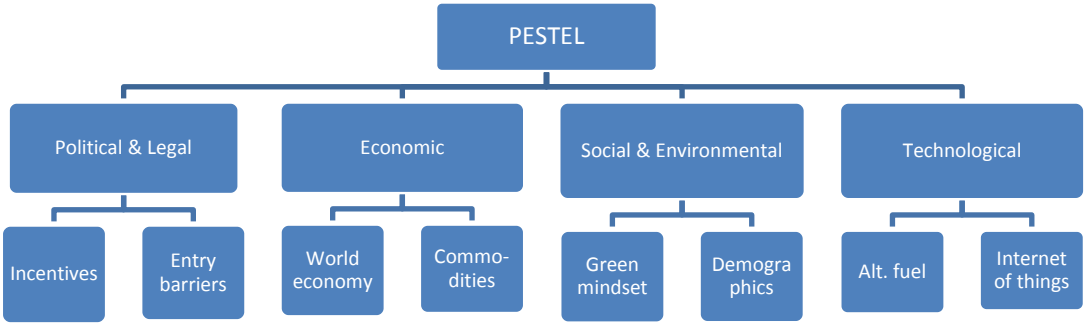
We aim to answer this through a modified PESTEL[65]-framework, where Political & Legal and Social & Environmental factors have been merged. The PESTEL framework evaluates the macro factors that may affect Tesla´s performance while being out of the company´s control.[66] Macro factors affect industries and companies differently, so it´s important to understand which macro factors are likely to affect a company´s cash flows and risks, now and in the future.[67]

The market for alternative fuel vehicles is relatively new and rapidly evolving, characterized by rapidly changing technologies, competition, evolving government regulation and industry standards, frequent new vehicle announcements and changing consumer demands and behaviors.[68] Currently, batteries account for approximately one third of the company COGS. Therefore, the widespread adoption of EVs must be supported by a minimum of these four factors:[69]

[65] Political, Economic, Social, Technological, Environmental and Legal
[66] Petersen, C. & Plenborg, T. (2012): *Financial Statement Analysis & Valuation* p. 188
[67] Petersen, C. & Plenborg, T. (2012): *Financial Statement Analysis & Valuation* p. 189
[68] Tesla Motors: Q3 Report 2015, p. 32
[69] Bloomberg.com: www.bloomberg.com/features/2016-ev-oil-crisis/

- Government incentives lowering the cost of ownership and/ or production
- Manufacturers operate with very low or negative margins
- Customers accept to pay a premium for driving EV´s
- Battery costs decline through scale economies and technological advancements

In the start-phase of alternative fuel vehicles, the first three factors are the drivers of early adoption. However, these factors cannot be sustained in the long run. Factor four, declining battery costs, is therefore the only solution for EVs. But as forecasted by Bloomberg New Energy Finance, the lowered battery cost is assumed to become the competitive advantage of electric vehicles after 2022. These among other key environmental factors will be discussed in the PESTEL analysis. Below is a table the eight chosen macro factors discussed in the PESTEL analysis:



2.1.1 Political & legal factors

The role of governments is critical in forming the EV-industry. Examples are: government regulations & economic incentives promoting fuel efficiency and alternate forms of energy. This also includes tax breaks and other governmental incentives to purchase and operate electric vehicles.[70]

2.1.1.1 Government incentives & restrictions

The adoption or elimination of government and economic incentives is critical for the success of the EV-industry in its competitiveness with the gasoline car. Tesla currently has international operations and subsidiaries in various countries and jurisdictions in Europe and Asia that are subject to the legal, political, regulatory and social requirements and economic conditions.[71] One of the strongest explanation variables of Tesla´s global vehicle sales is specific countries incentives. Historically, the cost of EV-batteries has been 1/3 of the cars total retail price. Even though much progress is done with battery cost, it is predicted[72] that

[70] Tesla Motors: Q3 Report 2015, p. 32
[71] Tesla Motors: Q3 Report 2015, p. 38
[72] Wired.com: www.wired.com/2016/03/sorry-dont-expect-tesla-model-3-cost-30k/

the unsubsidized total cost of ownership of EVs not will fall below ICE cars before 2022.[73] Leading forward to this date, we expect prices of EVs to decline in order to become directly competitive with ICE-cars. By this stage, government incentives would be gone, as they no longer are needed.

Monetary government incentives in Tesla´s three largest markets		
US	Norway	China
7.500 USD tax credit	Elimination of: import tax, 25 % VAT and gasoline car tax	Elimination of registration tax worth 12.000 USD

North-America: Substantial investments are being done through the Department of Energy such as Recovery Act, American Recovery and Reinvestment Act and Advanced Energy Manufacturing Tax Credit program. These programs boost EV-demand and profitability for Original Equipment Manufacturers (OEMs)[74]. For customers the most important incentive is the $ 7.500 USD tax credit.[75]

Europe: The EU has decided on certain climate goals with the goal of reducing the dependency of import from other countries, while preserving the environment. Originally the goal was to reduce the CO2 dependency in 2020 with 20 percent from 1990-levels.[76] However, with the successful 19 percent decline from 1990 levels, EU decided in 2014 to aim for a more ambitious reduction of 40 percent by 2030.[77] From 2015, new cars must now on average release maximum 130 g CO2/km and per 2020 an average of maximum 95 g CO2/km.[78] Similar efforts have been applied in the US, China and Japan. We expect that the demands for electrical vehicles increase in the future, pushing manufacturers towards lower emission vehicles. Other political initiatives can be seen in for example in Norway, where ICE-cars have very high fees. Despite Norway´s modest demographic profile, Norway is currently second largest market for Tesla. This is a prime example of how incentives can make or break EV-sales. In Norway, EVs is not subject to neither import tax, taxes on non-recurring vehicle fees, the 25 percent value added tax or the purchase taxes on gas-powered vehicles.[79] However, the future of such incentives is uncertain. Europe´s second largest Tesla-market, Denmark, was also created by similarly favorable incentives. They will now be

[73] Bloomberg.com: www.bloomberg.com/features/2016-ev-oil-crisis/
[74] International Economic Development Council (2015): *Analysis of the Electric Vehicle Industry*
[75] Teslamotors.com: *www.teslamotors.com/support/incentives*
[76] European Commission: *ec.europa.eu/clima/policies/strategies/2020/index_en.htm*
[77] The Guardian: *www.theguardian.com/world/2014/oct/24/eu-leaders-agree-to-cut-greenhouse-gas-emissions-by-40-by-2030*
[78] McKinsey & Company (2013): *EVolution Report*
[79] Tesla Motors: Q3 2015 Report, p. 39

reduced[80], as Tesla´s retail price will be subject to a 150 percent increase leading forward to 2020, as a result of taxes and fees on electric vehicles.[81]

- *Asia*: Similar incentives are being done in China where owners of Tesla-vehicles don't have to pay registration fees, saving them up to $ 12.000 dollars per car.[82] The Chinese government have aim to make 30 percent of all public vehicles driven by alternative energy by 2016.[83] In China, there are restrictions on new vehicles through lotteries and auctions in order to reduce vehicle volume. This is done to prevent the rising risk of extremely high air pollution and reduce the dependency of fuel import.

2.1.1.2 Entry barriers

Tesla´s distribution model is built for rapid innovative expansion. However, it has encountered several legal and political issues. In order to reach their 2020 goals, successful international expansion is might be critical.

- *Chinese challenges*: China´s protectionist regime creates further entry barriers. Tesla suffers of the lack of subsidies, benefitted by its local competitors, as well as the high import taxes of foreign cars carried by the customers. Thereby the local EV-manufacturer BYD is currently crushing Tesla´s sales number in the battle for China´s new EV-market. BYD delivered 61.722 plug-in EVs in 2015[84], of which most were in China. Tesla´s goal was 10.000 vehicles, but they disappointingly only managed to deliver 5.000. Musk addressed the situation by stating: "we are still doing reasonably well in mainland China, but we do face quite high import duty and we do not yet have access to local incentives".[85] The obstacles for Tesla's cars in Mainland-China are much greater than it would be anywhere in the world.

- *New technology entry:* Automobile manufacturer are subject to environmental, health and safety laws and regulations at numerous levels both in the United States and abroad. As Tesla´s new software update "Autopilot" is a completely new feature that US and as foreign regulators have limited experience with, there is a risk that regulators could restrict whether and how customers are able to use Autopilot. This could adversely affect Tesla and other manufacturers' business.[86]

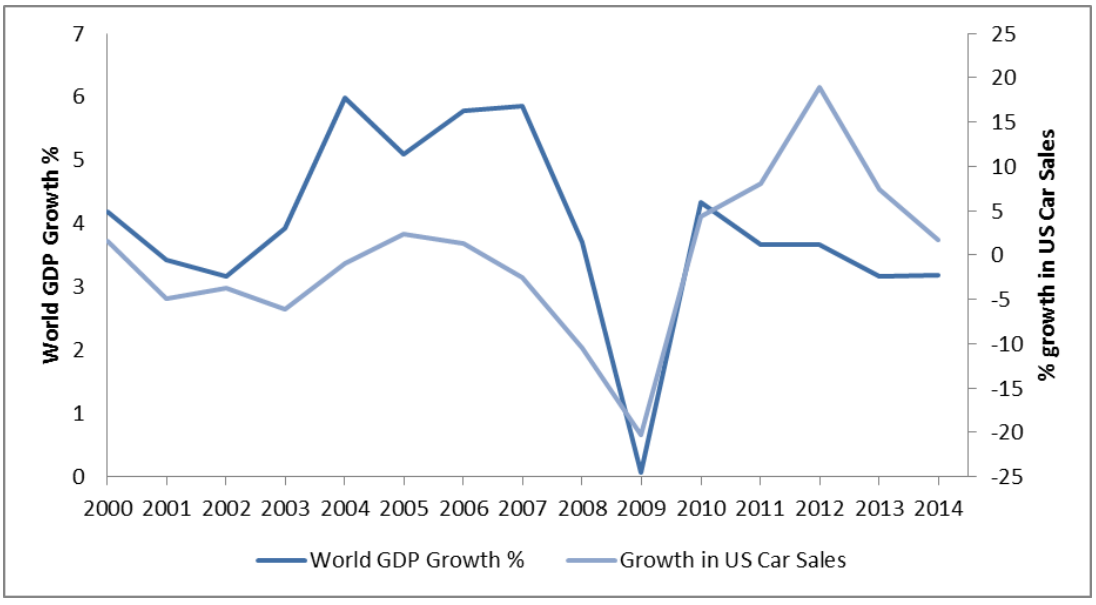
[80] Tesla Motors: Q3 2015 Report, p. 40
[81] SKAT: *www.skat.dk/SKAT.aspx?oId=1817284*
[82] Greencarreports.com: *www.greencarreports.com/news/1095173_tesla-model-s-gets-huge-incentive-in-shangahi-no-12k-fee-for-registration*
[83] Greentechmedia.com*: www.greentechmedia.com/articles/read/china-calls-for-30-of-government-cars-to-use-alternative-fuel*
[84] Cleantechnica.com: *www.cleantechnica.com/2016/01/30/teslas-2016-china-sales-target-is-50-the-2015-target/*
[85] Chargedevs.com: *www.chargedevs.com/newswire/tesla-sales-challenging-in-china-but-healthy-in-hong-kong/*
[86] Tesla Motors: *Q3 2015 Report, p.40*

2.1.2 Economic factors

The capital goods sector tends to benefit on a strong and growing economy. If the economic condition worsens, the demand for capital goods is among the first to disappear.[87] Tesla can be categorized as a capital good meaning that their future sales figures are affected by the consumer's disposable income. Hence, the sector is pro-cyclical.

2.1.2.1 World Economy

The Gross World Product (*GWP) vs. automotive industry:* GWP is steadily growing. Global growth, currently estimated at 3.1 percent in 2015, is projected at 3.4 percent in 2016 and 3.6 percent in 2017.[88] China is the world's largest car market, measured in both annual car sales and growth, as it just surpassed the United States. One risk factor of Tesla´s sales are economic fluctuations as the industry is highly cyclical. A cyclical industries are higher in periods of economic prosperity and expansion, while tends to be lower in periods of economic downturn[89]. The industry´s dependency on employment rates, global consumer spending, financing rates and the world price of crude oil, makes it vulnerable to economic shifts.[90] This can be expressed in the graph below.



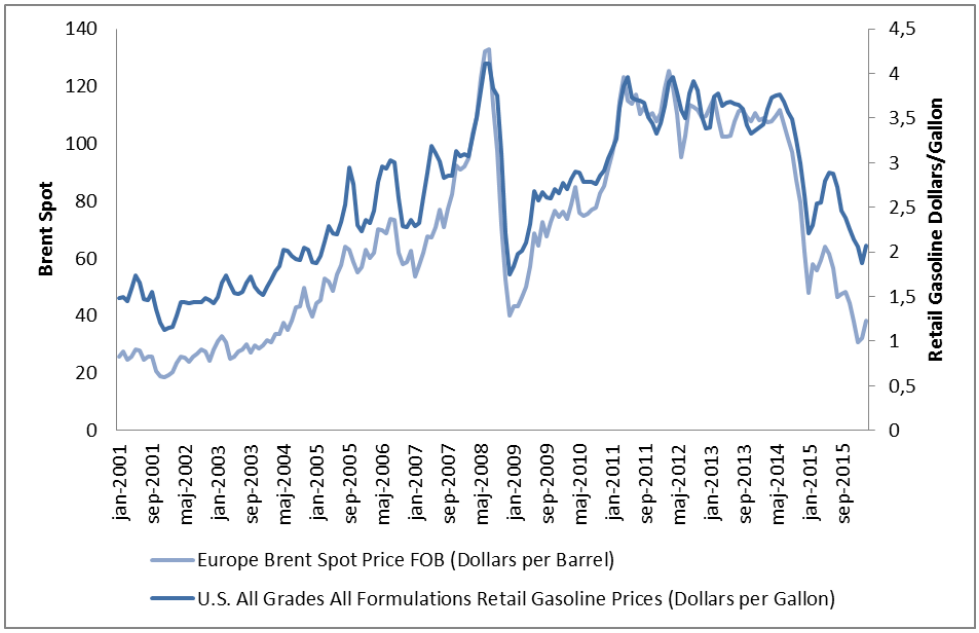
World GDP growth vs. US Car Sales, Authors / U.S .Energy Information Administration

[87] Investopedia: *www.investopedia.com/terms/c/capital_goods_sector.asp*
[88] International Money Fund: *www.imf.org/external/pubs/ft/weo/2016/update/01/*
[89] Investopedia.com: *www.investopedia.com/terms/c/cyclical_industry.asp*
[90] Ibisworld.com: *www.ibisworld.com/industry/global/global-car-automobile-sales.html*

- *Exchange rates:* The recent strengthening of the U.S. dollar therefore has reduced, and any further strengthening of the U.S. dollar would tend to further reduce, Tesla´s revenues as measured in U.S. dollars. As Tesla´s operations to a larger extent will occur in markets outside the US, exchange rates will be a greater risk factor for Tesla. Currently, Tesla has much higher revenues than costs denominated in other currencies such as the euro, Norwegian kroner, Chinese yuan and Canadian dollar.[91]
- *Borrowing rates:* It is common to finance cars purchases though loans. If borrowing rates are too high, this would have a negative effect on new car sales, as consumers rather maintain their existing vehicles.[92]

2.1.2.2 Commodities

- *Energy markets:* Oil prices have declined markedly since September 2015, reflecting expectations of sustained increases in production by the Organization of the Petroleum Exporting Countries (OPEC) members aiding continued global oil production in excess of oil consumption.[93] Futures markets are currently suggesting only modest increases in prices in 2016 and 2017.[94] Lower gasoline prices are a risk factor for the EV industry as lower gas prices makes EV´s in isolation less attractive.



Brent Spot vs. Gasoline Prices US, Authors / U.S .Energy Information Administration

[91] Tesla Motors: *Annual Report 2015, p. 16*
[92] Investopedia.com: www.investopedia.com/articles/stocks/08/auto-stock.asp
[93] Bloomberg: *www.bloomberg.com/features/2016-ev-oil-crisis/?cmpid=yhoo.headline*
[94] World Economic Outlook Update: *January 2016*

- *Raw materials*: Increasing raw material prices cannot, due to competitive reasons be carried over to the customers. Price increases would therefore pressure Tesla´s margins. Raw material availability is probably the biggest challenge facing the Gigafactory 1 outside of the need for basic demand.[95] It is also the only part of Tesla´s value chain that the company does not control. Tesla incurs significant costs related to procurement of raw materials for manufacturing high-performance electric cars and assembling vehicles. The key input factors are iron and steel castings, forgings, alloy wheels, fuel injection systems, batteries, electrical wiring systems and electronic information systems.[96] Tesla also uses interior systems such as plastic finishers, glass, consumables and fuels. The rising input costs could have a major impact on the operational costs of the company. These costs are not easily transferred to the customers due the intense price competition. We therefore incorporate increasing raw material costs in the forecast of COGS[97].

- *Lithium*: Tesla´s lithium-ion battery technology relies on the supply of lithium. Cutting Tesla's battery cost by 30 percent requires a secure long term supply of lithium. 70 percent of the world's lithium is found in Chile, Argentina and Bolivia. The global increase in lithium demand might cause a shortage. According to FMC Lithium, Tesla will likely pay high market prices for lithium by the end of this decade.[98] However, we assume constant lithium prices in the forecast period.

2.1.3 Social & environmental factors

2.1.3.1 Green mindset

Due to the increasing awareness of global warming and pollution, lower emission vehicles naturally increase in demand. This comes from both political requests described above, but also environmentally conscious consumers themselves. However, the adoption of EVs depend on consumers perceptions about electric vehicle quality, safety (in particular with respect to lithium-ion battery packs), design, performance and cost.[99]Further, a common concern among consumers is the limited range over which electric vehicles may be driven on a single battery charge. We estimate this to be more important purchasing criteria than simply "going green". In the industry analysis we argue that Tesla first and foremost compete with other premium priced vehicles, rather than other EVs.

[95] Financial Times*: www.ft.com/cms/s/0/4a924a64-99df-11e5-987b-d6cdef1b205c.html#axzz45i1yXXHy*
[96] Tesla Motors: *Annual Report 2015, p. 17*
[97] COGS = Cost of Goods Sold
[98] Financial Times: *www.ft.com/intl/cms/s/0/4a924a64-99df-11e5-987b-d6cdef1b205c.html*
[99] Tesla Motors: *Q3 2015 Report, p. 34*

2.1.3.2 National preferences

Chinese challenges: One major problem of the Chinese entry is consumers' range anxiety. Consumers fear running out of power in the major traffic jams bothering Chinese cities, supported by the poor Chinese charging infrastructure.[100] To counter this problem in the short term Tesla aims to calm Chinese customers of the convenience of home charging, before a sufficient Supercharger network is in place. Another market complication is that the Chinese upper class capable of the Model S price tag, likes to be chauffeured around, of which the Model S back-seat experience did not live up to desired comfort levels. Tesla tries to counter the disappointing back seat experience with the option of a $ 2000 luxury upgrade.

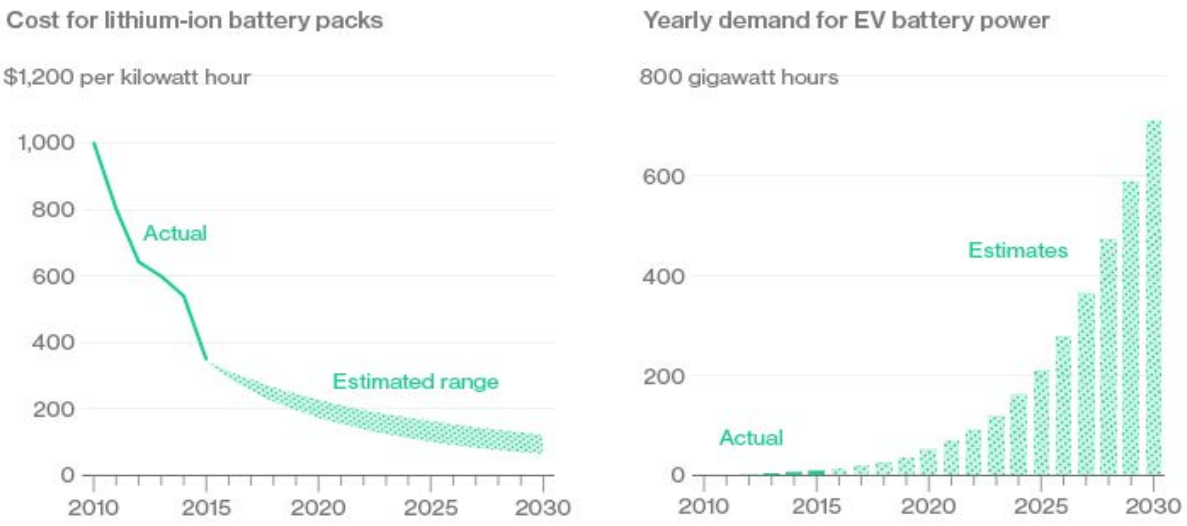
German patriotism: Germany is the largest economy and most populous country in Europe. The country is also the world´s leading premium vehicle manufacturer. However, German consumers rather prefer to buy German cars; over the American Tesla´s.[101] Tesla´s sales numbers have therefore been very low in Germany. But a recent survey revealed that 66 percent of German consumers would be willing to buy a Tesla Model 3.[102]

2.1.4 Technological factors

2.1.4.1 Alternative fuel vehicles

The most technically challenging aspect of EVs is the battery pack. On the performance side, manufacturers aim to produce batteries who are safe, provide long range and withstand temperature changes. At the same time, manufacturers are dependent on cost reductions in order to make vehicles at a competitive price comparably to ICE-cars. Cost reductions will come in the form of economies of scale and technological advancements. Currently batteries make up an average 1/3 of total EV costs. [103] As battery costs continue to fall, demand for EVs will rise. This will be further discussed in the industry analysis.

[100] Bloomberg: *www.bloomberg.com/news/articles/2015-03-29/musk-reboots-tesla-china-strategy-as-range-anxiety-crimps-sales*
[101] Bgr.com: *bgr.com/2015/09/20/model-s-sales-germany/*
[102] Cleantechnica.com: *cleantechnica.com/2016/04/11/66-of-germans-would-consider-a-tesla-model-3-according-to-poll/*
[103] Bloomberg.com: *www.bloomberg.com/features/2016-ev-oil-crisis/*



Cost and demand forecast of EV batteries, Source: Bloomberg New Energy Finance

Still, these batteries last shorter than a full gasoline tank in ICE-cars. Another concern is the decline of an electric vehicle's range, resulting from deterioration over time in the battery's ability to hold a charge. Batteries based on lithium can also on rare occasions cause fire as experienced with some Model S vehicles. Negative public perceptions regarding the suitability of lithium-ion cells for automotive applications, such as a vehicle or other fire, could seriously harm Tesla.[104] This is also the case even if such incident does not involve Tesla´s vehicles.[105]

2.1.4.2 Internet of things

The Internet of Things revolves around increased machine-to-machine communication, built on cloud computing and networks of data-gathering sensors. In the future, everything would be connected or "smart".[106] This is a key fundament of self-driving cars; as vehicles now are able communicate with their surroundings. The impacts on the automotive industry are expected be transformational, not incremental. This will be addressed in the Porter´s 5 forces.

2.1.5 Sub-conclusion: Environmental analysis

Q1: How do environmental factors affect the share price?
+ Government support schemes play a key role in EV growth.
+ Technological progress of alternative fuel challenges gasoline vehicles in near future.
- Automotive industry is sensitive to changes in GDP (ref. 2007) and commodity prices.

[104] Tesla Motors: *Annual Report 2015*
[105] Businessinsider.com: *www.businessinsider.com/tesla-is-tanking-2013-10?IR=T*
[106] Wired.com: *www.wired.com/insights/2014/11/the-internet-of-things-bigger/*

2.2 Industry analysis

*In this section we aim to analyze the following question (*Q2*)*: *"How do industry specific factors affect the share price?"*

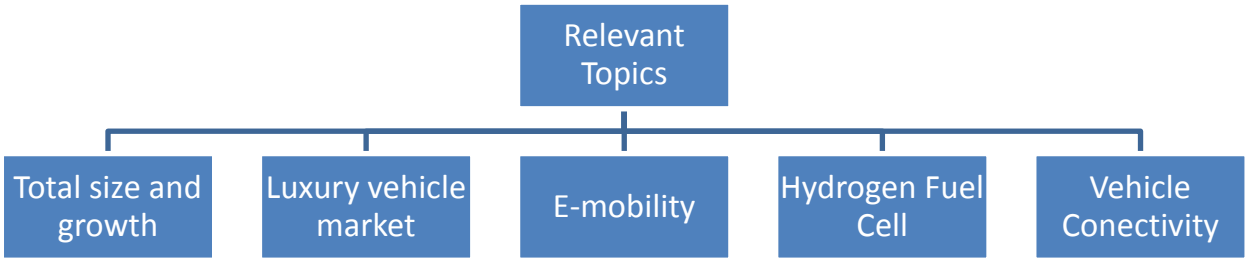
The industry analysis is divided into two parts. First, to gain a broad perspective of Tesla's current competitive landscape, we analyze the size and trends of the global automotive industry. Secondly, we analyze the size and trends in the luxury vehicle ($ 30 000 +) and alternative fuel segments where Tesla competes.

Tesla´s relative production scale

According to KPMG´s Annual Automotive Survey 2015, 90 million new vehicles were sold in 2015. Luxury cars, of which we define as vehicles priced 30.000 USD or above, represented approximately 10 million of these vehicles. 80 percent of these vehicles were sold under the brands Mercedes, BMW or Audi.[107] In comparison Tesla only sold about 50.000 vehicles in 2015.

2.2.1 The global automobile industry

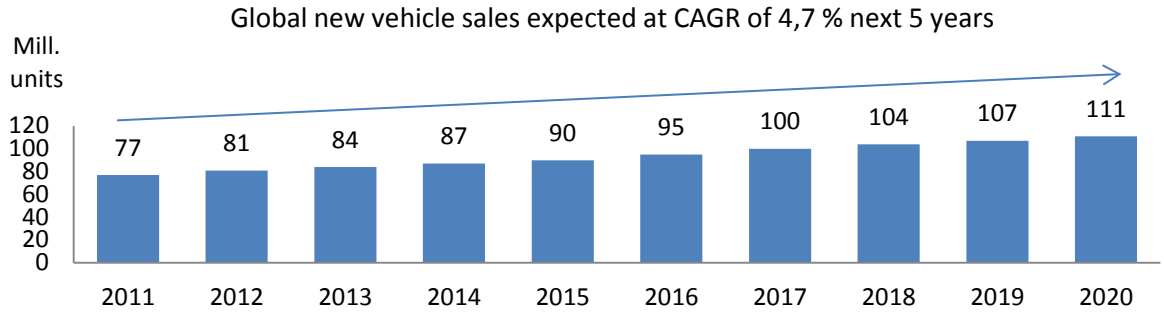
We believe the following five topics are of high importance in understanding the global automotive industry, and its effect on Tesla´s share price.



[107] PRnewswire.com: *www.prnewswire.com/news-releases/a-study-of-the-global-luxury-car-market-2015-2020-300201262.html*

2.2.1.1 Total size and growth

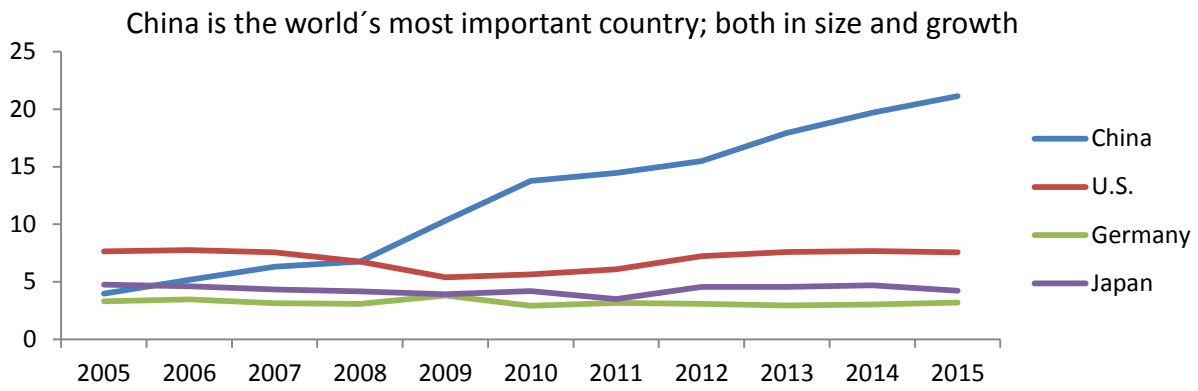
Growth rates: Globally the automotive industry was a nine trillion USD revenue per year industry in 2015,[108] making it the one of the world´s largest industry in revenues. All automotive segments are expected to grow in volume. After recovering from the financial crisis of 2007, more than 90 million vehicles were sold in 2015 worldwide. Within the next two year, global vehicle sales will pass 100 million. Growth will continue on the back of increasing demand in emerging markets like China.[109]



The main growth is related to budget cars, based upon the historical preference for such automobiles in developing countries. Historically, North America has been the predominant automotive market in the world. But over the past decade, Asia with its Chinese growth-machine, have claimed the throne as the leading sales region (graph below). The Chinese economy has been growing at an about 7.5 percent annually for the past 10 years,[110] causing the demand for automobiles between 2005 and 2015 to grow from 4 to 21 million new vehicles per year.[111] North-America and Western Europe sales volume are back to

[108] IBISworld.com: *www.ibisworld.com/industry/global/global-car-automobile-sales.html*
[109] KMPG (2015): *Global Automotive Executive Survey*
[110] Worldbank.com: *www.data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG*
[111] Statistica.com Database

pre-crisis levels and still growing.



Passenger car sales, top 4 countries, Source: Statistica Database

China, U.S., Germany and Japan also have the highest production volume in the world, causing substantial competition against local manufacturers. Although China does not have any global car brands, the country is able to supply its own demand of 20 million vehicles per year from a large number of smaller manufacturers. Both Japan and Germany are strong net exporters of cars, while the US is a net importer of vehicles.

- *US*: Luxury brands make up about 20 percent of the American car sales, generating more than $ 100 billion in revenues[112]. Popular American brands are Lexus, Audi, Ferrari and Cadillac. Sales for premium cars in the country are likely to be more than 2.3 million units by 2020.[113]

- *Asia*: Premium car manufacturers have found an increasing demand from China's growing wealthy consumers, representing a huge market opportunity. China is now BMW's biggest single market. McKinsey [114]forecasts luxury car sales in China will reach 3 million units by 2020. According to their survey analysis, only 12 percent owners expressed interest in driving pre-owned premium cars, while the rest mostly favored new cars. Asian luxury brands created by large Asian manufacturers, such as Lexus, Acura and Infinity seek to gain market share from the three German giants (Mercedes, BMW and Audi). Hyundai, Honda, Toyota and Nissan are also challenging western home markets with lower price and improved fuel efficiency. All companies compare their cars in performance and innovativeness.

[112] Reportlinker.com: *www.reportlinker.com/ci02180/Luxury-Automobile.html*
[113] McKinsey (2013): *The Road to 2020 and Beyond*
[114] Reportlinker.com: *www.reportlinker.com/ci02180/Luxury-Automobile.html*

- *Europe*: Europe's improving economy has fueled the demand for premium cars. Germany's luxury car brands, such as Mercedes-Benz, BMW and Audi are dominant in this industry worldwide.

The global automotive industry is a highly competitive market where 12 global actors sold 80 percent of the 90 million new vehicles in 2015. With about 50.000 vehicles sold in 2015, Tesla only represents 0,056 percent of new vehicles.

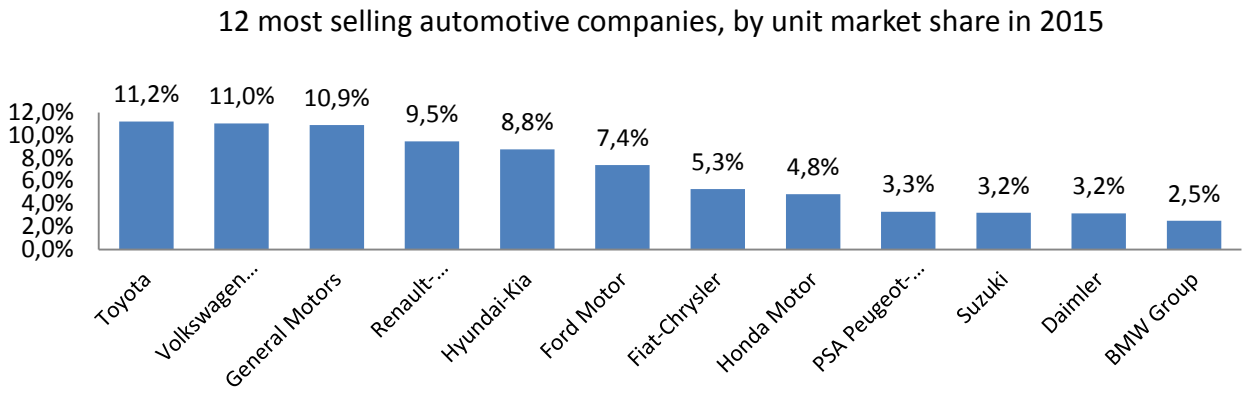


Figure Market share, new vehicles global 2015, Source: Statistica

2.2.1.2 Luxury vehicle segment

For an improved analysis of Tesla, we segment the luxury vehicle segment across two axes:

- Price: We believe that Tesla first and foremost competes against other vehicles in the same price segment, not other EVs. We believe that the affordability is the primary consumer constraint in determining our segmentation.
- Powertrain technology:[115] Tesla has a unique competitive position as both an EV-producer and a luxury car company. Tesla is the world's only premium EV-manufacturer. As many other mass-market brands have entered the pure electric vehicle market, they all have their foundation in producing gasoline vehicles. Further, Tesla´s Model S & X are the only pure electric vehicles in the high-end luxury price segment.

Luxury Automotive Industry Map ($30k+)				
Price segments	ICE (95%)	Hybrid (%)	Electric (0,6%)	Fuel cell
Ultra-luxury > $100k USD				
High-end luxury $75k – $100k				
Mid-size luxury $60 - $75k				
Entry-level luxury 45k - 60k				
Premium compact $30k - $45k				

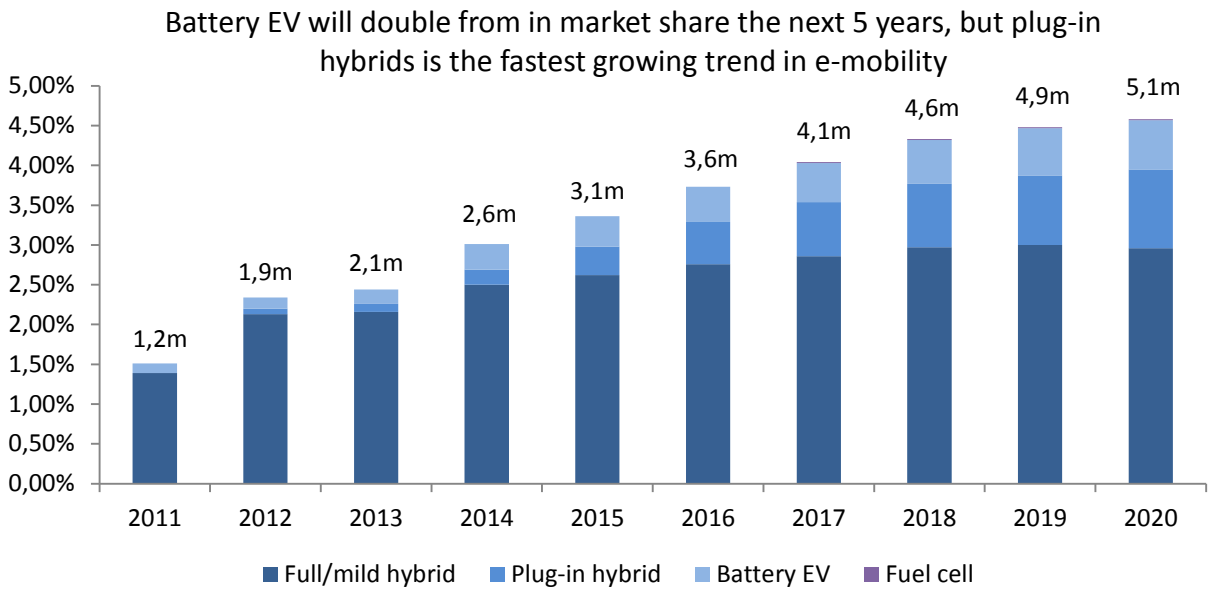
Price & Powertrain Segments Overview

- High-end luxury ($75k – $100k): Tesla is currently located in the high-end luxury segment of the automotive market due to the high price of Model S and X. Our closest competitor is similarly priced ICE-cars and hybrids, and will form the base for the competitive arena of high-end luxury vehicles. The main players in the high-end luxury segment are the three German companies; BMW, Mercedes and Audi.
- Premium compact ($30k - $45k): With the entry of Model 3, Tesla enters the lower priced premium compact segment. This segment is even more competitive. In this segment Model 3 meets direct competition from premium EVs.

2.2.1.3 E-mobility

Below we want to address some key automotive trends that are changing the competitive scenery. The mobility eco-system becomes more complex, as the global automakers must choose between different and sometimes conflicting technologies.

After decades of failed commercialization attempts, the revenge of the alternative fuel vehicles are now driven by increasing regulatory demand, coupled with technological improvements.[116] With governmental incentives to reduce CO2 emissions and falling battery production costs, business models are approaching profitability. According to the KMPG Annual Automotive Survey 2015, the most important powertrain technological investment for global automakers is ICE-downsizing, in order to focus on alternative fuel technologies. Focusing on the further development of the internal combustion engine could imply falling behind their more innovative rivals. However, the shift is currently very slow paced. By 2020, less than 5 percent of global powertrain fleet will be electrified and only 0.62 percent fully electric. Investing too much too soon on future trends are risky with existing loyal customers at stake. Traditional automakers investing in EVs risk cannibalizing their original ICE-sales. This is one of Tesla´s main competitive advantages. The four major alternative fuel powertrain technologies are presented in table below, ranged after their 2015 market share, measured in number of vehicles.



Alternative fuel vehicle short term development, Source: KPMG 2015 Annual Automotive survey, compiled by author

- *Internal combustion engines (ICE):* Due to its century-long head-start, ICEs is the far most common on the market today with 96.64 percent of global vehicle fleet. However, based on their 98.5 percent market share just five years prior, they are slowly losing ground to hybrid vehicles.
- *Hybrid vehicles:* These vehicles provide the flexibility of running on electricity on shorter trips, and switching to petroleum when the battery is empty. This compromise makes hybrids the fastest growing

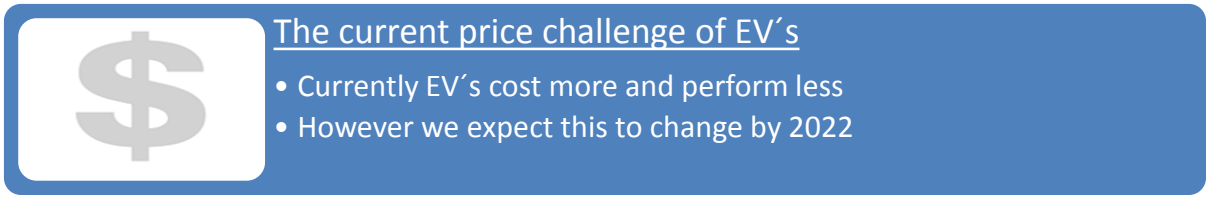
[116] Ref. History of Tesla

powertrain technology.

- *Pure electric vehicles:* Pure electric vehicles are more fuel saving and eco-friendly than hybrids. On the downside EVs suffer from short range, long charging time and high production cost of battery packs.
- *Fuel cells vehicles:* Hydrogen as a fuel has not yet reached the mass market, but is expected to gain a 0,01 percent market share of total vehicle fleet in 2017. These vehicles charge batteries with the conversion of hydrogen to electricity within the vehicle powertrain.

Type	Mkt %	ICE	Battery	Fueling method
ICE	96,64	Yes	No	Petrolium hose
1) Hybrid electric	2,62	Yes	Yes	Petroleum hose + Regenerative breaking
2) Plug-in hybrid	0,36	Yes	Yes	Petroleum hose + Electric hose
3) Pure electric	0,38	No	Yes	Electric hose
4) Fuel cell	0,00	No	Yes	Hydrogen hose[117]

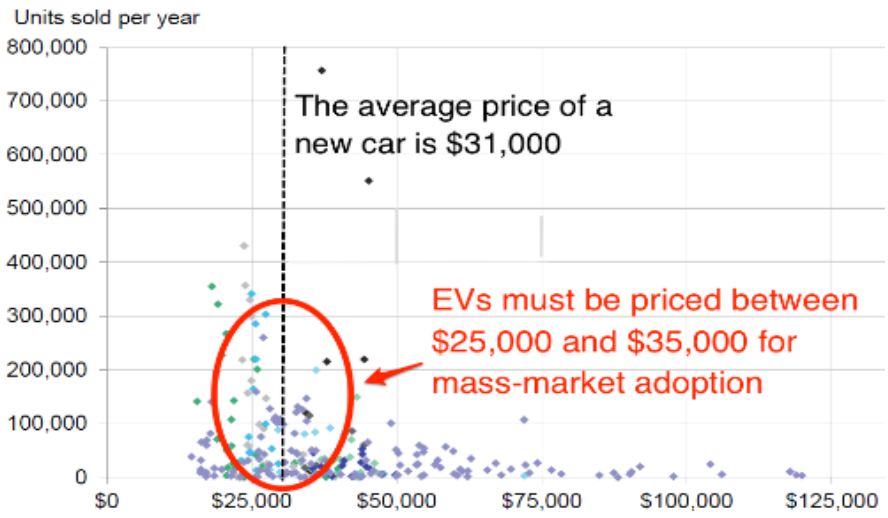
The most important trend is the hybrid segment. This segment provides the flexibility of a gasoline vehicle, but with battery usage for shorter trips. Still, hybrids are excluded from Tesla´s product line. CEO Elon Musk explains that hybrids are too much of a compromise, and that they will eventually be replaced with fully electric vehicles.[118] The key issue for electric cars has been the batteries. However, this is about to change with the new lithium batteries produced by Tesla. The much anticipated fuel cell vehicles might only represent 0.01 percent of the world vehicle sales by 2020, totaling at 16.000 vehicles per annum.



- *Current price issue*: The key challenge today is the cost of electric vehicles. Mass-market cars need mass-market prices. The average price of a new car in the US was $ 31.000 USD.[119] We use this as a benchmark for how low EVs must be priced in order to realize Tesla´s vision of transitioning mobility from gasoline to

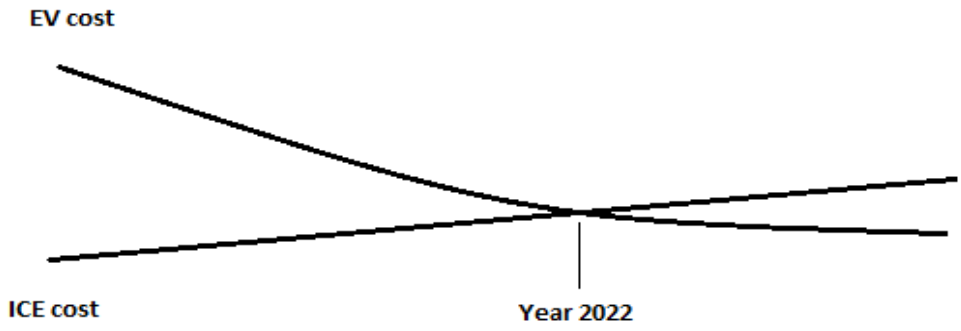
[117] See further explanation in section "Hydrogen fuel cell vehicles"
[118] Teslamotors.com: *www.teslamotors.com/blog/secret-tesla-motors-master-plan-just-between-you-and-me*
[119] Bloomberg.com: *www.bloomberg.com/news/articles/2016-02-09/will-the-tesla-model-3-really-sell-for-25-000*

electricity. This conclusion is key to our forecasting of Tesla´s average revenue per vehicle, explained in part 3.2.3.1 “Revenue forecast”.



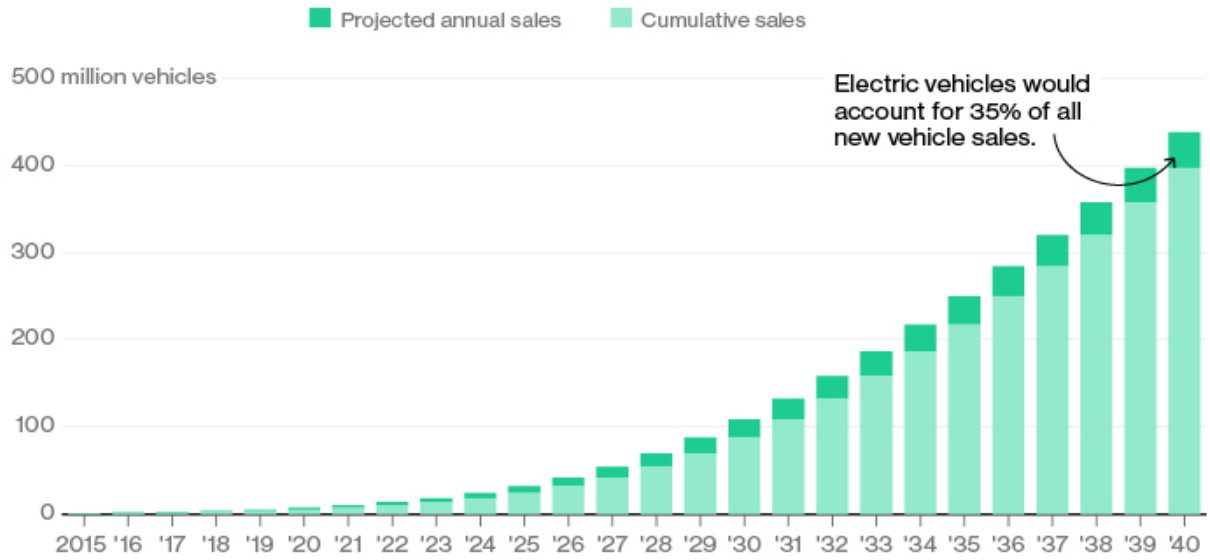
Mass-market pricing Source: Bloomberg New Energy Finance

Today Nissan Leaf is the world´s most sold EV with a price of about $ 30.000. We believe this is fairly high given the value proposition of this vehicle. Therefore, we expect much greater cost reductions in EVs before they become a truly mass-market trend. This is especially true as government incentives are diminishing. According to Bloomberg New Energy Finance, the year 2022 marks the year where EVs compete with ICE cars on price.

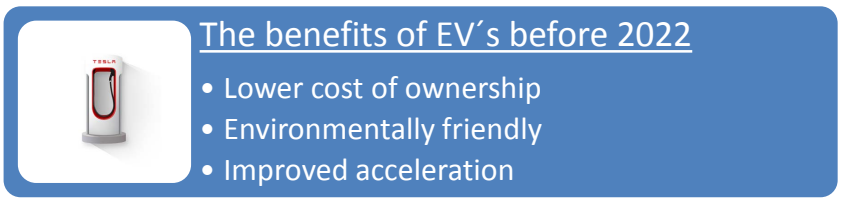


EV cost development, Created by Authors, Source: Bloomberg New Energy Finance

Future price development: Building on this estimate, we expect Tesla and other EVs to lower their retail selling prices, tracking the lower production cost of battery pack. In order to exploit the competitive advantage of lower battery costs, it makes strategic sense to ensure growing market share of both Tesla and the EV-market by either matching or undercutting their ICE-competitors on price. As consumers become price indifferent between EVs and ICEs we expect Tesla and other EV-manufacturers to start increasing their prices. While battery cost continues to decline, Tesla would be able to outperform ICE-peers on price and margins. This assumes that the prices of ICEs are forced to follow the general inflation and no revolutionary cost reductions are done. We expect the EV-sales to take off from 2022, as the Bloomberg New Energy Finance department expects electric vehicles to cost the same as their ICE-counterparts by this date. [120]



Development of EV sales Source: Bloomberg New Energy Finance

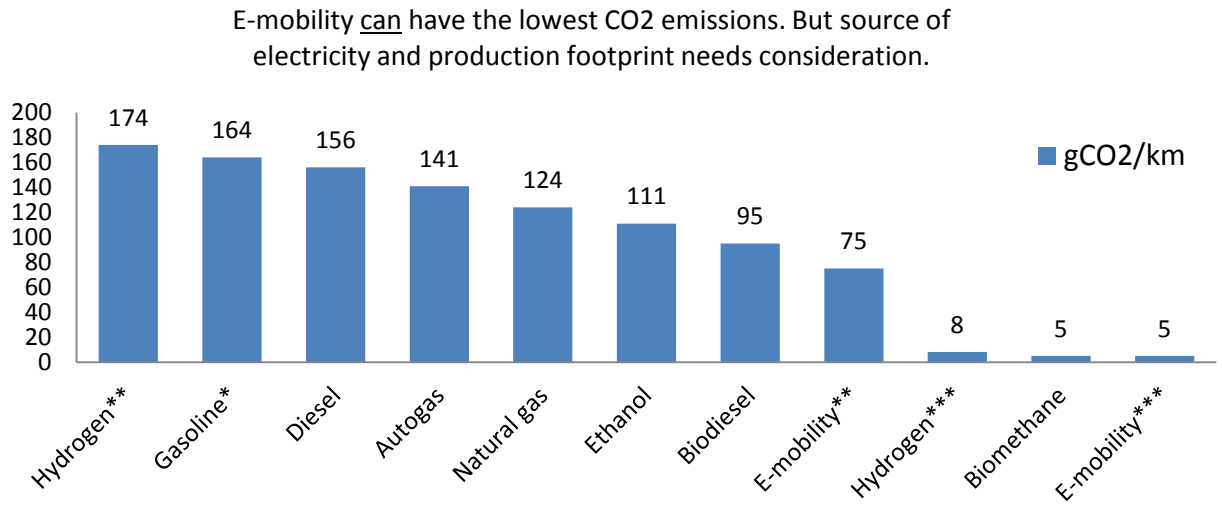


All mass-market alternative fuel vehicles today use an electrified powertrain (either fully or partially) providing customers three main incentives:

[120] Bloomberg.com: www.bloomberg.com/features/2016-ev-oil-crisis/

- *Cost of ownership:* Electricity is a cheaper fuel source than gasoline, reducing the cost of ownership over time. As this equation is strongly correlated with gas prices, EVs become more attractive with higher gas prices. EVs reduce the need for maintenance as the engine only contain a few moving parts compared to the ICE-car containing several hundred.

- *Environmentally friendly:* Pure electric vehicle can have the lowest CO2 emissions. As consumers can be internally motivated by protecting the environment, this can be further monetary incentivized through tax breaks or other perks from the government.



*Explanation: * Reference vehicle: 7L/100km **Current mix *** 100 % regenerative*

Wheel-to-well CO2 use, Source: PwC Autofacts[121], Authors

Note that CO2-elimination by EVs is constrained by electricity coming from a 100 percent renewable source. Before the global wide-spread adoption of a solar and wind harnessing infrastructure, E-mobility´s "well-to-wheel"[122] CO2-emissions are on average only half of the gasoline mobility. If the electricity comes from for example burning coal, EVs would be less environmental friendly. Further, the table does not include the eco-impact of battery pack production.

- *Improved acceleration:* An EV improves acceleration as it provides max torque instantly, while an ICE-car needs to pick up quite some speed to deliver max torque. This is exemplified in Tesla´s impressive acceleration metrics presented in the introduction.

[121] PwC (2016): *Autofacts Analyst Note, Europe: Electrification and Beyond*
[122] The environmental impact of a given product or service throughout its lifespan

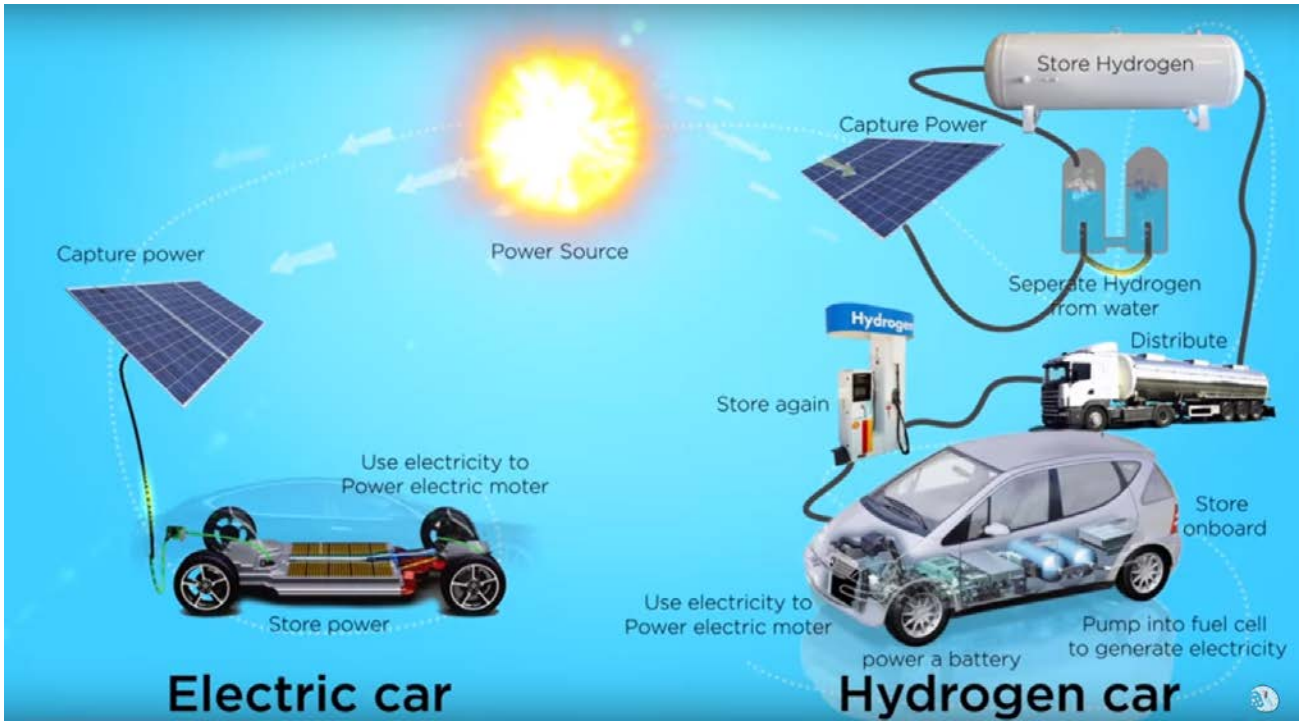
2.2.1.4 Hydrogen fuel cell vehicles

The hydrogen fuel cell car is driven by an electric engine, just as the conventional electric car. The difference between the two is how the electricity to power the engine is stored. In Tesla Model S the electricity comes from a huge battery pack, while in the hydrogen car, Toyota Mirai, electricity is generated thorough a chemical proses between hydrogen and oxygen. The use of a hydrogen car leaves zero emission, as the Mirai only produces water and heat. It is necessary to identify if, and to what extent, the hydrogen car is a threat to Tesla, when predicting future growth in later sections. This section explains why the hydrogen car is not considered a threat to Tesla within our budget period.

Toyota is the largest car company in the world[123], and is also leading the evolution of hydrogen fuel cell cars. They believe that hydrogen is the future energy source, and invests a lot of resources in their hydrogen projects.[124] In an interview with Financial Times in October 2015, chief engineer of the Toyota Mirai, Yoshikazu Tanaka, said that it is not good enough to have only the battery vehicles or only the hydrogen vehicles in the future, and that we need to make sure to get the full potential from both alternatives.[125] Today the price of a standard hydrogen car is approximately the same as the Model S. It is difficult to see that someone who could afford a premium electric family sports car would settle on a basic car model to the same price. The hydrogen car is also approximately 50 percent more expensive than the same model with ICE.

- *Infrastructure*: One advantage for the hydrogen car relative to the battery car is that refueling is takes under five minutes, just as the traditional car with an ICE. Its limitations lie in the availability of refueling stations. Hamburg has four stations which is the same as in the entire UK.[126] Norway, an important market for Tesla has six hydrogen stations. Electricity is a necessary part of our infrastructure and is more or less available anywhere as opposed to hydrogen. For a wide spread adoption of EV, infrastructure of EV-charging stations is a critical component. EVs must provide a compelling price, range and reliability. Today´s gasoline charging network has a leap start to EV. However, EVs has a competitive advantage to gasoline vehicles as they can be recharged for free. Solar energy is an abundant energy source that can be harnessed through solar cell panels connected to charging stations. As EV-market leader Tesla is shaping the global landscape of EV-charging stations. However, they have a long way to go in relation to charging time, range and expansion. This is especially the case in China.

[123] See chart of the world's most valuable automotive companies in the introduction
[124] Toyota-global.com: *www.toyota-global.com/innovation/environmental_technology/fuelcell_vehicle/*
[125] Financial Times: *www.ft.com/cms/s/2/a2d9151e-7427-11e5-a129-3fcc4f641d98.html#axzz415NeirkM*
[126] Financial Times: *www.ft.com/cms/s/2/a2d9151e-7427-11e5-a129-3fcc4f641d98.html#axzz415NeirkM*



Electric vs. Hydrogen: electric vehilces, different storage & infrastructure[127]

The picture above illustrates why it is difficult to see how hydrogen cars can be more environmental-friendly than electric cars even if the hydrogen in derived from a renewable source. There are a lot of steps before the hydrogen car can produce electricity, while a battery car can be charged directly from a solar panel. Hydrogen is something that needs to be produced. In that manner it is not an energy source. The only way hydrogen can be more environmental friendly than using a battery is if the hydrogen is derived using renewable energy sources such as solar energy. This is not necessarily the case today. BP and GE derive hydrogen from fossil fuels.[128]

With today's technology it does not make sense to substitute the electric car with the hydrogen car. It is simply too expensive and too inefficient. Although not unbiased, Elon Musk states that he does not want to give hydrogen more thought, do to its energy inefficiency[129]. Below is a table showing the pros and cons for a hydrogen car relative to a battery car.

[127] 5 Hours Ahead: *www.youtube.com/watch?v=2mk-Q4HMjOU*
[128] Worldwatch.org. *www.worldwatch.org/node/4516*
[129] Thinkprogress.org: *www.thinkprogress.org/climate/2015/02/12/3621136/tesla-elon-musk-hydrogen-dumb/*

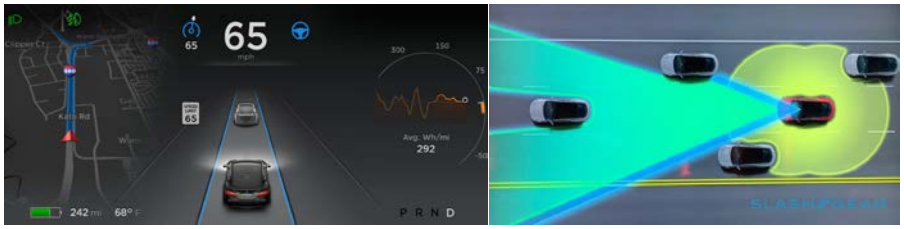
Hydrogen fuel cell vehicles relative to electric vehicles	
Pros	**Cons**
Refilling is done the same way as in a normal ICE. It takes under 5 minutes. Future supply of hydrogen is abundant, battery pack materials (lithium-ion) are not.	Costs 40-50% more than the same model with ICE A basic standard model costs the same as a Tesla, There is few refueling possibilities Deriving hydrogen from renewable energy sources is the only way to make it close to "pollution-free". So far the hydrogen is not derived in this way Electricity is already a part of our infrastructure and is more or less available anywhere as opposed to hydrogen

Hydrogen fuel cell vehicles, Authors

2.2.1.5 Connectivity

Driver-less vehicles: In the age of innovative technologies, self-driving cars are the last evolutionary step for vehicle connectivity. By 2020 up to 10 percent of all mass-produced vehicles will be driverless.[130] Contradicting most people's intuitive response, self-driving cars are safer with the reduction of driver error. In January 2016, the US Department of Transport addressed their willingness to allow fully autonomous cars with: "We are on the cusp of a new era in automotive technology with enormous potential to save lives, reduce greenhouse gas emissions and transform mobility for the American people".[131] Even if it still is a lot of work to do, both within the technological and legal field, the development phase is drastic. Cost of electronics and software is less than 20 percent than the cost 10 years ago. Electronic systems contribute to more than 90 percent of innovation and new features. As the timeframe for new vehicle launches is 3 -4 years, the cycle for new vehicle software is measured in months.[132] Consumer research suggests that drivers of the next generation want their cars to act as smartphones on wheels in order to remain connected and productive while on the go. Customers are ready to pay a sizeable amount for a fully connected vehicle that meets all their technology needs and wants.[133]

[130] KPMG (2015): *Annual Automotive Survey*
[131] Nhtsa.gov: *www.nhtsa.gov/About+NHTSA/Press+Releases/ci.dot-initiatives-accelerating-vehicle-safety-innovations-01142016.print*
[132] PWC (2015): *Automotive Perspective Infographic*
[133] Dupress.com: *dupress.com/articles/internet-of-things-iot-in-automotive-industry/*



Tesla´s current Autopilot Software Update

Alternative mobility services: Car sharing and alternative mobility services have gained attention the recent years, mostly though the brand Uber. These type of services reduce the demand to own once own car. The rapid pace of urbanization in China should see a rise in car sharing services. But as most Chinese consumers want to own their own vehicle, this market is expected to remain small. Within the next 15 years, automotive executives expect this to gain market share and become an important source of profit.[134] We do not incorporate these services to Tesla´s vehicle sales.

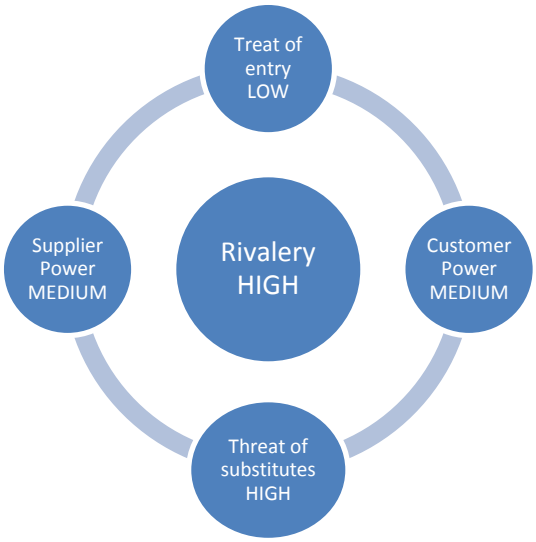
UBER

[134] KPMG (2015): *Annual Automotive Survey*

2.2.2 Porter´s 5 forces

The attractiveness of an industry is a determined by the possibilities of earning a return above the cost of capital.[135] Higher competition reduces the chances of gaining above normal returns. To improve the detail of analysis and highlight Tesla´s unique positioning, we apply the following categorization:

- Direct competitors: pure electric luxury vehicles
- Substitutes: ICE & hybrid luxury vehicles



By the five forces of competitive pressure we will analyze the profitability in this segment. Tesla is unique in their zero-emission high-end luxury sedan profile. For this analysis of the luxury automotive industry, the different engine technologies will be treated as substituting products competing in different price segments. A substitute is a product that provides almost the same value to the customer as a direct competitor. Very different forms of transportation such as public transportation are not included. Even though Tesla does not have any direct competitors in its current bracket, competition is still fierce in the same price segment across substituting engine technologies. From 2017, Tesla will meet direct competition in the premium compact EV-segment.

2.2.2.1 Threat of new entrants

If an industry earns above normal returns, it will attract new firms pushing the profitability towards a competitive level.[136] However, the entry into the automotive industry is usually blocked due to its capital

[135] Petersen & Plenborg (2012): *Financial Statement Analysis, p. 189*
[136] Grant, R (2010): *Contemporary Strategic Analysis, p. 66*

intensity and fierce competition. Other protective factors are the high degree of product differentiation and of competition in the industry, which make it less attractive. A positive factor for new entrants is that the switching costs of customers are not prohibitively high.

CAPEX & Scale Economies: Auto manufacturing is one of the most capital-intensive industries on earth, which is a major reason why there hasn't been a successful new US auto entrant in nearly a century other than Tesla.[137] Tesla´s has rarely generated positive free cash flow. The initial investments in R&D and manufacturing capabilities can reach $ 1 Billion. This is a reason why most new entries into the premium segment have been from large manufacturers such as Toyota (with Lexus) and Nissan (with Infinity). The capital requirements of the automotive industry might block all but a few of the world's largest companies such as Google and Apple.

According to Elon Musk, Apple is currently working on their own electric car, although not publicly announced. Apple has reportedly hired a number of engineers, software programmers, and other experts from the automobile segment over the last year.[138] The typically high investments in R&D, production facilities and marketing must be amortized over a large volume of automobiles in order to achieve cost efficiencies. This poses an obvious barrier to the typical low volume automobile start-up. Currently BMW, Daimler, Nissan, Fiat, Ford and Mitsubishi have electric vehicles on the market. Porsche, Lexus, Audi, Volkswagen and Volvo are in the development phase. Chinese manufacturers have started producing EVs for the Chinese market, and some of these are expected to enter the US market, such as BYD (funded by Warren Buffet). General Motors GM has partnered with a Korean electronics company LG to produce lithium-ion car batteries. Also, Faraday Future, an electric car manufacturer based in California, has teamed up with Chinese technology company Letv to build a $ 1 billion lithium-ion battery facility. Both of these partnerships pose a serious threat to Tesla's domination of the electric vehicle market.[139]

Brand: The brand equity is regarded as the second most important entry barrier. Customers in the premium segment buy the symbols of exclusivity, superior quality and performance. Several Asian manufacturers have created luxury brands to compete with the European and American brands for decades, but overcoming decades of prestige and history is hard. Toyota´s Lexus have been able to make

[137] Fool.com*: www.fool.com/investing/general/2016/01/18/is-bob-lutz-wrong-about-tesla-motors.aspx?source=eogyholnk0000001&utm_source=yahoo&utm_medium=feed&utm_campaign=article*
[138] Yahoo Finance: *finance.yahoo.com/news/apple-entering-electric-car-market-160616749.html*
[139] Yahoo Finance: *finance.yahoo.com/news/panasonic-backs-teslas-gigafactory-investing-190107913.html*

their entry in the US luxury market, but the German trio still dominates 80 percent of the market due to their strong brands.

- *Government and legal barriers*: Complying with regulatory requirements such as environmental and safety standards might weigh more heavily on incumbents due to economies of scale. However, by focusing on environment friendly EVs and safety improving autopilot functions, barriers might be lower due to governmental subsidies. This might both protect and fuel the growth of Tesla and other high-tech EV-manufacturer. Across borders, governments tend to protect and support national OEMs, as these are often extremely important for the national economy and labor force.

Our conclusion is that the threat of new entrants is medium

2.2.2.2 Threat of substitutes

- *Price segments*: A luxury vehicle provides two basic needs; transportation and the assortment of the privileged status of the driver. A substitute for premium vehicles would be shifting either one step up or down the price segment. The distinction between luxury vehicle segmentation is sometimes unclear. The cash price of each model can vary up to 50 percent depending on option choices, as in Tesla´s case. Further, the vast technological progress made in the automotive industry makes previously luxury features available also in-luxury vehicles. This includes driving assistance systems and touch screens. Luxury vehicles are forced to innovate rapidly to maintain their exclusivity. Further, a worse economic situation might lead customers towards cheaper vehicles or even used cars, as their disposable income decreases or financing options become more expensive.

- *Powertrain technology:* Tesla primarily competes in the extremely competitive premium sedan market with more established internal combustion manufacturers.[140] The competition from BMW, Audi, and Mercedes are a direct threat to Tesla´s market and profits. Further, hybrid vehicles are expected to grow in popularity over the next years. As discussed in the PESTEL analysis, hydrogen is not considered to be a treat in the near future.

Our conclusion is that the threat of substitutes is extremely high

[140] Tesla Motors: *Annual Report 2015*

2.2.2.3 Supplier bargaining power

The automotive supply business is highly fragmented. Many suppliers depend on one or two automakers for their products. If an automaker wants to switch supplier, this is devastating for the actual supplier. In the luxury segment suppliers are less weak, since luxury cars require exclusive materials and manufactured parts of high quality, which only a smaller number of suppliers are able to deliver. This makes the switching costs for luxury car makers higher than those of mass-market manufacturers. International sourcing is less of a threat too, since the need to preserve an image of excellence and prestige can restrict the ability to purchase parts from firms located in emerging countries. Tesla´s vehicles use over 3000 parts sourced from 350 suppliers. Like many other luxury automotive manufacturers, many of these are sourced from a single supplier. The most critical items are battery packs and lithium.

- Battery packs: Tesla has fully qualified only one cell for battery packs used in production vehicles. But as battery production becomes in-house, this improves the Tesla´s bargaining power.
- Lithium: Tesla needs the lithium industry. Lithium is the only part of the supply chain that Tesla has not arranged any contracts.

Our conclusion is that supplier bargaining power is medium.

2.2.2.4 Customer bargaining power

In the automotive industry, customers generally have high bargain power given many suppliers of relatively homogenous products and high degree of information. This is almost true also for the luxury segment. However, the customers in the pure electric segment looking for any of the additional luxury features (premium performance, long range, charging infrastructure, status and comfort) have only on option. Tesla is the only pure electric luxury manufacturer. Customers' lack of options in this niche category reduces customer bargaining power to medium.

Generally customers have substantial power, mainly because of the large variety of luxury brands and products to choose from, and because of the presence of substitutes. The market offers customers many different brands and car models, with widely differing performance, quality, appearance, pricing and additional features. The customer can freely choose the product that best fits his / hers preferences, status and lifestyle among many. The Internet has improved customers' access to information about the characteristics of car models, and to the experience and reviews of past users and experts. That forces premium car makers to continuously improve quality in order to not fail to meet the high expectations of customers and also to not fall behind competitors' innovations. On the other hand, once a customer has

bought a car, there are moderate switching costs to change to another, since the current car's value wills is reduced when it is sold in the used car market or returned to the car-dealer. Brand loyalty in the luxury car segment is higher than for lower-end cars, since customers tend to develop a closer emotional relationship between their self-image and their car's brand (provided that the expectations are being met). Another favorable factor for car-companies is that the size of buyers and of their individual orders is small, since most of the customers buy only one car every some years, reducing the significance of the behavior of an individual customer. The presence of many substitutes to luxury cars enhances significantly the bargaining power of potential customers. Customers may choose to use any of a wide range of transportation devices instead of luxury cars to move; for instance in a period of economic recession or slowdown such as that of 2007-2012, potential buyers are likely become more cost conscious and switch to less glamorous, but cheaper and more "normal" cars.

Our conclusion is that customer bargaining power is medium.

2.2.2.5 Rivalry in the industry

Rivalry is a consequence of one or more of the players in an industry wanting to change and promote their position in the competitive landscape. High rivalry indicates that the potential for profits are limited.[141]

- *Premium segment:* The worldwide automotive market is highly competitive. The global market leaders as BMW, Mercedes and Audi compete intensely, with Lexus getting a foothold in the US Luxury market. The competition is to a larger degree extending to emerging markets, where companies hope to get buyers from the growing middle class of China.

In a vehicle model perspective, Tesla´s flagship vehicle the Model S, is US market leader in both the EV and the luxury cars segment. However, on a company level Tesla remains an incumbent automotive manufacturer without the financial muscles, brand value or customer base of their peers. Therefore, many of Tesla´s current and future competitors many have greater financial, manufacturing, technical, marketing and other resources. By this these competitors may be able to devote greater resources to the design, development, manufacturing, distribution, promotion, sale and support of their products. Further these companies have greater customer bases, industry ties, operating histories and name recognition.[142] Linked to the high entry barriers, the high sunk costs generate high exit barriers. Companies in loss may stay in the market increasing the rivalry.

[141] Petersen & Plenborg 2012, *Financial Statement Analysis*
[142] Tesla Motors: *Q3 Report 2015, p. 36*

Premium automotive manufacturers also compete to become the technological leader. More non-premium vehicles gain technological features previously behold of premium vehicles. Premium manufacturers are answering with upgrading their technological features in order to preserve their premium attribute. The market for "connectivity" is expected to be the next big thing. Tesla is regarded as one of the market leaders in this development. In this field BMW, Daimler, GM, Volkswagen, Toyota and Tesla are regards as the leading.[143]

Alternative fuel: The market for alternative fuel is particularly competitive. The hybrid segment is expected to take market share from the ICE segment in the years to come. In the hybrid market, GM, Toyota, Ford and Honda are strong competitors. Tesla is expected to become even more competitive as the lower priced vehicle model 3 is released in 2017.[144] (See table in introduction). Unlike the Model S & X, there are direct competitors in sight. Specifications look very competitive, however as beauty is in the eye of the beholder, Tesla a significant esthetic advantage. Brand equity, price and range will also be key competitive factors. It is reasonable that by the time Model 3 reach the same scale production as their EV-competitors in 2-3 years, the competitors presented above would most likely have improved in performance and maybe also price. EV-manufacturers will benefit from the growing market of alternative fuel vehicles. Market growth is driven by oil concerns, carbon dioxide emissions, rapid technology advances and growing congestion.

Our conclusion is that rivalry in the industry is high

2.2.3 Sub-conclusion: Industry analysis

Q2: How do industry specific factors affect the share price?
+ The global industry CAGR [145] of ~4.7 %, mainly driven by China. The increasing Chinese demand represents an opportunity for Tesla, despite the current high entry barriers. + EV´s expected to be competitive with gasoline cars by 2022, due to low battery costs. After this, the low battery cost is expected to become a competitive advantage of EV´s. - The premium vehicle and EV segments are highly competitive. We expect competition to further increase in the EV-segment after Model 3 in 2017.

[143] KMPG (2015): *Annual Automotive Survey*
[144] Tesla Motors: *Annual Report 2015*
[145] CAGR = Compounded Annual Growth Rate

2.3 Internal analysis

In this section we will analyze the following question (Q3): *"How is the Tesla share price affected by its internal strengths and weaknesses?"*

The value chain analysis identifies organizational capabilities within each of the firm's functional areas. The value chain is separated into primary and support activities. In order to assess the relevance and value generated for the shareholders, we assess the competitive advantage of each element. This will be summarized into a VRIO-model [146]at the end of the internal analysis.

The value chain was first described in Michael Porter´s 1985 book "Competitive Advantage".[147] The model has been modified to isolate the most relevant elements of Tesla´s value chain.

Supporting Activities			
Adm. & Financial	Financial underdog, Musk Co. synergies		
HRM	Attracting top industry competence		
Product & Tech	Superior design and engineering, High R&D investments		
Procurement	Close relationship with cells suppliers. Raw materials costly.		
Primary Activities			
Supply	Production	Sales & Distribution	Service & Charging
Gigafactory 1	Fremont Factory	250 High-End Stores	400 Free Chargers

Tesla Value Chain Summary

2.3.1 Supporting activities

Supporting activities are aimed to support the company´s core operations. Tesla´s product & technology development, administrative & financial, human resource management (HMR) and procurement are of critical value to the success of Tesla's core operations.

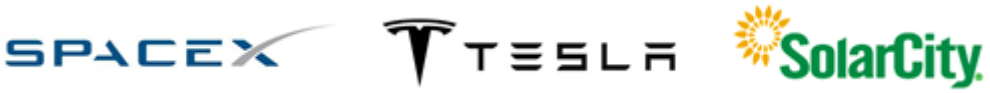
2.3.1.1 Administrative and financials

Administrative syngeries: As decribed in the introduction, Elon Musk takes on the roles of CEO, Product Architect, Chairman, largest owner and co-founder. He is also regarded as the most important driver of the company´s ambitions. Besides this, he also serves as CEO and CTO of SpaceX (develops and manufactures

[146] VRIO = Value, Rarity, Imitability and Organization
[147] Porter, M (1985): *Competitive Advantage*

space launch vehicles) and the Chairman of Solar City (solar provider). Tesla and SpaceX shares operational similarities as they both are high-tech manufacturing companies. Tesla does part of its design and engineering in the SpaceX rocket factory in Hawthorne, California. Tesla and SolarCity both relate to renewable energy. Tesla are benefitting greatly from the supply of solar cell panels from SolarCity, providing the Superchargers with free electricity. This infrastructure is however not fully developed.

Even though Musk is highly active in Tesla´s management, he cannot devote his whole time to the company. Musk splits his time almost 50 – 50 between Tesla and SpaceX. Still, the time limitations caused by his level of multitasking might be compensated by the synergies of running such interconnected companies. As this is regarded as a competitive advantage, Musk is not promised to stick around after model 3 hits the market. We regard the dependency of Musk and certain other high-ranging executives as a critical risk factor for Tesla.



Companies Run By Elon Musk

Financials: Tesla has historically strong funding capabilities. This is needed to cover the huge investments and day-to-day cash burn rate. According to Thilo Koslowski, the vice president and automotive practice leader at technology research firm Gartner Inc. “Tesla won’t have any problems raising funds. There are plenty of people out there who believe in Musk’s vision.”[148] However, Tesla is an industry light-weight. Their financial infrastructure is similar to that one of a start-up. Tesla is primarily equity financed due to their high-risk profile. Still, they are investing heavily in manufacturing and R&D in order to reach their 500.000 vehicle goal for 2020. Compared to the more mature Original Equipment’s Manufacturers (OEMs) Tesla has relatively small financial muscles to tackle financial hurdles and challenges. In case of a mass scale recall of Tesla vehicles (for example due to safety issues related to either batteries or technology), Tesla might go bankrupt. Similarly, if the market adoption of their vehicles is lower than expected Tesla operates with a relatively smaller margin of safety.

2.3.1.2 Product and technology development

Tesla´s core competence is powertrain engineering, vehicle engineering and innovative manufacturing. The core intellectual property is contained within the electric powertrain and the development of vehicles that capitalizes on the “uniqueness of an electric powertrain”. Tesla has high investments in R&D related to the

[148] Ibtimes.com: w*ww.ibtimes.com/tesla-motors-secures-750m-credit-it-desperately-needs-cover-daily-costs-it-burns-1965838*

development and materialization of this intellectual property.

One of Tesla´s major strengths are the focused extensive research and development (R&D) activities. The company leverages on its (R&D) capabilities to launch new and innovative products. Tesla's R&D activities focus on the development of manufacturing processes, Model S cost reductions and right-hand drive Model S. Moreover it also includes the significant engineering, and design activities carried out by the company to support its Model X development and other R&D activities. The company carries out these activities at its Palo Alto facility in California. The company incurred $ 464.7 million towards R&D expenses in FY2014. Telsa's technology innovations have resulted in an extensive intellectual property portfolio with more than 200 issued patents.

2.3.1.2.1 Powertrains

The same powertrain technology is used in all of Tesla's current and future model, as well as the powertrain components made for other OEM´s. In order to assess the competitive advantage of core competence, we need to analyze the most important components closer.

1) Battery pack
2) Power electronics
3) Motor
4) Gearbox
5) Control software

Electric Powertrain Elements

- *Battery*: Tesla aims to design high energy density at a low cost while maintaining safety, reliability and long life. The Model S battery has 85-kilowatt hours of useful energy. As the range on a single charge declines as a function of usage and time, the batteries are therefore backed up with warranty of unlimited miles over an eight year period. One great advantage of the batteries is the flexibility in regard to battery cell chemistry, form factor and vendor. This allows Tesla to leverage the substantial advancements in battery technology made globally and thereby continue to improve the cost-per-kilowatt hour of the batteries.

- *Power electronics:* This governs the flow of electrical current in and out of the battery and throughout the car. Power electronics controls torque generation in the motor and energy delivery to the battery while charging. Tesla can recharge on a variety of different Alternating Current (AC) electrical sources, enabling the customer to either charge at the Supercharger network or conveniently at home over night with the

Tesla Mobile Connector.

- *Vehicle control & infotainment systems:* In order to leverage performance and safety systems of the vehicles and battery packs, advanced control software is required. The numerous processors in the car require custom software algorithms providing control traction, stability, sustained acceleration and regenerative breaking. Almost all of this software is developed internally providing a smoother interface. Tesla also delivers autopilot systems that include road tracking, lane changing, automatic parking, driver warning systems and automatic braking functions.

Tesla now has years of experience in powertrain development to both self and other OEMs, with a huge leap to its competitors. This leap is regarded as a sustainable competitive advantage.

2.3.1.2.2 Design and engineering

Tesla has developed significant in-house abilities to both design and engineer EVs and has core competencies in computer aided design and crash test simulations. This reduces the time-to-market for new models. Several sub-systems of traditional automobiles need substantial redesign to work with an electrical powertrain. This includes the Heating, Ventilation and Air Conditioning (HVAC) system to match the different heat generation between EVs and ICE cars, as well as reducing the weight of the car to maximize range. The cars are built with a lightweight aluminum body and chassis. The design and engineering is a competitive advantage.

The company leverages on its core competencies which include powertrain, vehicle engineering and innovative manufacturing. These capabilities provide the company a competitive edge over its peers. Tesla's core intellectual property comprises the electric powertrain. The electric powertrain consists of the battery pack, power electronics, motor, and gearbox and control software. The company's battery pack system store significant amount of energy to power and run the electric car. The battery packs have a modular design enabling them to leverage technology developments for different vehicles and other products. The battery pack system includes cooling systems, safety systems, charge balancing systems, battery engineering for vibration and environmental durability, robotic manufacturing processes, customized motor design and the software and electronics management systems for managing the performance of its battery systems. The electric powertrain also comprises power electronics which manage the flow of electrical current throughout the car. Furthermore, the powertrain also includes sophisticated control software which monitors the performance and safety of its system. These are integrated to form a complete system for driving the electric vehicles. Tesla's powertrain and battery pack

inculcate a modular design, which enables next generation electric vehicles to integrate to this technology. Furthermore, the powertrain is highly compact in design and comprises less moving parts than the internal combustion powertrain. This feature enables Tesla to serve a diverse range of applications including any custom powertrain requisites of other manufacturers.

2.3.1.3 Human Resource Management

As Tesla is perceived as one of the most innovative and "cool" company in the car-industry we believe Tesla is able to recruit talents more easily than its competitors. This is causing an inflow of talent and experience to Tesla from other companies and from the Universities. This can be regarded as a competitive advantage today, but as more and more companies realize the need to copy Tesla´s innovativeness, this advantage might reduce in the future.

2.3.1.4 Procurement

Tesla has developed a close relationship with several key suppliers, particularly in cell production with Panasonic. Similarly to other OEMs Tesla sources many of the components needed for their vehicles from single source suppliers. Further, Tesla has high procurement cost of raw materials. This is due to the small market of raw materials used specifically for high-performance EVs. [149]

2.3.2 Primary activities

Tesla´s value chain is unique compared to other automotive manufacturers, due to its high degree of vertical integration. OEMs usually stick to manufacturing and assembly, and don´t usually integrate deal ships, service, charging and fueling. An illustration of the complete automotive value chain is provided below.

Automotive Industry Value Chain				
Raw Materials	Tier 2 Supplier	Tier 1 Supplier	OEM	Dealer
Steel, aluminum, cobalt, cobber, lithium etc.	Basic automotive parts	Major automotive components	Assembles components	Point of sale for OEM's

Automotive Industry Value Chain

2.3.2.1 Supply

Tesla is highly dependent upon its suppliers, as the Model S requires global sourcing of 3000 parts from over 350 suppliers. A majority of these suppliers are single sources for Tesla´s components. Probably the most important supplier is Panasonic who supply the battery packs. However, this changes with the construction of the Gigafactory 1 in the Nevada desert.

[149] Tesla Motors: *Annual Report 2015*

- Raw materials: This is the only part of Tesla´s value chain that the company does not control either through full ownership, Joint Venture or contracts. Tesla is therefore at high risk related to fluctuating prices. As discussed in the environmental analysis these costs are expected to increase.
- Gigafactory 1: Tesla is now integrating the production of lithium-ion cells and finished battery packs for the models: S, X and 3, as well as the Tesla Energy products. This is done through the construction of the $ 5 billion Gigafactory 1. The X square meters factory would lower the cost of cell production to 30 percent of today´s cost and supports the high volume demand of batteries created by the 500.000 vehicle per year goal in 2020. The cost reduction comes from using economies of scale, innovative manufacturing, reduction of waste, and the simple optimization of locating most manufacturing process under one roof. Tesla has a strategic relationship with Japanese Panasonic, the current battery supplier. Panasonics investing $ 1,6 billon in the factory, as well as participating in its daily operations. Tesla received $ 1.25 billion of incentive grants from the State of Nevada in the form of tax breaks and perks, as the factory is expected to boost the state economy with $ 100 billion over the next two decades. This, along with the sunny climate, determined the remote location of the factory.

Before the Gigafactory announcement, battery was considered Tesla´s largest bottle neck. As Tesla certainly still could run into hiccups along the way to 2020 battery supply is no longer considered a problem. The factory broke ground in 2014, is expected to start cell production by 2017 and reach full capacity of 35 million gWh by 2020. The Gigafactory will be powered by renewable energy sources, with the goal of achieving net zero pollution. After the successful launch of Tesla Energy products, the facility was re-named as “Gigafactory 1”. Due to the increased capacity demand, Elon Musk revealed their plans of several Gigafactories in the future. Due to Tesla´s activities and interests in Japan, the Gigafactory 2 could be built in this country. As of 2015, Japan was the second-biggest source of Tesla components after North America.

Left [150]- Gigafactory progress, March 2016, Right [151]– Gigafactory complete, 2020

[150] Eltreck.com: *www.electrek.co/2016/03/29/tesla-gigafactory-march-2016/*
[151] Teslamotors.com

Both the cost and complexity of building and operating such an enormous factory might exceed current anticipations. Tesla´s CEO is known for setting highly ambitious deadlines. Further, Tesla´s has no direct experience of producing lithium-ion batteries themselves, or building a facility of this size. Any delays or problems would affect Tesla´s brand, financial conditions and operating result. As this timely completion remains one of company´s main risk factor the coming years, the complete Gigafactory will remain one of Tesla´s most important sustainable competitive advantages.

2.3.2.2 Production

- *Fremont factory (Assembly):* Tesla manufactures their cars in their self-owned Fremont Factory, close to the Palo Alto Headquarter. The factory contains 5.3 million square feet of manufacturing and office space, currently able to produce 100.000 vehicles annually. GM and Toyota once owned the factory in a joint venture operation with the peak production 500.000 vehicles per year. By being the single owner, Tesla has secured the production capacity to reach their 500.000 vehicle goal. Tesla also owns a manufacturing facility in Lathrop, California, to produce various aluminum components. The factory is continuously improved in order to ramp up production. The past year $ 1,6 billion have been invested in the factory to expand and improve its robotic assembly line. At the same time, head count has increased with 29 percent now totaling at 13,058[152] The ramping production of Model X and 3 (of which the latter is intended to support the basis of their 2020 sales goals) might experience significant delays or other complications. The disappointing Model X delivery statistics in 2015 of only 208 vehicles, warn shareholders of such a risk factor. The Model X and 3 share their production facility with Model S. With the simultaneous production of current and future models, as well as Tesla Energy products, delays remain a key risk factor.

2.3.2.3 Sales and distribution

Tesla´s distribution model is significantly different from other Original Equipment Manufacturers (OEMs). While other OEMs rely on external automotive dealerships to sell their vehicles, Tesla sells their vehicles through their company-owned Tesla Store and over the Internet.

- *Company owned stores & Internet sales*: There are several challenges related to Tesla´s vertical integration. First, it imposes a slower expansion in addition to more expenditure, while other OEMs have more established distribution channels. Second, the zero inventory strategy imposes a long waiting time for customers. As the waiting time takes several months, this can eliminate the most impatient customers. However, experience of entering a Tesla store, located in either high-end malls or "affluent suburbs", is

[152] Teslarati.com: *www.teslarati.com/analysts-tour-tesla-factory-cite-stunning-progress/*

different than the everyday dealerships. Tesla recruited George Blankenfield, the man who developed the iconic Apple stores, to model the same strategy for the Tesla store.[153] In the middle of the store the customers will find a complete Model S or X, while a more exposed version in the back showing of the battery and motor. The store is equipped with touch-screens where the customer can calculate fuel saving of an EV and also display the looks and add-ons of their potential vehicles. The salesmen are not compensated on commission, creating a relaxing atmosphere for the customers. After purchasing, the vehicles will be delivered to the customs home, office or where ever he / she would like after two to three months.

Celebrity CEO Elon Musk & the Tesla Store concept

Celebrity CEO Elon Musk: Historically, Tesla has primarily relied their marketing on word-of-mouth and media coverage. The CEO Elon Musk explain: "You should use all your money on making the product the best possible and very little on marketing". Much of the publicity can be argued to come from Elon Musk´s celebrity status and grand visions for EVs and renewable energy. However, Tesla´s marketing budget has soured rapidly due to international expansion of Superchargers and Tesla Stores.

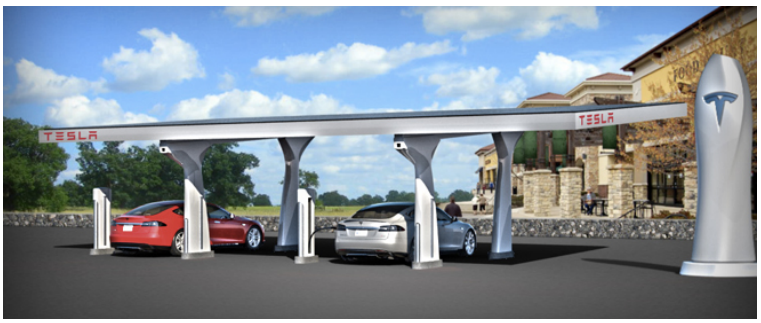
2.3.2.4 Primary activity - Service & Charging

Vehicle service & software updates: Servicing electric vehicles is different than servicing vehicles with internal combustion engines and requires specialized skills, including high voltage training and servicing techniques. The service is performed at certain company owned Tesla service centers and by mobile technicians known as Tesla Rangers. One of the benefits of EVs is that they do not need any oil changes or tune-ups the following months after purchase like ICE-cars. If some flaws however occur, Tesla´s engineers can tap into the vehicles Internet connection and download software updates. The current vehicle fleet is installed with the hardware capable of handling software not yet invented.

Charging stations: Tesla now has over 400 free of charge charging stations worldwide. It takes X minutes to fully recharge. This service will in the future come from solar panels on the charging stations. The

[153] Vance, A. (2015): *Elon Musk: Tesla, SpaceX, and the Quest for a Fantastic Future*

customer can also charge his / hers vehicle at home over night with the Home Charging kit. Both the range of the battery, demographic expansion of Superchargers and Home Charging limited the initial worries of running out of power.



Future Superchargers fueled with solar cell panels

Warranty & resale guarantee: In order to limit the customer's worries of buying into such a new and uncertain automotive technology, Tesla provides The New Vehicle Limited Warranty for Model S and Model X. This warranty lasts for eight years, 125,00 or unlimited miles, depending on the size of the vehicle's battery. We believe that both warranties and resale value guarantees are expected to decrease in the future as the reliability of the vehicles to improve.

2.3.1 Value, Rarity, Imitability and Organization (VRIO)

Tesla's current high valuation is supported by the competitive advantage highlighted below. In the modified VRIO-table below, we have listed up Tesla´s most valuable supporting and primary activities providing them a sustained, temporary or unexploited competitive advantage.

VRIO					
Resource	Valuable	Rare	Imitable	Exploited in Org.	Implication
Supporting activities					
Powertrain tech	Yes	Yes	Long term	Yes	Temporary
Design & eng.	Yes	Yes	Long term	Yes	Temporary
Elon Musk Adm.	Yes	Yes	No	Yes	Sustainable
Funding raising	Yes	Yes	No	No	Unexploited
Primary activities					
Gigafactory 1	Yes	Yes	Long term	No	Unexploited
Fremont factory	Yes	Yes	Long-term	Not fully	Temporary
Tesla Stores	Yes	Yes	Long-term	Yes	Temporary
Elon Musk Celeb.	Yes	Yes	No	Yes	Sustainable
Superchargers	Yes	Yes	Long-term	Yes	Sustainable
Software updates	Yes	Yes	Yes	Not fully	Temporary

While these strengths are the main drivers of optimism in the Tesla share, there are a few internal weaknesses not addressed in the VRIO table with a negative effect on the share price.

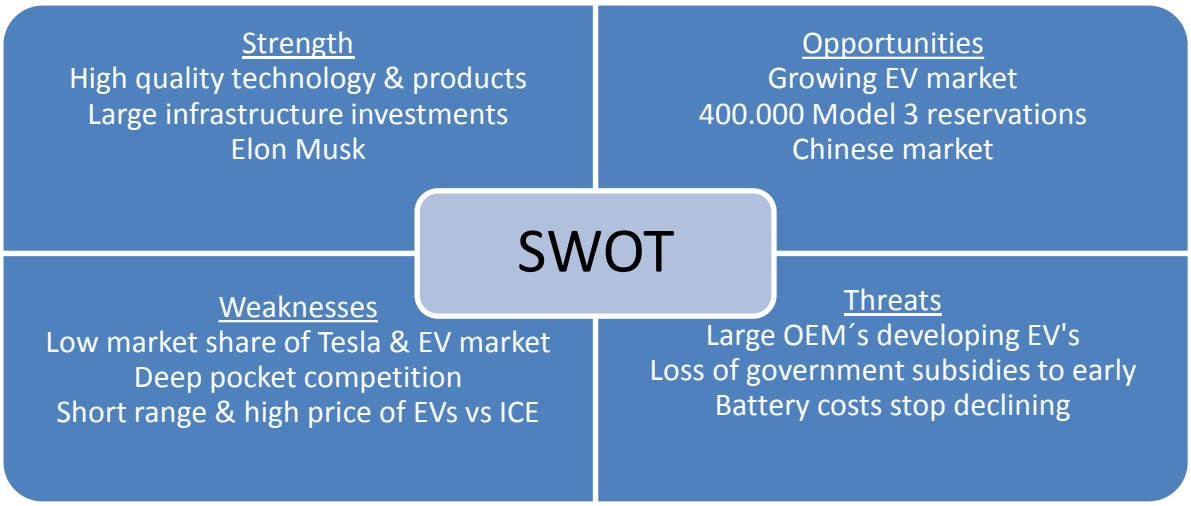
Industry underdog: Despite strong funding capabilities, Tesla is as highlighted in the industry analysis one of the smallest automotive manufacturer. Despite being highly skilled and efficient in design, production, R&D, marketing and talent recruitment, their industry competitors can out-compete Tesla by sheer volume. Tesla's lower budget, economies of scale, less established brand, fewer current customers and distribution channels are currently negative factors for the share price.

2.3.2 Sub-conclusion: Internal analysis

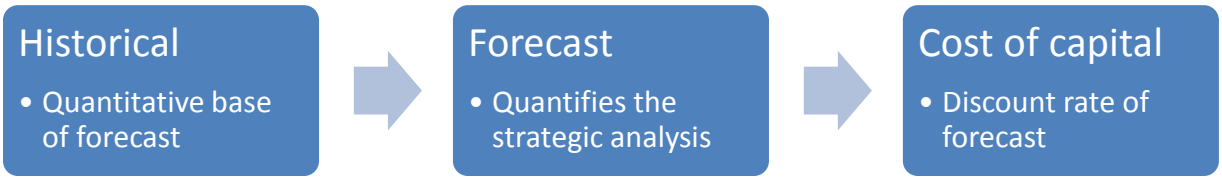
Q3: How do internal factors affect the share price?
+ Strong supporting activities: Technology, design & engineering and Elon Musk. + Strong primary activities: Gigafactory, Tesla Factory, Tesla Stores, Superchargers, Software. We regard these as Tesla´s main sustainable competitive advantages. - Tesla is an industry underdog with lower budget, low economies of scale, new brand & fewer customers. This represents a risk factor within the budget period. However, within the budget period we see production, not demand, as the main bottleneck.

2.4 SWOT

The conclusions in the strategic analysis are of great importance as they now will be quantified in the financial forecast, serving the basis of Tesla´s valuation. Our key findings from the strategic analysis are presented in the SWOT below.



3 Financial Analysis



3.1 Historical financial analysis

In this section we will analyze the following question (Q4): "How does historical performance predict future performance?"

In order to analyze the historical performance of Tesla, we reformulate the reported financial statements to analytical financial statements. When calculating financial ratios and assessing profitability it is beneficial to distinguish between operating and financing activities. Operating items are the primary driving force behind value creation and make the company unique and hard to copy. Financing items convey how operations and investments are financed, of which is easier to replicate. Investment activity "disappears" because investment in operating assets is included in operations and investments in financial assets are included in the financial activities.

- *Appendix 4 & 5*: We have presented both the analytical income statement & balance sheet in Appendix 4 & 5 respectively.

3.1.1 Reformulation of income statement

We have chosen to highlight the following income statement items in order to improve the level of the analysis:

- *Gross profit, adjusted:* As depreciations was recorded in the cost of revenues, the depreciations has been added to the adjusted gross profit. The depreciation is now separated as a separate item.
- *Earnings before Interest, Tax, Depreciation and Amortization (EBITDA):* The U.S. GAAP does not require reporting EBITDA. The separation of gross profit and EBITDA is important in order to compare Tesla with other companies. Tesla has comparable gross profit margin with other auto companies, but much higher R&D and SG&A costs due to Tesla's high growth phase. For Tesla, this makes gross profit a relatively more interesting measure of operating profitability than EBITDA.

- *Earnings Before tax (EBT):* In order to calculate the effective tax rate of Tesla, we have first calculated the EBT. The effective tax rate is needed to calculate the tax on Earnings before Interest and Tax (EBIT) and the tax shield. Effective tax rate is calculated as: "Effective tax rate = income tax / EBT".
- *Net Operating Profit after Tax (NOPAT):* Since both operating and financial activities affect taxes, we have used the effective tax rate in order to separate the sources of tax. NOPAT is the measure of operating profitability and will therefore be used in the valuation of the company.
- *Total non-recurring items:* In this case "other income", of which we classified as a financial item. These are separated as they are not expected to appear every year.

We will classify the different items in Tesla´s income statement as being either core operating ("O") or financial ("F") items. The following two items can be discussed:

- *Other income (expense), net (F):* This consists primarily of foreign exchange gains and losses related to Tesla's foreign currency-denominated assets and liabilities. Tesla expects their foreign exchange gains and losses will vary depending upon movements in the underlying exchange rates. Exchange rate differences are mostly recognized in the income statement as part of financial income and expenses. But as exchange rate differences are related to both operating and financing activities, it could be argued that exchange rate differences could be separated into an operating and financial component. Tesla has reported this item after their operating result, along with financial expenses. Therefore we will also classify other income as a financial item.
- *Provision for Income Taxes (O):* Income taxes are classified as an operational item, due to the lack of information. However the annual report states that accrued interest and penalties related to unrecognized tax benefits are classified as income tax expense.[154]

3.1.2 Reformulation of balance sheet

In the analytical balance sheet we separate the reported balance sheet items into either operating assets/liabilities, or financial assets/ liabilities. This enable us to calculate the net operating assets, also called the invested capital of the firm.[155] In order to match the items in the analytical income statement with the related items in the analytical balance sheet, items marked as operating (O) and financing (F) activities in the income statement, must be marked the same way in the balance sheet. Each balance sheet item has been examined and certain questionable items are reviewed below:

[154] Tesla Motors: *Annual Report 2015 p. 73*

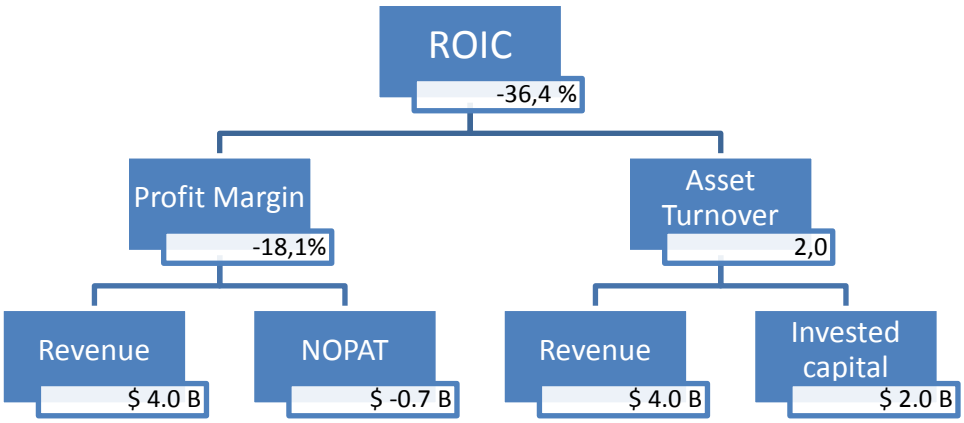
[155] Invested Capital = Net Operating Assets = Operating Assets – Operating Liabilities = Net Interest Bearing Debt + Equity

- *Cash and cash equivalents (F):* Cash can be separated into operating cash and excess cash. Because the cash position increases over time, it seems fair to treat cash and cash equivalents as excess cash and a part of financing activities.
- *Operating lease vehicles, net (O):* Tesla offers a resale value guarantee to all Model S buyers. All customers who buy a Model S and finance their vehicle through one of Tesla's banking partners have the option to sell their vehicle back to Tesla after three years for a pre-determined price. If the customer chooses not to exercise this option, the operating lease is recognized in automotive sales. If they do choose to sell their vehicle back, Tesla runs the risk of not being able resell the car with profit,[156] which would have a negative impact on next year's revenue. This post is therefore considered as part of operations. The initial purchase price less resale value (operating lease vehicle) is recognized in automotive sales.[157]
- *Customer deposits/ reservation payments (O):* This item refers to prepayments and is an important part of Tesla's business model. These prepayments are part of the on-going operations and are later reflected as operating profits. Therefore it is a part of the operating liabilities.[158]
- *Resale value guarantees (O):* As mentioned under the item "Operating lease vehicles, net" Tesla offers a resale value guarantee. The value of the guarantee is directly affecting revenues and is therefore classified as operating liability.
- *Deferred revenue (O):* This item is closely related to the resale value guarantee and the operational lease. It impacts the automobile revenue and is categorized as an operating item.
- *Convertible senior notes, convertible preferred stock warrant liability and total convertible preferred stock (F):* These are categorized as commitments and contingencies in the reported balance sheet. All items with attachments as a bond or option and are therefore categorized as financial liabilities.

[156] Tesla Motors: *Annual Report 2015, p. 48*
[157] Tesla Motors: *Annual Report 2015, p. 50*
[158] *Petersen & Plenborg 2012, Financial Statement Analysis, p. 77*

3.1.3 Historical performance and profitability

In this section we will analyze Tesla´s historical performance and profitability of operations. We have applied the DuPont-framework.



DuPont framework with figures for 2015

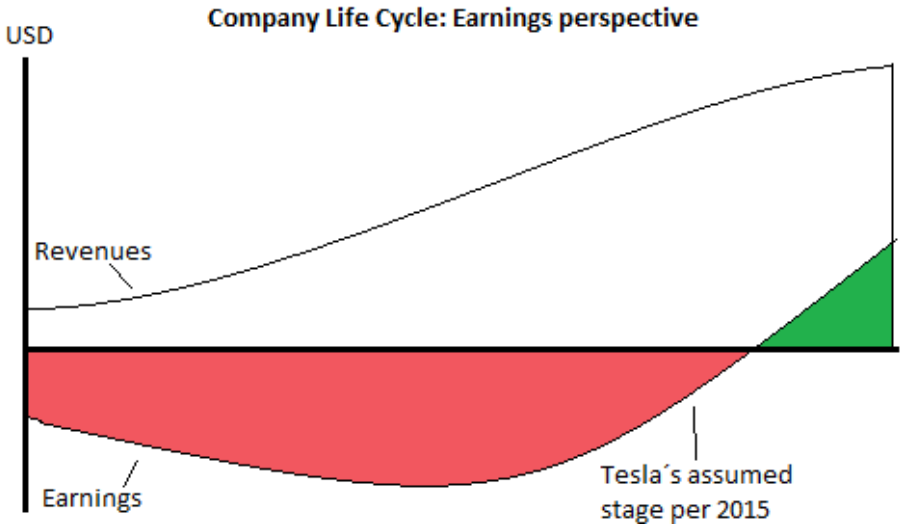
3.1.3.1 Return on Invested Capital (ROIC)

When we evaluate the performance of a company, we would like to start with the return on invested capital (ROIC). We use this metric, rather than ROE, as it is the overall profitability measurement for operations. It also makes Tesla more comparable with peers, as it´s not affected by differences in capital structure.

Tesla profitability	2010	2011	2012	2013	2014	2015
ROIC	-290,3 %	-163,2 %	-136,7 %	-16,2 %	-21,2 %	-36,4 %
Profit Margin	*-125,9 %*	*-123,4 %*	*-95,4 %*	*-3,2 %*	*-6,2 %*	*-18,1 %*
Turnover rate of invested capital	*2,3*	*1,3*	*1,4*	*5,1*	*3,4*	*2,0*

ROIC, Authors

Tesla´s ROIC has been negative in the period 2010 - 2015, with an average of -110,6 percent. As this has seen a slight improvement after the launch of the Model S, Tesla still compares poorly to its more mature premium automotive manufacturers. We explain this to Tesla´s early stage of the Life Cycle, not by poor operating management. Tesla is an early-stage company characterized with rapidly growing revenues, but still negative earnings. In the next section, “forecasting”, we explain our specific assumptions on the earnings development.

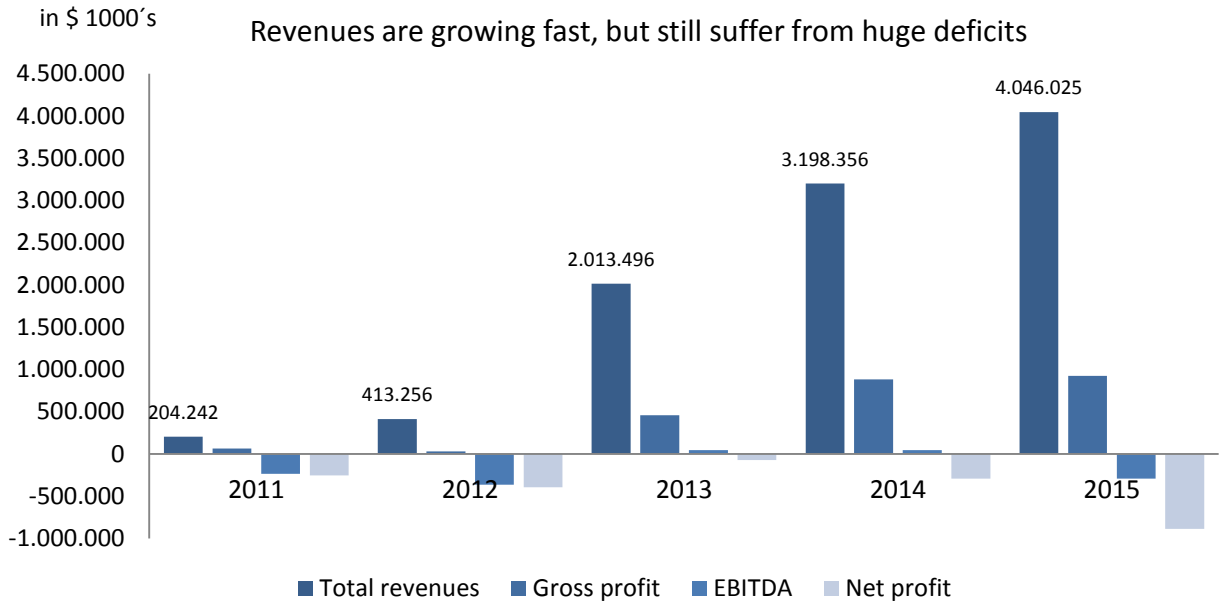


Company Life Cycle: Earnings Perspective, Created by Authors

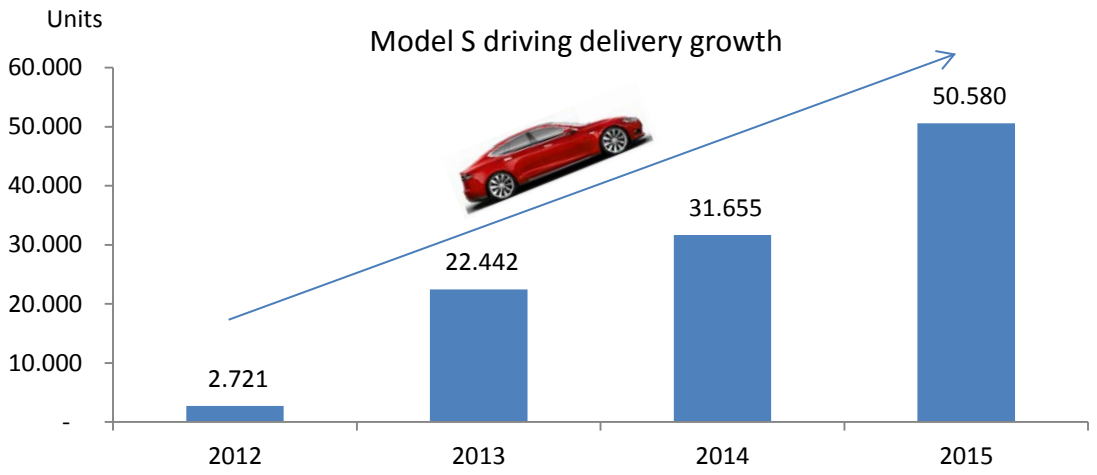
The ROIC is the product of profit margin and asset turnover rate. By assessing these ratios, we can further determine if the problem is related to operations or the utilization of invested capital.

3.1.3.2 Profit margin

The profit margin can be improved through higher revenues or lower cost. We will therefore analyze revenues and costs separately. The analysis will be further illustrated through indexing and common size so we can see the development in relative sizes.

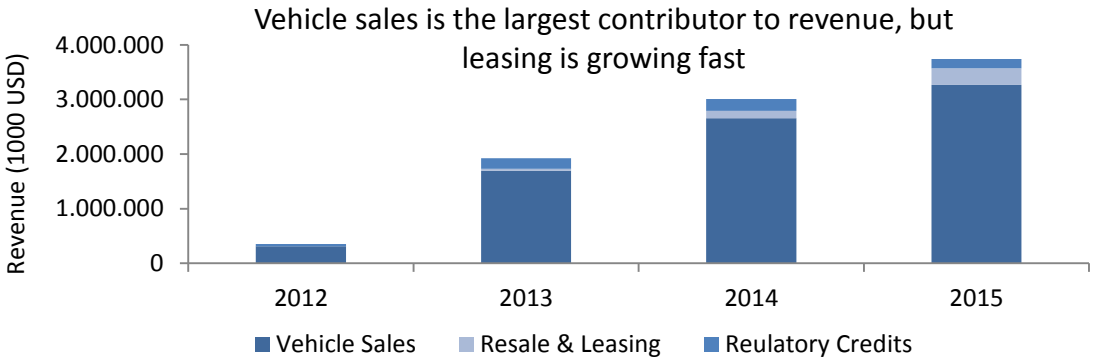


Revenues: The revenues have been growing exponentially each year. From 2015, Tesla's revenue is divided in two main areas; “automotive revenue” and “service and other revenue”. Vehicle sales are Tesla´s main income source. Vehicle sales numbers also include Internet connectivity, supercharging access, and specified software updates for cars equipped with Autopilot hardware.



Vehicle delivery numbers

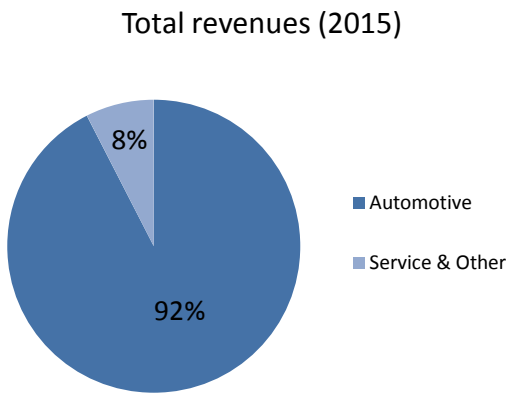
The second most important source of revenue for Tesla has been sales of regulatory credits to other automotive manufacturers, accounting for almost 10 percent of revenues in 2012 and 2013. Without this source of revenue, Tesla would have had negative margins this period. Further, Tesla´s automotive revenues include the amortization of revenue for cars sold with resale value guarantees and Model S leasing revenue. This is the fastest growing revenue in percent of total automotive revenue.



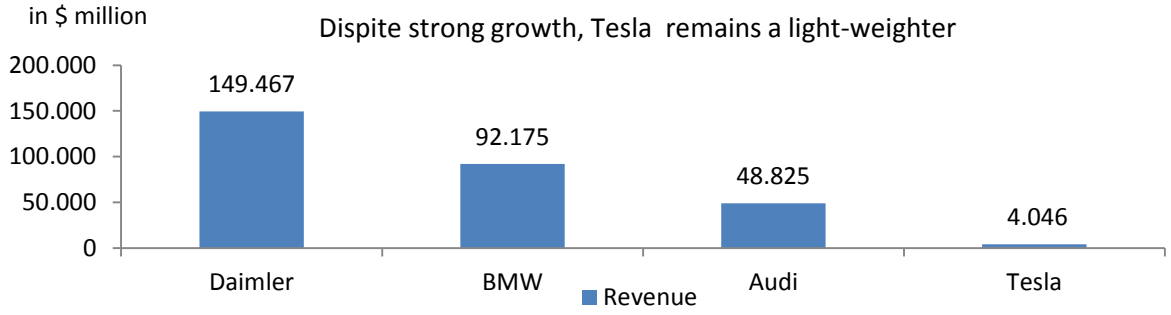
Auto. revenue	2012	2013	2014	2015
Vehicle Sales	89%	88%	88%	87%
Reulatory Credits	11%	10%	7%	5%
Resale & Leasing	0%	2%	4%	8%
Auto. revenue	100%	100%	100%	100%

Automotive revenue distribution

Prior to the launch of the Model S, development and sales of electric powertrain components represented an important income source for Tesla. A long side with developing the Model S, Tesla also partnered up with Daimler to produce the electrified Mercedes-Benz and an electric Toyota Rav4. Tesla still sells electric powertrain components to Daimler and other OEMs, however to a less important degree relative to total revenues. Also included in service and other revenues are revenue related to maintenance services, sales of pre-owned Tesla- cars and Tesla Energy products. The latter of which was launched in 2015, and is expected to grow in importance over the coming years.



Total revenue distribution



Peer benchmarking

Cost of revenues: Tesla does not distinguish between variable or fixed costs of revenues. Their of automotive sales includes direct parts, material and labor costs, manufacturing overhead, royalty fees, shipping, logistic costs and reserves for estimated warranty expenses. The cost of revenues has primarily been related to the production of the Model S. The gross margin in 2012 was low, due to the commencement of the Model S coupled with production inefficiencies caused by slow production ramp and

higher initial parts costs.[159] In 2013 the higher vehicle production volumes, efficiencies in manufacturing and supply chain, design improvements, as well as reduction of waste in the supply chain boosted gross margin.

Common size analysis	2010	2011	2012	2013	2014	2015
Total revenues	100%	100%	100%	100%	100%	100%
Automotive sales	-69%	-57%	-90%	-74%	-67%	-70%
Development services	-5%	-13%	-3%	0%	0%	0%
Services and other	0%	0%	0%	-4%	-5%	-7%
Total cost of revenues	-74%	-70%	-93%	-77%	-72%	-77%
Gross profit	26%	30%	7%	23%	28%	23%
Research and development	-80%	-102%	-66%	-12%	-15%	-18%
Selling, general and administrative	-72%	-51%	-36%	-14%	-19%	-23%
Depreciation	9%	8%	7%	5%	7%	10%
EBITDA	-117%	-115%	-88%	2%	1%	-7%
Depreciation and amortization	-9%	-8%	-7%	-5%	-7%	-10%
EBIT	-126%	-123%	-95%	-3%	-6%	-18%
Tax on EBIT	-0,16%	-0,24%	-0,03%	-0,15%	-0,40%	-0,38%
NOPAT	-125,9 %	-123,4 %	-95,4 %	-3,2 %	-6,2 %	-18,1 %

R&D: Tesla expenses R&D costs as they occur, causing them to be relatively higher in the company's early stage. The year prior to the launch of Model S, R&D peaked at 102 percent of the company's revenues. As economies of scale grew R&D have been dropping significantly the past years. However they were still 18 percent of revenues in 2015. It is apparent that R&D costs increase prior to the launch of new vehicles. The slight increase from 12 to 18 percent in 2013 – 2015 was related to the completion of Model X. With further economies of scale and fewer products in the line, we expect R&D costs to decline.

Selling, general & administrative (SG&A): Tesla´s marketing efforts have previously been through word of mouth. But from 2013 to 2015 the SG&A have grew faster than revenues. SG&A expenses increased primarily from employee compensation expenses worldwide related to higher headcount and costs to support an expanded retail, service and Supercharger footprint, as well as the general growth of the business. The company grew from 5859 employees in 2013 to 15.000 in 2015. As the company matures, we expect R&D and SG&A to converge towards a peer average.

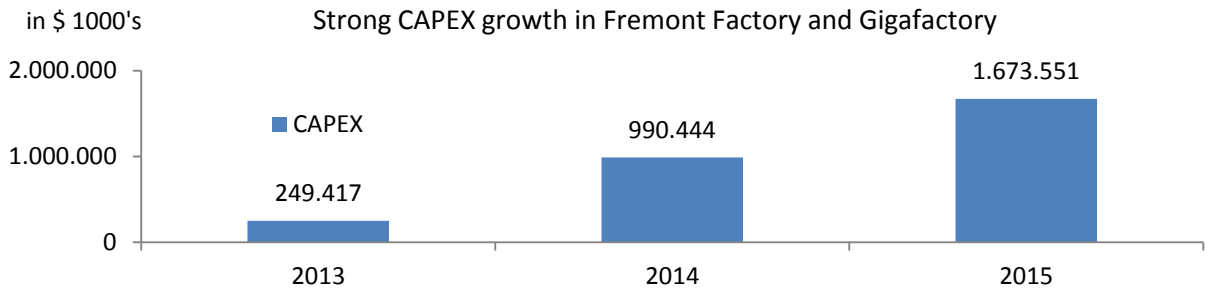
[159] Tesla Motors: *Q3 Report 2012*

Peer common-size (2015)	Daimler	BMW	Audi	Tesla
Revenue	100%	100%	100%	100%
Cost of revenue	-79%	-80%	-86%	-77%
Gross Profit	21%	20%	14%	23%
SGA	-11%	-9%	-8%	-18%
R&D	-3%	0%	0%	-23%
Net other income	1%	0%	3%	0%
EBITDA	9%	10%	9%	-7%
Depreciation	0%	0%	0%	-10%
EBIT	9%	10%	9%	-18%
Tax on EBIT	-3%	-3%	-2%	0%
NOPAT	5,8%	7,2%	6,5%	-18,1%

3.1.3.3 Turnover rate

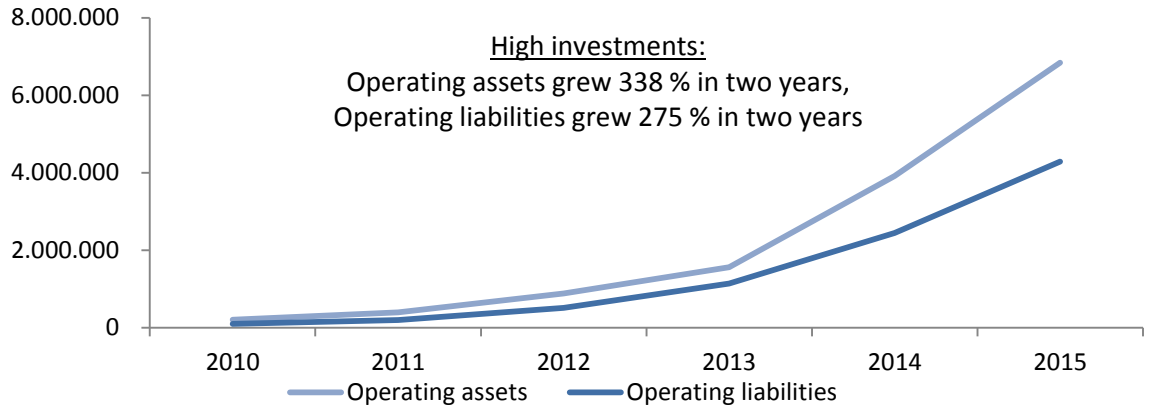
The turnover rate is the relation of between revenue and invested capital. Higher turnover rate is desired as it indicates that invested capital is more productive. Tesla´s turnover rate has been quite unstable the past years.

- *Invested capital:* The main cost driver is Property, Plant and Equipment (PP&E). The automotive industry is highly capital intensive, with high investments in production facilities. In 2010 Tesla invested in the Fremont factory in order to ramp up their Model S production. [160] Significant investments were done in 2011 in order to rebuild the factory improve operational efficiency. By 2012, the factory was fully operational. Tesla will invest over $ 2 billion in the Gigafactory 1 towards the 2020.

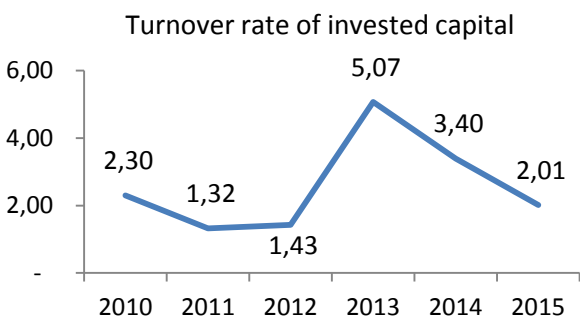


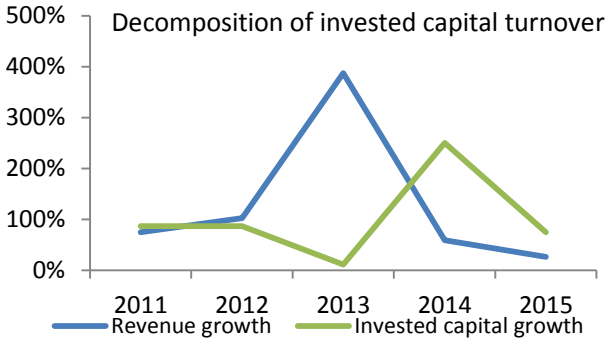
[160] See appendix for complete list of facilities

Both operating assets and liabilities have experienced a rapid growth. After PP&E Tesla´s fast growing operating lease vehicle fleet is the second largest driver of operating assets.



Development of turnover rate: Prior to Tesla capitalizing on their investments in the Model S, the company had a low turnover rate. However, after the sales numbers of Model S boosted in 2013, so did the turnover rate - increasing from 1,4 to 5,1 in one year. The drop in 2014 and 2015 comes from a higher growth in invested capital than in revenues. The main driver for this trend is the rapid build-up of operating lease vehicles.





3.1.3.4 Value creation metrics: company and owner perspective

- *Economic value added* (*EVA):*[161] If Return On Invested Capital (ROIC) exceeds Weighted Average Cost of Capital (WACC) a company creates returns or EVA. That is why an operating profit has to exceed cost of capital to be value creating . Tesla has "destroyed" value for their owners in the period 2010-2015. Even with the success of the Model S, the company is burning cash faster than it can generate revenue. ROIC is below WACC every year, despite improving on average significantly over time.

Year	2010	2011	2012	2013	2014	2015
EVA	-151.855	-266.726	-421.966	-102.168	-289.234	-923.846
ROIC	-290,30%	-163,20%	-136,70%	-16,20%	-21,20%	-36,40%
WACC	9,50%	9,50%	9,50%	9,50%	9,50%	9,50%
Invested Capital	50.651	154.439	288.538	397.289	941.709	2.009.114

We use ROIC when comparing companies as ROIC is not affected by leverage. Further, by identifying profitable businesses and understanding their strategy, companies can improve their own profitability.

- *Return on Equity* (*ROE):*[162] The ROE takes into account operating profitability, but in contradiction to ROIC we also include the effects of net borrowing cost and financial leverage. By using average balance sheet numbers from 2011 - 2015 we get the following numbers:

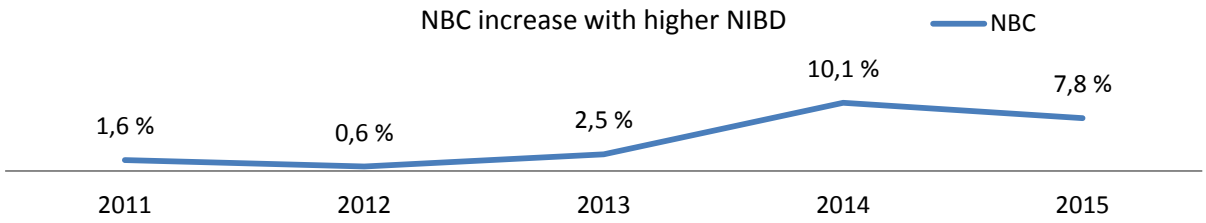
Owner profitability	2011	2012	2013	2014	2015
ROE	-281,2 %	-363,9 %	-34,9 %	-58,4 %	-125,3 %
ROIC	-163%	-137%	-16%	-21%	-36%
Net borrowing cost in percent	-1,6 %	-0,6 %	-2,5 %	-10,1 %	-7,8 %
Financial leverage	0,72	1,65	1,00	1,19	2,01

- *Effect of financial leverage on profitability*: The effect of financial leverage illustrates the additional value of being financed with debt. This value is created by the tax shield that occurs as a benefit for owners when using debt financing. ROIC and Net Borrowing Cost (NBC) is called spread. It is important that the ROE is higher than the NBC[163], if not higher leverage will kill growth. If the spread between ROIC and NBC is positive, financial leverage contributes positively to sustainable growth. If the spread is negative, higher leverage kills profitability. In our case, the spread is negative every year. The company is primarily financed

[161] EVA = (ROIC – WACC) * Average Invested Capital
[162] ROE = ROIC + (ROIC - NBC) * NIBD/Equity

[163] NBC = Net financial expenses after tax / net interest-bearing debt

with equity, causing the effect of financial leverage to be small. Tesla´s Return On Equity (ROE) is even lower than the ROIC. However after launching the Model S, ROE improved rapidly. The average ROE after the launch of the model S was -96,1 percent compared to a -57,7 percent ROIC. In order to further evaluate the level of ROE, we would need to compare the ROE to the cost of equity, which would give us the residual income (RI). NCB increase with Net Interest Bearing Debt (NIBD) as shown below.



Residual Income RI:[164] Given Tesla´s ROE being negative, the residual income would also be negative.

RI	2011	2012	2013	2014	2015
RI	-626.793	-651.317	-176.045	-536.933	-1.349.191
ROE	-281%	-364%	-35%	-58%	-125%
re	9,6%	9,6%	9,6%	9,6%	9,6%
Equity BVE	224.045	124.700	667.120	911.710	1.088.944

3.1.4 Liquidity Risk

To understand Tesla's ability to meet obligations, we analyze liquidity risk. Liquidity measures how fast assets can be transformed to cash so it can be used to meet obligations. Liquidity ratios could benefit on, in some cases, to be compared with liquidity measures to that of its peers. A peer liquidity assessment is not included in our thesis because it would have little clarification value in the process of answering our problem statement. We believe our liquidity assessment of Tesla is providing sufficient information to continue our analysis. By looking at selected ratios we are able to asses Tesla's long term and short term liquidity risk.

3.1.4.1 Short term liquidity risk

How Tesla is able to meet sudden unforeseen expenditures is a good indicator of their short term liquidity. Unforeseen expenditures are often associated with operations. Due to negative numbers in the analytic income statement and balance sheet, current ratio and quick rate provides the most valid information for short term risk assessment.

[164] (ROE – cost of equity) * Average Book Value of Equity

The current and quick ratios both measure to what extend assets cover liabilities. The difference is that quick ratio only includes the most liquid current assets and is therefore also perceived to be relatively more conservative. Although an acceptable current ratio is different depending on the industry, it is argued that a ratio above 2,0 indicates a low liquidity risk.[165] As seen from the table below the current ratio consistently shows a ratio above 2. The quick ratio is as mentioned more conservative. Based on these ratios Tesla is considered to have medium liquidity risk in the short run.

Short term liquidity	2010	2011	2012	2013	2014	2015
Current assets	307.618	681.904	1.089.937	2.407.483	5.819.930	8.038.310
Current liabilities	72.324	271.165	411.460	13.037	613.833	2.040.375
Current ratio	4,25	2,51	2,65	184,67	9,48	3,94
Cash and cash equivalents	99.558	255.266	201.890	845.889	1.905.713	1.196.908
Short term marketable securities	-	25.061	-	-	-	-
Accounts receivable	6.710	9.539	26.842	49.109	226.604	168.965
Quick ratio	1,47	1,07	0,56	68,65	3,47	0,67

3.1.4.2 Long term liquidity risk

The financial leverage and solvency ratio indicate how Tesla is able to meet obligations in the long run. A high financial leverage and a low solvency ratio would indicate high long term liquidity risk.[166] Using the market value of equity the financial leverage is consistently below 0,26 over the historical period. The solvency is never below 0,8. In contrast, the interest coverage ratio is high. In our case, with negative Earnings Before Interest and Tax (EBIT) and net financial expenses, this indicates high liquidity risk. Tesla has never been able to cover financial expenses from operating profits. Tesla is unable to cover interest expenses due to negative operating profit. The long term liquidity risk is therefore considered to be high.

Long term liquidity	2010	2011	2012	2013	2014	2015
Shares outstanding	94.910	104.530	114.210	123.090	125.690	131.420
Share price	26,63	28,56	33,87	150,43	222,41	240,01
Market value of equity	2.527.453	2.985.377	3.868.293	18.516.429	27.954.713	31.542.114
Total liabilities	179.034	489.403	989.490	1.749.810	4.937.541	7.003.516
Financial Leverage	0,07	0,16	0,26	0,09	0,18	0,22
Shareholders equity and liability	2.706.487	3.474.780	4.857.783	20.266.239	32.892.254	38.545.630
Solvency ratio	0,93	0,86	0,80	0,91	0,85	0,82
EBIT	-146.838	-251.488	-394.283	-61.283	-186.689	-716.629
Net financial expenses	-3.817	-7.317	-2.434	-1.794	-10.143	-97.947
Interest coverage ratio	38,47	34,37	161,99	34,16	18,41	7,32

Long term liquidity ratios, Authors

[165] Petersen & Plenborg (2012): *Financial Statement Analysis, p. 155*
[166] Petersen & Plenborg (2012) *Financial Statement Analysis,* p. 158

3.1.5 Sub-conclusion: historical financial analysis

Q4: How does historical performance predict future performance?
+ Positive revenue trend and high investments fuel future growth.
- Tesla has negative ROIC due to high COGS, R&D and SG&A.

3.2 Financial forecasting

In this section we will analyze the following question (Q5): *"How will key financial value drivers develop within the budget period?"*

We aim to answer this question by quantifying and explaining our conclusions from the strategic analysis.

Appendix 6, 7 & 8: The complete pro forma income, balance and cash flow statement forecast is presented in appendix 6, 7 & 8 respectively.

3.2.1 Budget period

Although the future is unknowable, careful analysis can yield insights into how a company may develop (McKinsey, 2010). The budget period is the period where items are assumed not to be constant. We see the budget period as 2016 to 2025. After this period we believe Tesla will reach a steady state period. To simplify the model and avoid the error of false precision, we split the budget period into two periods:

1. A detailed 2016 to 2020 forecast, which develops complete balance sheets and income statements with as many links to real variables (e.g., unit volumes, cost per unit) as possible.
2. A simplified forecast for 2021 - 2025, focusing on a few important variables, such as revenue growth, margins and invested capital turnover.

This approach not only simplifies the forecast, but it also forces focusing on the business' long-term economics, rather than the individual line items of the forecast.

3.2.2 Terminal period

The terminal period is the year where the company reaches steady state. This is defined by McKinseyas the time when:

1) The company grows at a constant rate by reinvesting a constant proportion of its operating profits into the business each year.

2) The company earns a constant rate of return on both existing capital and new capital invested.

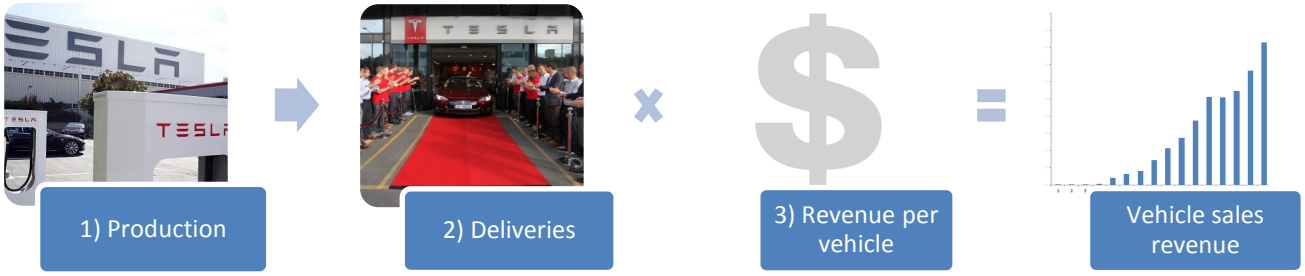
This results in free cash flow growth at a constant rate for the steady-state company and can be valued using a growth perpetuity. [167]

We believe that this steady state has to be in the years after 2020, when the Gigafactory is completed and Tesla has become a mass market auto manufacturer. We have therefore chosen 2025, as we believe that Tesla will achieve higher growth rates than the general economy in following 5 years after the completion of the first Gigafactory. We aim to make the forecast period long enough that the company's growth rate is less than or equal to that of the aggregate economy, as higher growth rates would eventually make companies unrealistically large.

3.2.3 Pro forma income statement

3.2.3.1 Revenue forecast

Our revenue forecast builds on a bottom-up approach. Historically, Tesla´s main bottleneck has been production capabilities. We believe the first constraint to overcome in order to reach their 2020 ambitions is the company´s production capabilities within the near future. We will therefore start with a forecast of production capabilities, before forecasting when these produced vehicles will convert into deliveries. Lastly, in order to forecast revenue we will multiply these deliveries with the average revenue per vehicle.



Vehicle Sales Revenue Forecast Approach, Source: Compiled by authors.

Appendix 9: The complete excel sheet of revenue forecast calculations are presented in appendix 9.

We mainly devote the revenue forecast analysis to vehicle sales, as we see this as the main catalyst for

[167] McKinsey, Valuation

revenue development. Tesla also has other revenue lines than those directly derived from vehicle sales, which also needs to be included in the forecasting. However, vehicle sales have constituted for on average 83 percent of total revenues the past three years. The remaining revenue lines are either directly or indirectly correlated to vehicle sales.

Total production forecast: 2016 - 2025

- First, we explain our production forecast methodology
- Second, we elaborate on the development of each model

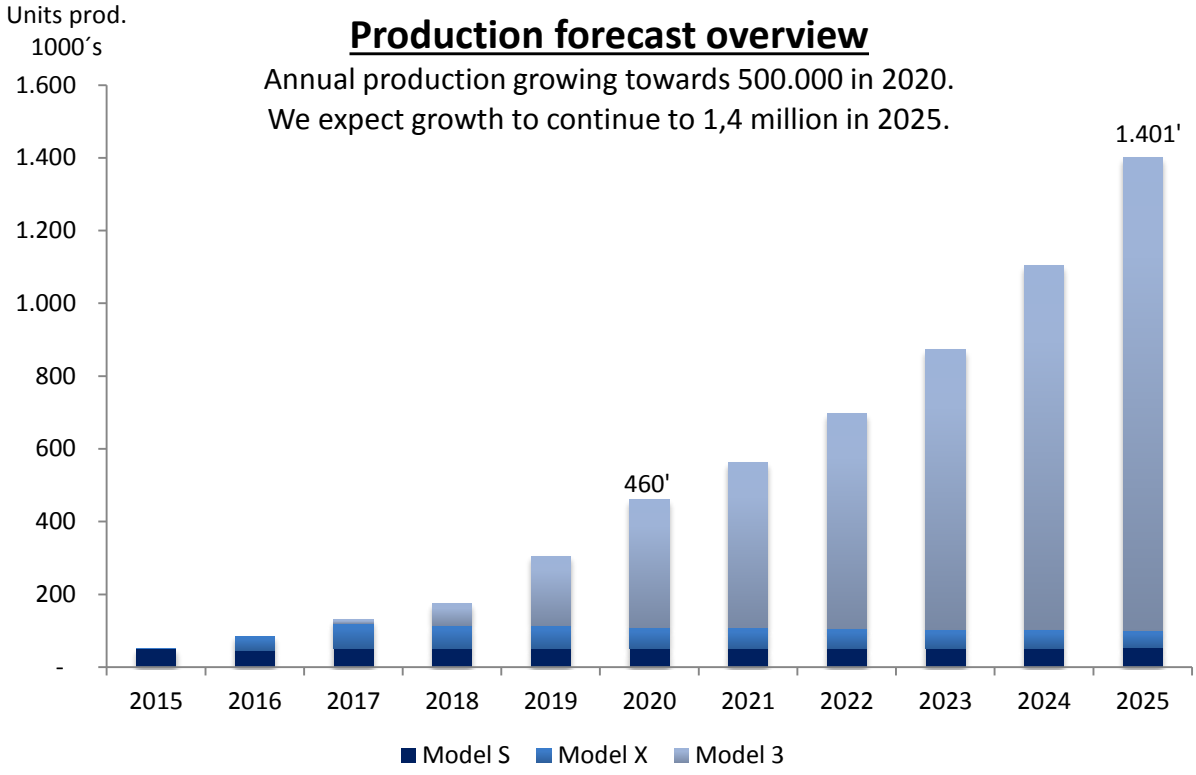
Methodology: To forecast production, we will use the company´s own predictions. However, the scarcity of publically available information on their future production capacities poses a challenge. The main guidance for future production capacity is the goal of 500.000 vehicles annually by the year 2020. The future capacity and operations of Fremont Factory and Gigafactory are directed towards this overarching vehicle goal. The Fremont factory has previously been able to produce 500.000 vehicles per year during the 1980´s, under production capacities less sophisticated and efficient than what is assumed to be possessed by Tesla today. We are therefore confidence that the Fremont Factory has the capacity to reach this goal, given the current investment rate in PP&E to produce sufficient assembly lines for Model X and 3 to ensure volume and quality. The production guidance has historically shown to be overly ambitious, by failing to achieve multiple guidance statements. However, there are three reasons to believe that Tesla will be achieving the guidance targets and predictions from 2016 and forward.

Reason 1: As explained in the strategic analysis, demand is not a problem, as the market continuous to absorb Tesla's vehicles. Thus, production capacity will be the main constraint. Reservations are currently years in advance. Despite no paid advertising or Model X or 3 displayed in stores, sales growth continues to grow.

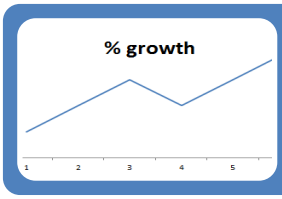
Reason 2: Tesla is now guiding short-term with a range. This gives room for a worst and best scenario. Musk stated in Q2 2015: *"Winning needs to feel like winning".* This gives confidence that Tesla will be more careful with their guidance after this date and therefore the guidance deserves more credibility. Learning from the experience of achieving tremendous sales growth, and still miss guidance target two years in a row, Tesla might have stronger incentives than ever to hit their targets. Tesla has forecasted a production of 80.000 to 90.000 vehicles in 2016. We think that the arguments presented above provide confidence in Tesla reaching the midrange of this target (85.000 vehicles). However, the goal of producing 500.000 vehicles was given several years ago, in the period were Musk´s guidance statements were assumed to be

beyond realistic expectations. Although this is still the overarching goal for the company, we believe they will underscore it by an estimated 6 percent, producing 460.000 vehicles by 2020 (See calculation in appendix).

- *Reason 3*: Tesla´s production of Model S was underestimated in 2013 when its production ramped. If history repeats itself, 2016 would become similar for the Model X production ramp.



Annual Production Forecast 10 years, Source: Authors

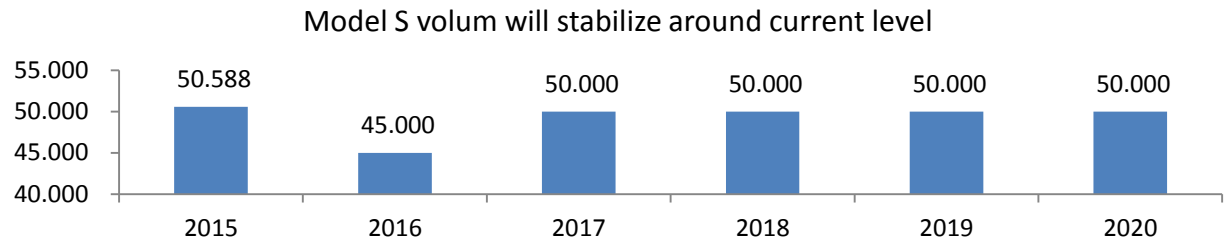


Detailed growth forecast: 2016 - 2020

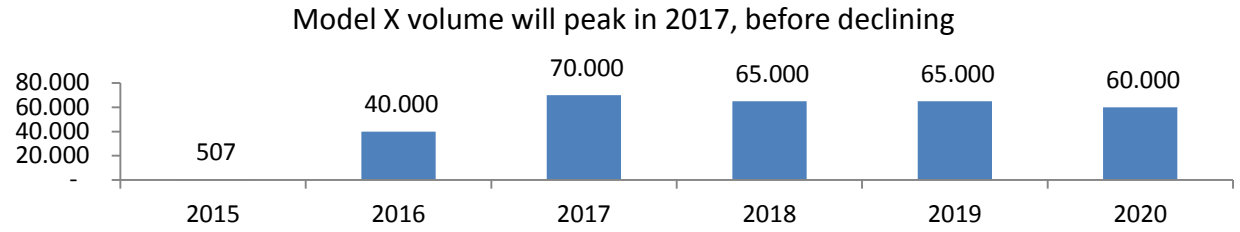
- Below we explain our assumed production growth in this period
- Conclusion: we expect a CAGR of 55,8 %

CAGR = *Compound Annual Growth Rate*

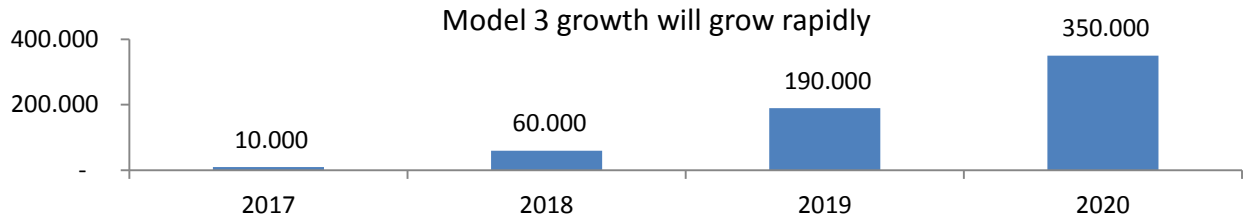
We expect Tesla will experience insignificant delays leading forwards to 2020. Tesla would total at 460.000 vehicles, just 40.000 short from their 500.000 target. The development of each model is elaborated below.



- *Model S:* This vehicle has seen tremendous growth the past years driving the successful execution of Stage 2 of their product strategy. However, with the introduction of new models, we believe that sales will stabilize around the current production volume with only a slight decrease from today´s peak.

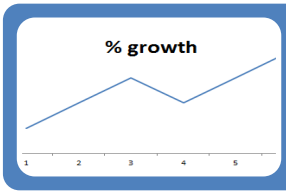


- *Model X:* This vehicle first started production in late 2015. However, both Q4 2015 with 507 vehicles and Q1 2016, with its 4000 vehicles, are way below anticipations. The production ramp is expected to hit in Q2 2016 with an announced production capacity of 1000 vehicles per week, giving a production capacity of 12.000 vehicles per quarter. This totals at a 40.000 for 2016. However, we do not see the strategic necessity of this vehicle (ref. Stage 2 product strategy), believing that Tesla will downscale production to give room for Model 3.



- *Model 3*: This car is announced launch in late 2017. Therefore we don´t forecast any significant

production before Q1 2018. Along with upcoming Gigafactory, production ramp will be allowed on a much larger scale. Given the great volume of reservations, we believe that a 350.000 volume by 2020 is realistic.



Simplified production forecast: 2021- 2025

- Below we explain our assumed production growth pre 2025
- Conclusion: we expect a CAGR of 25 %

Post 2020 we assume that Tesla will continue to develop their production capacity by investing in new PP&E. We see the necessity for another factory to appear in the near future. This must be realized either through a massive expansion of the current Fremont Factory, or the construction of a brand new factory. Although Tesla has not publicly announced plan for a new vehicle factory, they have announced they will build several new Gigafactories in the future. With these continued investments explained in the CAPEX forecast in a later section, the company would have increased their production capacity to 1.4 million vehicles by 2025. We have chosen this number as it would follow a natural progression of Tesla´s 2016 – 2020 growth. This can be displayed in the 10 year forecast graph above. Despite being a threefold increase from the 2020 volume, it is only half of the forecasted CAGR from the period of 2016 – 2020.

Model S

- Stable growth of a classic model
- 1 % growth, ending at ~50.000 by 2025

Model X

- Decling sales of a "strategically unneccesary" model
- - 4 % annual growth, ending at ~50.000 by 2025

Model 3

- The main driver of vehicle sales
- 30 % annual growth, ending at ~1.300.000 by 2025

Future model

- Rumours of new Roadster
- But as no offical plans is revealed, no rumours are forecasted

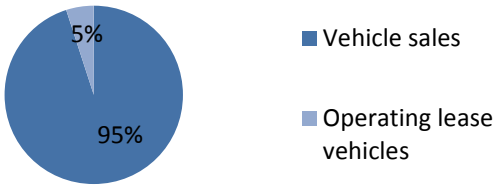
To review how our assumptions of production capacity are reflected in the capital expenditure requirement, see the forecast of non-operating assets below.

From production to delivery forecast:

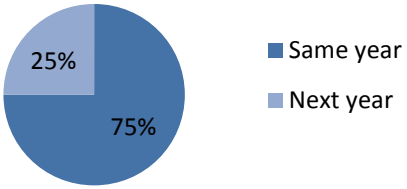
- Below we explain our assumed delivery growth relative to production
- Conclusion: annual delivery < production due to delivery lag and leaseing

Tesla is known for promoting their lean production line, where each vehicle produced is a product of a customer request. A vehicle is not produced before an order is made. But as revealed in the historical financial analysis, Tesla´s annual production and delivery numbers have not matched. This gap is caused by vehicles stuck in transit or vehicles used for leasing instead of vehicle sales. In forecasting automotive delivery we therefore need to make two assumptions.

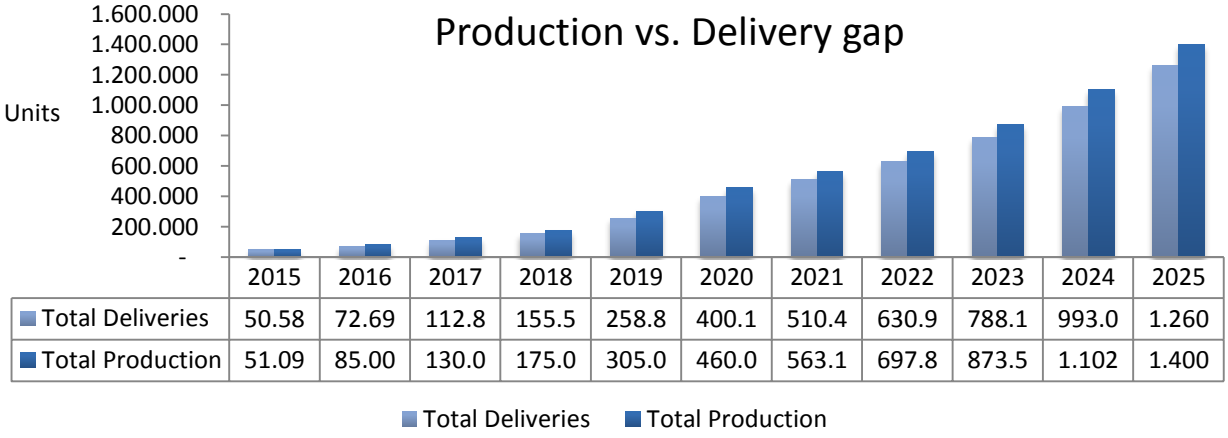
Assumption 1:
5 % of vehicles produced are used for leasing



Assumption 2:
Vehicles produced in Q4 is delivered next year



[168]



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total Deliveries	50.58	72.69	112.8	155.5	258.8	400.1	510.4	630.9	788.1	993.0	1.260
Total Production	51.09	85.00	130.0	175.0	305.0	460.0	563.1	697.8	873.5	1.102	1.400

Table Delivery Forecast

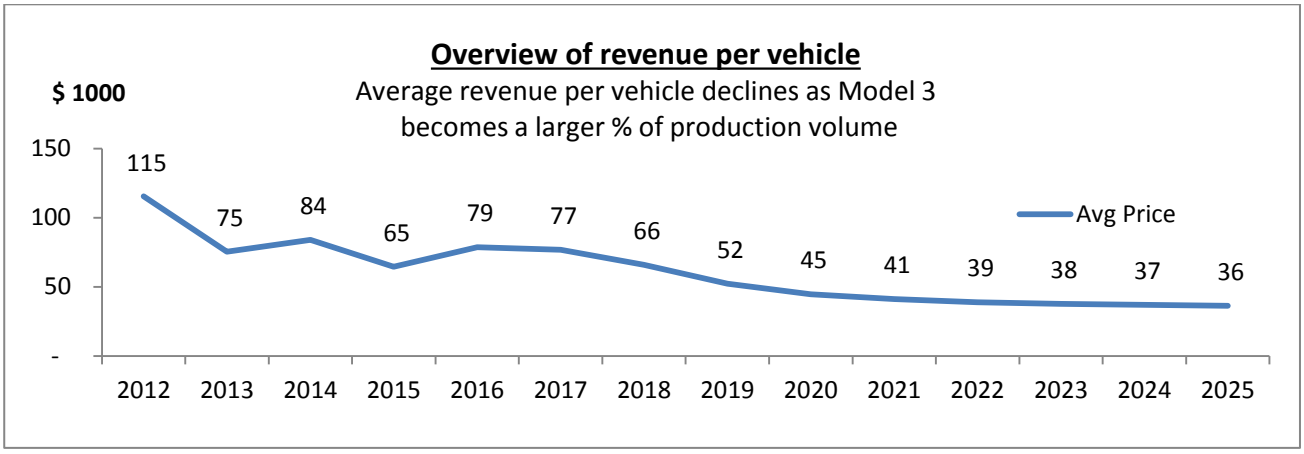
[168] Assumption 2: For simplification matters we assume annual production to be equally distributed over all 4 quarters.

Given these assumptions we can convert the production forecast into a delivery forecast as presented above. As revenue from vehicle sales is not recorded until the delivery is made,[169] the periodization of vehicle delivery´s will greatly impact the periodization of recorded annual revenue. Our assumption that Q4 vehicles are delivered in next Q1 are rather conservative. However, we believe that is rational to be conservative in our estimates to incorporate the risk of delays.

Revenue per vehicle:

- Below we explain our assumed revenue per vehicle delivered
- Conclusion: price decline follows lower battery costs to grow EV market

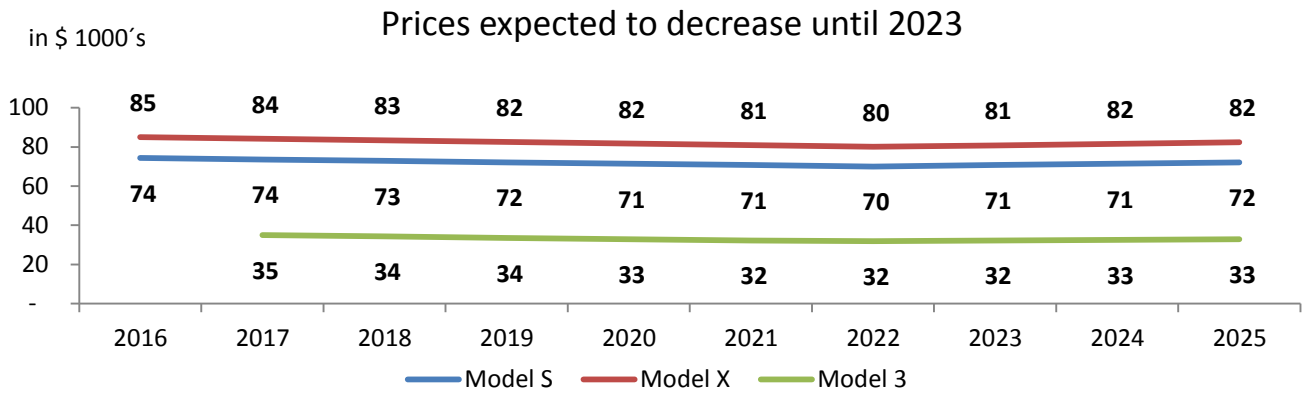
Tesla does not foreclose information on average transaction price for vehicles sold, nor product mix sold. However, on their website the customer can order vehicles starting from 70.000 USD and up to 130.000 USD. Tesla has also stated that the Model X and 3 starts at 80.000 and 35.000 USD respectively.



As retail sales price does not equal revenue per vehicle, we review historical revenue per vehicle [170] in order to estimate how retail selling prices convert in to revenue. The revenue per vehicle in 2015 was $ 65.000 USD, of which is well below the lowest average transaction price of 70.000 USD. This brings knowledge that revenue per vehicle sold for these two models is assumed to be close to the guided base transaction prices.

[169] Tesla Motors: *Annual Report 2015*

[170] $Revenue\ per\ vehicle\ sold = Revenue\ from\ vehicle\ sales\ /\ Units\ delivered$



Key assumptions on pricing strategy: Following the arguments made in the strategic analysis on the price developments of EVs relative to ICE-cars, we assume the following price changes pre and post 2022.

Δ Price	Pre 2022	Post 2022
Model S	-1%	1%
Model X	-1%	1%
Model 3	-2%	1%

The Model 3 is expected to decline faster in price due to more competition in the lower priced premium segment as discussed in Porter´s 5 forces.

- *Model S*: Historically the average revenue per vehicle has fluctuated a great deal, depending on battery pack and other options. The lower margin in 2015 as compared to 2014 was primarily due to product and regional mix shift, as a greater percentage of sales were derived from vehicle models with lower average selling prices.[171]. For those wanting a more affordable car, Tesla introduced Model S 70 with a starting price of $ 70,000 before incentives and fuel savings. Given the uncertainties regarding future product and regional mix for model S, we use an average from 2014 – 2015, deriving at 74.000 USD for 2016.
- *Model X*: Tesla expects their average vehicle transaction price to increase slightly during 2016, as Model X grows to become a larger share of our deliveries throughout the year. We estimate the Model X, to generate $ 85.000 USD in average revenue per vehicle. This is $ 5000 USD above the base transaction price. We assume buyer of Model X has a higher income background, first as it is a higher priced car and because it is a family car. We assume higher income consumers are less price sensitive, and that they will buy higher priced battery pack and other options.
- *Model 3*: Lastly the Model 3 is guided at a 35.000 USD baseline price tag. We estimate this to generate

[171] Tesla Motors: *Annual Report 2015*

35.000 USD in average revenue per vehicle based on a consensus of analytical reports. We further think that competition grows in the EV segment. We expect prices to decline 2 percent annually from 2018 to 2022. From 2023, prices will increase with 1 percent as they are comparably equally priced as ICE-cars.

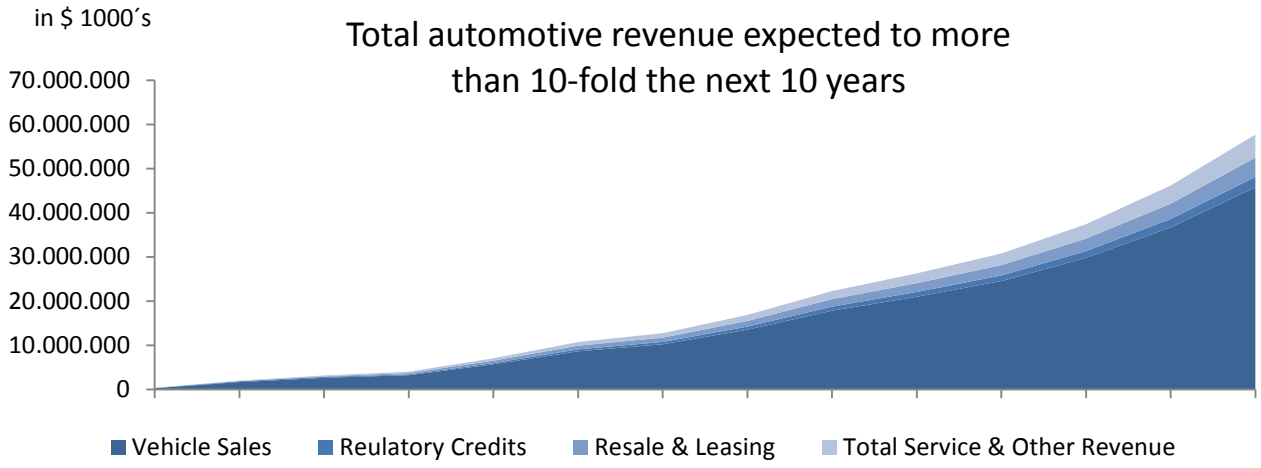
Other assumptions in calculating total revenue

- Regulatory credits: 5 % of vehicle sales
- Resale value guarantee & leasing: 9,48 % of vehicle sales
- Service & other: 8,2 % of of automotive revenue, 0.2% annual growth

Regulatory credits: These are expected to remain a part of Tesla´s revenue in the future as well. We forecast it to be 5 percent of vehicle sales, the same as in 2015.

Resale value guarantees and leasing: Leasing is proven to be a growing revenue line, while the amortization of resale value guarantee is expected to decrease. We forecasted this revenue line at 9,48 percent of vehicle sales each year, the same as in 2015.

Service & other: Tesla´s second revenue segment is constituted of 8,2 percent of automotive revenue in 2015. This segment includes the much-anticipated Tesla Energy. As explained in the strategic analysis, the Tesla Energy products are not expected to constitute for a major part of revenues in the budget period. Further, Tesla has not foreclosed any specific revenue history or expectations on this revenue line. Our best estimate is therefore the 2015 relation of 8,2 percent, with a slight increase of 0,2 percentage point per year to include the growth of Tesla Energy.



Billion USD	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total revenue	4,0	7,1	10,8	12,8	16,9	22,3	26,3	30,8	37,4	46,2	57,7
Growth	27%	75%	52%	19%	32%	32%	18%	17%	22%	23%	25%

Total revenue is expected to reach $ 22.3 billon USD by 2020. This represents an average growth of 42 percent per year from 2015. Further, we expect revenues to grow to 57.7 billion by 2025. This represents an average growth rate of 21 percent from 2020.

3.2.3.2 EBITDA margin

To forecast the operational profitability of Tesla we forecast all the items before EBITDA in the analytical income statement. We will forecast the three operational expenditures of Tesla:

EBITDA forecast value drivers		
COGS as % of revenue	R&D as % of revenue	SG&A as % of revenue

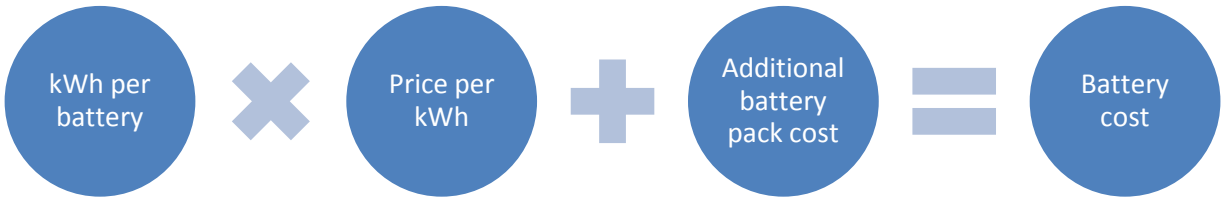
As these costs are mostly variable we choose to calculate them as percent of total revenue. In the following sections we forecast the items in order to estimate EBITDA.

COGS forecast

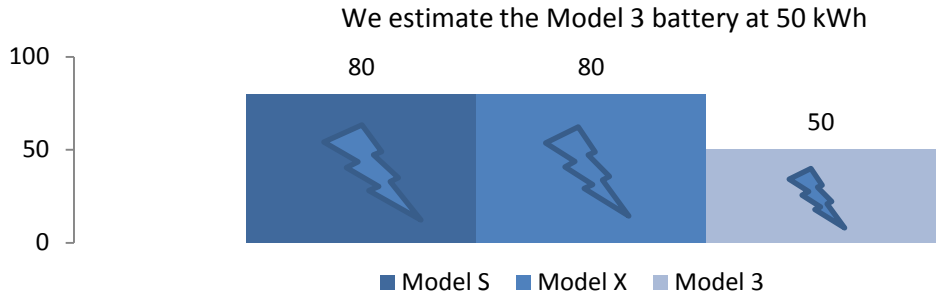
- Greatly benefits on declining battery costs
- High start-up costs related to production of new models
- Raw material prices expected to increase

Tesla´s COGS structure as an EV-manufacturer differs from other OEMs as their largest cost is the batteries. In order to understand how the changes of battery prices affect the COGS, we have broken down the batteries into its underlying components. The table below presents the main estimates driving COGS as percent of revenues.

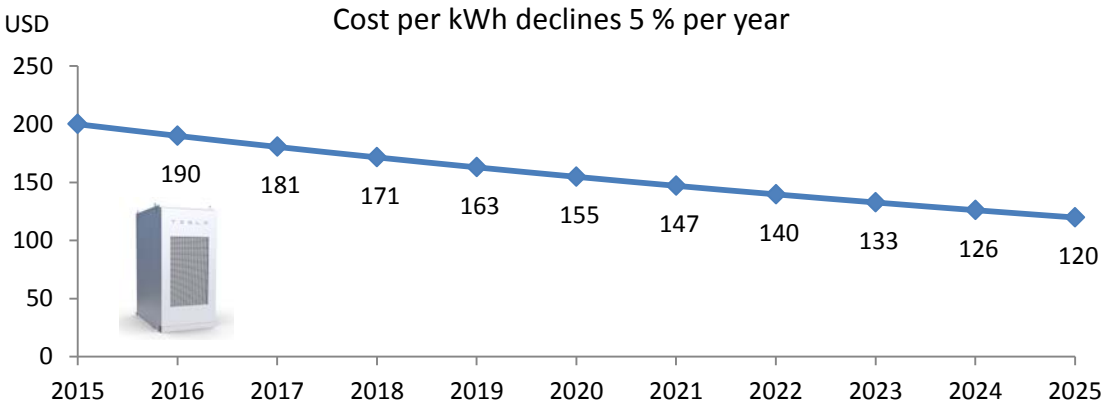
Appendix 10: The complete excel sheet of COGS calculations are presented in appendix 10.



- *kWh per battery:* Tesla´s two current models come with either a 70 or 90 kWh battery pack. We apply an average of 80 kWh per battery. Using this estimate we at least do not risk underestimating battery costs, as there probably are sold more 70 kWh packs than 90 kWh packs. Tesla has not published the size of the model 3 battery, however it has stated a minimum range of 345 km. Based on knowledge that the Model S 70D currently can drive 6,3 km on 1 kWh, Model 3 would need a 55 kWh battery if it carried the same weight as the Model S. But as Model 3 is substantially lighter than a Model S, we estimate that it would sell an average of 50 kWh battery packs per vehicle. Again we aim to not underestimate costs, as the vehicle probably carries a smaller battery.



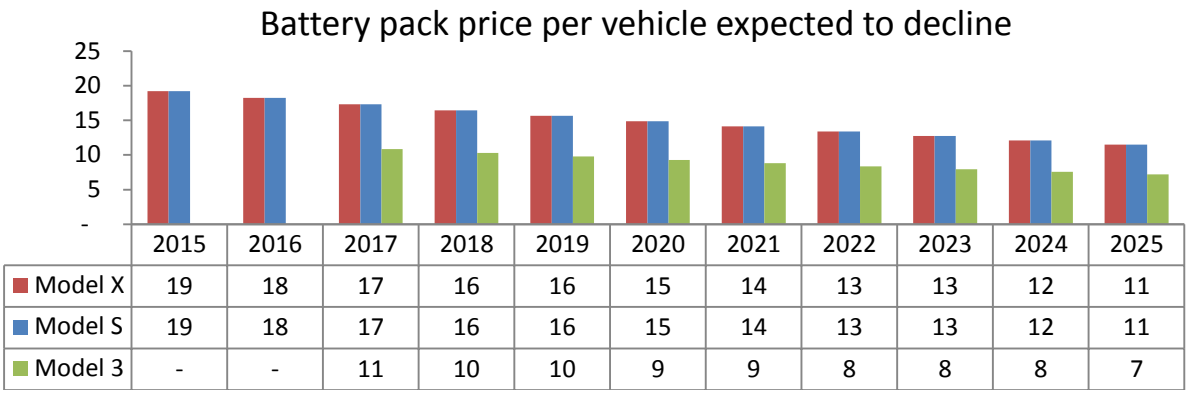
- *Price per kWh:* As battery pack prices are not publicly listed information, their actual costs are highly speculative. Based on industry experts and analysts, we estimated a kWh price of 200 USD in 2015. Tesla has stated a 30 percent reduction of battery costs from 2014 to 2020. This will give a CAGR of – 5 percent per year (30 percent I a six years period).



Total battery cost: As Tesla does not reveal their actual battery costs base, our estimates is based on the estimates from industry experts. Based on our knowledge on kWh needs and price of kWh we estimate cost per battery pack.

Battery cost	S & X (2016)	Model 3 (2017)
kWh/battery	80	50
Price kWh	190	181
Total kWh price	15.200	9.025
Add. Cost (20%)	3.040	1.805
SUM	18.240	10.830

Assuming a 5 % decline per year, we estimate the following data:

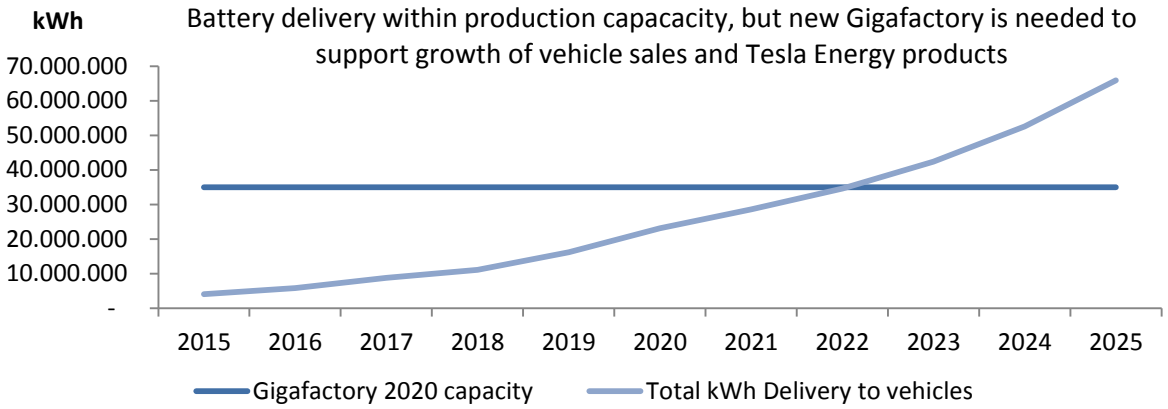


	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Model X	19	18	17	16	16	15	14	13	13	12	11
Model S	19	18	17	16	16	15	14	13	13	12	11
Model 3	-	-	11	10	10	9	9	8	8	8	7

Lithium-ion cells and the battery packs that hold them are the single most costly part of modern electric cars. How fast their costs will fall remains the defining factor in making those cars affordable for the mass-market. Tesla´s battery cost is well below the industry average of 340 USD. However, Tesla is not alone in the cost reduction race. GM just announced that their Chevy Bolt will have a kWh cost of 145 USD by 2017.[172]

Total kWh production: As a sanity check, our estimates of 27 million kWh by 2020 are aligned with Tesla´s kWh production capacity. The Gigafactory 1 with the purpose of producing all batteries for both vehicles and home storage has an annual production capacity of 35 GWh or 35 million kWh.

[172] Greencarreports.com: *www.greencarreports.com/news/1103667_electric-car-battery-costs-tesla-190-per-kwh-for-pack-gm-145-for-cells*

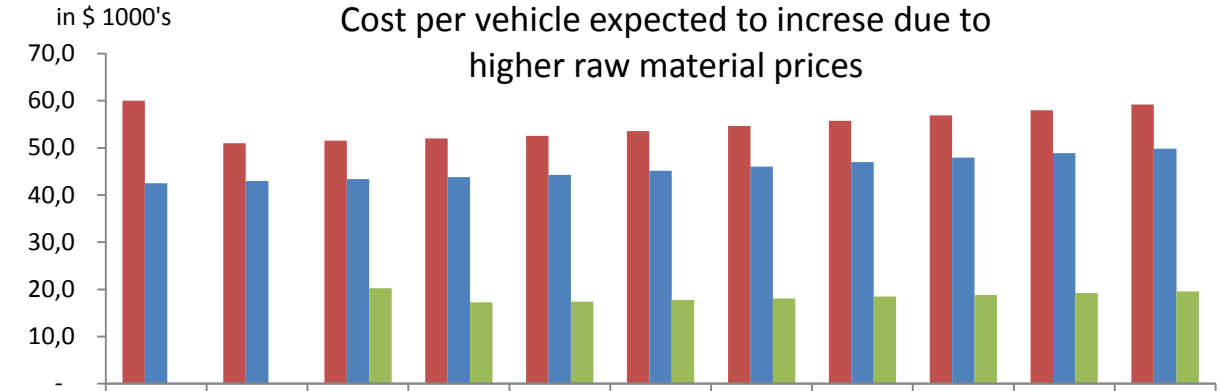


Cost of vehicle exclusive battery: Similarly as Tesla does not reveal their battery costs; they do not reveal their cost of vehicle exclusive batteries. We apply the following estimates below in calculating the cost per the Model S exclusive batteries. Historically, Tesla´s COGS percent increase when introducing a new vehicle. As described in the financial analysis, gross margins were negatively affected in 2012 with the introduction of Model S and in 2015 with Model X. We assume annual production cost to decline 15 percent for Model X in 2016, and 15 percent for Model 3 in 2018. Further we assume these costs to increase 2 percent per year due to increasing raw material prices as described in the strategic analysis.

Model 3 costs	TSLA est. 17
Base vehicle	13.900
Aluminum and scale	350
Sensors	200
Propulsion systems	2.800
EV accessory systems	3.020
Sum excl. battery	20.270
Battery pack	10.450
SUM variable cost	30.720

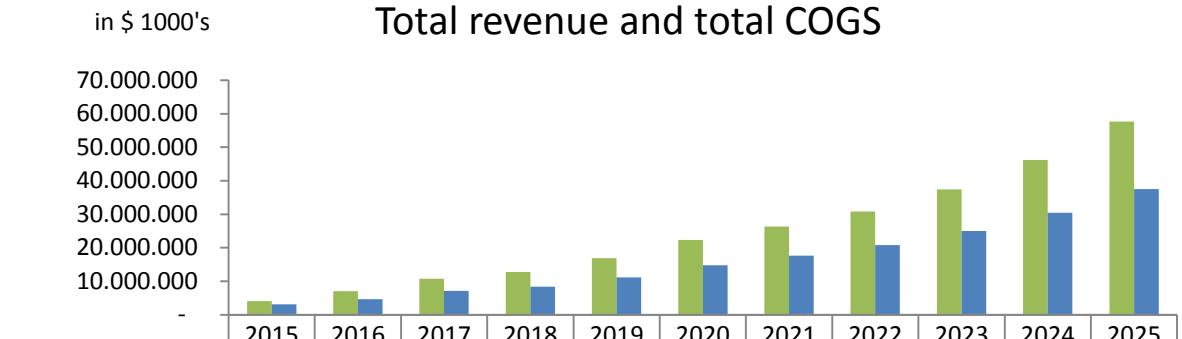
Table 1: Tesla Model 3 Cost, Source: UBS

By applying our estimates in the table above, we get the following estimates:



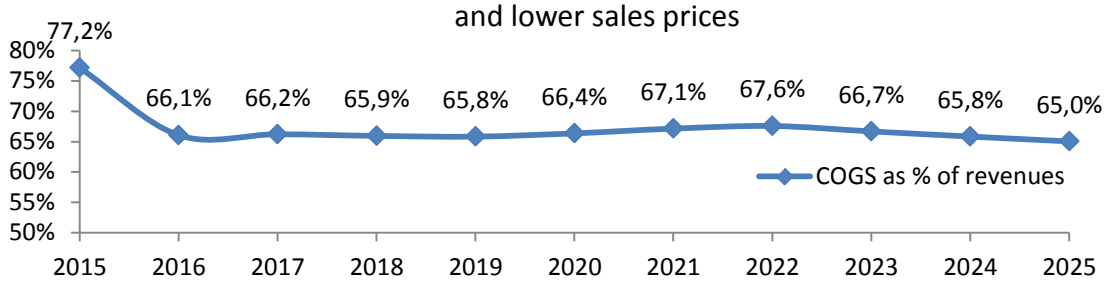
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Model X	60,0	51,0	51,5	52,0	52,5	53,6	54,7	55,8	56,9	58,0	59,2
Model S	42,5	43,0	43,4	43,8	44,3	45,1	46,0	47,0	47,9	48,9	49,8
Model 3			20,3	17,2	17,4	17,7	18,1	18,5	18,8	19,2	19,6

- *COGS as percent of revenues:* Based on our estimates on the cost of battery packs and the cost of vehicles exclusive batteries we estimate COGS, by multiplying the cost of each vehicle with the respective number of vehicles sold that year. It is important to use the number of delivered vehicles, not produced, as Tesla reports COGS when delivered not produced.



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total revenue	4.046	7.081	10.75	12.76	16.89	22.29	26.28	30.78	37.41	46.16	57.70
Total vehicle cost	3.122	4.679	7.120	8.415	11.12	14.79	17.64	20.80	24.95	30.39	37.52

COGS as % of revenues remains relatively stabile over time.
Lower battery prices are offset by higher raw material costs and lower sales prices



For premium manufacturers, COGS are on average 70 percent of revenues. After the introduction of Tesla Model 3 we expect the cost of revenues to move towards the lower part of the historical cost and move just below 70 percent in 2019. Tesla can focus on streamlining their organization and production when the Model 3 is delivering steady and growing figures resulting in a reduction in COGS as percent of revenues. As a sanity check we calculate the margin per vehicle:

Margin per vehicle	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Model S	21,5%	21,3%	20,9%	20,5%	19,1%	17,6%	16,0%	16,6%	17,2%	17,6%
Model X	22,8%	22,2%	21,6%	21,0%	19,3%	17,5%	15,7%	16,1%	16,4%	16,7%
Model 3		12,5%	24,6%	23,7%	21,8%	19,9%	19,0%	20,5%	21,8%	22,9%

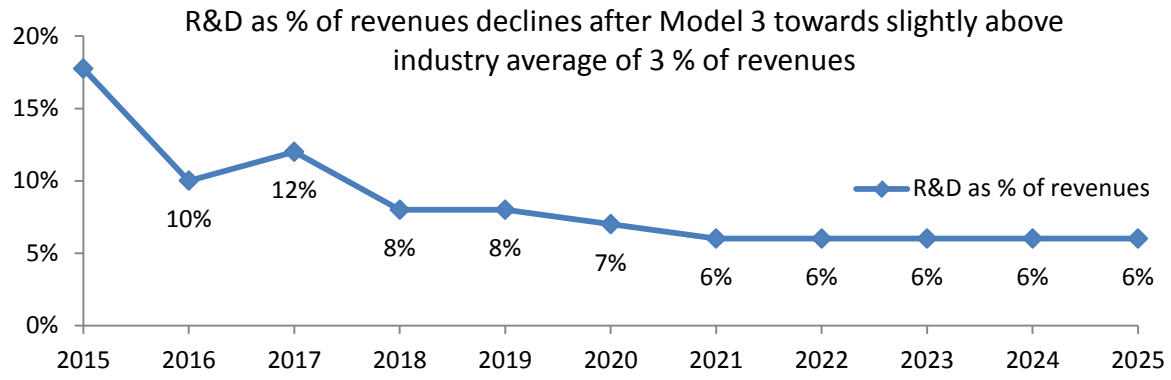
R&D forecast

- Lower R&D costs expected to boost EBITDA margin the next years
- High R&D costs related to production of new models

In 2011 Tesla's R&D spending accounted for 102 percent of revenues, but this number has dramatically decreased since. This is a normal development for a company in growth. The knowledge achieved from the historical R&D investments covers all the cars Tesla produces and it is not necessary to do those investments again. Future R&D is related to the development of new models and software development.

- *New models*: R&D costs as a percentage of revenues are expected to increase in 2017 with the launch of Model 3. With the assumption that there will be no new models within the budget period, expenses relative to revenue are expected to have a linear decrease until 2020.
- *Software*: Since most hardware such as sensors and cameras are standard equipment in the produced cars, R&D are assumed to be mostly related to software updates. The possibility to download the latest

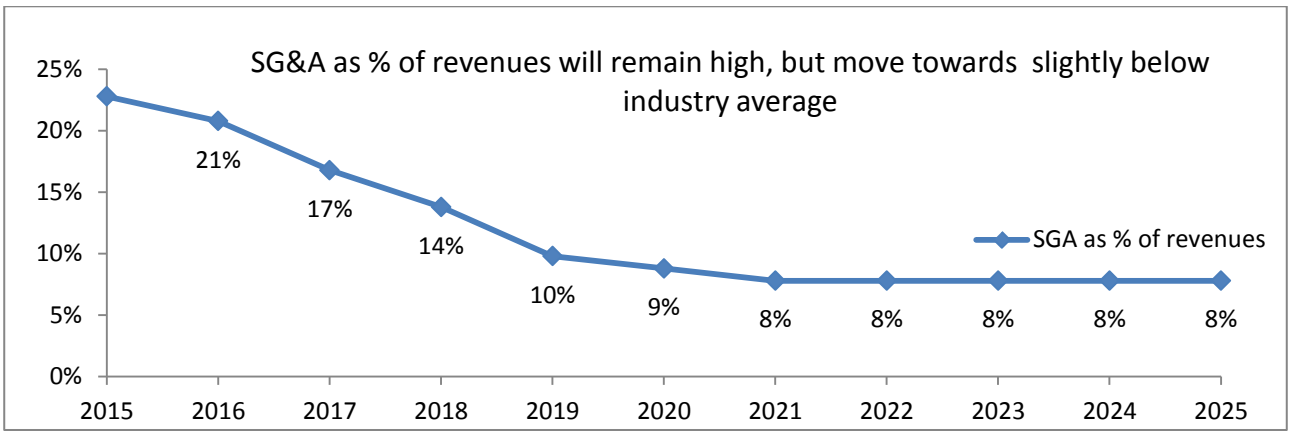
software to enable the use of autopilot is an illustrative example of one feature that has been available, but not activated.



SG&A forecast

- High costs related to expansion of Superchargers & retail stores
- Successful entry to the Chineese & international market is costly

The selling, general and administrative item in the income statement shows a pattern very much similar to the R&D item. We expect it to remain high in several years to come due to a costly Chinese entry, Supercharger & Tesla store expansion. However, we expect this item gradually decline as a percentage of revenue. This progression is natural when the Supercharger network and Tesla stores are sufficiently built out, while more agreements are being settled regarding international expansion. As Tesla has never needed to rely on marketing of their products, we believe they will undercut the industry average of 9 percent. As a best estimate we believe SG&A converge toward 8 percent of total revenues.



EBITDA-margin

- We expect strong improvements in EBIDA-margin
- Mostly from lowered R&D and SG&A costs

As Tesla reports their financial statements by function, not by nature, we need to add depreciations before calculating EBITDA. Calculation of depreciation forecast is described below.

Income statement	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Revenue	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
COGS % of revenues	-77%	-66%	-66%	-66%	-66%	-66%	-67%	-68%	-67%	-66%	-65%
R&D % of revenues	-18%	-10%	-12%	-8%	-8%	-7%	-6%	-6%	-6%	-6%	-6%
SG&A % of revenues	-23%	-21%	-17%	-14%	-10%	-9%	-8%	-8%	-8%	-8%	-8%
Depreciation % of NCOA	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
EBITDA margin	-7%	12%	14%	21%	25%	26%	27%	26%	27%	27%	27%

3.2.3.3 Other income statement items

Income statement	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Depreciation % of NCOA[173]	-8,0%	-8,0%	-8,0%	-8,0%	-8,0%	-8,0%	-8,0%	-8,0%	-8,0%	-8,0%	-8,0%
NBC %	28,7%	-11,2%	-11,2%	-11,2%	-11,2%	-11,2%	-11,2%	-11,2%	-11,2%	-11,2%	-11,2%
Effective tax rate	-1,5%	-1,5%	-1,5%	-6,5%	-16,5%	-25,0%	-25,0%	-25,0%	-25,0%	-25,0%	-25,0%

- *Tax rate:* Tesla´s tax rate has historically been low with an average of 1.25 percent since 2009. This is due to years with deficits and governmental tax breaks. As Tesla matures and reaches profitability, we believe that they will reach a 25 percent tax rate. This is the approximate average tax rate for the areas in which Tesla will build their charging stations.[174]

- *Net borrowing cost (NBC):* NBC shifted from 40 persentin 2014 to - 29 percent in 2015. Using an average of this would result in a bad proxy for future NBC. Historically interest expenses have been related to the Department Of Eenegy loans. Especially as NIBD were positive in 2013, causing a positive 40 percent positive NBC in 2014. Therefore, the NBC have been calculated using the cost of debt, found in the WACC (Section Cost of Capital). This is estimated at 11,2 percent.

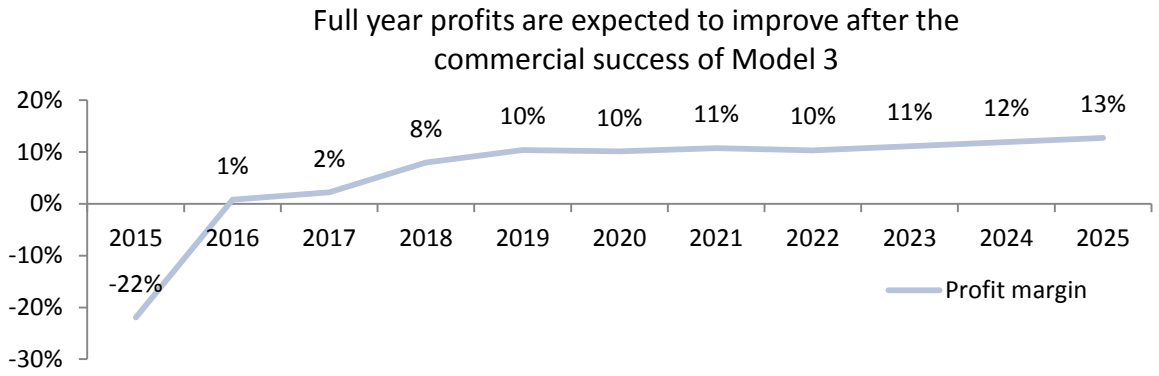
[173] NCOA = Non-Current Operating Assets
[174] KPMG.com: www.home.kpmg.com/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html

Depreciation: When CAPEX is not correlated with revenue, such as in high growth phases, McKinsey (2010) suggests calculation total depreciation as a percentage of PP&E. However in Tesla´s case, depreciations only constituted for approximately half of annual depreciations. Much of the remaining depreciations were related to the operating lease vehicle fleet. We therefore chose to forecast depreciations as percent of non-current operating assets to improve the accuracy of our forecast. As of 2015, depreciations was 8,02 percent of non-current operating assets. We expect this to remain.

3.2.3.4 Profit margin

We expect Tesla to become profitable after the successful launch of Model 3. After this Tesla we expect Tesla to be the most profitable company in the automotive industry.

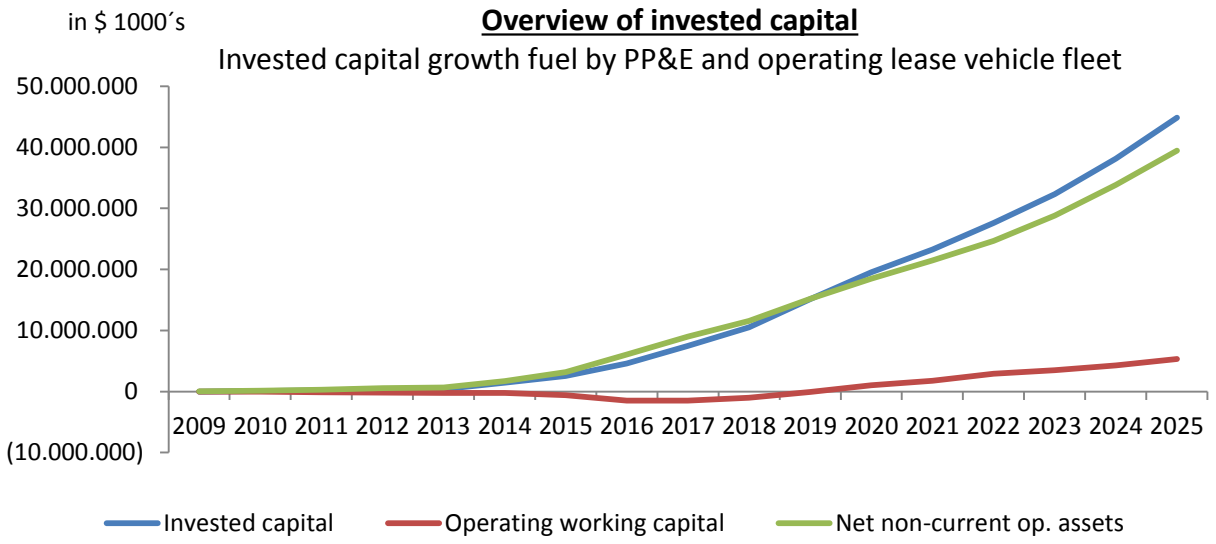
Profitability	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gross margin	23%	34%	34%	34%	34%	34%	33%	32%	33%	34%	35%
EBITDA	-7%	12%	14%	21%	25%	26%	27%	26%	27%	27%	27%
EBIT	-18%	3%	5%	12%	16%	18%	19%	19%	20%	20%	21%
NOPAT margin	-18%	3%	5%	11%	14%	13%	14%	14%	15%	15%	16%
Profit margin	-22%	1%	2%	8%	10%	10%	11%	10%	11%	12%	13%



3.2.4 Pro forma Balance Sheet

To forecast the balance sheet, we will first forecast invested capital. This first involves calculating the operating working capital and the net non-current operating assets.

Invested capital calculation structure



Invested capital overview

3.2.4.1 *Operating working capital*

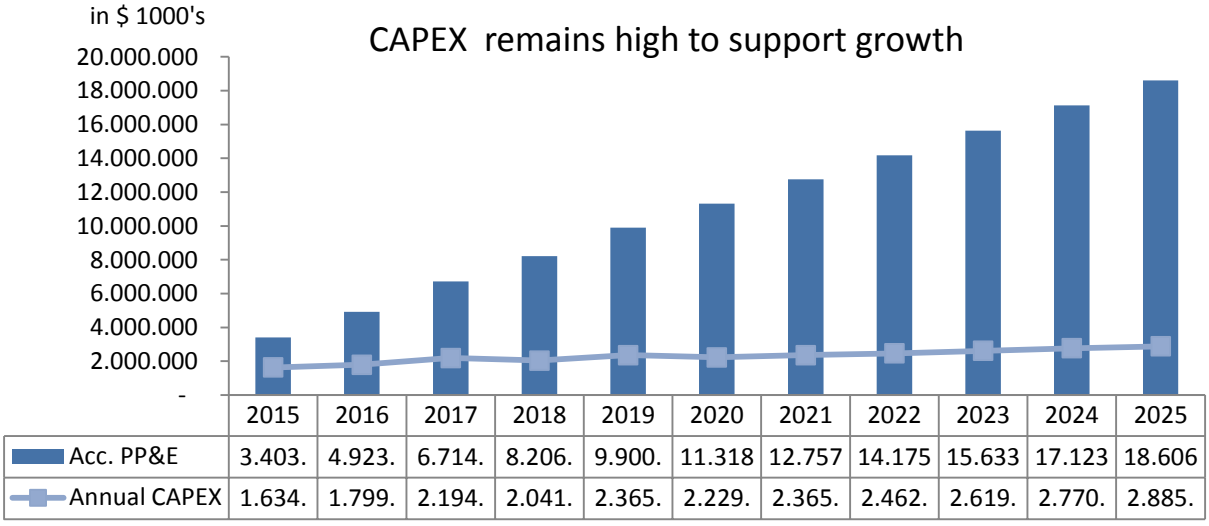
When forecasting operating working capital revenue is the most common forecast driver. Inventories and accounts payable are exceptions as they are tied to input prices, making COGS a better forecast driver (McKinsey, 2010). Given the information we are provided on Tesla´s operating working capital, our best estimates are based on historical averages from 2009 to 2015. The exception is the resale value guarantee, where the ratio from 2015 is applied.

Op. Work. Cap Forecast	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Current operating assets											
Acc. Rec. % of revenues	4,2%	4,8%	4,8%	4,8%	4,8%	4,8%	4,8%	4,8%	4,8%	4,8%	4,8%
Inventories % of COGS	40,9%	40,9%	40,9%	40,9%	40,9%	40,9%	40,9%	40,9%	40,9%	40,9%	40,9%
Prepaid Exp. % of revenues	3,1%	4,8%	4,8%	4,8%	4,8%	4,8%	4,8%	4,8%	4,8%	4,8%	4,8%
Non-current operating assets											
Acc. Pay. % of COGS	29,3%	26,3%	22,3%	18,3%	14,3%	13,3%	12,3%	10,3%	10,3%	10,3%	10,3%
Accrued Lia. % of revenues	10,4%	10,4%	10,4%	10,4%	8,4%	8,4%	8,4%	8,4%	8,4%	8,4%	8,4%
Def. Rev. % of revenue	10,5%	10,5%	10,5%	10,5%	10,5%	10,5%	10,5%	10,5%	10,5%	10,5%	10,5%
Customer Dep. % of revenue	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%	7,0%
Def. Dev. Comp % of revenue	0,0%	4,0%	4,0%	4,0%	4,0%	4,0%	4,0%	4,0%	4,0%	4,0%	4,0%
Res. Val. Guar. % of revenue	3,4%	3,2%	3,0%	2,8%	2,6%	2,4%	2,2%	2,0%	1,8%	1,6%	1,4%

3.2.4.2 Net non-current operating assets

Net NC Op. Assets	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Non-current operating assets											
Op. Lease V. % of Rev.	44,3%	44,3%	44,3%	44,3%	44,3%	44,3%	44,3%	44,3%	44,3%	44,3%	44,3%
PP&E % of Rev	84,1%	69,5%	62,4%	64,3%	58,6%	50,8%	48,5%	46,0%	41,8%	37,1%	32,2%
Other assets % of Rev	1,8%	1,8%	1,8%	1,8%	1,8%	1,8%	1,8%	1,8%	1,8%	1,8%	1,8%
Non-current operating liabilties											
NC Op. Lia. % of Rev	52,0%	30,0%	25,0%	20,0%	15,0%	14,0%	13,0%	12,0%	11,0%	10,0%	10,0%

PP&E: With the upcoming investments in Gigafactory and Model X and 3, the correlation between CAPEX and revenue will be nonlinear. We will therefore forecast PP&E based on expected CAPEX levels, rather than as a percent of revenue. Tesla has guided their CAPEX to $ 1.5 billion in 2016, a decrease from 1.6 billion in 2015. This came after Musk ordered "cash is king" in the 2016 earnings call, in order to reduce the cash burn and become net cash flow positive earlier. However, in order to support the ambitious production goals we expect CAPEX to increase, and remain over $ 2 billion USD in the budget period. The CAPEX will not support Tesla´s growing leasing vehicle fleet as this is funded through COGS. CAPEX is needed mainly to increase manufacturing capacity of vehicles and batteries.



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Acc. PP&E	3.403.	4.923.	6.714.	8.206.	9.900.	11.318	12.757	14.175	15.633	17.123	18.606
Annual CAPEX	1.634.	1.799.	2.194.	2.041.	2.365.	2.229.	2.365.	2.462.	2.619.	2.770.	2.885.

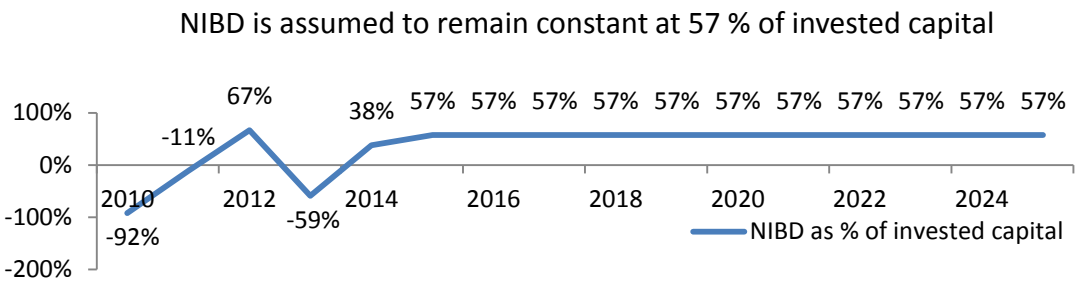
As a sanity check we compare our CAPEX and PP&E estimates with BMW and Daimler using our 2025 estimate of Tesla with their current 2015 numbers. Our estimates seem sensible with one major deviation; units/PP&E. However we believe this can be explained by higher vertical integration at Tesla.

Billion USD (EUR/US=1,09)	BMW (15)	Daimler (15)	Tesla (25)
Annual CAPEX (core)	6.312	5.499	3.064
PP&E (core)	18.983	26.446	19.447
CAP % of core rev.	7%	4%	5%
Revenue (core)	93.234	142.250	61.289
Vehicle sales (units)	2.247	2.851	1.295
Op. Leases Value	38.112	17.292	27.136
Units/PP&E	8,45	9,28	15,02

- *Operating lease vehicles, net:* We assume this to grow with the same rate as vehicle sales. The past years, Tesla´s leasing vehicle fleet has grown in size. We believe vehicle sales are a good proxy for the demand of leasing vehicles.
- *Other assets*: We are assumed to maintain at 1.8 percent of revenue as in 2015.
- *Non-current operating liabilities:* As this liability is mainly driven by the resale value guarantee, we expect this to diminish drastically over time.

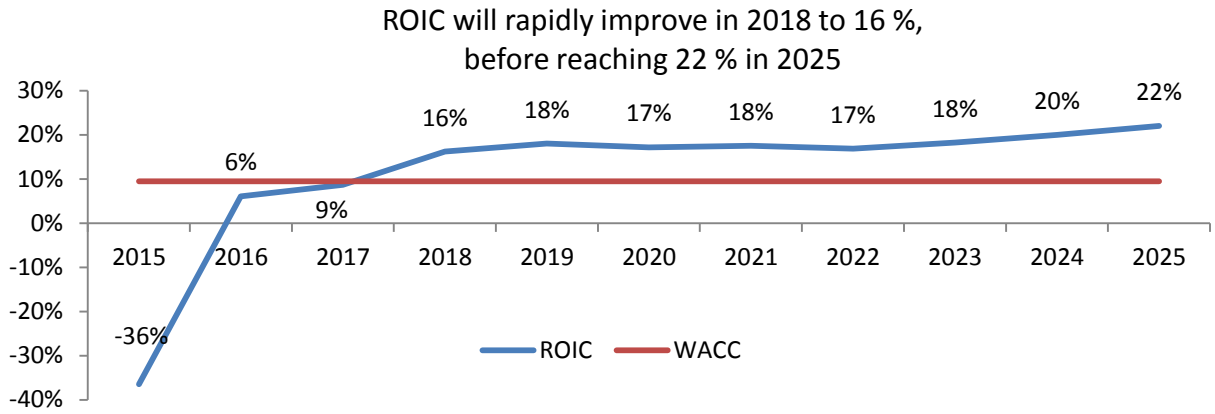
3.2.4.3 *Non-operating assets*

Given the major fluctuations in NIBD as percent of invested capital, using an historical average is believed to be flawed. Our best forecast estimate would therefore be the 2015 ratio of 57 percent remains the same.



3.2.5 ROIC

Tesla´s improved ROIC over the next years is a natural evolution as Tesla matures into a large scale automotive manufacturer. With this Tesla benefits of increasing sales driven by Model X and 3 ramp, improved operational efficiency and the necessary economies of scale, needed in such an capital intensive industry.



3.2.6 Sub-conclusion: financial forecasting

Q5: How will key financial value drivers will develop within the budget period?
+ Tesla´s is expected to meet guidance. Demand is not an issue with Model 3.
+ We expect continued revenue growth, coupled with lower battery costs, R&D and SG&A costs to make Tesla highly profitable after the Model 3 launch.
- Delivery is constrained by production capacity. We include the risk of delay´s in the forecast.

3.3 Cost of Capital

In this section we will analyze the following question (Q6): *"What is the appropriate cost of capital?"*

In later sections Tesla is valued using a discounted cash flow (DCF) model. The DCF method finds the enterprise value by discounting forecasted future cash flows. To do so the cost of capital is needed for discounting purposes, more specifically the weighted average cost of capital (WACC). The WACC represents the opportunity cost investors face when investing in a single firm instead of investing in others with similar risk. There are three main aspects in estimating the WACC. These are the cost of equity, cost of debt after tax and capital structure.[175] Below, the different components are elaborated.

[175] McKinsey & Company (2010): *Valuation, p. 235*

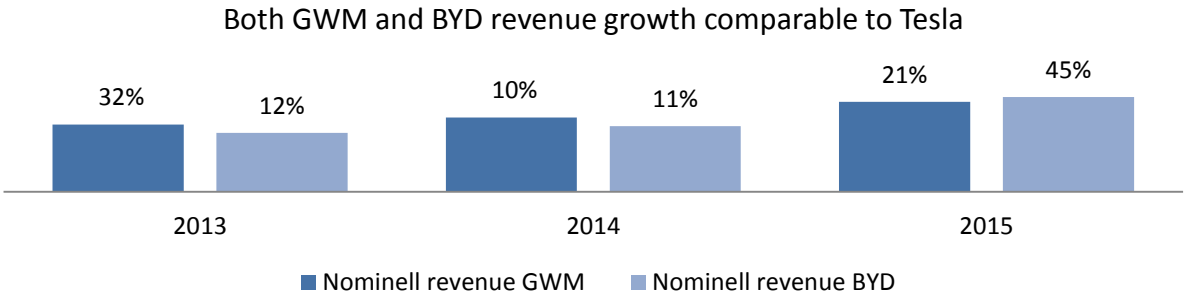
3.3.1 Peers for estimation purposes

As mentioned in the introduction, this section introduces peers that are suitable for estimation purposes. The selected peers can be placed in two categories: high growth auto manufacturer peers and financial peers.

3.3.1.1 High growth auto manufacturers

BYD is a Chinese company listed on Hong Kong Stock Exchange and Shenzhen Stock Exchange. BYD is mainly an IT company related to rechargeable battery business, computer assembly and components, together with being an electric auto manufacturer known as BYD Auto[176]. BYD Auto have a large market share in China and is constantly increasing their market share on fully electric vehicles with the e6 being the 6th most sold electric car in China in 2015[177].

GWM is one of the bestselling Chinese car manufacturers in China[178][179] and in rapid growth. GWM is a suitable peer because on their growth and because of their popularity in Chinese market where Tesla intend to expand their business.



High growth automaker revenue growth, Authors/Yahoo Finance

3.3.1.2 Financial peers

Due to Tesla's nature we find it necessary not only to use mature companies as peers and for benchmarking purposes. In this section three peers are chosen for their maturity and financial status. A short description can be found in appendix 11. There are no auto manufacturers with a financial state and maturity comparable to that of Tesla. Hence, the financial peers can be identified with the following characteristics:

[176] BYD.com: www.byd.com/aboutus/profile.html
[177] Chinaautoweb.com: www.chinaautoweb.com/2016/01/sales-ranking-of-china-made-pure-electric-cars-in-2015/
[178] Chinaautoweb.com: www.chinaautoweb.com/2016/01/best-selling-china-made-suvs-in-2015/
[179] Chinaautoweb.com: www.chinaautoweb.com/2016/03/best-selling-sedans-suvs-and-mpvs-in-february-2016/

- They are all at an early maturity stage
- IPO after 2009
- Listed on NASDAQ
- They operate in the same sector as Tesla: Capital Goods
- Operating income are low or negative due to high expenses from R&D and/or costs of goods sold
- They are primarily financed with equity

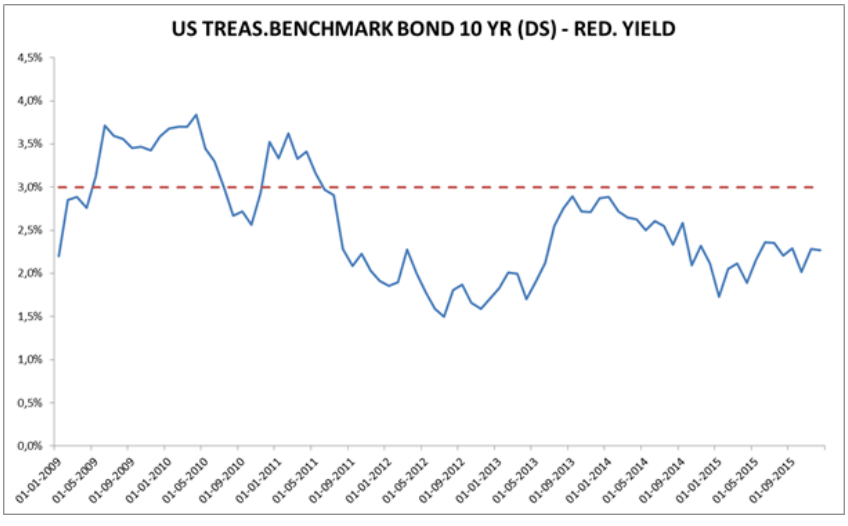
3.3.2 Required Cost of Equity - CAPM

The cost of equity consists of three factors: the systematic risk, represented as the beta, the market risk premium and the risk-free rate. There is a consensus that the capital asset pricing model (CAPM) is an acceptable way of calculation return on equity and it is also the most commonly used.[180] The tree factors mentioned is expressed in the formula below.

$$E(R_i) = r_f + \beta_i[E(R_m) - r_f]$$

3.3.2.1 Risk-free rate

In the annual reports Tesla operates with a risk-free rate of 1,65 percent. The risk free rate is an expression of how much an investor can earn without taking on any risk.[181] The risk free rate is usually reflecting the return on government bonds with the assumption that they are in fact risk-free. Based on a 10 year U.S. Treasury bond benchmark, which should have a realistic indication of the risk-free rate and a base year of 2009 it, can be seen that the risk free rate fluctuates around 3 percent. For the remaining of this thesis a 3 percent risk-free rate will be applied.



Risk free rate, Authors / Datastream

[180] McKinsey & Company (2010): *Valuation, p. 237*
[181] Petersen & Plenborg (2012): *Financial Statement Analysis, p. 249*

3.3.2.2 Market portfolio

NASDAQ is the second largest stock exchange in the world measured in market capitalization. It is known to be a technology and IT-electronic stock exchange with listings as Apple, Ebay, Amazon, Microsoft, Google, Facebook, etc. Because Tesla is listed on NASDAQ it can be argued that a beta and a market portfolio based on NASDAQ index would be the most sensible thing to choose, because it represents similar companies to Tesla. However, we are first and foremost viewing Tesla as a premium car company, making NASDAQ less relevant for estimation purposes. Also, the market portfolio should by definition consist of nothing but systematic risk because it is, theoretically, perfectly diversified and equally weighted. With that in mind we have chosen the S&P 500 to represent the market portfolio in our calculations.

3.3.2.3 Market risk premium

The market risk premium is the excess return, the difference between the expected return of the market and the risk-free rate, on the market portfolio. This is a key component in the CAPM.[182][183] The market risk premium is expressed in the formula below.

$$\left[E(R_m) - r_f\right]$$

Our estimations are based on historical excess return, which is a good proxy for future premiums. The market risk premium is a result of investors, being risk averse, demanding a premium for holding stocks instead of bonds.[184] Based on the average annual historical returns of the S&P500 from 1990 to 2015 our best guess for future expected market returns is 8,41 percent. With a risk-free rate of 3 percent the market risk premium yields 5, 41 percent.

3.3.2.4 The systematic risk

In the CAPM model, the beta is a measure of risk that represents the stock sensitivity to the market as opposed to firm specific risk. A high beta indicates higher risk which will lead to a higher required compensation from investors, a low beta will lead to lower compensation to the firm's investors. The beta therefore affects the return on equity positively.[185] There are several different approaches for estimating the beta of Tesla. To increase our estimation quality, different methods are applied before the final beta is estimated based on these results. In the sections below a regression model is used to estimate the "raw" beta of Tesla before a industry beta is considered, following a smoothening technique.

[182] CAPM = Capital Asset Pricing Model
[183] Berk & DeMarzo (2014): *Corporate Finance, p. 404*
[184] McKinsey & Company 2010, Valuation, p. 242
[185] Petersen & Plenborg (2012): *Financial Statement Analysis, p. 251*

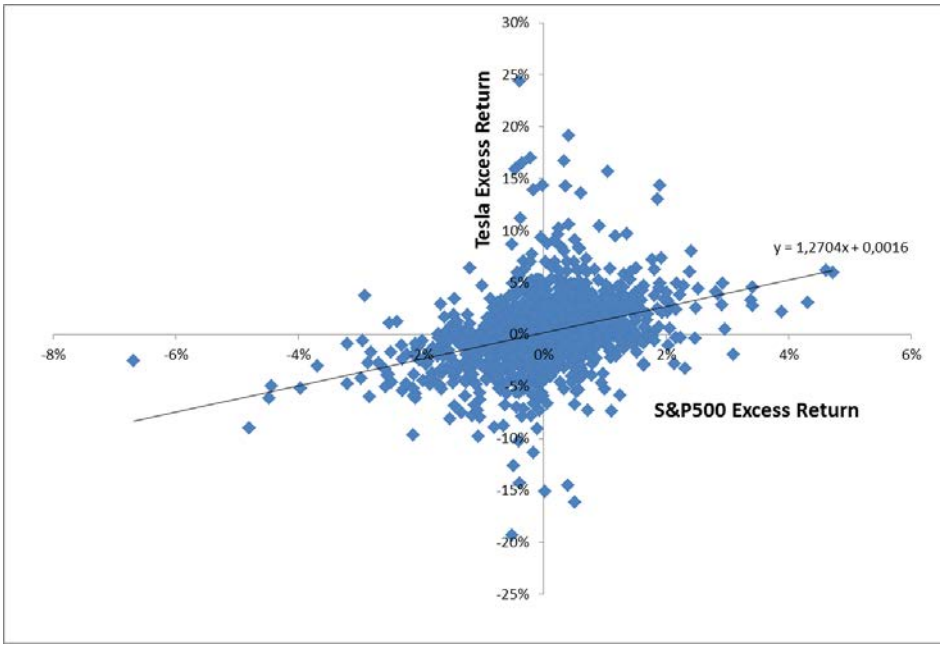
3.3.2.4.1 Regression beta

The regression beta is based on the historical excess returns of Tesla and the market portfolio.[186] By running the Ordinary Last Square Assumption (OLS), we can estimate the linear regression that corresponds to the smallest Sum of Squared Errors (SSE). The following model is applied to estimate the OLS with the assumption that there is a linear relationship between Tesla's stock return and the beta.

$$R_t(i) = \alpha_i + \beta_i(E[R_m] - r_f)$$

The result from the linear regression model is a beta value of 1,27 as seen from the graph below. Next section reveals the regression and a smoothening beta for Tesla and its peers.

Appendix 11: Cost of capital



Regression beta, Authors

3.3.2.4.2 Peer group beta and Blume-adjusted beta

For simplification purposes the Blume-adjusted-beta smoothening technique is applied. The assumption behind this theory, used by Bloomberg, is that as a company changes over time (growth rates, capital structure, etc.), so will the beta value. As a result the beat will converge to 1, representing the beta of the market portfolio.[187] This way of thinking is very much in line with how we believe Tesla will evolve, being more as other premium car companies in the future.

[186] Petersen & Plenborg (2012): *Financial Statement Analysis, p. 251*
[187] McKinsey & Company (2010): *Valuation, p. 257*

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

Peers	Regression beta	Blume-adjusted beta
Financial / life-cycle		
Pacific Biosciences Of California, Inc.	1,77	1,51
Telenav, Inc.	1,09	1,06
Control4	1,29	1,19
Average	1,38	1,25
Premium automakers		
Daimler	1,15	1,10
Audi	0,32	0,55
BMW	1,13	1,09
Average	0,87	0,91
High growth automakers		
Build Your Dreams	1,89	1,59
Great Wall Motor	1,42	1,28
Average	1,66	1,44
Total Average	1,26	1,17
Tesla	1,27	1,18
Applied beta		1,22

Blume adjusted beta values, Authors

Applying the formula above we find the Blume adjusted beta for Tesla and its peers. Continuing our analysis we will apply a beta value of 1,22, being an average of the regression result and the Blume adjustment for Tesla's beta and peer beta.

Using the CAPM formula we are now able to calculate the cost of equity. As seen from the table below, the cost of equity for tesla is 9,6 percent.

Risk-free rate	3,00%
Martket return	8,41%
Premium	5,41%
Beta	1,22
Cost of equity	9,60%

3.3.3 Cost of Debt

Early 2014 the credit rating agency Standards & Poor gave Tesla a B-rating, a rating they affirmed in June 2015.[188] They have not rated the company since. According to Standard & Poor a B-rating is given to companies that fit the following description:

[188] Streetinsider.com: *www.streetinsider.com/Credit+Ratings*

"…the obligor currently has the capacity to meet its financial commitment on the obligation. Adverse business, financial, or economic conditions will likely impair the obligor's capacity or willingness to meet its financial commitment on the obligation."

This supports the findings in the liquidity risk analysis; that Tesla might have difficulties to meet obligations in the long run. Compared to its peers in the automobile industry, B is a "junk" rating. According to Petersen & Plenborg 2012, a credit spread between 3,2 percent and 13,1 percent can be applied for companies with a rating of B.[189] In the following sections a credit spread of 8,15 percent is applied, which adjusted for the risk-free rate results in a cost of debt of 11,15 percent. As we will see in the following sections, the cost of debt has little impact on the valuation because of Tesla's capital structure.

Credit Spread	8,15%
Risk-free rate	3,00%
Cost of debt	11,15%

3.3.3.1 Tax rate

The historical effective tax rate for Tesla is below 1 percent. We do not believe that this is representative for the future; we assume that Tesla will converge to that of its premium car-manufacturer peers in the long run. An effective tax rate of 25 percent is therefore applied, which is also the global average tax rate.[190]

3.3.4 Capital Structure and WACC

By combining the cost of capital and cost of debt together using the WACC formula, we get a combined rate for the cost of capital. This is done by using the target weights on debt and equity to enterprise value on a market basis. The market value of equity is calculated simply by multiplying number of shares with share value (31.12.15), resulting in a total market equity value of $ 31.542.114.000. The net interest bearing debt is assumed to be a good representative of market value of debt.

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

[189] Petersen & Plenborg (2012): *Financial Statement Analysis, p. 291*
[190] KPMG.com: *home.kpmg.com/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html*

Source of capital	Proportion of total capital	Cost of capital	Marginal tax rate	After tax opportunity cost	Contribution to weighted average
Debt	4,44	11,15	25,00	8,36	0,37
Equity	95,56	9,60		9,60	9,18
WACC	100,00				9,55

WACC, Authors

As seen from the table above, the weighted average cost of capital is 9,55 percent. Because the company is in a starting process, it is predominantly founded with equity. As a result the cost of debt has little effect on the weighted average.

3.3.5 Sub-conclusion of cost of capital

Q6: What is the appropriate cost of capital?

+/- We estimate the WACC to be 9.55 percent.

4 Valuation

Based on the quantified parameters in the financial analysis, will now calculate the share price through different valuation modes, while also provide a discussion regarding their validity.

4.1 Application of valuation models

In this section we will analyze the following question (Q7): "What is the market value per share using relevant valuation models?"

Appendix 12: The formulas used in the valuation models are found in appendix 12.

4.1.1 Economic Value Added (EVA)

The technical advantage with EVA in the case of Tesla is that it reduces potential noise and miscalculations compared to other DCF models that rely on future Free Cash Flow to the Firm (FCFF) and Free Cash Flow to Equity (FCFE). The reason is that the EVA model uses Net Operating Profit After Tax (NOPAT) and invested capital as input, eliminating the uncertainty regarding forecasts of FCFF and FCFE. Hence, EVA relies on accrual accounting data and has gained increasing attention recent years. The model bases the value of a company by its invested capital summed with all future EVAs. Due to Tesla's nature we believe that this approach is the most suitable. Equations related to discounting EVAs and the terminal period are in appendix 12.

EVA Model, USD (1000´s)	2016	2017	2018	2019	2020
NOPAT	218.459	528.144	1.463.129	2.311.205	2.983.183
Invested capital, beginning of period	2.553.472	4.596.986	7.495.030	10.509.184	15.112.012
WACC	9,55%	9,55%	9,55%	9,55%	9,55%
Cost of capital	243.780	438.874	715.550	1.003.312	1.442.744
EVA	-25.321	89.270	747.579	1.307.893	1.540.440
Discount factor	0,91	0,83	0,76	0,69	0,63
Present value of EVA	-23.114	74.388	568.664	908.177	976.433

EVA Model, USD (1000´s) - continued	2021	2022	2023	2024	2025
NOPAT	3.758.241	4.301.634	5.478.796	7.054.096	9.160.941
Invested capital, beginning of period	19.534.681	23.256.021	27.603.657	32.302.090	38.123.500
WACC	10%	10%	10%	10%	10%
Cost of capital	1.864.976	2.220.252	2.635.321	3.083.880	3.639.650
EVA	1.893.265	2.081.382	2.843.475	3.970.216	5.521.291
Discount factor	0,58	0,53	0,48	0,44	
Present value of EVA	1.095.490	1.099.381	1.371.026	1.747.470	

Invested capital, beginning of period	2.553.472
PV of EVA, forecasting horizon	7.817.915
PV of EVA, terminal period	37.118.815
Estimated market value of firm	47.490.202
Net interest-bearing debt	-1.464.528
Estimated market value of equity	46.025.674

Share prices	Per 01.05.16
Shares outstanding (per 31.12.15)	131.420
Share price (per 01.05.16)	241
Target price	350
Potential upside	45%

4.1.2 Discounted Cash Flow (DCF): Free Cash Flow to Firm

As a control check, we compare that the FCFF estimate is equal to the EVA estimate.

FCFF Model, USD (1000´s)	2016	2017	2018	2019	2020
FCFF	-803.177	-1.131.540	-863.127	-891.017	387.005
WACC	9,55%	9,55%	9,55%	9,55%	9,55%
Discount factor	0,91	0,83	0,76	0,69	0,63
Present value of FCFF	-733.180	-942.907	-656.558	-618.706	245.309

FCFF Model, USD (1000´s) – cont.	2021	2022	2023	2024	2025
FCFF	1.400.097	1.491.416	3.033.633	4.198.337	6.297.746
WACC	9,5%	9,5%	9,5%	9,5%	9,5%
Discount factor	0,58	0,53	0,48	0,44	
Present value of FCFF	810.131	787.763	1.462.713	1.847.876	

PV of FCFF forecasting horizon	2.202.442
PV of FCFF, terminal period	42.338.803
Estimated market value of firm	44.541.245
Net interest-bearing debt	-1.464.528
Estimated market value of equity	46.005.773

Share prices	Per 01.05.16
Shares outstanding	131.420
Current	241
Target price	350
Potential upside	45%

4.1.3 Multiple analyses

To supplement our DCF results a relative valuation by multiples is applied to compare the company with its peers. However, given the lack of comparable peers, our hypothesis is that a multiple analysis carries less validity in valuing Tesla. Nevertheless, we will use this method for illustration purposes.

Because it is a lot of uncertainty associated with Tesla and also with future revenue, there will be a spread between the best case value and the worst case value of Tesla. Different scenarios and sensitivity resulting in this spread are discussed in later sections. By supplementing our results with a relative valuation we strive to narrow the spread. Also, a valuation based on multiples is often popular amongst practitioners, as it has a low level of complexity and is quick to estimate.[191] Our peer group presented earlier, and the multiples are based on an average of multiples from our own calculations supplemented by information from Yahoo Finance.

Multiple analyses can be performed in several ways. By strictly looking at the multiples and compare them between peers, we can get an indication of what is expected from a company in the future or if a company is relatively more expensive to buy than others. If a company has higher multiple values than its peers it can suggest that the company is overpriced. It can also mean that there are high expectations to future earnings making high multiples attractive. The challenge of finding good peers has been discussed earlier. The fact that it is difficult to find a suitable peer group can weaken the result from the relative valuation. We use a diversified peer group because there is no perfect peer to Tesla. The premium automotive companies we have focused on in the previous section have a completely different financial state than Tesla. The two other peer groups are chosen to adjust for these differences in our calculations.

Because of differences in accounting standards for different ratios a valuation based on multiples (which are influenced by these differences) will yield different results. [192] It is therefore normal to apply multiples as EV/EBITDA and price-to-earnings ratios. EV is this time an abbreviation for Enterprice Value (not Electrical Vehicle). The EV/EBITDA allows comparing of firms regardless of capital structure, making it possible to analyze cash flows to all providers of capital. The Price – Earning (P/E) ratio is also widely used. It indicates how much an investor invests to get one dollar of the company's earnings.[193] Normally these ratios would be applied, but because Tesla has negative earnings and negative EBITDA, multiples based on these numbers makes little sense. As a result we have selected three multiples that rely on enterprise value, revenue and equity value.

[191] Petersen & Plenborg (2012): *Financial Statement Analysis, p. 226*
[192] Petersen & Plenborg (2012): *Financial Statement Analysis, p. 232*
[193] Investopedia.com: *www.investopedia.com/terms/p/price-earningsratio.asp*

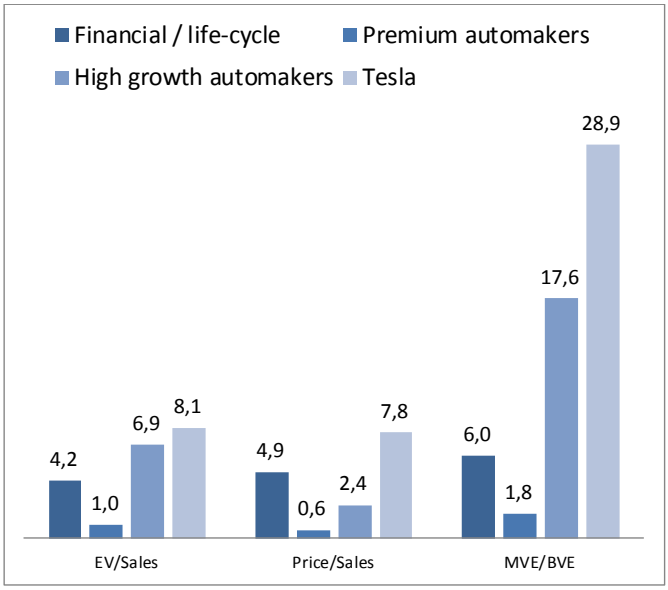
Enterprise value / Sales are a good measure of profit-making ability, which is interesting for investors. In addition, the multiple is not susceptible to accounting differences amongst the companies. This multiple is widely used for companies where operating costs exceeds revenue.[194]

Price/Sales is the market value of equity divided by total revenue. As the EV/Sale, it reduces the possible effect of differences in accounting principles, as it is difficult to manipulate.[195] Being equity multiple it is even harder to manipulate the numbers than Enterprise value based ratios.

Price/Book or Market to Book Value of Equity (MVE/BVE) is market value of equity divided by the book value of equity. Besides being intuitive and simple, this multiple is widely used for valuation purposes to find out if a stock is overpriced, underpriced or rightly valued.

Appendix 13 & 14: The analytical income statement and balance sheet of financial and premium peers used in the multiple analysis calculations are presented in appendix 12 & 13.

Peers	EV/Sales	Price/Sales	MVE/BVE
Financial / life-cycle			
Pacific Biosciences Of California, Inc.	11,36	12,13	15,31
Telenav, Inc.	0,69	1,47	1,34
Control4	0,55	1,04	1,48
Average	4,20	4,88	6,04
Premium automakers			
Daimler	1,12	0,56	1,53
Audi	0,37	0,59	2,47
BMW	1,47	0,64	1,38
Average	0,99	0,60	1,79
High growth automakers			
Build Your Dreams	8,92	3,17	23,85
Great Wall Motors	4,78	1,7	11,37
Average	6,85	2,435	17,61
Total Average	3,66	2,66	7,34
Tesla	8,13	7,77	28,86



Multiples, Authors/Yahoo Finance

By applying the average of multiples calculated from peers and compare them to that of Tesla, we get an impression of how the company is priced. The indication is the same on all multiples. Tesla shows much higher multiples than the peer group average. This is an indication that it is either heavily overpriced or reflecting the markets positive believe in future earnings potential.

[194] Macabacus.com: *www.macabacus.com/valuation/multiples*
[195] Morningstar.com: *news.morningstar.com/classroom2/course.asp?docId=143911&page=6*

	Weight	Share price
EV/Sales	33%	101,82
Price/Sale	33%	82,29
MVE/BVE	33%	61,04
	100%	81,72

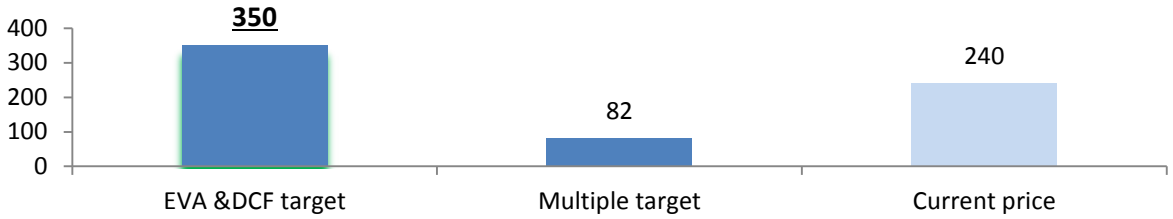
Multiple valuation, Authors

In a valuation based on these multiples Tesla shows up highly overpriced. By weighing the result from the multiple equally we get a share price of 81,72 as shown in the table above.

When applying the EVA and FCFF model we derive at a share price of 350 USD per 1st of May 2016. This is an upside of 45 percent from the current market value. By applying a multiple analysis we derive at a share price of 82 USD, representing a downside of - 66 percent. The major deviation between the two models was no surprise given the unique case of Tesla Motors. A common approach is to weight these estimates equally, giving a target of 216 USD. However we have chosen to disregard the 82 USD estimate in our final valuation estimate. Given the lack of comparable peers, a multiple analysis carries less validity this case.

Conclusion	Chosen		Disregarded	
Method	EVA & DCF	Multiple	EVA & DCF	Multiple
Weight	100%	0%	50%	50%
Target price	350	82	350	82
SUM $ Target price	**350**		**216**	

We conclude with a share price of $ 350 USD per share, derived solely from the EVA & DCF models.



4.1.4 Sub-conclusion: application of valuation models

Q7: What is the market value per share using relevant valuation models?
+ EVA & DCF-models estimate a share price of $ 350 per 1st of May 2016. Upside of 45 percent.
- The multiple analyses are disregarded given the lack of comparable peers.

4.2 Sensitivity analysis

In this section we will discuss our last question (Q8): "How is the valuation affected by changes in key estimates?"

The sensitivity analysis displays how changes in our calculations alter the result of our valuation. This is valuable as EVA and DCF models are based on assumptions and estimates that are subject to high levels of uncertainty and subjectivity. Therefore there will always be a lot of uncertainty related to the calculations of WACC in a DCF valuation. To better understand the target price, we perform a sensitivity analysis of the estimated fundamental value.

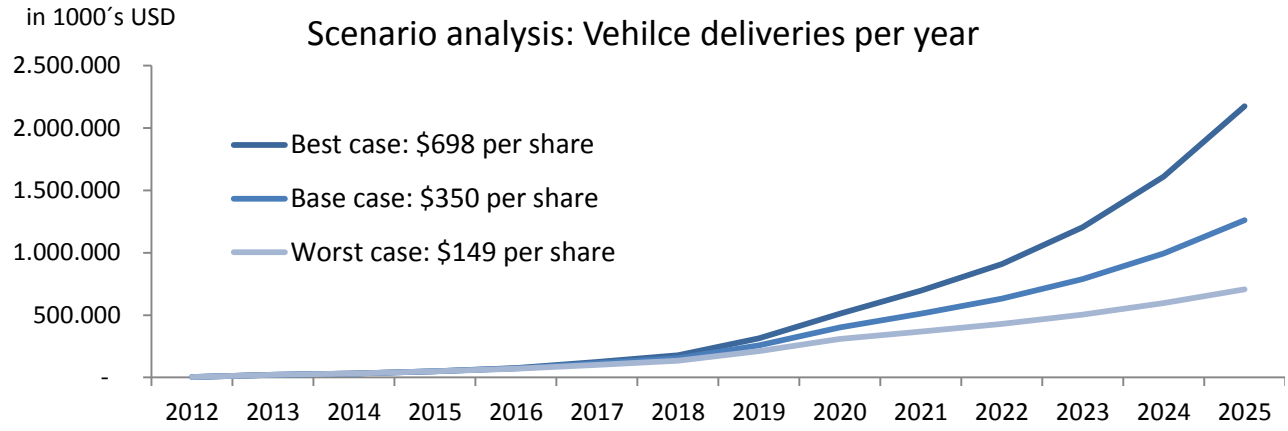
Appendix 15: The calculation of scenario analysis price per share is presented in the appendix 14.

4.2.1 Changes in key forecast estimates

In the scenario analysis we present three different scenarios, and compare the outcome on the share price. We regard the production and delivery of vehicles and battery pack cost as the most critical to highlight.

	Worst case	Base case	Best case
Year	**Industry level**		
2020	EV adoption dissapoints	EV follows predicted curve	EV sales outperform predictions
2025	Governmental support gone early	Governmental support diminished	Governmental support diminished
	Competitive rivalery		
2020	Peers outcompete Tesla	Fierce competitons	Competitors fail to compete
2025	Hard preassure on margins	Moderate preasure on margins	Little preasure on margins
	Quantified effect on company level & share price		
2020 Units Sold	Major production delays **308.636**	Insignificant production delays **400.188**	Outperform production guidance **512.176**
Rel. to base*	(-15% deliveries, -10% gross margin)		(+15% deliveries, +5%, gross margin)
2025 Units Sold	Demand & margins disappoints **707.600**	Demand & margins follow trend **1.260.085**	Demand & margins outperform trend **2.173.261**
Rel. to base*	(-30% sales, -15% gross margin)		(+30% deliveries, +10% gross margin)
PPS	**149 USD**	**350 USD**	**698 USD**

- Relative to base percentages as calculated as the accumulated average sales and gross margin in 2015 – 202 and 2020 – 2025 respectively. The difference in gross margin change in best/worst case are explained by an assumed greater downside than upside in both time segments.



- As we can se from this figure there is a large difference between best and worst case scenario (698 UDS – 149 USD). All calculations of the share prices are found in the appendix.

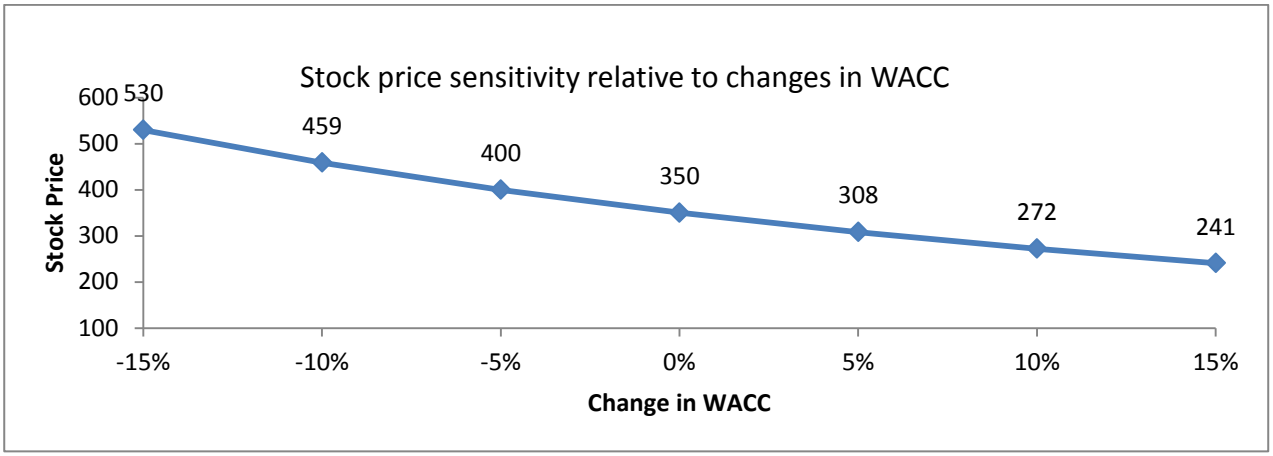
4.2.2 Changes in cost of capital

The present value of EVA in the terminal period is 78 percent of the estimated market value of the firm, indicating a high sensitivity to changes in WACC and terminal growth rate.

Δ WACC	WACC	Enterprise Value	Market Value of Equity	Stock Price	Δ Stock Price	Potential upside/downside
-15%	8,11%	71.093.190	69.628.662	530	51%	121%
-10%	8,59%	61.756.542	60.292.014	459	31%	91%
-5%	9,07%	54.006.152	52.541.624	400	14%	67%
0%	9,55%	47.490.202	46.025.674	350	0%	46%
5%	10,02%	41.952.732	40.488.204	308	-12%	28%
10%	10,50%	37.203.127	35.738.599	272	-22%	13%
15%	10,98%	33.096.564	31.632.036	241	-31%	0%

WACC sensitivity, Authors

The table above shows the effect of changes in WACC. A relatively modest change of +/-5 percent results in a stock price range between 184 and 232 indicating a downside between -3 and -24 percent based on the primo 2016 numbers. The graph below illustrates the table above.



WACC sensitivity, Authors

4.2.3 Sub-conclusion: sensitivity analysis

Q8: How is the valuation affected by changes in key estimates?
- Changes in the highly uncertain key estimates (such as future vehicle sales and margins) cause major price deviations. The Tesla stock is therefore regarded as highly risky.

4.3 Overall conclusion of valuation – buy/sell (per 1st of May 2016)

Our target price of one Tesla share is $ 350. Given the upside of 45 percent we regard this as a buy candidate, taking into account the great risk highlighted in the sensitivity analysis. We advise possible investors to consider the Tesla share as a long term investment given its high present value of terminal value relative to total enterprise value.

Target price (Per 1st of May 2016)	Investment decision (Buy/sell)	Investment horizon (Short/medium/long)
$ 350 (45 % upside)	**BUY**	Long-term

5 Conclusion

The objective for this thesis was to determine the share price of one Tesla Motor share per 1st of May 2016. In order to answer this question we asked in the introduction eight sub-questions aimed to support our answer. These questions and our conclusions are presented in the table below.

5.1 Overview of sub-conclusions

	Research question: What is the true market value of one share per 1st of May 2016?
Strategic analysis	***Q1: How do environmental factors affect the share price?*** + Government support schemes play a key role in EV growth. + Technological progress of alternative fuel is challenging gasoline vehicles in near future. - Automotive industry is sensitive to changes in GDP (ref. 2007) and commodity prices.
	Q2: How do industry specific factors affect the share price? + The global industry CAGR [196] of ~4.7 %, mainly driven by China. The increasing Chinese demand represents an opportunity for Tesla, despite the current high entry barriers. + EV´s expected to be competitive with gasoline cars by 2022, due to low battery costs. After this, the low battery cost is expected to become a competitive advantage of EV´s. - The premium vehicle and EV segments are highly competitive. We expect competition to further increase in the EV-segment after Model 3 in 2017.
	+ Strong supporting activities: Technology, design & engineering and Elon Musk**.** + Strong primary activities: Gigafactory, Tesla Factory, Tesla Stores, Superchargers, Software. We regard these as Tesla´s main sustainable competitive advantages. - Tesla is an industry underdog with lower budget, low economies of scale, new brand & fewer customers. This represents a risk factor within the budget period. However, within the budget period we see production, not demand, as the main bottleneck.
Financial	***Q4: How do historical performance affect the share price?*** + Positive revenue trend and high investments fuel future growth - Tesla has negative ROIC due to high COGS, R&D and SG&A costs
	Q5: How will key financial value drivers develop in the budget period?

[196] CAGR = Compounded Annual Growth Rate

	+ Tesla´s is expected to meet guidance. Demand is not an issue with Model 3. + We expect continued revenue growth, coupled with lower battery costs, R&D and SG&A costs to make Tesla highly profitable after the Model 3 launch. - Delivery is constrained by production capacity. We include the risk of delay´s in the forecast.
	Q6: What is the appropriate cost of capital? +/- We estimate the WACC to be 9.55 percent.
Valuation analysis	**Q7:** ***What is the market value per share using relevant valuation models?*** + EVA & DCF-models estimates a share price of $ 350 per 1st of May 2016. There is an upside of 45 %. - The multiple analysis is disregarded given the lack of comparable peers.
	Q8: ***How is the valuation affected by changes in key estimates?*** - Changes in the highly uncertain key estimates (such as future vehicle sales and margins) cause major price deviations. The Tesla stock is therefore regarded as highly risky.

5.2 Final conclusion

Based on these eight sub-conclusions, our final conclusion is that the true market value of one Tesla Motor share per 1st of May 2016 is $ 350. This implies an upside of 45 percent from current market value of $ 240.

5.3 Discussion

Evaluation of case: In many valuation cases, however the best prediction of the future is often the past. However, we have found this to hold more truth for mature and stable companies than an early stage, high growth company. Valuing companies early in the life cycle is difficult, partly because of the absence of operating history.[197] Tesla´s high growth and uncertain future presents an interesting valuation case. By looking at Tesla´s historical financial statements in isolation, Tesla´s current market value cannot be reflected nor accurately predicted. Tesla has never had a full year of profit but still ranks as among the top ten most valuable automotive companies in the world. Therefore, as the share price is a product of future, not historical cash flows, our financial forecast had to become strongly grounded in the strategic analysis. As we must strongly emphasize the uncertainty regarding these estimates, we believe this to be the most

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

likely outcome based on the arguments presented in our strategic and financial analysis. The estimation of the company value is based on a bottom-up analysis on the production capacity to 2020, as we see this as the company´s bottle neck. By taking this approach we have been able to estimate how future key financial value drivers will develop. Our main focus has been on production capacity and COGS [198]development. We conclude that Tesla will experience strong growth the next years, reaching their 2020 goals to a sufficient degree. We assume production will reach 1.4 million units per 2025. As COGS continue to be pressured downwards by lower kWh cost in batteries, we are confident Tesla is approaching profitability.

Looking forward: The company has grown substantially since the commercial success of the Model S. With last year sales surpassing 50.000 vehicles, Tesla stay focused on the grand ambition of a tenfold increase by 2020. Confidence is strong in the company, despite ever delivering a positive full year result. The future success of Tesla depends on several macroeconomic, industry-specific and internal factors which are impossible to accurately forecast. However, grounded by the arguments presented in this analysis, we are confident in the rapid development of the electrical vehicle industry and the sustainable competitive advantages possessed by Tesla. Therefore, we believe that the company is well positioned to accelerate the world´s transition towards electric mobility and sustainable energy.

[198] COGS = Cost of Goods Sold

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7 Appendix

Appendix 1: Global operative facilities overview

Location of facility	M Sq.F	Ownership	Primary Use
US			
Gigafactory (in progress)	10,00	JV	Battery production
Fremont, California	5,40	Owned	Manufacturing & engineering
Lathrop, California	0,43	Owned	Manufacturing
Fremont, California	0,50	Lease	Administration
Palo Alto, California	0,35	Lease	Corporate HQ
Fremont, California	0,30	Lease	Sales & marketing
Hawthorne, California	0,10	Lease	Engineering and design
Europe			
Tilburg, Netherlands	0,50	Lease	European HQ
Amsterdam, Netherlands	0,07	Lease	Administration
Asia			
Beijing, China	0,01	Lease	Administration, sales and marketing

Appendix 2: Comments to performance and price metrics

- Model S 70D are presented as an all-wheel drive. The rear wheel option starts at $ 70.000 USD and have lower performance.
- The range is NEDC estimates per charge, and may vary greatly upon driving and climate.
- With the Ludacris Speed Upgrade of $ 10.000 USD acceleration drops to 2.8 and 3.4 seconds for S and X respectively. Prices for Model X are not officially published, but base price is stated to be $5.000 USD above the Model S.
- Model 3 estimates are based on the information provided during the unveiling March 31.
- Performance and price metrics continuously improve. These numbers were retrieved from the company website April 8. 2016.

Appendix 3: Standard equipment and option pricelist

Option pricelist	USD
Autopilot convenience features	2.500
Premium interior and lightening	3.000
Smart air suspension	2.500
Ultra high fidelity sound	2.500
Subzero weather package	1.000
Rear facing seats (7 seat)	3.000
Non-costom paint	1.500
All glass panoramic roof	1.500
21" Turbine Wheels	4.500
Next generation seats	2.500
Carbon fiber décor	1.000
Sum all options	25.500

Standard equipment (Free)
Free Supercharger network access
GPS enabled Homelink
Lane departure warning
Maps and navigation, real time traffic updates
Automatic keyless entry
Parking sensors
Power-folding and heated side mirrors
8 year infinite mile battery and drive unit warranty
Daytime running lights
Blind spot warning
Automatic emergenc braking
SUM

Additional P90D option:	
Ludicrous speed upgrade	10.000
Carbon fiber spoiler	1.000
Sum P90D extra options	11.000

Appendix 4: Tesla, Analytical Income Statement

Analytical Income statement	2009	2010	2011	2012	2013	2014	2015
Automotive sales	111.943	97.078	148.568	385.699	1.921.877	3.007.012	3.740.973
Development services	-	19.666	55.674	27.557	-	-	-
Services and other	-	-	-	-	91.619	191.344	305.052
Total revenues	111.943	116.744	204.242	413.256	2.013.496	3.198.356	4.046.025
Automotive sales	-102.408	-79.982	-115.482	-371.658	-1.483.321	-2.145.749	-2.823.302
Development services	-	-6.031	-27.165	-11.531	-	-	-
Services and other	-	-	-	-	-73.913	-170.936	-299.220
Total cost of revenues	-102.408	-86.013	-142.647	-383.189	-1.557.234	-2.316.685	-3.122.522
Gross profit	9.535	30.731	61.595	30.067	456.262	881.671	923.503
Research and development	-19.282	-92.996	-208.981	-273.978	-231.976	-464.700	-717.900
Selling, general and administrative	-42.150	-84.573	-104.102	-150.372	-285.569	-603.660	-922.232
Depreciation	6.940	10.623	16.919	28.825	106.083	231.931	422.590
EBITDA	-44.957	-136.215	-234.569	-365.458	44.800	45.242	-294.039
Depreciation and amortization	-6.940	-10.623	-16.919	-28.825	-106.083	-231.931	-422.590
EBIT	-51.897	-146.838	-251.488	-394.283	-61.283	-186.689	-716.629
Income tax	-26	-173	-489	-136	-2.588	-9.404	-13.039
Tax Shield	-1,78	-8,21	-4,69	-0,62	-367,51	-3.236,04	-2.367,61
Tax on EBIT	-28	-181	-494	-137	-2.956	-12.640	-15.407
NOPAT	-51.925	-147.019	-251.982	-394.420	-64.239	-199.329	-732.036
Interest income	159	258	255	288	189	1.126	1.508
Interest expense	-2.531	-992	-43	-254	-32.934	-100.886	-118.851
Other expense, net	-1.445	-6.583	-2.646	-1.828	22.602	1.813	-41.652
NFE, before tax	-3.817	-7.317	-2.434	-1.794	-10.143	-97.947	-158.995
Tax shield	1,78	8,21	4,69	0,62	367,51	3.236,04	2.367,61
NFE, after tax	-3.815	-7.309	-2.429	-1.793	-9.775	-94.711	-156.627
Net profit	-55.740	-154.328	-254.411	-396.213	-74.014	-294.040	-888.663

Appendix 5: Tesla, Analytical Balance Sheet

Analytical balance sheet	2009	2010	2011	2012	2013	2014	2015
Accounts receivable	3.488	6.710	9.539	26.842	49.109	226.604	168.965
Inventory	23.222	45.182	50.082	268.504	340.355	953.675	1.277.838
Prepaid expenses and other current assets	4.222	10.839	9.414	8.438	27.574	94.718	125.229
Current operating assets	30.932	62.731	69.035	303.784	417.038	1.274.997	1.572.032
Operating lease vehicles, net	-	7.963	11.757	10.071	382.425	766.744	1.791.403
Property, plant and equipment, net	23.535	114.636	298.414	552.229	738.494	1.829.267	3.403.334
Other assets	2.750	22.730	22.371	21.963	23.637	43.209	74.633
Non-current operating assets	26.285	145.329	332.542	584.263	1.144.556	2.639.220	5.269.370
Operating assets	57.217	208.060	401.577	888.047	1.561.594	3.914.217	6.841.402
Accounts payable	15.086	28.951	56.141	303.382	303.969	777.946	916.148
Accrued liabilities	14.532	20.945	32.109	39.798	108.252	268.884	422.798
Deferred revenue	1.377	4.635	2.345	1.905	91.882	191.651	423.961
Customer deposits	26.048	30.755	91.761	138.817	163.153	257.587	283.370
Deferred development compensation	156	-	-	-	-	-	-
Resale value guarantee	-	-	-	-	-	-	136.831
Current operating liabilities	57.199	85.286	182.356	483.902	667.256	1.496.068	2.183.108
Deferred revenue, less current portion	1.240	2.783	3.146	3.060	181.180	292.271	446.105
Other long-term liabilities	3.459	12.274	14.915	25.170	58.197	173.244	364.976
Resale value guarantee	-	-	-	-	236.299	487.879	1.293.741
Convertible preferred stock warrant liability	1.734	-	-	-	-	-	-
Non-current operating liabilities	6.433	15.057	18.061	28.230	475.676	953.394	2.104.822
Operating liabilities	63.632	100.343	200.417	512.132	1.142.932	2.449.462	4.287.930
Net operating assets (Invested capital)	-6.415	107.717	201.160	375.915	418.662	1.464.755	2.553.472

Working capital	2009	2010	2011	2012	2013	2014	2015
Current assets	30.932	62.731	69.035	303.784	417.038	1.274.997	1.572.032
Current liabilities	57.199	85.286	182.356	483.902	667.256	1.496.068	2.183.108
NWC	-26.267	-22.555	-113.321	-180.118	-250.218	-221.071	-611.076
ΔNWC		3.712	-90.766	-66.797	-70.100	29.147	-390.005
Intangible and tangible assets	26.285	145.329	332.542	584.263	1.144.556	2.639.220	5.269.370

Cash and cash equivalents	69.627	99.558	255.266	201.890	845.889	1.905.713	1.196.908
Restricted cash and marketable securities	-	73.597	23.476	19.094	3.012	17.947	22.628
Restricted cash	3.580	4.867	8.068	5.159	6.435	11.374	31.522
Short-term marketable securities	-	-	25.061	-	-	-	-
Fiancial assets	73.207	178.022	311.871	226.143	855.336	1.935.034	1.251.058
Convertible senior notes/Convertible debt	-	-	-	-	182	601.566	-
Convertible senior notes, less current portion	-	-	-	-	586.119	1.806.518	-
Total convertible preferred stock	319.225	-	-	-	-	58.196	42.045
Long-term debt, current portion	-	-	7.916	50.841	-	-	633.166
Long-term debt, less current portion	-	71.828	268.335	401.495	-	-	2.040.375
Common stock warrant liability	-	6.088	8.838	10.692	-	-	-
Capital lease obligations, current portion	290	279	1.067	4.365	7.722	9.532	-
Capital lease obligations, less current portion	800	496	2.830	9.965	12.855	12.267	-
Financial libailities	320.315	78.691	288.986	477.358	606.878	2.488.079	2.715.586
NIBD	247.108	-99.331	-22.885	251.215	-248.458	553.045	1.464.528
Common stock	7	95	104	115	123	126	131
Additional paid-in capital	7.124	621.935	893.336	1.190.191	1.806.617	2.345.266	3.414.692
Accumulated other comprehensive loss	-	-	-3	-	-	-	-3.556
Accumulated deficit	-260.654	-414.982	-669.392	-1.065.606	-1.139.620	-1.433.682	-2.322.323
Equity	-253.523	207.048	224.045	124.700	667.120	911.710	1.088.944
NIBD + Equity (invested capital)	-6.415	107.717	201.160	375.915	418.662	1.464.755	2.553.472

Appendix 6: Forecast of Analytical Income Statement

Forecast of Analytical Income Statement						
Analytical Income statement	2015	2016	2017	2018	2019	2020
Automotive sales	3.740.973					
Development services	-					
Services and other	305.052					
Total revenues	4.046.025	7.081.630	10.753.152	12.761.501	16.895.676	22.292.967
Automotive sales	-2.823.302					
Development services	-					
Services and other	-299.220					
Total cost of revenues	-3.122.522	-4.679.184	-7.120.812	-8.415.657	-11.121.789	-14.795.120
Gross profit	923.503	2.402.446	3.632.340	4.345.843	5.773.887	7.497.847
Research and development	-717.900	-708.163	-1.290.378	-1.020.920	-1.351.654	-1.560.508
Selling, general and administrative	-922.232	-1.472.521	-1.805.834	-1.760.262	-1.654.683	-1.960.339
Depreciation	422.590	656.805	936.243	1.130.172	1.418.880	1.732.269
EBITDA	-294.039	878.566	1.472.371	2.694.834	4.186.429	5.709.270
Depreciation and amortization	-422.590	-656.805	-936.243	-1.130.172	-1.418.880	-1.732.269
EBIT	-716.629	221.762	536.128	1.564.662	2.767.549	3.977.000
Income tax	-13.039	-871	-3.606	70.430	345.527	752.318
Tax Shield	-2.367,61	2.432	4.378	31.103	110.817	241.499
Tax on EBIT	-15.407	-3.302	-7.984	-101.533	-456.344	-993.817
NOPAT	-732.036	218.459	528.144	1.463.129	2.311.205	2.983.183
Interest income	1.508					
Interest expense	-118.851					
Other expense, net	-41.652					
NFE, before tax	-158.995	-163.295	-293.978	-479.308	-672.064	-966.415
Tax shield	2.367,61	2.432	4.378	31.103	110.817	241.499
NFE, after tax	-156.627	-160.863	-289.600	-448.205	-561.246	-724.917
Net profit	-888.663	57.596	238.544	1.014.924	1.749.959	2.258.267

Forecast of Analytical Income Statement

Analytical Income statement	2021	2022	2023	2024	2025
Automotive sales					
Development services					
Services and other					
Total revenues	26.285.351	30.786.692	37.419.550	46.169.364	57.701.658
Automotive sales					
Development services					
Services and other					
Total cost of revenues	-17.649.412	-20.805.441	-24.954.072	-30.396.882	-37.529.746
Gross profit	8.635.939	9.981.251	12.465.478	15.772.482	20.171.912
Research and development	-1.577.121	-1.847.202	-2.245.173	-2.770.162	-3.462.099
Selling, general and administrative	-2.048.557	-2.399.371	-2.916.305	-3.598.224	-4.496.997
Depreciation	1.995.317	2.275.539	2.637.830	3.080.937	3.626.391
EBITDA	7.005.577	8.010.218	9.941.831	12.485.033	15.839.206
Depreciation and amortization	-1.995.317	-2.275.539	-2.637.830	-3.080.937	-3.626.391
EBIT	5.010.260	5.734.679	7.304.000	9.404.096	12.212.815
Income tax	939.844	1.061.401	1.384.082	1.833.794	2.442.639
Tax Shield	312.175	371.644	441.122	516.206	609.235
Tax on EBIT	-1.252.019	-1.433.045	-1.825.205	-2.350.000	-3.051.874
NOPAT	3.758.241	4.301.634	5.478.796	7.054.096	9.160.941
Interest income					
Interest expense					
Other expense, net					
NFE, before tax	-1.249.245	-1.487.226	-1.765.257	-2.065.723	-2.438.003
Tax shield	312.175	371.644	441.122	516.206	609.235
NFE, after tax	-937.070	-1.115.581	-1.324.135	-1.549.517	-1.828.768
Net profit	2.821.171	3.186.053	4.154.660	5.504.579	7.332.174

Appendix 7: Forecast of Analytical Balance Sheet

Forecast of Analytical Balance Sheet						
Analytical balance sheet	2015	2016	2017	2018	2019	2020
Accounts receivable	168.965	341.226	518.137	614.909	814.112	1.074.179
Inventory	1.277.838	1.914.875	2.914.069	3.443.962	4.551.399	6.054.646
Prepaid expenses and other current assets	125.229	274.495	416.809	494.655	654.902	864.110
Current operating assets	1.572.032	2.530.596	3.849.015	4.553.526	6.020.414	7.992.935
Operating lease vehicles, net	1.791.403	3.135.436	4.761.025	5.650.235	7.480.667	9.870.351
Property, plant and equipment, net	3.403.334	4.923.783	6.714.848	8.206.742	9.900.005	11.318.491
Other assets	74.633	130.628	198.353	235.399	311.658	411.216
Non-current operating assets	5.269.370	8.189.847	11.674.226	14.092.375	17.692.329	21.600.058
Operating assets	6.841.402	10.720.442	15.523.241	18.645.901	23.712.743	29.592.993
Accounts payable	916.148	1.232.497	1.590.789	1.543.432	1.594.865	1.973.669
Accrued liabilities	422.798	740.010	1.123.673	1.333.540	1.427.636	1.883.692
Deferred revenue	423.961	742.046	804.170	954.363	1.263.536	1.667.170
Customer deposits	283.370	1.062.504	1.505.835	1.404.233	1.352.273	892.536
Deferred development compensation	-	-	-	-	-	-
Resale value guarantee	136.831	225.328	320.644	355.007	436.223	530.988
Current operating liabilities	2.183.108	4.002.384	5.345.112	5.590.575	6.074.533	6.948.054
Deferred revenue, less current portion	446.105					
Other long-term liabilities	364.976					
Resale value guarantee	1.293.741					
Convertible preferred stock warrant liabili	-					
Non-current operating liabilities	2.104.822	2.121.072	2.683.099	2.546.142	2.526.198	3.110.258
Operating liabilities	4.287.930	6.123.456	8.028.211	8.136.717	8.600.731	10.058.312
Net operating assets (Invested capital)	2.553.472	4.596.986	7.495.030	10.509.184	15.112.012	19.534.681

Operating working capital	2015	2016	2017	2018	2019	2020
Current assets	1.572.032	2.530.596	3.849.015	4.553.526	6.020.414	7.992.935
Current liabilities	2.183.108	4.002.384	5.345.112	5.590.575	6.074.533	6.948.054
Operating working capital	-611.076	-1.471.789	-1.496.098	-1.037.049	-54.119	1.044.881
ΔNWC	-390.005	-860.713	-24.309	459.048	982.931	1.099.000

Net non-current operating assets	2015	2016	2017	2018	2019	2020
Non current operating assets	5.269.370	8.189.847	11.674.226	14.092.375	17.692.329	21.600.058
Non current operating liabilities	2.104.822	2.121.072	2.683.099	2.546.142	2.526.198	3.110.258
SUM	3.164.548	6.068.775	8.991.127	11.546.233	15.166.131	18.489.801
Net N.C operating assets	3.164.548	6.068.775	8.991.127	11.546.233	15.166.131	18.489.801
Change N.C operating assets	1.478.722	2.904.227	2.922.352	2.555.106	3.619.897	3.323.670

Analytical balance sheet	2015	2016	2017	2018	2019	2020
Cash and cash equivalents	1.196.908					
Restricted cash and marketable securities	22.628					
Restricted cash	31.522					
Short-term marketable securities	-					
Fiancial assets	1.251.058					
Convertible senior notes/Convertible debt	-					
Convertible senior notes, less current porti	-					
Total convertible preferred stock	42.045					
Long-term debt, current portion	633.166					
Long-term debt, less current portion	2.040.375					
Common stock warrant liability	-					
Capital lease obligations, current portion	-					
Capital lease obligations, less current port	-					
Financial libailities	2.715.586	2.177.254	2.727.308	2.622.067	3.112.142	3.150.756
NIBD	1.464.528	2.636.573	4.298.728	6.027.477	8.667.401	11.203.995
Common stock	131					
Additional paid-in capital	3.414.692					
Accumulated other comprehensive loss	-3.556					
Accumulated deficit	-2.322.323					
Equity	1.088.944	1.960.413	3.196.302	4.481.707	6.444.611	8.330.686
NIBD + Equity (invested capital)	2.553.472	4.596.986	7.495.030	10.509.184	15.112.012	19.534.681

Forecast of Analytical Balance Sheet

Analytical balance sheet	2021	2022	2023	2024	2025
Accounts receivable	1.266.551	1.483.446	1.803.048	2.224.655	2.780.334
Inventory	7.222.716	8.514.266	10.212.022	12.439.397	15.358.398
Prepaid expenses and other current assets	1.018.861	1.193.340	1.450.440	1.789.596	2.236.605
Current operating assets	9.508.127	11.191.052	13.465.509	16.453.648	20.375.338
Operating lease vehicles, net	11.638.004	13.631.002	16.567.741	20.441.776	25.547.772
Property, plant and equipment, net	12.757.188	14.175.310	15.633.720	17.123.481	18.606.150
Other assets	484.860	567.892	690.241	851.640	1.064.365
Non-current operating assets	24.880.052	28.374.203	32.891.703	38.416.897	45.218.287
Operating assets	34.388.179	39.565.255	46.357.212	54.870.545	65.593.625
Accounts payable	2.177.938	2.151.283	2.580.251	3.143.038	3.880.576
Accrued liabilities	2.221.037	2.601.387	3.161.845	3.901.179	4.875.624
Deferred revenue	1.965.739	2.302.370	2.798.405	3.452.756	4.315.194
Customer deposits	789.524	616.862	749.762	925.079	1.156.147
Deferred development compensation	-	-	-	-	-
Resale value guarantee	573.510	610.150	666.765	730.336	797.358
Current operating liabilities	7.727.747	8.282.051	9.957.028	12.152.388	15.024.899
Deferred revenue, less current portion					
Other long-term liabilities					
Resale value guarantee					
Convertible preferred stock warrant liability					
Non-current operating liabilities	3.404.411	3.679.547	4.098.093	4.594.657	5.742.321
Operating liabilities	11.132.158	11.961.598	14.055.121	16.747.045	20.767.221
Net operating assets (Invested capital)	23.256.021	27.603.657	32.302.090	38.123.500	44.826.404

Operating working capital	2021	2022	2023	2024	2025
Current assets	9.508.127	11.191.052	13.465.509	16.453.648	20.375.338
Current liabilities	7.727.747	8.282.051	9.957.028	12.152.388	15.024.899
Operating working capital	1.780.380	2.909.001	3.508.481	4.301.260	5.350.438
ΔNWC	735.500	1.128.620	599.481	792.779	1.049.178

Net non-current operating assets	2021	2022	2023	2024	2025
Non current operating assets	24.880.052	28.374.203	32.891.703	38.416.897	45.218.287
Non current operating liabilities	3.404.411	3.679.547	4.098.093	4.594.657	5.742.321
SUM	21.475.641	24.694.656	28.793.609	33.822.240	39.475.966
Net N.C operating assets	21.475.641	24.694.656	28.793.609	33.822.240	39.475.966
Change N.C operating assets	2.985.840	3.219.015	4.098.953	5.028.631	5.653.726

Analytical balance sheet	2021	2022	2023	2024	2025
Cash and cash equivalents					
Restricted cash and marketable securities					
Restricted cash					
Short-term marketable securities					
Fiancial assets					
Convertible senior notes/Convertible debt					
Convertible senior notes, less current portion					
Total convertible preferred stock					
Long-term debt, current portion					
Long-term debt, less current portion					
Common stock warrant liability					
Capital lease obligations, current portion					
Capital lease obligations, less current portion					
Financial libailities	3.434.014	3.693.660	4.096.241	4.570.697	5.109.061
NIBD	13.338.346	15.831.906	18.526.663	21.865.497	25.709.906
Common stock					
Additional paid-in capital					
Accumulated other comprehensive loss					
Accumulated deficit					
Equity	9.917.675	11.771.751	13.775.427	16.258.004	19.116.499
NIBD + Equity (invested capital)	23.256.021	27.603.657	32.302.090	38.123.500	44.826.404

Appendix 8: Forecast of Cash Flow Statement

Forecast of Cash Flow Statement						
Cash flow statement	2015	2016	2017	2018	2019	2020
NOPAT	-732.036	218.459	528.144	1.463.129	2.311.205	2.983.183
Depreciation	422.590	656.805	936.243	1.130.172	1.418.880	1.732.269
Δ Operating working capital	390.005	860.713	24.309	-459.048	-982.931	-1.099.000
Δ N.C. Operating assets	-1.894.128	-3.549.866	-3.842.679	-3.666.066	-5.014.656	-5.026.491
Correction for lease vehicles	770.544	1.010.713	1.222.443	668.685	1.376.485	1.797.043
Free cash flows to the firm (FCFF)	-1.043.025	-803.177	-1.131.540	-863.127	-891.017	387.005
Net new financial liabilities	911.483	1.172.045	1.662.155	1.728.750	2.639.923	2.536.595
NFE, after tax	-156.627	-160.863	-289.600	-448.205	-561.246	-724.917
Free cash flow to equity holders (FCFE)	-288.169	208.005	241.015	417.417	1.187.660	2.198.683
Dividends	0	0	0	0	0	0
Cash surplus	-288.169	208.005	241.015	417.417	1.187.660	2.198.683

Forecast of Cash Flow Statement					
Cash flow statement	2021	2022	2023	2024	2025
NOPAT	3.758.241	4.301.634	5.478.796	7.054.096	9.160.941
Depreciation	1.995.317	2.275.539	2.637.830	3.080.937	3.626.391
Δ Operating working capital	-735.500	-1.128.620	-599.481	-792.779	-1.049.178
Δ N.C. Operating assets	-4.947.236	-5.455.870	-6.691.941	-8.057.192	-9.280.117
Correction for lease vehicles	1.329.275	1.498.734	2.208.428	2.913.275	3.839.709
Free cash flows to the firm (FCFF)	1.400.097	1.491.416	3.033.633	4.198.337	6.297.746
Net new financial liabilities	2.134.351	2.493.559	2.694.757	3.338.833	3.844.409
NFE, after tax	-937.070	-1.115.581	-1.324.135	-1.549.517	-1.828.768
Free cash flow to equity holders (FCFE)	2.597.378	2.869.394	4.404.255	5.987.653	8.313.387
Dividends	0	0	0	0	0
Cash surplus	2.597.378	2.869.394	4.404.255	5.987.653	8.313.387

- As lease vehicles are financed through COGS, and thereby is accounted for in NOPAT, they must be corrected for in the cash flow statement.

Appendix 9: Revenue Forecast

REVENUE FORECAST						
Production	2015	2016	2017	2018	2019	2020
Model S	50.588	45.000	50.000	50.000	50.000	50.000
Model X	507	40.000	70.000	65.000	65.000	60.000
Model 3			10.000	60.000	190.000	350.000
Total Production	51.095	85.000	130.000	175.000	305.000	460.000
		66,4%	*52,9%*	*34,6%*	*74,3%*	*50,8%*
Vehicle sales deliveries	2015	2016	2017	2018	2019	2020
Model S	50.372	44.077	46.313	47.500	47.500	47.500
Model X	208	28.620	59.375	62.938	61.750	58.188
Model 3		-	7.125	45.125	149.625	294.500
Total Deliveries	50.580	72.698	112.813	155.563	258.875	400.188
Lease vehicle deliveries	2015	2016	2017	2018	2019	2020
Model S	2.598	2.320	2.438	2.500	2.500	2.500
Model X		1.506	3.125	3.313	3.250	3.063
Model 3		-	375	2.375	7.875	15.500
Total new lease vehicles	2.598	3.826	5.938	8.188	13.625	21.063
Inventory/ vehicle in transit	2015	2016	2017	2018	2019	2020
Model S inventory	8.748	7.351	8.601	8.601	8.601	8.601
Model x inventory	299	10.172	17.672	16.422	16.422	15.172
Model 3 inventory			2.500	15.000	47.500	87.500
Total inventory	9.047	17.523	28.773	40.023	72.523	111.273
% of deliveries	2015	2016	2017	2018	2019	2020
Model S, Units	99,6%	60,6%	41,1%	30,5%	18,3%	11,9%
Model X, Units	0,4%	39,4%	52,6%	40,5%	23,9%	14,5%
Model 3, Units			6%	29%	58%	74%
SUM	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Vehicle Sales / Unit	2015	2016	2017	2018	2019	2020
Model S	65	74	74	73	72	71
Model X		85	84	83	82	82
Model 3			35	34	34	33
Avg Price	65	79	77	66	52	45
Total Revenue	2015	2016	2017	2018	2019	2020
Vehicle Sales	3.262.873	5.710.904	8.655.756	10.253.452	13.550.163	17.845.918
Reulatory Credits	168.700	295.270	447.528	530.133	700.583	922.686
Resale & Leasing	309.400	541.533	820.777	972.278	1.284.886	1.692.229
Total Service & Other Revenue	305.052	533.923	829.091	1.005.638	1.360.043	1.832.134
Total Automotive Revenue	3.740.973	6.547.707	9.924.061	11.755.863	15.535.632	20.460.832
Total Revenue	4.046.025	7.081.630	10.753.152	12.761.501	16.895.676	22.292.967
Growth	27%	75%	52%	19%	32%	32%

REVENUE FORECAST

Production	2021	2022	2023	2024	2025
Model S	50.500	51.005	51.515	52.030	52.551
Model X	57.600	55.296	53.084	50.961	48.922
Model 3	455.000	591.500	768.950	999.635	1.299.526
Total Production	563.100	697.801	873.549	1.102.626	1.400.998
	22,4%	*23,9%*	*25,2%*	*26,2%*	*27,1%*

Vehicle sales deliveries	2021	2022	2023	2024	2025
Model S	47.856	48.335	48.818	49.306	49.799
Model X	55.290	53.078	50.955	48.917	46.960
Model 3	407.313	529.506	688.358	894.866	1.163.325
Total Deliveries	510.459	630.919	788.132	993.089	1.260.085

Lease vehicle deliveries	2021	2022	2023	2024	2025
Model S	2.519	2.544	2.569	2.595	2.621
Model X	2.910	2.794	2.682	2.575	2.472
Model 3	21.438	27.869	36.229	47.098	61.228
Total new lease vehicles	26.866	33.206	41.481	52.268	66.320

Inventory/ vehicle in transit	2021	2022	2023	2024	2025
Model S inventory	8.726	8.852	8.980	9.109	9.239
Model x inventory	14.572	13.996	13.443	12.912	12.403
Model 3 inventory	113.750	147.875	192.238	249.909	324.881
Total inventory	137.048	170.724	214.661	271.930	346.523

% of deliveries	2021	2022	2023	2024	2025
Model S, Units	9,4%	7,7%	6,2%	5,0%	4,0%
Model X, Units	10,8%	8,4%	6,5%	4,9%	3,7%
Model 3, Units	80%	84%	87%	90%	92%
SUM	100,0%	100,0%	100,0%	100,0%	100,0%

Vehicle Sales / Unit	2021	2022	2023	2024	2025
Model S	71	70	71	71	72
Model X	81	80	81	82	82
Model 3	32	32	32	33	33
Avg Price	41	39	38	37	36

Total Revenue	2021	2022	2023	2024	2025
Vehicle Sales	21.003.339	24.555.149	29.790.963	36.690.004	45.771.113
Reulatory Credits	1.085.934	1.269.572	1.540.279	1.896.980	2.366.499
Resale & Leasing	1.991.629	2.328.427	2.824.910	3.479.108	4.340.219
Total Service & Other Revenue	2.204.450	2.633.544	3.263.398	4.103.273	5.223.827
Total Automotive Revenue	24.080.901	28.153.149	34.156.152	42.066.091	52.477.831
Total Revenue	26.285.351	30.786.692	37.419.550	46.169.364	57.701.658
Growth	18%	17%	22%	23%	25%

Appendix 10: Forecast of COGS as % of revenue

COGS as % of revenue	2015	2016	2017	2018	2019	2020
Avg. kWh per battery						
Model S	80	80	80	80	80	80
Model X	80	80	80	80	80	80
Model 3			50	50	50	50
Deliveries						
Model S	50.372	44.077	46.313	47.500	47.500	47.500
Model X	208	28.620	59.375	62.938	61.750	58.188
Model 3	-	-	7.125	45.125	149.625	294.500
Sum	50.580	72.698	112.813	155.563	258.875	400.188
Gigafactory 2020 capacity	35.000.000	35.000.000	35.000.000	35.000.000	35.000.000	35.000.000
Total kWh Delivery to vehicles	4.046.400	5.815.805	8.811.250	11.091.250	16.221.250	23.180.000
Cost per kWh	200	190	181	171	163	155
battery cost per vehicle						
Model S	19	18	17	16	16	15
Model X	19	18	17	16	16	15
Model 3	-	-	11	10	10	9
Total battery cost (million)	971.136	1.326.004	1.908.517	2.282.247	3.170.954	4.304.698
Cost per vehicle excl. Battery						
Model S	42,5	43,0	43,4	43,8	44,3	45,1
Model X	60,0	51,0	51,5	52,0	52,5	53,6
Model 3			20,3	17,2	17,4	17,7
Total vehicle cost excl. Battery	2.151.386,0	3.353.180,6	5.212.295,2	6.133.410,8	7.950.834,8	10.490.421,6
Cost per vehicle incl. Battery						
Model S	61,7	61,2	60,7	60,3	59,9	60,0
Model X	79,2	69,2	68,8	68,5	68,2	68,5
Model 3	-	-	31,1	27,5	27,2	27,0
Total vehicle cost	3.122.522,0	4.679.184,2	7.120.811,9	8.415.657,3	11.121.789,1	14.795.119,7
Total revenue	4.046.025	7.081.630	10.753.152	12.761.501	16.895.676	22.292.967
COGS as % of revenue	77%	66%	66%	66%	66%	66%
COGS as % of vehicle sales	96%	82%	82%	82%	82%	83%
Gross margin	23%	34%	34%	34%	34%	34%
Revenue per vehicle						
Model S	64,8	74,4	73,6	72,9	72,2	71,4
Model X	0,0	85,0	84,2	83,3	82,5	81,7
Model 3	0,0	0,0	35,0	34,3	33,6	32,9

COGS as % of revenue					
COGS as % of revenue	2021	2022	2023	2024	2025
Avg. kWh per battery					
Model S	80	80	80	80	80
Model X	80	80	80	80	80
Model 3	50	50	50	50	50
Deliveries					
Model S	47.856	48.335	48.818	49.306	49.799
Model X	55.290	53.078	50.955	48.917	46.960
Model 3	407.313	529.506	688.358	894.866	1.163.325
Sum	510.459	630.919	788.132	993.089	1.260.085
Gigafactory 2020 capacity	35.000.000	35.000.000	35.000.000	35.000.000	35.000.000
Total kWh Delivery to vehicles	28.617.325	34.588.370	42.399.780	52.601.150	65.907.044
Cost per kWh	147	140	133	126	120
battery cost per vehicle					
Model S	14	13	13	12	11
Model X	14	13	13	12	11
Model 3	9	8	8	8	7
Total battery cost (million)	5.048.727	5.797.044	6.750.931	7.956.442	9.470.636
Cost per vehicle excl. Battery					
Model S	46,0	47,0	47,9	48,9	49,8
Model X	54,7	55,8	56,9	58,0	59,2
Model 3	18,1	18,5	18,8	19,2	19,6
Total vehicle cost excl. Battery	12.600.685,0	15.008.397,5	18.203.141,1	22.440.440,0	28.059.110,5
Cost per vehicle incl. Battery					
Model S	60,2	60,4	60,6	61,0	61,3
Model X	68,8	69,2	69,6	70,1	70,7
Model 3	26,9	26,8	26,8	26,8	26,8
Total vehicle cost	17.649.412,2	20.805.441,1	24.954.072,4	30.396.882,4	37.529.746,0
Total revenue	26.285.351	30.786.692	37.419.550	46.169.364	57.701.658
COGS as % of revenue	67%	68%	67%	66%	65%
COGS as % of vehicle sales	84%	85%	84%	83%	82%
Gross margin	33%	32%	33%	34%	35%
Revenue per vehicle					
Model S	70,7	70,0	70,7	71,4	72,1
Model X	80,8	80,0	80,8	81,6	82,5
Model 3	32,3	32,0	32,3	32,6	32,9

Appendix 11: Cost of capital

Regression Statistics	
Multiple R	0,357179173
R Square	0,127576962
Adjusted R Square	0,126969002
Standard Error	0,031764531
Observations	1437

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0,211729773	0,211729773	209,8442296	1,73869E-44
Residual	1435	1,44789411	0,001008985		
Total	1436	1,659623883			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,001587362	0,000838301	1,893546574	0,058486214	-5,7065E-05	0,003231789	-5,7065E-05	0,003231789
S&P500 Excess Return	1,270427667	0,08770037	14,48600116	1,73869E-44	1,098392997	1,442462337	1,098392997	1,442462337

PACIFIC BIOSCIENCES OF CALIFORNIA, INC. (PACB)

From the heart of Silicon Valley PACB develops high-quality, innovative technologies to push boundaries of molecular technology. They provide laboratory analytical instruments and software analyzing tools and believe that their products will lead to advances that will lead to long lasting benefits for the world regarding deceases and food and energy supply.

After the IPO in the stock has had a bumpy ride with a strong recovery in Q4 2015.

Telenav, INC. (TNAV)

Telenav produces applications for mobile phones. They offer what they call smart navigation products for everyday use in cars and everywhere else. The product features a personalized navigation devise for easier usage than the traditional navigation apps. Their product are available at the most important mobile platforms in the US, Europe, Asia and Latin America.

Control4 Corporation (CTRL)

CTRL deliver one technological platform that controls all technology in your home. Everything from TV and radio to temperature and surveillance is operated through their system allowing customers to control everything from their phone of a screen on the wall. It is called “smart home” and “intelligent living” with the intention of atomizing the home.

Appendix 12: EVA & FCFF valuation formulas

$$Enterprise\ value_0 = Invested\ capital_0 + \sum_{t=1}^{\infty} \frac{EVA_t}{(1+WACC)^t}$$

$$Value\ terminal\ period = \left(\frac{EVA_t}{(WACC - g)}\right) * Discount\ factor_{t-1}$$

Appendix 13: Analytical Statements, Financial Peers

tax rate	0%	0%	0%	0%	0%	0%
Pacific Biosciences Of California, Inc.						
AIS	2010	2011	2012	2013	2014	2015
Product revenue	0	31.486	20.089	20.039	35.299	37.502
Service and other revenue	0	1.487	5.894	6.446	8.511	10.896
Contractual revenue	1.674	890	0	1.696	16.784	44.384
Total revenue	1.674	33.863	25.983	28.181	60.594	92.782
Cost of product revenue	0	18.725	18.796	15.706	29.626	30.704
Cost of service and other revenue	0	2.104	6.247	6.056	7.566	8.628
Total cost of revenue	0	20.829	25.043	21.762	37.192	39.332
Gross profit	1.674	13.034	940	6.419	23.402	53.450
Research and development	-111.821	-76.080	-47.623	-45.217	-48.230	-60.440
Sales, general and administrative	-30.087	-46.710	-47.655	-38.745	-38.026	-45.187
Gain on lease amendments	0	0	0	0	0	23.043
EBITDA	-145.394	-115.559	-100.987	-83.191	-67.075	-32.811
Depreciation and amortization	-5.160	-5.803	-6.649	-5.648	-4.221	-3.677
EBIT	-140.234	-109.756	-94.338	-77.543	-62.854	-29.134
Tax on EBIT	0	0	0	0	0	0
NOPAT	-140.234	-109.756	-94.338	-77.543	-62.854	-29.134
Other income (expense), net	68	368	147	728	-478	364
Interest expense			-274	-2478	-2828	-2.926
NFE, before tax	68	368	-127	-1750	-3306	-2.562
Tax on NFE	0	0	0	0	0	0
NFE, after tax	68	368	-127	-1750	-3306	-2.562
Net Loss	-140.166	-109.388	-94.465	-79.293	-66.160	-31.696

Pacific Biosciences Of California, Inc. ABS	2010	2011	2012	2013	2014	2015
Accounts receivable	341	4.557	2.822	2.746	3.406	5.245
Inventory, net	6.864	15.517	9.592	10.050	11.335	10.955
Prepaid expenses and other current assets	2.235	2.093	2.006	1.135	1.671	12.071
Current operating assets	9.440	22.167	14.420	13.931	16.412	28.271
Accounts payable	9.515	4.742	2.988	1.717	5.608	4.749
Accrued expenses	7.994	10.258	8.204	7.905	11.441	15.551
Deferred service revenue, current	3.221	4.236	3.378	4.046	6.121	6.815
Deferred contractual revenue, current	110	140	173	6.785	6.785	10.822
Other liabilities, current				2.102	1.534	241
Current operating libilities	20.840	19.376	14.743	22.555	31.489	38.178
Property and equipment, net	12.311	18.398	14.329	9.236	6.601	8.548
Other long-term assets	322	317	354	490	162	7.518
Non-current operating assets	12.633	18.715	14.683	9.726	6.763	16.066
Deferred service revenue, non-current	0	1.616	800	518	1.129	1.143
Deferred contractual revenue, non-current	2.114	3.075	2.145	26.519	19.735	1.312
Other liabilities, non-current	2.927	2.786	2.613	3.517	2.153	1.386
Non-current operating liabilites	5.041	7.477	5.558	30.554	23.017	3.841
Net operating asstes (Invested Capital)	-3.808	14.029	8.802	-29.452	-31.331	2.318
Cash and cash equivalents	147.650	58.865	46.540	26.362	36.449	33.629
Long-term restricted cash						4.500
Investments	136.024	118.569	54.040	86.166	64.899	48.641
Financial assets	283.674	177.434	100.580	112.528	101.348	86.770
Notes payable				13.347	14.124	14.948
Financing derivative				549	944	600
Financial liabilites	0	0	0	13.896	15.068	15.548
NIBD	-283.674	-177.434	-100.580	-98.632	-86.280	-71.222
Common stock	612.054	632.961	645.372	66	74	80
Additional paid-in-capital	-21	57	30	684.413	736.339	786.636
Accumulated other comprehensive income	-332.167	-441.555	-536.020	14	9	-7
Accumulated deficit				-615.313	-681.473	-713.169
Equity	279.866	191.463	109.382	69.180	54.949	73.540
NIBD + Equity	-3.808	14.029	8.802	-29.452	-31.331	2.318

Effective tax rate	-39%	-30%	-16%	-12%	-36%
Telenav, Inc.					
AIS	2011	2012	2013	2014	2015
Product	10.752	24.186	69.162	72.747	100.768
Services	188.366	181.336	122.638	77.566	59.471
Total revenue	199.118	205.522	191.800	150.313	160.239
Product	6.364	13.615	38.164	36.775	55.270
Services	31.786	30.833	30.949	24.066	23.514
Total cost of revenue	38.150	44.448	69.113	60.841	78.784
Gross profit	160.968	161.074	122.687	89.472	81.455
Research and development	-52.617	-65.764	-60.349	-60.573	-68.060
Sales and marketing	-16.588	-25.345	-30.435	-33.138	-26.975
General and administrative	-19.757	-26.084	-24.765	-26.176	-23.606
Restructuring costs	0	0	-1.671	-4.412	-1.150
EBITDA	64.297	35.710	-2.941	-41.586	-43.575
Depreciation	-7.709	-8.171	-8.408	-6.759	-5.239
EBIT	72.006	43.881	5.467	-34.827	-38.336
Provison for income tax	-28.592	-13.559	-1.093	4.015	13.006
Tax from NFE	458	444	198	154	817
Tax on EBIT	-28.134	-13.115	-895	4.169	13.823
NOPAT	43.872	30.766	4.572	-30.658	-24.513
Other income, net	1.173	1.484	1.207	1.288	2.267
NFE before tax	1.173	1.484	1.207	1.288	2.267
Tax shield	-458	-444	-198	-154	-817
NFE after tax	715	1.040	1.009	1.134	1.450
Income from discontinued operations, net of tax	-2.013	602	7.486	-	-
Net income (loss)	42.574	32.408	13.067	-29.524	-23.063

Telenav, Inc. ABS	2011	2012	2013	2014	2015
Accounts receivable	30.711	25.316	28.193	25.762	36.493
Deferred income taxes, net	2.951	1.403	867	784	327
Income taxes receivable				6.932	6.080
Prepaid expenses and other current assets	10.204	14.319	11.113	9.491	4.288
Current assets	43.866	41.038	40.173	42.969	47.188
Property and equipment, net	9.079	15.442	11.753	8.814	7.126
Deferred income taxes, net, non-current	1.589	2.872	3.771	550	443
Goodwill and intangible assets, net		923	18.805	40.733	37.528
Other assets	3.333	5.036	4.814	3.931	6.843
Non-current assets	14.001	24.273	39.143	54.028	51.940
Accounts payable	3.176	3.059	1.604	502	830
Accrued compensation	7.847	9.116	8.855	12.874	9.628
Accrued royalties	4.704	4.397	9.833	3.671	9.358
Other accrued expenses	4.308	8.385	16.729	12.343	10.918
Deferred revenue	48.490	9.222	7.025	2.381	2.109
Income taxes payable	49	1.350	95	804	724
Current liabilites	68.574	35.529	44.141	32.575	33.567
Deferred rent, non-current	8	8.410	8.884	7.129	4.858
Deferred revenue, long-term				55	4.719
Other long-term liabilities	4.129	4.322	6.180	7.677	4.595
Non-current liabilites	4.137	12.732	15.064	14.861	14.172
Net operating assets (invested capital)	-14.844	17.050	20.111	49.561	51.389
Cash and cash equivalents	24.053	6.920	25.787	14.534	18.721
Short-term investments	179.257	192.548	165.898	122.315	101.195
Restricted cash			2.668	5.995	4.878
Financial assets	203.310	199.468	194.353	142.844	124.794
NIBD	-203.310	-199.468	-194.353	-142.844	-124.794
Common stock	42	42	40	40	41
Additional paid-in capital	115.064	118.855	118.193	129.278	140.406
Accumulated other comprehensive income (loss)	537	370	373	576	-1.540
Retained earnings	72.823	97.251	95.858	62.511	37.276
Total stockholders' equity	188.466	216.518	214.464	192.405	176.183
NIBD + Equity	-14.844	17.050	20.111	49.561	51.389

Control4 AIS	2012	2013	2014	2015
Accounts receivable, net	13.078	15.064	20.155	21.322
Inventories	12.515	15.312	14.212	19.855
Prepaid expenses and other current assets	1.871	1.773	2.075	3.842
Current assets	27.464	32.149	36.442	45.019
Property and equipment, net	2.666	3.943	5.089	6.584
Intangible assets, net	926	928	1.409	4.547
Goodwill			231	2.760
Other assets	887	1.120	1.329	1.650
Non-current assets	4.479	5.991	8.058	15.541
Accounts payable	14.435	13.314	15.016	17.588
Accrued liabilities	6.571	6.821	4.750	5.880
Deferred revenue	542	644	843	1.099
Current portion of notes payable	1.321	1.138	915	727
Current liabilities	22.869	21.917	21.524	25.294
Other long-term liabilities	1.620	467	1.291	938
Non-current liabilities	1.620	467	1.291	938
Invested capital	7.454	15.756	21.685	34.328
Cash and cash equivalents	18.695	84.546	29.187	29.530
Restricted cash			311	296
Short-term investments			53.523	37.761
Long-term investments			14.509	13.716
Financial assets	18.695	84.546	97.530	81.303
Notes payable	1.838	1.828	913	186
Warrant liability	601	-		
Redeemable convertible preferred stock	116.313	-	-	-
Financial liabilites	118.752	1.828	913	186
NIBD	100.057	-82.718	-96.617	-81.117
Common stock	0	2	2	2
Treasury stock	0	0	0	-9.020
Additional paid-in capital	12.988	200.545	212.388	220.782
Accumulated deficit	-105.587	-102.084	-93.928	-95.580
Accumulated other comprehensive income (loss)	-4	11	-160	-739
Equity	-92.603	98.474	118.302	115.445
NIBD+Equity	7.454	15.756	21.685	34.328

Tax	0%	4%	-7%	5%	-19%
Control4					
ABS	2011	2012	2013	2014	2015
Revenue	93.376	109.512	128.511	148.800	163.179
Cost of revenue	-50.534	-57.225	-64.234	-72.443	-81.645
Cost of revenue-inventory purchase commitment	0	-1.840	380	0	0
Gross margin	42.842	50.447	64.657	76.357	81.534
Research and development	-19.211	-20.310	-24.979	-27.365	-32.385
Sales and marketing	-17.546	-20.182	-21.975	-25.887	-32.594
General and administrative	-9.805	-10.150	-12.329	-14.195	-17.355
Litigation settlement	0	-2.869	-440	-47	-21
EBITDA	-5.474	-5.049	2.414	5.825	-5.221
Depreciation	-1754	-1985	-2520	-3038	-4400
EBIT	-3.720	-3.064	4.934	8.863	-821
Income tax expense	0	-141	-248	-411	-268
Tax on NFE	0	-20,39028	-78,21488	-14,2005	-109,0202
NOPAT	-3.720	-3.225	4.608	8.438	-1.198
Interest net	-392	-264	-454	62	202
Other income (expense)	227	-254	-729	-358	-765
NFE before tax	-165	-518	-1183	-296	-563
Tax on NFE	0	20,390285	78,214876	14,20054	109,0202
NFE after tax	-165	-497,6097	-1104,785	-281,799	-453,9798
Net income (loss)	-3.885	-3.723	3.503	8.156	-1.652

Appendix 14: Analytical Statements, Premium Peers

Effective tax rate	*-28%*	*-32%*
AIS Daimler	2014	2015
Revenue	129.872	149.467
Cost of sales	-101.688	-117.670
Gross profit	28.184	31.797
Selling expenses	-11.534	-12.147
General administrative expenses	-3.329	-3.710
Research and non-capitalized development costs	-4.532	-4.760
Other operating income	1.759	2.114
Other operating expense	-1.160	-555
EBITDA	9.388	12.739
Depreciation		
EBIT	9.388	12.739
Income tax	-2.883	-4.033
Tax shield	222	2
Tax on EBIT	-2.661	-4.031
NOPAT	6.727	8.708
Share of profit from equity-method investments net	897	464
Other financial expense net	458	-27
Interest income	145	170
Interest expense	-715	-602
NFE before tax	785	5
Tax on NFE	-222	-2
NFE after tax	563	3
Other expense net	1125	7
Net profit	7.290	8.711

ABS Daimler	2014	2015
Equipment on operating leases and receivables from fin	94.729	112.456
Inventories	20.864	23.760
Trade receivables	8.634	9.054
Current assets	124.227	145.270
Intangible assets	9.367	10.069
Property plant and equipment	23.182	24.322
Other assets	8.277	8.209
Non-current assets	40.826	42.600
Trade payables	10.178	10.548
Current liabilities	10.178	10.548
Provisions	28.393	26.145
Other liabilities	9.085	12.347
Non-current liabilities	37.478	38.492
Net opreating assets (invested capital)	117.397	138.830
Equity-method investments	2.294	3.633
Cash and cash equivalents	9.667	9.936
Marketable debt securities	6.634	8.273
Other financial assets	5.987	7.454
Financial assets	24.582	29.296
Financing liabilities	86.689	101.142
Other financial liabilities	10.706	12.360
Financing liabilities	97.395	113.502
NIBD	72.813	84.206
Equity	44.584	54.624
NIBD + Equity	117.397	138.830

Effective tax rate	*-28%*	*-26%*
AIS AUDI	2014	2015
Revenue	45.183	48.825
Cost of goods sold	-39.334	-41.816
Gross profit	5.849	7.009
Distribution costs	-3.353	-3.810
Administrative costs	-287	-334
Other operating income	2.763	3.537
Other operating expence	-914	-3.246
Result from participations	755	1.318
EBITDA	4.813	4.474
Depreciation of long-term investments and marketable s	-1	-165
EBIT	4.812	4.309
Income tax expence	-1.253	-989
Tax shield	-89	-150
Tax on EBIT	-1.342	-1.139
NOPAT	3.470	3.170
Net interest	-320	-568
NFE before tax	-320	-568
Tax shield	89	150
NFE after tax	-231	-418
Profit transferred under a profit transferred agreement	-3.239	-2.752
	3239	*2752*
Net profit for the year	0	0

ABS AUDI	2014	2015
Inventories	2.102	2.435
Receivables and other assets	14.566	12.802
Current assets	16.668	15.237
Intangible assets	235	242
PP&E	6.328	7.181
Deferred expences	19	120
Non-current assets	6.582	7.543
Special items with an equity portion	7	6
Provisions	12.196	13.352
Current liabilites	12.203	13.358
Liabilities	8.383	8.396
Deferred income	348	368
Non-current liabilities	8.731	8.764
Net operating assets (invested capital)	2.316	658
Long-term financial investments	4.065	5.863
Other securities	3.616	5.096
Cash on hand and balances with banks	100	100
Financial assets	7.781	11.059
NIBD	-7.781	-11.059
Subscribed capital	110	110
Capital reserve	8.570	10.190
Retained earnings	1.417	1.417
Equity	10.097	11.717
NIBD + Equity	2.316	658

Effective tax rate	*-33%*	*-31%*
AIS BMW	2014	2015
Revenues	80.401	92.175
Cost of sales	-63.396	-74.043
Gross profit	17.005	18.132
Selling and administrative expenses	-7.892	-8.633
Other operating income	877	914
Other operating expenses	-872	-820
EBITDA	9.118	9.593
Depreciation		
EBIT	9.118	9.593
Inome taxes	-2.890	-2.828
Tax from NFE	-136	-113
Tax on EBIT	-3.026	-2.941
NOPAT	6.092	6.652
Result from equity accounted investments	655	518
Interest and similar income	200	185
Interest and similar expenses	-519	-618
Other financial result	-747	-454
NFE before tax	-411	-369
Tax shield	136	113
NFE after tax	-275	-256
Profit	5.817	6.396

ABS BMW	2014	2015
Inventories	11.089	11.071
Trade receivables	2.153	2.751
Receivables from sales financing	23.586	28.178
Current tax	1.906	2.381
Other assets	5.038	4.693
Current assets	43.772	49.074
Intangible assets	6.499	7.372
PP&E	17.182	17.759
Leased products	30.165	34.965
Investments accounted for using the equity method	1.088	2.233
Receivables from sales financing	37.438	41.865
Deferred tax	2.061	1.945
Other assets	1.094	1.568
Non-current assets	95.527	107.707
Other provisions	4.522	5.009
Current tax	1.590	1.441
Trade payables	7.709	7.773
Other liabilites	7.775	9.208
Current liabilities	21.596	23.431
Pension provisions	4.604	3.000
Other provisions	4.268	4.621
Deferred tax	1.974	2.116
Other liabilities	4.275	4.559
Non-current liabilities	15.121	14.296
Net operating assets (invested capital)	102.582	119.054
Financial assets	5.384	6.635
Cash and cash equivalents	7.688	6.122
Other investments	408	428
Financial assets	2.024	2.208
Financial assets	15.504	15.393
Financial liabilities	43.167	49.523
Financial liabilities	37.482	42.160
Financial liabilities	80.649	91.683
NIBD	65.145	76.290
Subscribed capital	656	657
Capital reserves	2.005	2.027
Revenue reserves	35.621	41.027
Accumulated other equity	-1.062	-1.181
Equity attributable to shareholders in BMW AG	37.220	42.530
Minority interest	217	234
Equity	37.437	42.764
NIBD+Equity	102.582	119.054

Appendix 15: Best case and worst case valuation

Scenario analysis: Worst case (1000's)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
NOPAT	239.851	610.787	1.761.828	2.949.639	4.008.900	5.633.836	6.817.772	9.203.127	12.582.922	17.379.800
Invested capital, beginning of period	2.553.472	4.806.775	8.255.091	12.052.040	18.368.062	25.001.283	31.692.926	39.772.510	49.327.405	61.821.596
WACC	9,55%	9,55%	9,55%	9,55%	9,55%	9,55%	9,55%	9,55%	9,55%	9,55%
Cost of capital	243.780	458.903	788.113	1.150.608	1.753.599	2.386.872	3.025.723	3.797.081	4.709.287	5.902.107
EVA	-3.929	151.885	973.715	1.799.031	2.255.301	3.246.964	3.792.049	5.406.046	7.873.635	11.477.693
Discount factor	0,91	0,83	0,76	0,69	0,63	0,58	0,53	0,48	0,44	
Present value of EVA	-3.587	126.565	740.679	1.249.213	1.429.559	1.878.774	2.002.952	2.606.609	3.465.540	

Invested capital, beginning of period	2.553.472
PV of EVA, forecasting horizon	13.496.306
PV of EVA, terminal period	77.162.809
Estimated market value of firm	93.212.587
Net interest-bearing debt	-1.464.528
Estimated market value of equity	91.748.059

Share prices	Per 01.05.16
Shares outstanding (per 31.12.15)	131.420
Share price (per 01.05.16)	240
Target price	698
Potential upside	191%

Scenario analysis: Worst case (1000's)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
NOPAT	187.641	429.441	1.140.650	1.693.946	2.070.646	2.304.030	2.486.110	2.976.958	3.595.598	4.372.672
Invested capital, beginning of period	2.553.472	4.387.198	6.771.457	9.103.242	12.306.677	15.065.717	16.773.360	18.768.718	20.649.014	22.861.440
WACC	9,55%	9,55%	9,55%	9,55%	9,55%	9,55%	9,55%	9,55%	9,55%	9,55%
Cost of capital	243.780	418.846	646.471	869.086	1.174.918	1.438.324	1.601.352	1.791.849	1.971.361	2.182.581
EVA	-56.139	10.595	494.179	824.859	895.728	865.707	884.758	1.185.109	1.624.237	2.190.091
Discount factor	0,91	0,83	0,76	0,69	0,63	0,58	0,53	0,48	0,44	
Present value of EVA	-51.247	8.829	375.909	572.767	567.772	500.919	467.327	571.419	714.900	

Invested capital, beginning of period	2.553.472
PV of EVA, forecasting horizon	3.728.595
PV of EVA, terminal period	14.723.654
Estimated market value of firm	21.005.720
Net interest-bearing debt	-1.464.528
Estimated market value of equity	19.541.192

Share prices	Per 01.05.16
Shares outstanding (per 31.12.15)	131.420
Share price (per 01.05.16)	240
Target price	149
Potential upside	-38%