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Chair of Introduction to Business Economics

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Why is Tesla worth more than General Motors? Comprehensive analysis of the world's most captivating company

Supervisor

Professor Saverio Bozzolan

Candidate

Nicola Cinti

193461

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To my family,
for their unlimited support.

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Introduction

Tech or Automotive?

Looking at the market behaviour, there is uncertainty about the classification of Tesla. The Californian company, currently leading the sector of full-electric vehicles, produces cars and batteries – and indeed is officially a car manufacturer – but it shows numbers that are more congenial to a technology company.

In the last decades, from the late 90s, financial markets have shown particular excitement for tech companies: fostered first by the shining rise of Microsoft and then by Google, Apple and Amazon, every IT company benefited by an inflated expectation of profits.

At a certain point, in the late 1990s, showing ".com" in the company name was sufficient to rake up millions from investors. The consequences of this ferment manifested in the infamous bubble in which financial markets collapsed, and since then investors have been more conservative with IT companies. In Exhibit 1 we can see the different growths of two representative tech companies compared to two carmaker companies over the last 10 years (note that Alphabet is the umbrella brand of Google).

Exhibit 1 – Source: YCharts - 2017

What we can observe is that while market capitalization for the automotive sector has been quite flat, that of the tech sector has increased constantly. Regarding carmakers, this can be read as a symptom of maturity and stability in a sector that shows consolidating movements and an oligopolistic outlook, with a few big players fighting for market shares[1]. On the other hand, main tech companies obtained big profits, pushing the financial markets to acquire more and more stakes. Tesla definitely lies somewhere in the middle. Engaging in a fierce competition in the field of innovation, it is impressing analysts and shareholders: in April, 2017, it surpassed the market value of giants like General Motors and Ford, becoming the most valuable US carmaker[2]. The numbers reported are not related to profits – depressingly negative – but rather to capitalization, that has skyrocketed over the last few years.

Since its foundation in 2003, Tesla has showed a steadily positive trend of growth, increasing its value through several factors that we will analyse during the thesis. Markets, investors, funds, big companies, suppliers and some analysists support the idea of a bright future for Tesla, attaching to it a high potential return for the years to come.

As we can see from the Exhibit 2, in the period 2012 – 2017 Tesla's market value experienced a huge increase, from a value of roughly 4B to today's 54B dollars. While it is quite normal that a

[1](Reuters 2017)
[2](Waters and Waldmeir 2017)

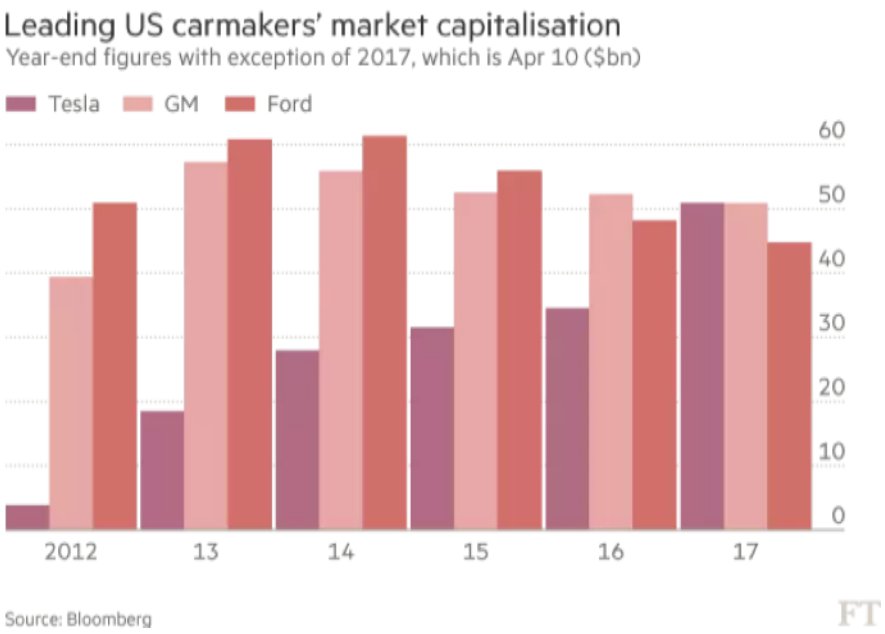

Exhibit 2 – Source: Bloomberg - 2017

new successful start-up multiplies its initial value several times, seeing it surpassing GM and Ford is something uncommon, that is worthwhile to examine.

Our analysis will focus on three chapters: the first one concerning the history of Tesla, its founder Elon Musk, its main models and the future steps of the company.

The second chapter will analyse the company in its entireness, connecting it with the market, its competitors and the challenges ahead. It will determine analytically strengths and weaknesses of Tesla – also referring to eminent opinions – and will try to explain why markets are pushing the company's value above GM.

Lastly, the third chapter will explain with numbers and financial analysis why Tesla's stocks are so valuable. In order to do this, we will undertake a comparison between Tesla and GM, trying to comprehend whether the market is going in the right direction or it is deceived by the beautiful livery of Tesla's cars.

At the end of the third chapter will be discussed how the market is forming expectations, sometime basing investment decisions on the antecedent successful path of other companies, analysing the Amazon growth of the last 20 years.

1. The Company

1.1 History of Tesla

1.1.1 The Foundation

Tesla Motors was founded in 2003 in San Carlo, California, and named after Nikola Tesla, one of the inventors of the electric induction motor. The claim about the principal characteristic of Tesla's products is quite clear. The founding team was composed by Elon Musk and JB Straubel: the former provided most of the capital to run the business, becoming Chairman of the Board and Product Design Chief. During the first years of activity, with the company incurring heavy losses and significant production delays, Musk took over as CEO, soon becoming the face of Tesla.[3]

1.1.2 Elon Musk

Endowed with a remarkable personality and business acumen, Elon Musk is a South African-born Canadian-American who made his fortune through a brilliant career in the start-up sector. He claims his mission is to change the world and improve humanity, as he aims to reduce global

[3](Van den Steen 2015)

warming as well as avoiding human extinction by creating colonies on Mars.[4] As of May 2017, he owns an estimated net worth of $13.9B, making him the 80th most wealthy person in the world.[5]

Born on June 28, 197 in Pretoria, Gauteng, South Africa, Musk immediately showed skills in programming and he loved reading. At the age of 17, he moved to Canada, obtaining citizenship thanks to his mother's nationality. Then he studied at both the University of Pennsylvania and the University of Wharton obtaining, respectively, a bachelor degree in Physics and in Economics[6]. After developing and selling a company called "Zip2" for 300 million, he focused on "X.com", thereafter called PayPal, facilitating the online payment system. After the full implementation of the system in eBay, he sold PayPal to eBay itself for 1.5bn dollars, gaining the possibility to focus entirely on his dreams, as he admitted. While dealing with SpaceX – the world's first commercial company aimed at developing and selling private rockets and at stimulating investment in the aerospace sector[7] – he acquired stakes in Tesla motors, subsequently taking control.

Now he spends his time controlling his companies and founding new ventures: the most recent is "The Boring Company", trying to facilitate wheel transportation and reduce traffic by digging underground tunnels in the most congested cities in the world. During the presidential elections of 2016 he became a member of President Donald Trump's Strategic and Policy Forum. In a later interview, Musk publicly criticised the President because of concerns about his moral stature and personality. In June 2017, Musk resigned from Trump's advisory council, due to the withdrawal of the President from the Paris Agreement on climate change and emission reduction.[8]

1.1.3 Early Steps

None of Tesla's founders had a background in the car industry and neither did its original engineering team. Over time, Tesla assembled a team that was a mix of specialists from the car industry and people living in the Silicon Valley. According to Musk's beliefs, being in the Silicon Valley gave it an important edge when it came to this kind of innovation.

The first car launched was the Roadster. Given the low popularity, Tesla encountered difficulty in accessing Tier-1 suppliers. Tier-1 suppliers are those which usually deal with large and well established companies. Indeed, they generally own the most advanced technologies and relevant production capabilities. Given this issue, some strategic components as well as the entire car's powertrain were built in-house and this led fixed costs to sensibly rise. Conversely, most of the other pieces was outsourced. The body was developed by Lotus and assembled in the U.K.

[4](Musk 2013)
[5](Forbes 2017)
[6](Elliott 2012)
[7](Space Frontier Foundation 2001)
[8](Sharman 2017)

The Tesla Roadster, costing $109,000, was warmly accepted by the press. What impressed journalists and specialized magazines was the capability of accelerating faster than a Lamborghini as well as the incredible noiselessness.[9] "It changed the way people looked at electric vehicles", some observers claimed.[10] In addition it presented very comfortable interiors and two ample baggage vans, one under the bonnet and the other in the usual position. This peculiar characteristic of electric vehicles (from here onwards "EV") is obtained thanks to the smaller dimension of an electric engine compared to an internal combustion engine. This represents one of the main value propositions the company offers.

1.2 Models

1.2.1 Model S

The first truly mass-produced car was the Model S. For this car, the company used a different approach: Tesla planned to entirely develop and assemble the Model S in-house. At first glance, analysts were not confident about Tesla's plan. In fact, it was trying to overcome the traditional procedure that small companies producing vehicles use, namely to buy pieces and acquire parts from other manufacturing companies. This resulted in the risk of a consistent cost increase that neither Tesla, nor analysts, were looking at confidently. The same company did not hide its concerns about sustainability of this plan.[11] But the car crisis played in its favour: through an agreement with Toyota – which injected roughly $50M in equity – Tesla was able to acquire for just $42M a recently idled plant in Fremont, California, built in a previous joint collaboration by Toyota itself and General Motors (from here onward "GM"). This plant, once producing 100,000 cars per year, seemed the perfect facility to bring to the United States the production initially placed abroad. Thanks to its vocation for saving, Tesla was successful in realizing a plan of resources acquisition spending about $300 million out of $1 billion required to get such a plant operational.

During the development of the Roadster, Tesla found out that instead of designing a new battery specifically for its own car, it could efficiently use rechargeable 18650 format Lithium-Ion batteries developed by Panasonic. The 18650 format, slightly smaller than a common AA battery, is commonly used for personal computers well as professional instruments. This was in countertendency with what Nissan was doing with its "Nissan Leaf", equipped with 192 battery

[9](Van den Steen, Tesla Motors 2015)
[10](Baer 2014)
[11](Holmes, 2010)

cells instead of the approximately 7,000 of the Roadster and Model S. From the collaboration with Panasonic the creation of a safe battery pack evolved, presenting an innovative cooling system which could reduce energy dispersion and solve the need for battery production that Tesla required. Model S' batteries were estimated to have double energy storage and to be lighter. This allowed Tesla to reduce the battery pack cost to about $200 - $300 for each kWh; in a 60-kWh engine, this resulted in an average $17,000 cost, half the price of the Nissan Leaf's battery pack.

Other constructors were impressed by the quantity of new technologies implemented: all the controls were replaced by a 17" touch screen in the middle of the dashboard through which you could manage music, air conditioning, driving style as well as check the level of battery and the state of all the components. In addition, all the mechanical elements – from brakes to lights to suspension – are controlled by a computer.[12] Even the key was removed: when the driver approaches the car, it automatically unlocks and the door handle, normally retracted, comes out.

After the first 10,500 cars sold, Musk declared that he expected a number of 40,000 in the following year. The car was launched in June 2012 and soon started getting good reviews, being named "Car of the Year 2013".

1.2.2 Model X

Tesla's Model X was conceived as a premium high-sector vehicle able to compete with the Audi Q7, BMW X5, Porsche Cayenne. Produced in the Tesla Factory in Fremont, it shares the full-sized sedan platform and the panoramic windshield with the Model S. At the beginning of its development, engineers expected to use 60% of Models S' parts in the Model X, a forecast then downgraded to only 30%. The exciting feature regards falcon wing doors to access the second and third row seats as long as there is thirty centimetres space on the side of the vehicle (a very good result if you think that getting out of a car with less than thirty centimetres would be a tough task even with a traditional door). The car is equipped with an electronic "Flat Earth wide band radar system" able to see through metal and to avoid the opening or the closing of the doors with a nearby object. Model X shares the same engine and the same platform with the Model S, even if, due to its crossover setting – and thus its greater weight – it needed a more powerful battery pack. Comparing the powertrains of the two models, Model S is commercialized with two engines of either 50kWh or 75kWh while for the Model X, Tesla provided a 70kWh and a 90Wh battery pack. Reservations started in February 2012 without announcing prices and real sales started in September 2016.

[12](Van den Steen, Tesla Motors 2015)

1.2.3 Model 3

One of the main reasons for which the price of Tesla's shares is skyrocketing is the imminent launch of the new Tesla Model 3. The market thinks it will quintuplicate revenues. This model represents the pursuance of the strategy Musk has put in place in these years: "I'm producing premium models to raise money. I raise money to design and produce mass Electric Vehicles for years to come".

It would be the first step in this direction. The Tesla Model 3 in fact, would cost around $35,000, as declared by Musk himself, definitely less than the $100,000 required to park a Model S in your garage. Nevertheless, investors are quite cautious about this figure. They estimate that a Model 3 with acceptable features, innovations and a good powertrain would cost, on average, $45,000 (not to mention the import costs for European customers). This launch indeed presents a lot of risks, as Tesla is skipping one of the principal steps of the development of an EV: the intermediate prototype testing, from which the car evolves into the penultimate prototype, and then into the final perfected model.[13] Once again, Musk is trying to force the basic rules of production standards, and investors really believe that he can succeed in its first mover attempt. Bulls are betting on the new Model 3's assembly lines, developed, according to Reuters,[14] with advanced analysis techniques as well as the supervision of Peter Hochholdondiger, a previous Audi manager, who worked on the establishment of a new plant in Mexico.[15]

The Tesla Model 3 is a three volume sedan, and its main competitors are the BMW 3 Series, the Mercedes Class C and the Audi A3.[16] To finance the project, Tesla has started taking reservations in advance: they have more than 400,000 refundable reservations of the amount of $1,000. In other words, so far it has already brought the company at least $4B.

While it will present some cheaper features in order to make the car more accessible, it will be still equipped with a 75kWh powertrain with 345 km (214 miles) autonomy. For instance, the handles will not be retractile in this case. Musk expects to start production in July 2017 with roughly 2,000 cars. Then the Fremont plant will produce 4,000 cars until it will reach an expected maximal rate of 10,000 units/week in 2018, making about 430,000 models per year. This number is very near to the maximum capacity of the Californian plant, estimated at 500,000 units/year. [17]

[13](Ragoni, International Business Time 2017)
[14](Sage, 2017)
[15](Ragoni, International Business Time 2017)
[16](Lambert 2016)
[17](Canali 2017)

1.3 Milestones and Other Activities

1.3.1 Future Steps

At the current stage, Tesla has declared that it is willing to maintain its strategy of average prince EVs. Its next model is expected to be another SUV, smaller than the Model X, with a price of around $50,000. It would share the same battery pack of the Tesla Model 3 and also the platform would be the same. Some rumours hypothesise the release of a bigger model, a larger version of the Model 3 with the aim of competing with cars like the Audi A8 and the Mercedes Class S, even if it seems unlikely that the company will challenge these models with undiscussed success before having acquired a satisfactory share in the three-volume market as well as a stronger brand recognition.

Concrete news regarding the assembly process is already in the public domain: in order to make a significant cut to manufacturing expenditures and wages, Tesla has replaced most of the production with futurist entirely-mechanized robots which undertake most of the tasks that were done by employees.[18]

1.3.2 SolarCity

It was 2006 when two brothers Peter and Lyndon Rive, Musk's cousins, founded SolarCity, relying on Musk's suggestion. The company is active in the instalment and maintenance of solar panels and batteries storing solar energy. It also purchases energy in excess to reduce the costs to the customers.

Solar city, representing the biggest solar panel provider in the US with 6,200 MW of power on its account by 2014, has been acquired by Tesla in June 2016, with the aim of "Creating a seamlessly integrated Tesla battery & solar power product that looks beautiful", according to Musk himself. [19]

To diversify its pool of assets, SolarCity has developed together with Tesla a solar panel which fulfils both the aims of tile and solar energy capturing instruments, called "Solar Roof". The product, launched in 2017 in the US, insists on an attractive design and a long-life warranty.[20]

[18](Ragoni, International Business Time 2017)
[19] Musk's official Twitter profile
[20](Tesla Website 2017)

1.3.3 Self-Driving

A field in which Tesla is investing a lot of resources and that analysts think will become crucial in the near future, is the Self-Driving technology. Its direct competitors are Google (with the subsidiary Waymo) and the in-house built self-driving systems by Ford, BMW, Mercedes and some other smaller companies. Waymo and Tesla are ahead of the competition, with more than 1 million miles of self-driving covered and some years of experience behind them.

The main difference between the two is that while Waymo started before and can count on Google's advanced technology and expertise, it doesn't have as many cars on the roads as Tesla. Tesla, in fact, has used a series of sensors and small cameras in each car that are useless to the customer so far, but are allowing it to collect zettabytes of data about self-driving: their car-base is roughly 180,000 EVs worldwide. However, analysts cast some doubts about the sustainability of Tesla's procedures, pointing out that the company is gathering a lot of data, but not the right ones.[21] According to UBS, the collection of data coming from the manual driven cars will not give detailed information about which response the vehicle should have in continuously changing situations. In the Exhibit 3 can be observed a prospect of the characteristics of Tesla's driving system, utilizing a set of cameras identifying objects up to 250 meters.

Exhibit 3 – Source: Tesla Official Website - 2017

[21](Johnson, Levy e Hempel 2017)

2. Corporate Analysis

Having analysed Tesla's main pillars, investment areas, objectives and value proposition, we have the instruments necessary to undertake a deeper study about the general environment, namely the market for EVs and batteries. Positioning Tesla in a competitive and structured market will allow us to understand what kind of challenges it is expecting from competitors, and how likely the company will fulfil the objectives in the quarters ahead.

I also mentioned batteries. Why? As we have seen in the first chapter, in the EV market batteries are a key driver of profitability: representing a big share of the cost of the EVs, batteries are the "newest" technology, as there is fierce competition in cutting the price. Acknowledging Tesla's strengths and weaknesses, we will try to comprehend why bulls are stockpiling its shares and what income they expect for the future.

The real question is whether Tesla is overpriced or has a fair market cap. The answer to this question will allow us to answer the initial question, too: why Tesla, a company that has never been profitable, is worth more than GM?

2.1 Industry Analysis

2.1.1 Industry Growth Rate

The Electric Car market is divided into two principal branches: the HEV (Hybrid Electronic Vehicles) market and the EV (Electronic Vehicle) market. Even if their names are similar and the focal point is the same, the two markets have few things in common. The former is often simply constituted by a hybrid gasoline engine with some additional horsepower provided by the small battery that recharges with kinetic energy during braking and with the car movement. The latter instead is conceived as totally different mechanics: based on a battery powertrain, it completely relies on an electric engine, ruling out the internal combustion engine. Electronic Vehicles pursue the competitive advantage through the achievement of a wider autonomy and a battery cost cutting strategy.

The pure EV market is showing an increasing pace: 2015 was the year of the one million cars threshold, a symbolic achievement highlighting significant efforts deployed jointly by governments and industry over the past ten years.[22] Ambitious targets and policy support have lowered vehicle costs, extended vehicle range and reduced consumer barriers in a number of countries. The market shares of electric cars rose above 1% in seven countries in 2015: Norway, the Netherlands, Sweden, Denmark, France, China and the United Kingdom. Market shares reached 23% in Norway and nearly 10% in the Netherlands. China's booming electric car sales in 2015 made it the main market worldwide, ahead of the United States, for the first time. China is also home to the strongest global deployment of e-scooters and electric buses.

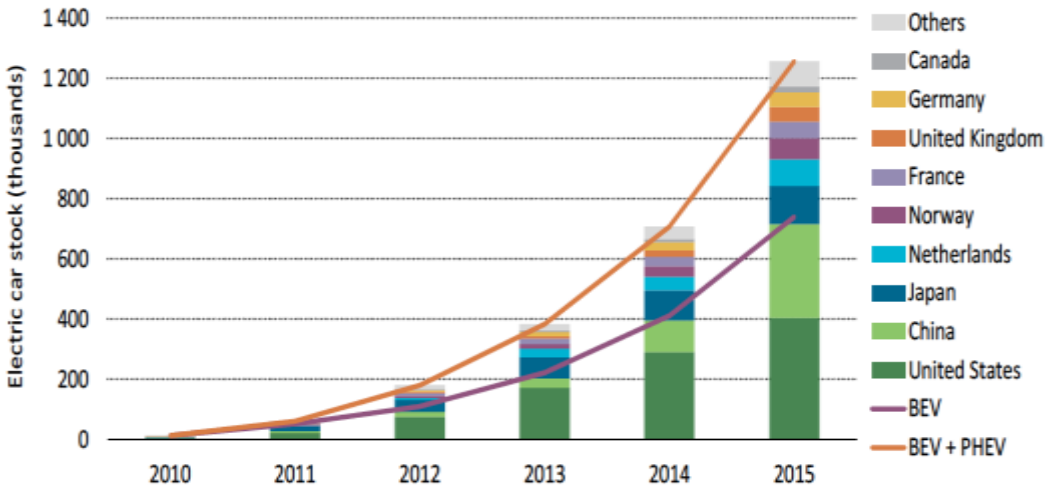

Exhibit 4 – Source: International Energy Agency - 2016

[22](International Energy Agency 2016)

2.1.2 Tesla's Competitors

Among the competitors we can mention the companies that have already started producing EVs on a large scale. The highest volumes of sales are represented by the Chevrolet Bolt (GM), the Nissan Leaf, the Toyota Prius and, in Europe, the Renault Zoe. The companies which produce these cars are large and sound and might represent a threat for Tesla's survival: indeed, due to their stable revenue outlook, they can better sustain a regime of losses in the EV sector while developing the market and expanding the recharging stations.[23] The same line of reasoning also applies to GM and Ford: that is why Tesla's market cap appears somehow overweight in this moment. The models we mentioned, however, are competitors regarding the electric engine, not the segment. Undertaking a segment comparison, the direct competitors are the BMW 328i, the Mercedes C300 and the Audi A4, which start selling at comparable prices of around $40,000.

2.1.3 Switching Costs

Switching costs are the costs that a consumer incurs as a result of changing brands, suppliers or products. Which is the power that Tesla has to retain customers compared to its competitors? How much can Tesla influence customers and stakeholders in general? One tie we should consider is the cost of installing a recharging station at home: it makes the customer more oriented toward a Tesla in the next car purchase, since they already have the equipment ready at home.

Apart from that, Tesla's switching costs are quite low. The company is still not diffuse worldwide and there is no such barrier that impedes a customer to purchase another EV. So, it would be a mistake for Tesla to consider its customer base as the number of sales: the EV market is very active, and incumbent companies may have to face a rapid rise in innovative and powerful entrants.

2.1.4 Economy of Scale

Musk and his management are insisting on dramatically reducing costs through economy of scale. The most immediate effort made in this direction has been to acquire an existing car-producing plant (the NUMMI plant, in Fremont). Then, hiring more and more engineers coming from other car producers, Tesla cut the costs of components, in part outsourcing production, in part designing common pieces for the entire range of cars. Despite this, for now, Tesla is definitely not a company relying on scale. Comparing it to GM and Ford, production is slow, plants are small

[23](Cobb 2016)

vis-à-vis the numbers Tesla claims and workers still need some years to master the advanced technologies.

In any case, the most relevant bet for Tesla is the scale that it would obtain in the battery production once the Gigafactory at Sparks, Nevada, is completed. Nowadays, the most relevant cost for a company producing EV is the cost of the battery pack: around $190/kWh,[24] in a 75kWh battery pack it would be roughly $14,250 cost per car. The aim for Tesla is to reduce this figure to $100/kWh. Bulls bet in a future lead of Tesla in the market of batteries: yet, there are companies like Samsung SDI and LG Chem that are leaders in this field, not forgetting Panasonic, the initial supplier of the Californian company. It seems quite unlikely Tesla will reach an edge in a short time against these well-established companies, and this gives rise to doubts over the optimistic bulls' expectations.

2.2 Competitive Strategy

2.2.1 The Competitive Advantage

Competitive advantages are conditions that allow a company or country to produce a good or service at a lower price or in a more desirable fashion for customers. These conditions allow the productive entity to generate more sales or superior margins than its competition. The competitive advantage can be reached in two ways: through the cost advantage or through the differentiation strategy.

In describing the higher Tesla market cap with respect to GM and Ford and the motivations that bring this company to have a so high value, we should first understand which of the two strategies the company is pursuing. Then, if this advantage really exists, we should understand if it justifies such a high market value and, most importantly, if it is sustainable in the long run.

2.2.2 Cost Leadership

The cost leadership strategy has the aim of reducing the marginal cost of the products below the competition, in order to allow the company to take the biggest possible share of the market. It is often driven by company efficiency, size, scale, scope and cumulative experience.

Tesla is not pursuing a cost leadership strategy. We cannot recognize in the company great efforts to reduce the cost of vehicles such as organizations like GM or Ford do, mainly because it does not have the right volume yet. This does not imply that at Detroit automakers are following

[24](Johnson, Levy e Hempel 2017)

a cost leadership strategy, but simply that Tesla has huge marginal expenses when it comes to production; the other two giants got rid of them long ago benefiting from huge sales. Poor experience, no economy of scale, high input costs: these are the things that impede Tesla from pursuing a cost leadership strategy. Not to be forgotten is the investment in risky R&D: when you innovate a lot, you cannot reduce prices so much, while companies that are cost cutting can.

2.2.3 Differentiation

Tesla's strategy is differentiation; it takes place every time a company sells a product with a characteristic that differentiate it from competitors. Examples of differentiation strategy can easily be found in luxury items, where each product has a specific identity and recognition that is not easily replicable and is built with time.

A company pursuing the differentiation strategy is able to charge an important mark-up on its products: what you are paying is an invisible value, that we can define "goodwill". Goodwill is also recognized as an asset in most accounting standards.

The differentiation for Tesla is the fact that it produces fully electric cars, being one of the few world producers. What it proposes is an energy network (considering also Solar City and energy-related subsidiaries) that companies like GM and Ford do not have. This network of interconnected ventures is convincing bulls of dealing with a disruptive idea that will take the market in the future. A too optimistic forecast, according to analysts. They do not give a true unique value proposition to Tesla, questioning its unique differentiation.

2.3 Corporate Strategy

2.3.1 Factors Inflating the Price

According to a recent Barclays report[25], investors flawing the price of Tesla stocks rely on five main assumptions that are all but certain to become realities in the next quarters. What analysts think is that the Tesla stock value increase is disconnected from fundamentals: it is more driven by momentum. In particular, investors buying Tesla shares are tagged as "Blue Pill minded": referring to the famous film "The Matrix", analysts argue that it is if bulls are in an artificial world, overestimating Tesla income capabilities, exactly like the Blue Pill in Matrix that let agents see the IT world instead of the real one.

[25](Johnson, Levy e Hempel 2017)

The five assumptions they think will drive the price of Tesla in future are:

1) Model 3 positive impact.
2) Significant and sustainable cost advantage in battery pack.
3) Significant lead in autonomous driving, meaning it will be the first by several years to achieve a fully self-driving EV.
4) Dominant market share, following Apple's fashion some years ago in the smartphone market.
5) Dominant position in other sectors like energy, mobility and insurance.

The main assumption that summarises the list above is the fact that investors think they are buying not a financial instrument or a vehicle but a "ticket to the future", and no one in the whole world is more able than Elon Musk in using arguments to convince consumers.

2.3.2 Model 3 Positive Impact

The first 24-hour orders for the Model 3 (which requires a $1,000 deposit) were 180,000, and first-week orders were 325,000 (see Exhibit 5). To put this in context, the order figure is larger than all Lexus sedans sold in 2016, more than all Cadillacs, Infiniti's, and Acura's combined, and amounts to almost as many Audi A4s sold (~355,000) and BMW 3-series cars sold (~401,000).[26]

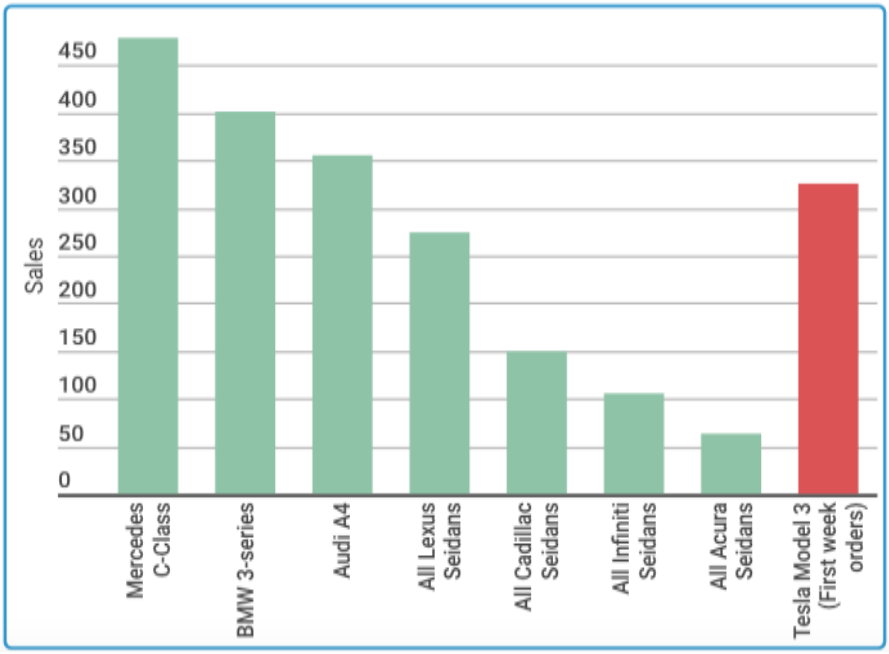

Exhibit 5 – Source: Bernstein - 2017

[26] (Toni Sacconaghi 2017)

We note that Model 3 orders today are purportedly around 400,000. Perhaps what is most stunning is that Model 3 orders in the first 24 hours were higher as a percentage of total annual auto sales than iPhone orders were as a percentage of total annual smartphone sales for every launch in history where Apple provided data. The comparison is not only fair, it may arguably be skewed in Apple's favour, as the iPhone sales orders are measured as a percentage of the total smartphone market (not versus the total cell phone market), and Tesla Model 3 orders are measured as a percentage of total car sales (not just luxury cars or EVs). Even if this comparison examines two different worlds, it still gives a taste of the disruptive Tesla potential.

A threat comes from the price of the car: the starting $35,000 is probably a face price. Tesla has not revealed the packages with the different equipment yet, but analysts forecast that a medium buyer who would include the most common features in its car (parking sensors, alloy wheels, a medium battery and so forth) would spend at least $50,000. A different price than the initial claim, which, given the medium-income customers targeted by the Model 3, might harm sales, affected by a high price elasticity. Analysts fear that of the 400,000 reservations, many of which coming from Toyota and Volkswagen owners, only 250,000 will materialize in purchases, causing severe losses in the already stressed Tesla's financial statement. Another important aspect is the hard customer adaptation to lower autonomy: a topic which General Motors and Ford have an advantage over.

2.3.3 Significant Cost Advantage in Batteries

As already stated during the previous discussion, battery cost represents a determinant of the successful commercialization of market-performing EVs (see section 2.1.4). Tesla is strongly committed to the realization of a cost cutting strategy, and succeeding in this parlous commitment would mean to rightly represent the optimistic forecasts of bulls. While Tesla presumably has a good lead over its competitors in battery cost on a like for like basis, and it has an opportunity to maintain some of its lead, there are several reasons why competitors will continue to narrow the gap with Tesla.

The company declared last year that the cost per battery was around $180/kWh. Elon Musk has also frequently cited the target of reaching $100/kWh – an important milestone, as many in the industry view $100/kWh as the cost parity point between EVs and traditional internal combustion engine vehicles. Elon Musk and team said nearly two years ago that they aimed to reach that level by 2020.

The Gigafactory is the pivot of this project: given its dimensions, the scale effect would be significant. Musk, in 2015, also stressed factors other than the scale effect to reach the $100/kWh target: benefits from larger cells, better supply chain and chemistry improvements. A Barclays' report suggests that Tesla will reach this target, but not in three years (2017-2020). Even though Tesla achieves 10% cost savings each year, analysts indicate 2022 as the most likely date: a more realistic expectation, for a company that hardly meets quarterly targets.

Among its competitors, GM is the closest company to the Tesla's cost breakdown, with a cell cost of only $145/kWh. It has a unique agreement with LG, as it rewarded the South-Korean company with a significant amount of contents for its Chevy Bolt. Moreover, we have to consider the position of Samsung SDI and Panasonic, both of them viewing EV batteries as a priority. Goldman Sachs suggests that, following this trend, the cost advantage for Tesla would be around $2,250 in 2020.[27] But with $15,000 of material and assembly costs, a 10% cost advantage for GM and Ford could close all but $750 of the cost gap.

2.3.4 Significant Lead in Autonomous Driving

The serious commitment of Elon Musk in different fields (SpaceX, Solar City and so forth) makes bulls eager to imagine Tesla leading the self-driving competition. Other companies developing such technology, like GM, lack the network that Musk created. This expectation is part of the big Tesla market cap, albeit other automakers are ahead and stand a better chance of achieving autonomous driving before Tesla.

The first clue that carried people to think that Tesla is ahead of competition is the roll-out of the autopilot system. In reality, it is simply a fusion of several ADAS (Advanced Driver Assistance Control) that could have been commercialized by any other company. The very simple reason for not having done it, is that companies like GM are not willing to bear the risk of ruining their reputation with an imperfect product. Conversely, Tesla did it. The same Musk, in October 2015 stated "we still think of it as a public beta – so we want people to be careful".

At December, 2016, Tesla had accumulated more than 1.3B miles of data from its autopilot equipped fleet (roughly 100,000 vehicles), in "shadow mode". [28] This means that while drivers are happily driving their cars, sensors track data and send them to Tesla. Conversely, according to Reuters, Waymo declared to have collected only 3.5M miles (2.2M autonomous and 1.3M manual

[27] (Pressman 2016)
[28](Hull 2016)

miles) with a fleet of 55 vehicles, albeit it produces 3M miles/day from the simulator in the lab.[29] Even if Tesla seems ahead of the competition on this framework, there is uncertainty comparing Tesla with other companies. GM comes to mind, since it currently has a larger fleet than Tesla, with 12M vehicles on the roads and OnStar capability, making it able to collect up to 6.7B data items/day.

Finally, an edge can be acquired not only through quantity, but quality. Tesla, incredibly, doesn't dispose of a MBLY system (Mobile Eye System) able to recognize objects and their probable movement, but a different system based on the recognition of the "presence" of an object. In 2016 the California Department of Motor Vehicles released a report on miles driven and disengagement of autonomous vehicles in the State. The disengagement rate expresses how often the car creates a danger great enough for the driver to have to take over. Main data are represented in Exhibit 6.

	Miles Driven	# of Disengagements	Disengagements / 1,000 Miles
BMW	638	1	1.6
Bosch	983	1,442	1,466.9
GM Cruise	9,623	262	27.2
Delphi Automotive	3,125	277	88.6
Ford	590	3	5.1
Google Auto/Waymo	635,868	124	0.2
Honda	N/A	N/A	NA
Nissan	4,099	28	6.8
Mercedes-Benz	673	336	499.3
Tesla Motors	550	182	330.9
Volkswagen	N/A	N/A	NA

Exhibit 6 – Source: California Dept. Of Motor Vehicles - 2016

This makes doubts about Tesla stronger: in 2016 it reported only 550 miles of autonomous driving, while Waymo reported 635,865 miles. This would not lead us to any conclusions if we did not analyse the disengagement rate. For every 1,000 miles, Waymo intervened only 0.2 times while Tesla 331 times.[30] For Waymo, this means a good implementation of available data and better use of industrial rigor and scale.

[29] (Sage 2016)
[30](California Dept of Motor Vehicles 2016)

2.3.5 Dominant Market Share

Bulls pushing the price for Tesla high will argue that demand for the new Model 3 will be unlimited. They are probably right: in the first one, two years, there is high probability that Tesla will be able to sell all the models it is able to produce. But what we cannot forget in this framework is the competition pressure. On the other hand, an expansion of the market for EVs will benefit Tesla, as the smartphone industry did with the expansion of the iPhone: the more people see EVs on the roads and become used to them, the more EVs will become desirable. Nevertheless, there are several challenges ahead of Tesla.

Even if Tesla can maintain its lead in battery cost, other automakers like GM and Ford can count on their scale production and efficiencies. We must not forget the different weights of sales: 7M cars sold during 2015 for GM while Tesla sold 50,000. Furthermore, many OEMs have announced EVs expansion plans: Daimler with is EQ brand, BMW with its iSeries and VW which, shocked by the emission scandal, is eager to restore its image as a "green" automaker. Finally, Tesla has a poor presence worldwide, and it is not as easy to transport as an iPhone. The penetration of markets requires time and expenses.

2.3.6 Energy, Mobility and Insurance

In addition to the car production, financial markets expect Tesla to expand in non-automotive areas like the insurance market and the mobility one. Tesla demonstrated that it had been able to overcome the enormous barriers to enter the automotive industry and this gives a sort of confidence to investors when the company deals with new challenges.

Tesla, nowadays, has a cost advantage on the production of batteries and in the installation of solar panels. Yet, this edge can be easily challenged by emerging start-ups as well as old incumbents which have a better network and more knowledge in the renewable energies field. Some threats can come from Samsung SDI and LG Chem on batteries, and from GE, Siemens, ABB and Johnson Control when it comes to battery integrators. This will result in a difficult affirmation of Tesla in the years to come.[31]

Tesla is also focusing in the field of ridesharing. The competition is between Uber and Lyft (the latter financed with 2M from GM) so far, and Tesla is willing to enter only on one condition: using only autonomous driving vehicles. In this way, the company is trying to differentiate from established operators that are splitting the world of ridesharing among themselves. The risk in this case is the same value proposition: for instance, in adverse weather conditions, the company would

[31](Wikipedia 2016)

not be able to run the service, due to the risk associated with a computer taking decisions. This would force customers to opt for a Uber's or a Lyft's human driver.

Usage based insurance, also called mile-based auto insurance, is a type of vehicle insurance whereby the costs are dependent upon the type of vehicle used, measured against time, distance, behaviour and place. This differs from traditional insurance, which attempts to reward safe drivers without analysing their behaviour and their driving attitude. Tesla made no secrets that it is investing in it. The aim is to charge a lower premium on skilled drivers: a strategy that can be implemented through the autonomous driving technology that the Californian company is developing. The plan for the future is to offer a single price for vehicle, maintenance and insurance. However, GM is already in the market as it operates with Verisk to get data from automakers (Verisk signed an agreement with OnStar, a GM's subsidiary in 2015). The mechanism is simple: GM provides raw data to Verisk, which elaborates it and sends it to UBI, the final insurer, that will provide the insurance plan.[32]

[32](Verisk 2015)

3. Financial Analysis

After the discussion had in the previous chapters, we have now a clearer picture of Tesla's history, of its fundamentals and of the achievements that the company accomplished over the years. We tried to extrapolate from hard data and facts what can be the strengths and the weaknesses of the company, and how it intends to manage them in the foreseeable future.

This attempt has the objective to make clear how a company that only sells tens of thousands of cars vis-à-vis the 7M cars of companies like GM and Ford, that has 14 years history, that has never been profitable and that has never paid any dividend, can skyrocket in price and market cap as it happened in 2017.

During the development of our previous discussion we have observed how most of the actual Tesla's capitalization (~62.32B) is probably driven by momentum, as bulls are expecting a bright future for the company. Nowadays, they are primarily interested in stockpiling Tesla shares at a "lower" price compared to what they think it will become in the future, with the hope to close their positions and realise big profits, or at least, to receive dividends from a healthy company.

So, at this point, the question we are more concerned with is: is this huge price a fair price for Tesla?

The sole acknowledgement of market, strategies, human actors and possible positive and negative scenarios is not enough to have a complete and exhaustive comprehension of the issue. To investigate further this phenomenon, we still need to look at the financial side, the one investors are primarily interested in.

Conscious of the differences between Tesla and GM, the latter was chosen for its representativeness of the "giant" surpassed by the rising star, albeit companies like Ford, Volkswagen or Toyota would have played the same role with quite similar results. For the analysis of data I referred to the Tesla Financial Statement downloaded from the official website, the GM Consolidated Financial Statement downloaded from the official website, and to other financial data banks like Bloomberg, Goldman Sachs, Barclays and the analytical support of YCharts.

3.1 Data

3.1.1 A Comparison

As stated in the introduction to Chapter 3, we will proceed to the final step of this thesis undertaking a comparative financial analysis of two representative actors of the recent market capitalization evolution in the US stock market: Tesla and General Motors. The Californian company, as we know, is interesting for its unstoppable share price increase, while the Detroit's company is here investigated for its benchmark role of solid and sound carmaker, with more than one century of experience and worldwide presence.

For the following analysis, we will proceed along this plan: first, we will list companies' key financial results in a table, namely: EBITDA, EBIT, Total Investments, Research and Development Expenses, Total Sales.

Second, we will list the indicators of shares evaluation, namely: Share Price, Shares Outstanding, Market Capitalization, Earnings Per Share, P/E Ratio, and Dividends Paid over the year.

Finally, we will analyse how the yearly financial performances influenced the price of the stocks for each company, and, comparing the two, we will investigate what is the difference between Tesla's and GM's market cap.

3.1.2 Key Financial Indicators

	Tesla			GM		
Financial Results						
Year	2014	2015	2016	2014	2015	2016
EBITDA	48,2M	-334,2M	399,6M	11,89B	16,18B	22,66B
EBIT	-183,8M	-756,8M	-547,5M	4,65B	8,16B	12,26B
Investments	1,07B	1,64B	2,27B	12,28B	13,40B	11,71B
R&D Expenses	464,7M	717,9M	834,4M	7,40B	7,50B	8,10B
Δ R&D Expenses	100,32%	54,49%	16,23%	2,78%	1,35%	8,00%
Sales	3,20B	4,05B	7,0B	155,93B	152,36B	166,38B
Δ Sales	58,87%	26,52%	73,01%	0,32%	-2,29%	9,20%
Shares Valuation						
Year	2015	2016	Current	2015	2016	Current
Share Price	222,23	237,19	380,39	33,56	34,51	34,62
Δ Share Price	46,03%	6,64%	60,37%	-17,96%	2,80%	0,35%
Shares Outstanding	125,7M	130,9M	164,2M	1,58B	1,54B	1,51B
Market Cap	27,86B	31,06B	62,51B	53,92B	53,69B	52,25B
EPS	-2,36	-6,93	-4,68	1,75	6,11	6,12
PE Ratio	--	--	--	21,12	5,487	6,013
Dividends Paid	--	--	--	3,17B	2,24B	2,37B

3.2 Benchmark Comparison

It is worth to stress that in this first part we are undertaking a benchmark comparison between Tesla and General Motors. This means that we are not comparing two companies in the same stage of development or having the same maturity or having the same dimensions. Furthermore they have different customers, different targets – even different products, if we want to distinguish between internal combustion engine and EVs.

A benchmark comparison is between two companies in the same sector that in the long run should show some comparable parameters, due to similar capital and market structures.

3.2.1 EBITDA

EBITDA stands for Earnings Before Interest, Taxes, Depreciation and Amortization. It is one indicator of a company's financial performance and is used to understand the earning potential of a business, although it has its drawbacks.

It is calculated as: Net Profits + Interests + Taxes + Depreciation + Amortization. A useful characteristic of the EBITDA is that it facilitates the comparison of the profitability across companies and industries, as it eliminates the effects of various financing strategies taken by each company from the income statement. Differently from the EBIT, it doesn't consider depreciation and amortization expenses.

Both EBITDA and EBIT are not official recognized by the GAAP. They are generally calculated by investors to evaluate the profitability of a company.

Tesla has shown a very volatile EBITDA in the last three years. In particular, we can observe deep changes both between 2014 and 2015 (-382,4M) and between 2015 and 2016 (+673,8M). This suggests us that we are dealing with a young company, still expanding, that may suffer production cycles: Tesla's drop in EBITDA in 2015 was principally due to expenses incurred in developing the new Model 3 and to the low sales registered. In 2015, in fact, revenues attested only at 4.04B from 3.20B in 2014 (+26% increase, not so good if we think about a company with a such low production) while they stepped up in 2016, at 7.00B (+73.27% increase), mostly driven by good deliveries performance.

We cannot describe the same volatility to GM, that reported a constant growing pace during the last three years: 11.89B in 2014, 16.18B in 2015 and 22.66B in 2016, with an average growth/year of ~33%. This can be considered as a sign of maturity reached through the dense net of dealers

worldwide, the bigger sales, the lower marginal costs, the wider car range, the professional vehicles production and so on.

Looking at these figures, it is clear that Tesla represents a riskier investment compared to GM. Also the volume of the two EBITDAs is rather different, with Tesla reporting a value in 2016 that is the 17% of the corresponding GM figure. This gap reflects in different capabilities of repaying debts in case of financial distress: GM, with its sounder base, will payback lenders more easily, or, at least, will find easier access to additional borrowing to fuel operations. Since investors are generally risk adverse, they are somehow compensating the higher Tesla exposure with greater expected returns fostered by a supposedly disruptive innovation.

3.2.2 EBIT

EBIT stands for Earnings Before Interest and Taxes. It is one indicator of a company's financial performance and is calculated as: Net Profits + Interests + Taxes. As previously stated, it does take into account depreciation and amortization expenses while ignores interests and taxes payments. It can also be calculated as Revenues – Operating Expenses. Market investors sometimes define it "Operating Profit" because it focuses on the company's ability to generate revenues from operations.

Tesla's EBIT is rather different from EBITDA as it has been always negative. In 2014 it was -183.8M, -756.8M in 2015 and -547.5M in 2016. We should focus on depreciation and amortization expenses in relation to revenues and expenses. Due to the dramatic increase in assets operated by Tesla between 2014 and 2016, depreciation and amortization expenses increased heavily. It moved from 231.93M to 947.10M, severely impacting the EBIT. The worst year was 2015, when revenues was low and operating expenses very high.

GM followed the same rate of growth demonstrated in the EBITDA calculations, with some interesting +75,50% in 2015 and +50,24% in 2016. Key contributors to the calculation of the EBIT maintained constant increasing proportions with expenses decreased (from 12.28B in 2014 to 11.71B in 2016) and revenues increased (from 155.67B in 2014 to 166.38B in 2016).

Even though numbers play in favour of GM, in the last three years Tesla's share price increased from $222.23 to $380.39 (+71,17%) while GM's from $33.56 to $34.62 (a 3.16% increase). And that is not all. Tesla even increased shares outstanding, so the price increase should also be adjusted to include the contrasting dilution force. Even if Tesla reported worse results in terms of EBIT and

EBITDA, bulls are rewarding its investment pace and its rapid rise, that is not easily recognizable looking at these indicators.

3.2.3 Investments and Expenses

One aspect that analysts are considering in evaluating Tesla is the investment pace, that has remained constant and positive over the past three years. Notwithstanding the persistent negative net income, Elon Musk has always been able to secure a continuous stream of investments to his company through several gimmicks. In the first years of production (2009 – 2012) the main sources of financing came from Musk's personal patrimony. After the sale of PayPal he had enough money to run the business and to get the creditworthiness to borrow money for an unknown venture, as Tesla used to be.

From the first launch of Model S, the world started putting eyes on Tesla. To sustain investments, the company borrowed $200.00M in 2013, $2.29B in 2014 to build the Gigafactory, $115.51M in 2015 and $948.28M in 2016. In addition, it issued common stocks for $415.00M in 2013, $0 in 2014, $750.00M in 2015 for the Model X and $1.72B in 2016 for the Model 3. Totally, it earned 4.50B from shares issuance since 2010.[33] A substantial amount of money that, analysts claim, has been burned with impressing speed.[34] And this can be a threat for Tesla's financial stability if it will not be able to convert investments in positive income.

On the other hand, this seemingly unlimited confidence from lenders is a life-saving matter for Tesla. Most investors pushed Tesla's shares price so high relying on the big share of capital invested. The amount of investments in the last three years has been consistent: $1.07B in 2014, $1.64B in 2015 and $2.27B in 2016. At the same time, correlated with its bigger entity, GM invested a lot, too: $12,28B in 2014, $13.40B in 2015 and $11.71B in 2016. It is worth reiterating how both companies are concentrated on the EV sector, and this requires high expenditures, albeit the two entities decided to invest in slightly different ways. GM's R&D expenditure is huge: with an annual expense of $8.10B in 2016, it is ranked 11th worldwide among large companies.[35] Even the share of R&D on total investment is high: 8.1B / 11.71B = 69.17% in 2016.

Given its younger nature, and despite its technology-oriented characteristics, Tesla main expenditures have been less concentrated on R&D in the last three years. In 2016, for instance, it spent $834.4M on R&D, namely 36.76% of total investments: still a very good ratio, but not as

[33] (Labert 2016)
[34] (Hull and Welch, 2017)
[35] (Ausick 2014)

high as GM's. The other money has been used to acquire plants, raw material, to pay wages and mostly to produce the Model 3. In short, to increase total assets.

One could be tempted to say that GM is more innovative than Tesla, given these different figures, yet it may not be the case. All things considered, Tesla is half a carmaker, half a tech company. Most of the employees and managers working in it come from the Silicon Valley or have been previously employed in the most technologically advanced companies in the world. Thus, it can simply be that Tesla has a competitive advantage in developing innovations and in exploiting them with respect to other carmakers. In other words, Tesla might be able to extract more innovation from every dollar invested in the company. A good news for bulls.

3.2.4 Sales

2016 has been a very good year for Tesla: cars deliveries totaled 76,230. Looking at Exhibit 7 we can see how much EVs it sold in the last four years.

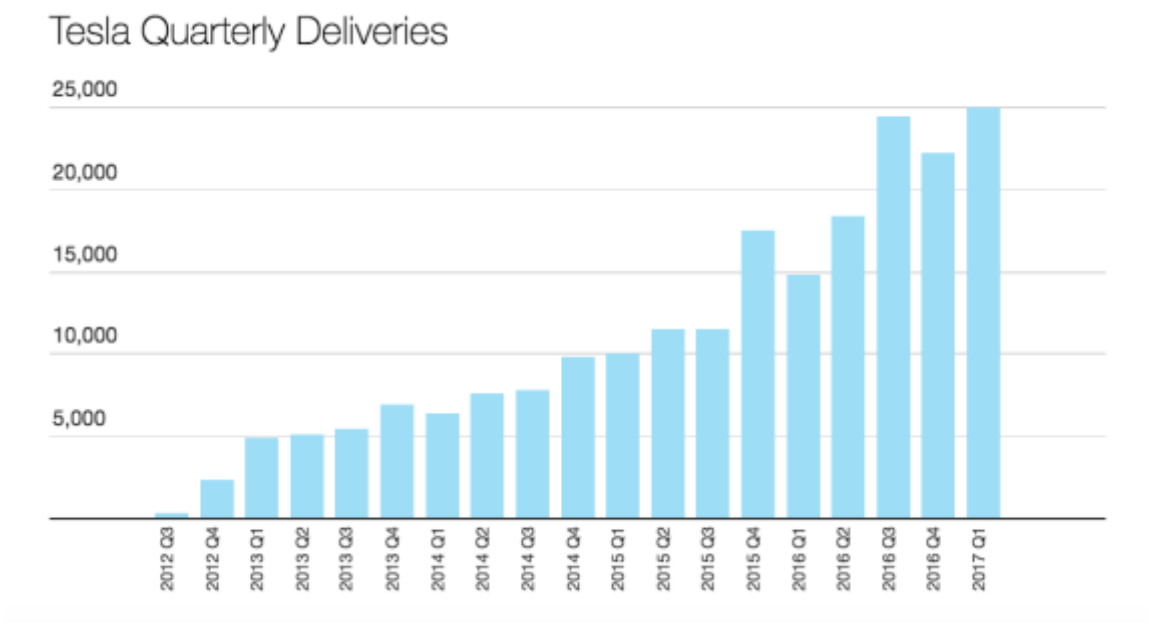

Exhibit 7 - Source: EV Obsession - 2017

Sales represent the driver of Tesla's success. After all, the company released its first model in 2011, and since that date it has already sold roughly 200,000 cars, all ranging from $90.000 to $250,000 in price. Of course, these numbers are not even comparable with GM's delivers, that last year totalled 9.7M of cars worldwide, but are encouraging.[36] According to Musk's beliefs, Tesla

[36] (Statista 2017)

expects to sell ~400,000 Model 3, a claim that made shares price to skyrocket even more in February.

Analysing the comparative table at section 3.1.2, we can see how the volume of sales we described above was converted in revenues in the last three years for Tesla. In 2014 sales amounted to $3.20B, then $4.05B in 2015 and $2.27B in 2016. If we look at the raw "Δ Sales" we note a positive and increasing pace in 2014, 2015 and 2016, respectively +58%, +26% and +73%; these numbers, quite relevant, are the base for the investors' expectations. This can probably what is making Tesla's market cap so big.

According to a recent J.P. Morgan's report, sales are expected to rise but Tesla is far from reaching consistent margin over each car sold. [37] The company, it claims, will see the annual growth rate of sales to decrease, mostly due to entrant competition and loss of the competitive cost advantage. Therefore, analysts think that a company with such a high market cap might experience a rapid drop in value as soon as its enormous expectation are not met.

3.2.5 Earnings Per Share

Earnings per share (EPS) are a financial gauge representing the portion of a company's profit allocated to each outstanding share of common stock. Earnings per share serve as an indicator of a company's profitability. They are calculated as follows:

$$EPS = \frac{Net\ Income - Dividends\ on\ Preferred\ Stocks}{Average\ Outstanding\ Shares}$$

The denominator states *average* because shares outstanding can change during a financial year, and reporting the average can give better results. Very often market analysis or financial reports use "Diluted EPS": this formula includes also the shares convertible, since they will become outstanding in the future.

EPS is generally considered as the most important source for determining the price of a given stock. Investors look good at it when increases, as the net income not distributed (retained earnings) can be used by the company to invest more and to strengthen its weaknesses. It is also used to calculate the Price / Earnings ratio.

[37] (Brinkman 2017)

EPS for the two companies have been quite different recently. As we can see from the comparative table in section 3.1.2, Tesla's EPS were -2.36 in 2014, -6.93 in 2015 and -4.68 in 2016, while they were +1.75 in 2014, +6.11 in 2015 and +6.12 in 2016 for GM.

Looking at the EPS formula, we can conclude that in order to obtain a positive number we should have a positive net income. In this case, since Tesla's net income is negative, EPS is negative, too. What is worst, Tesla's EPS are decreasing over time: this negative trend is fostered by two concurrent forces: the negative net income and the increasing outstanding shares. Both indicate two specific needs of Tesla. Net income is "voluntarily" negative: as we also explained before, to sustain this level of research, marketing, investments and PP&E, Tesla planned in advance to bear a negative income for a few years. Company's goal is growth, not income, for the moment. On the other hand, the increase of shares outstanding is a classic way of financing. Through new stock issue Tesla is paying the development and realization of its latest models. A concrete example is the recent new share issuance of $250M of common stocks and $750M of convertible notes, used to finance the last steps of the Model 3's launch.[38]

3.2.6 P/E Ratio and Dividends

The Price / Earnings Ratio (P/E ratio) is the ratio for valuing a company that measures its current share price relative to its per-share earnings. The P/E Ratio indicates the dollar amount an investor should invest in a company in order to receive one dollar of that company's earnings. This is why the P/E is sometimes referred to as *the multiple,* because it shows how much investors are willing to pay per dollar of earnings.

It is calculated as follows:

$$P/E\ Ratio = \frac{Current\ Share\ Price}{EPS}$$

The P/E Ratio is commonly intended as a positive measure of profitability. That is why it is worth nothing to report it, if negative. Tesla doesn't have a P/E Ratio because it has negative earnings and is not profitable. GM instead, has a positive P/E Ratio, that was rather high in 2015 and then decreased in 2016. In the numerator we have the current share price, and as we can observe from the table in section 3.1.2 it didn't change much, lately. What really changed is the

[38] (Ayre 2017)

EPS that increased in 2015 and 2016, thus causing a sensible reduction in the value of the P/E Ratio.

Tesla has neither a positive net income, nor dividends paid. This is not very strange for a young tech company. Some companies, as Warren Buffet stated, just prefer reinvesting earnings to increase the company's value. His idea is that investors can find return in the value increase of the shares given by retained earnings. [39]

At this stage, it would be completely useless for a company hungry for fresh capital to waste money in this way. On the other hand, a mature company like GM do distribute dividends. It is a natural process: as the company becomes big and mature and his shareholding strong and compact, there is high probability that the company will start paying dividends. Everyone should remember the Microsoft's first impressive dividend payment after years of pressure. However, large companies like GM and Microsoft have slowed down in their growth and have enough resources to pay dividends without harming corporates' interests.

3.2.7 Share Price and Price Target

Tesla, regarding share price, is experiencing the same vertiginous path that saw brilliant tech companies in the first years of 2000s to skyrocket in their valuation. The interesting thing here is that investors do know the risks associated with inflating so much the price of a company. They know that probably the company is not worth what they are paying. Despite this, they see Tesla as the new Apple, the new frontier to the future. And even if "dotcom" companies went down in their valuation (at least, in the first years after the bubble), in the financial market there is always a company, like Apple, that can't stop growing and that encourages investors to find the new rising star.

Tesla's shares price increased constantly; it was $222.23 in 2015, $237.19 in 2016 and is $380.39 now. From 2016 to 2017 it registered a +60,37%. At the same time, GM's share value was just $33.56 in 2015, $34.51 in 2016 and $34.62 now. What we can extrapolate from this data is that what investors are really interested in is not the actual income of the company. In automotive sector, they are looking for the companies with highest possible future growth. So we can depict the different nature of the two companies, Tesla and GM: on one hand, the brilliant disruptive company, and on the other, the old and not growing one.

[39] (Caplinger 2015)

Total company										
Scenario	Units	Revenue ($mn)	Op income ($mn)	Pre tax ($mn)	Post tax ($mn)	EPS	Multiple	Value per share	Present value per share	Probability
Failure								$0	$0	1%
Models S/X (Era 1)	85,000	8,075	1,009	999	800	$5.47	17.5x	$96	$91	19%
Gen III (Era 2)	435,000	23,825	2,506	2,496	1,997	$13.66	14.1x	$193	$137	70%
Mass (Era 3)	1,085,000	43,325	3,871	3,861	3,089	$21.13	13.0x	$275	$161	11%
Tesla Energy		3,704	370	370	296	$2.03	23.0x	$47	$35	
Assumes 20 GWh @ $185/kWh; 10% op. margin										
									$165	

Source: Barclays Research estimates

Exhibit 8 - Source: Barclays - 2017

Looking at Exhibit X, we can see how Barclays, in a recent report, set the target price for Tesla: calculating the probabilities of success of the Model 3, they tried to address a fair value to the share price, in order to inform investors on the real value of the company. The suggested price is $165, while the market one, today, is at $380. The stock price is considered as "underweight", that translated means "overvalued". They do believe that "the stocks are not accounting for the risk and challenges inherent in Tesla's ambition to become a mass-market OEM". [40]

This is just one valuation, one point of view. Most of the analysts that are now suggesting to "SELL", when I started this thesis suggested to "BUY". Uncertainty is the right word, as it can perfectly happen that Model 3 will be a success, and everyone owning Tesla stocks today will benefit from it. But as a matter of fact, numbers are indicating that the company will need more years to become a true mass-market OEM, and some institutional investors already started shorting it.

[40] (B. A. Johnson 2017)

3.3 Amazon's Evolution

3.3.1 Key Financial Indicators

	Amazon (Early years)			Amazon (Now)		
Financial Results						
Year	2001	2002	2003	2014	2015	2016
EBITDA	-231,22M	74,57M	244,53M	4,85B	8,308B	12,49B
EBIT	-412,26M	-7,708M	168,97M	99,00M	2,027B	4,376B
Investments	1.211B	928,49M	986,57M	26,06B	33,12B	43,54B
R&D Expenses	241,16M	215,62M	207,81M	9,275B	12,54B	16,08B
Δ R&D Expenses	-10,46%	-10,59%	-3,62%	39,35%	35,20%	28,23%
Sales	3,122B	3.933B	5.264B	88,99B	107,01B	135,99B
Δ Sales	13,03%	25,98%	33,84%	19,53%	20,25%	27,08%
Shares Valuation						
Year	2001	2002	2003	2015	2016	Current
Share Price	15,56	10,81	21,88	306,29	633,79	964,17
Δ Share Price	-81,11%	-30,53%	+102,40%	-23,27%	+106,92%	+52,13%
Shares Outstanding	358,56M	380,47	388,24M	463,00	471,00M	478,00M
Market Cap	6,01B	4,03B	7,33B	143,67B	325,31B	460,85B
EPS	-1,560	-0,390	0,090	-0,520	1,280	5,010
Dividends Paid	--	--	--	--	--	--
PE Ratio	--	--	--	--	--	--

3.3.2 A Successful Business

As we have previously said, part of investors is expecting a successful evolution for Tesla. They recognize in Tesla the next market leader in automotive sector, exactly the role that the Apple plays in the world of smartphones or Amazon in the world of e-commerce. Amazon itself can be a good example of the kind of evolution investors are expecting from Tesla, and a brief analysis of its key data can let us better understand why, despite negative returns, Tesla is acquiring more and more value.

Amazon is an American e-commerce and cloud-computing company founded on July 5, 1994, by Jeff Bezos and is based in Seattle, Washington. It is the largest Internet-based retailer in the world by total sales and market capitalization. Starting with the online sale of books and multimedia items, it opened its online store to any kind of good, becoming nowadays the most valuable retailer in the United States by market capitalization, surpassing Walmart. It owns several online stores worldwide and presently employs something like 300,000 people.

3.3.3 Continuous Evolution

In 2001 Amazon had just survived the dotcom bubble, after having seen its shares brutally depreciated. All the tech market suffered a severe reshaping. EBITDA reshaped too, presenting numbers similar to Tesla's today: -$231,22M. In the subsequent years, it improved its EBITDA as well as its EBIT. The latter moved close to the zero in 2002 and then became positive in 2003, after a complete recover from the bubble burst. From then on, Amazon's growth has been quite positive and stable, with the company reaching a leading position in the market and presenting this EBIT today: $4.85B, $8.30B and $12.40, respectively, in 2014, 2015 and 2016.

The pace of investments as well as R&D Expenses has been constant over time, guaranteeing the right flow of resources to every business unit. Sales steadily increased over time thanks to marketing, exclusive agreements, fast shipping and an infinite range of product. This made the overall value to increase by several factors up to the actual value of $964.17 vis-à-vis the $21.88 of 2003. The market cap also became way bigger than most of the Fortune 500 listed companies, ranking 4th in US just behind Apple, Alphabet and Microsoft.

Amazon's argument against dividends is similar to those of its peers. CEO Jeff Bezos hasn't been coy about using cash for reinvesting in its business, but in addition, Amazon hasn't been all that focused on generating profits in the first place. Indeed, by keeping margins thin, Amazon puts

itself in the best competitive position possible, discouraging would-be entrants to the industry and building up long-term market share.

For Amazon to pay a dividend, it would have to shift its focus toward near-term profits. That would be such a strategic transformation that it would have huge repercussions on Amazon's business for years to come.

This brief summary has no other purpose than to describe how a company presenting low performances for some years can attract investors' attention. Tesla is far from reaching Amazon's levels, and with this analysis we are absolutely not saying that it will succeed, maintaining a neutral position. But it can be useful to understand why the market is heavily betting on Tesla and where investors expect it to be in the next years.

Conclusion

In conclusion, this thesis tries to give a complete overview of the recent market cap increase of Tesla. It would not have been possible if I did not contextualize the company in its reality, mentioning its stronger points as well as its Achille's hells.

Tesla nowadays is a sound company, far from risk of bankruptcy, that is trying to revolutionize the world of cars selling Electric Vehicles. But above all, it is trying to take advantage of an untapped slice of the market to make enormous profits, and behind that it has Elon Musk, a visionary guy with a keen interest for the humanity and money. He is probably succeeding in its commitment, since what he has realized so far would be very hard to replicate. Despite this, the most difficult part has yet to come, and more and more people are wondering if he will overcome the new obstacles or if he will stumble upon some unexpected difficulty.

From our analysis emerged that the actual price of Tesla's stocks is probably given by high market expectations. Tesla is a well-managed company, but what is differentiating it from other well-managed companies producing the same products is its ability in marketing and Elon Musk's business acumen: both these things are concurring at bringing Tesla evaluation higher and higher, with some risks sometimes.

The interesting point is that as long as Tesla is able to maintain market cap and expectations so high, it will be able to obtain the credit it needs, the trust it seeks and the revenues it plans.

It will be intriguing too see the evolution of the company in the years to come.

Personally, I really enjoyed being involved in this analysis. I learnt how to deal with numbers, balance sheets, income statements, ratios, financial reports as well as technical issues regarding the automotive sector, my passion.

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