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OPTIMAL SOURCES OF FINANCE FOR A CORPORATE SECTOR

Diploma Thesis

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Abstract

The thesis aims to identify the optimal choices of capital structure for corporate firms, which are in the stage of growth. Firstly, there are mentioned the factors influencing on the companies' investing, financing and dividend decisions. For achieving the goal of the research, the main assumptions and models of different capital structure theories were studied. To conduct the analysis, Tesla Inc. has been chosen as a former start-up company, currently being in its growth stage. The study includes financial analysis of Tesla for 2009-2016 years. In this paper, the capital structure of companies with similar risk have been applied to Tesla. In the next step, for a more thorough analysis, the Modigliani-Miller theory's Proposition II has been applied to Tesla and the results of firm value and equity value have been compared with the results of other capital structures.

Keywords

Capital structure, financing decisions, capital structure theories, Modigliani-Miller theory, trade-off theory, pecking order theory, equity financing, debt financing

Declaration

I hereby declare that I worked out the Diploma thesis "Optimal sources of finance for a corporate sector" myself, under the supervision of Ing Dagmar Linnertová, Ph.D., and that I stated in it all the literary resources and other specialist sources used according to legislation, internal regulations of Masaryk University and internal management acts of Masaryk University and the Faculty of Economics and Administration.

Brno, 11 May 2017 ………………………….

Author's signature

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Firstly, I would like to express my sincere gratitude to my thesis supervisor Ing. Dagmar Linnertová, Ph.D., for her continuous support, patience, motivation and immense knowledge. Her guidance has been a tremendous help to completing the research.

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Introduction

The growth of a company requires continuous investments, which in the end are expected to increase profits of the company. And for financing these investments the company either uses the funds of the owners or borrows it (Clayman M., 2012).

Financial managers in corporate companies face the problem of choosing ways to finance their investments and firm growth. They need to choose a capital structure which will later prove its efficiency without having any adverse influence on the company's profitability.

The managers can have different options for financing the company, but it is important to choose the way, which will be optimal for the company in the long run, as it can have a direct impact on firm value, thus it is essential to minimize the weighted average cost of capital by selecting an optimal capital structure (Nielsen K., 2010).

At first, they need to decide if they will finance their investments from internal or external sources. Internal financing means that cash flows are financed by the money generated by existing assets of a firm. While in external financing the resources are raised outside the firm (Damodaran A., 2001). When choosing external financing the managers need to make a decision which part of their resources will be financed by equity financing and which part by debt financing and what is more optimal for them.

For private companies, equity financing means receiving equity capital either from the current stockholders (internal financing) or from private investors, usually from venture capitalists.

Debt financing is basically nothing different than borrowing money, which obligates the borrower to make cash flow payments to the lender. Money can be borrowed in the form of bank debts, different types of bonds, leasing, etc.

The difference between debt financing and equity financing is mostly about the rights that the holders are entitled to. In case of debt financing the lender is entitled to receive the principal and the interest payments, while in case of equity financing the investor is entitled to the resources left after paying all expenses and costs (Damodaran A., 2001).

Private companies can also be financed by so called hybrid securities, for example convertible bonds, which have some characteristics of both equity and debt. Holders of convertible bonds can convert them into a pre-agreed number of shares of the company (Damodaran A., 2001).

There are many factors that can influence on the company's decision about choosing ways of financing, namely asset structure, non-debt tax shields, growth, industry classification, size, earnings volatility, and profitability (Titman S., Wessels R., 1988).

The aim of this research is to identify and compare the optimal sources of finance for start-ups and business expansions. In order to achieve the goal of the thesis the financial analysis of Tesla Inc. will be conducted.

In the first part of the thesis the main decisions that financial managers have to make will be reviewed, as well as the factors which influence on those decisions. As a part of theoretical framework, the theories of capital structure with their main assumptions will be outlined and discussed. Furthermore, will be presented the financial instruments that the companies can choose to use for financing and the features typical to them. In the next part of the research will be discussed the financing decisions for start-up firms. Afterwards, a brief overview of Tesla will be given, after which will be done a financial analysis of the firm. For assessment of the financial results, they will be compared to the industry average data, as well as its main competitors' data.

1. Theoretical framework of financial sources for corporate sector

1.1. The Principles of Corporate Financing

Damodaran A. puts forward the view that there are three principles in the basis of corporate finance and each company that wants to maximize the value of the firm should follow them. Those principles are Investment principle, financing principle and dividend principle. Here is how they are explained:

- "*The Investment Principle: Invest in assets and projects that yield a return greater than the minimum acceptable hurdle rate. The hurdle rate should be higher for riskier projects and should reflect the financing mix used—owners' funds (equity) or borrowed money (debt). Returns on projects should be measured based on cash flows generated and the timing of these cash flows; they should also consider both positive and negative side effects of these projects.*
- *The Financing Principle: Choose a financing mix (debt and equity) that maximizes the value of the investments made and match the financing to the nature of the assets being financed.*
- *The Dividend Principle: If there are not enough investments that earn the hurdle rate, return the cash to the owners of the business. In the case of a publicly traded firm, the form of the return—dividends or stock buybacks—will depend on what stockholders prefer*" (Damodaran, 2014, p. 3).

1.1.1. The Investment Principle

Making investment decision can also be explained as choosing a right project to invest in, which will later return more than the minimum required rate. A rational investment decision will eventually lead to an increasing value of the firm. (Damodaran, 2001)

When facing the problem of choosing the right project to invest in, the managers usually analyze the project thoroughly to evaluate possible returns and expenses. Usually the expected profit is the most important factor in the assessment of the project, but besides that the cash flow should also be taken into consideration.

The companies' objective is to create as much wealth as possible for the owners. It should take all the projects up to the point, where the return on investments equals to the rate of interest in the respective financial market. Following this objective assumes to make investments in projects, which have positive Net Present Value, when discounted at a required rate of return for each investment (Pike R., Neale B., 2009).

Damodaran has summarized all these factors by categorizing rules for investment decision making:

Accounting Income-Based Decision Rules

This rule assumes taking into consideration the accounting measures of income while evaluating the projects. There are some variables that can be calculated based on expected operating income or net income, for example Return on Capital, Return on Equity, which should be compared to the cost of capital and cost of equity accordingly. And taking into consideration their difference, the investment decision upon the project should be taken.

(1) $Return\ on\ Capital\ (after - tax) = \frac{Earnings\ before\ interest\ and\ taxes\ (1 - tax\ rate)}{Average\ book\ value\ of\ total\ investment\ in\ project}$

(2) $Return\ on\ Equity = \frac{Net\ Income}{Average\ book\ value\ of\ equity\ investment\ in\ Project}$

However, having a positive accounting return does not always mean increasing the firm's value, which is mostly the main reason of making investments. As the accounting returns ignore the time value of money, not all the projects that ensure a positive accounting return, will increase the firm value. At the same time other projects, which are rejected because the return on capital is smaller than the cost of capital, could have increased the firm value (Damodaran, A., 2001).

Cash Flow-Based Decision Rules

Here Damodaran (2001) differentiates 2 different methods.

In the first one the accounting returns are calculated taking into account the cash earnings.

(3) $Cash\ Operating\ Income = EBIT(1-t) + Depreciation\ and\ Other\ Non-Cash\ Charges$

(4) $Cash\ ROC = \frac{Cash\ Operating\ Income}{Average\ Book\ Value\ of\ Capital}$

And if this index is greater than the cost of capital, only then the project should be accepted.

The same approach can be used to calculate the return on equity.

(5) $Cash\ Equity\ Income = Net\ Income + Depreciation\ and\ Other\ Non-Cash\ Charges$

(6) $Cash\ ROE = \frac{Cash\ Equity\ Income}{Average\ Book\ Value\ of\ Equity}$

This is a developed version of accounting return-based assessments, but still it does not give a complete image of the expected project returns, because it does not consider the capital maintenance expenditures and working capital investments, which can lead to showing higher returns on some investments.

Another approach of evaluating the investment project through cash flows is the calculation of the payback. Payback is explained as a period of time during which the cash flows from the project will cover the initial investment.

Lefley (1996, p. 208) states in his "The payback method of investment appraisal: A review and synthesis" article "*The payback method indicates how quickly the cost of an investment is recovered but does not measure its profitability*". As author Lefley points out in his article, according to Dean

J. (1954) payback is not an adequate and sufficient measure of an investment project's profitability, as it considers cash as a main concept of the measure. The strong academic disapproval of payback method comes from the fact that it considers only the returns up to the point, where the initial investments are covered. Payback method is recommended to be used to measure the liquidity of the project, but not the profitability. Two notable drawbacks of payback method were mentioned by Lefley (1996):

1. Payback does not consider the returns generated after the payback period
2. Payback ignores the timing of the returns

However, some authors support the usage of payback method in investment appraisal. Pike (1985) argued that the errors arising from ignoring the post-payback returns are to some extent compensated by the errors coming from not counting the time value of returns. Hoskins and Mumey (1979) claimed that the pre-payback period returns are a decent prediction of the post-payback period returns. However, in the current risky market positive returns within some period do not necessarily mean that the returns will continue being positive.

The second disadvantage of the payback method mentioned here is that it neglects the time value, which can be covered by using the discounted payback methods, which was proposed by Rappaport (1965). According to Lefley (1996, p. 210), "*Although the discounted payback period (DPP) method, as proposed by Rappaport, still ignores the returns after the payback period, and is therefore not a substitute for profitability measurement, it is an improved measure of liquidity and project time risk over the conventional PB method*".

Despite all these drawbacks, in the literature it has been mentioned about the simple and understandable characteristics of drawback, however, managers should not use this as a one and only criteria when choosing an investment project (Lefley, 1996).

Discounted Cash Flow Methods

Discounted cash flow methods give a better image of the project while making investment decisions. Their main advantage is that they consider the time value of money. The two most popular discounted cash flow methods are net present value and the internal rate of return (Damodaran, 2001).

Pike and Neale (2009) have explained the concept of net present value in the following way, "*To create wealth, the present value of all future cash inflows must exceed the present value of all anticipated cash outflows*".

The formula of Net present value calculation is the following

$$(7)\ NPV = \sum_{t=1}^{t=N} \frac{CF_t}{(1+r)^t} - Initial\ Investment,$$

where

CF_t = Cash flow in period t

r = discount rate

N = life of the project

And when the NPV has a positive value it means that the returns from the project are greater than the hurdle rate (Damodaran, 2014).

NPV is also characterized by some advantages that it has in the process of project evaluation.

- Net present values are additive: this means that it can give a cumulative NPV for all the projects that the firm has already invested and is planning to in the future.
- The calculation allows to consider the changes in the discount rates in some periods of time (Damodaran, 2001)

The next discounted cash flow method of investment project appraisal is the Internal rate of return, which is a calculation of a discount rate for which the net present value of the project equals to zero. And to detect if the project is worth to invest in or no, the IRR is compared with the discount rate. If the internal rate of return is greater than the discount rate, then the project can be acceptable for the investor.

As mentioned above there are a few methods, which can be helpful for the financial manager in making investment decisions to define where to make the investment. However, after finding the suitable asset or project to invest in, the companies need to choose the sources from where they will finance their further investments.

1.1.2. The Financing Principle

Once a firm has a clear investment decision, it needs to find optimal sources to fund the investments with the ability to maintain its profitability. There are several features of companies, sectors and financial markets that can have an influence on a firm's financing decision.

Rajan and Zingales (1995) put forward four major factors:

- The tangibility of assets: they support the view that if a greater the proportion of company's assets are tangible, meaning that that if the ratio of fixed assets among total assets is big, then the assets should serve as collaterals for loans, resulting in a higher leverage.
- The market-to-book ratio: the study conducted by Rajan and Zingales (1995) finds that companies with higher market-to-book ratio are more likely to issue stock rather than increase financial leverage. One of the explanations for this is that companies are inclined to issue stock, when the market price of their stocks is higher than the book value.
- The firm size: size of the firm is quite a controversial factor in financing decisions. Per one view the big companies are more diversified, which makes it less likely to go bankrupt. On the contrary, it is believed that there is more information in the capital markets about large companies, which makes their equity more competitive for investors, thus showing more inclination to issuing equity when making financing decisions.
- Profitability: there are again controversial arguments by different authors about the impact of profitability on the leverage level. As Rajan and Zingales illustrate the view of Myers and Majluf (1984), they believe the profitable firms would rather use their internal sources than to borrow money, while Jensen (1986) claims that from the views of the agency costs there is a positive relation between the profitability and leverage. The research conducted by the authors concluded that in case of fixed dividends and investments, the changes in profitability, however, cause inverse changes in the leverage of the firm.

There are some more determinants listed by other authors, which are believed to have a correlation with the financing decisions. Frank and Goyal (2009) added two more determinants to the list above and consider these as core factors affecting the market leverage:

- Industry median leverage: for different industries, there are different capital structures, which are more common for the firms in that particular market. Correspondingly, it is clear that the companies tend to stick to the median leverage ratio of the industry. It is empirically proven by the research conducted by Hovakimian et al. (2001).
- Expected inflation: even though some authors find the impact of expected inflation on the leverage to be minor, still it cannot be ignored. Taggart (1985) has indicated that in the period of high inflation the effect of tax advantage on debt is intensified.

Besides those factors, Frank and Goyal have put forward the corporate tax rates as a key factor. As described by Graham (2000) the tax benefit of debt is the money that is reduced from the taxable income as interest payments. And when the corporate tax rates are higher, it makes the effect of tax benefit on debt more notable, thus increasing the company’s leverage (Frank and Goyal, 2009)

1.1.3. The Dividend Principle

Firms have to make a decision on how much money and in which periods of time they should distribute the net profit among the shareholders and which part of it should be reinvested in the future investment projects of the company. There are multiple controversial views about the factors which are needed to be considered by managers upon making the dividend decision. As Gill et al. (2010) introduce the view of Modigliani and Miller in their paper, the dividend policy of the company does not alter the value of the firm, if the capital market can be considered as perfect.

As Watson D. and Head A. represent Modigliani and Miller’s argument, their main point was that “*as long as a company followed its optimal investment policy, its value was completely unaffected by its dividend policy*” (Watson D. and Head A., 2007, p. 287).

Yet there was a number of researchers, who believed that a well-made dividend decision can be an incentive for the change of a firm's share price. Watson D. and Head A. as well put forward the views of Lintner (1956) and Gordon (1959) that the shareholders would choose to receive dividends rather than having capital gain, as there can be no certain estimation of its future value.

A variety of factors were recognised in the literature to be influential in choosing a dividend policy for a firm, among which are:

- Corporate profitability: Linker had conducted a survey within 28 diversified companies to find out how the decisions about dividend payments to shareholders are made, and the results provided confirmatory evidence that the company's earnings are the dominant factor influencing on this decision (Linker, 1956). Same was proven by Baker et al.'s research (1985), with only one addition that the patterns of previous year's dividend payments and the estimated amount of profit for the following year have their impact as well.
- Cash flow: the companies should not risk their liquidity for paying the dividends, thus the cash flows should be taken into account while deciding when and in which amount to pay the dividends.
- Sales growth: the company's plans about future growth and expansion can significantly affect the dividend payout decision. As mentioned by Higgins (1972) for investors the dividends should be of inferior importance to increasing the firm value, hence in making dividend decisions investors should take into account the future need for financial resources for their projected growth.
- Market-to-book value: Gill et al. found in their research (2010) that the for some industries there is a positive relationship between the market-to-book value and the dividend payout ratio, meaning that the more value have the shares gained after the shareholders' first investment, the higher is the dividend payout rate.
- Debt to equity ratio: views of different authors on the correlation between the debt to equity and the firm's dividend have been presented by Gill et al. (2010). The results of surveys express that the companies, which have higher debt to equity ratio, are choosing a more restrained dividend policy. In other words, companies are mostly inclined to pay their debts first then to distribute the profits to the shareholders.

Even though these factors have been proven to be influential for the firm's dividend policy, still the strength of their impact can vary in different industries.

The link between the investment, financing, dividend decisions and firm value can be made by recognizing that the value of a firm is the present value of its expected cash flows, discounted back at a rate that reflects both the riskiness of the projects of the firm and the financing mix used to finance them. Investors form expectations about future cash flows based on observed current cash flows and expected future growth, which in turn depend on the quality of the firm's projects (its investment decisions) and the amount reinvested back into the business (its dividend decisions). The financing decisions affect the value of a firm through both the discount rate and potentially through the expected cash flows (Damodaran, 2014).

1.2. Capital structure theories

While searching for sources to finance their investments, financial managers strive to find the optimal capital structure, which would maximize the firm value.

The literature on corporate finance and especially on capital structure shows a variety of approaches, explaining the way how the companies can obtain the optimal capital structure. Each of them suggests their own models, which, in the end, helps to find an optimal structure providing maximum return with minimum risks. These theories and hypothesis are based on some assumptions, which include:

- Firms use only two sources of financing: perpetual riskless debt and ordinary shares.
- The dividend payout ratio is 100%, meaning that the total earnings are fully distributed among the shareholders and there are no retained earnings.
- The total assets are constant.
- The total financial sources of the company are constant. The capital structure can be changed by substituting debt financing with equity financing.
- The business risk is not expected change and is supposed to be unbiased by the capital structure and financial risk.
- The firm is supposed to have a perpetual life (Khan, 2008)

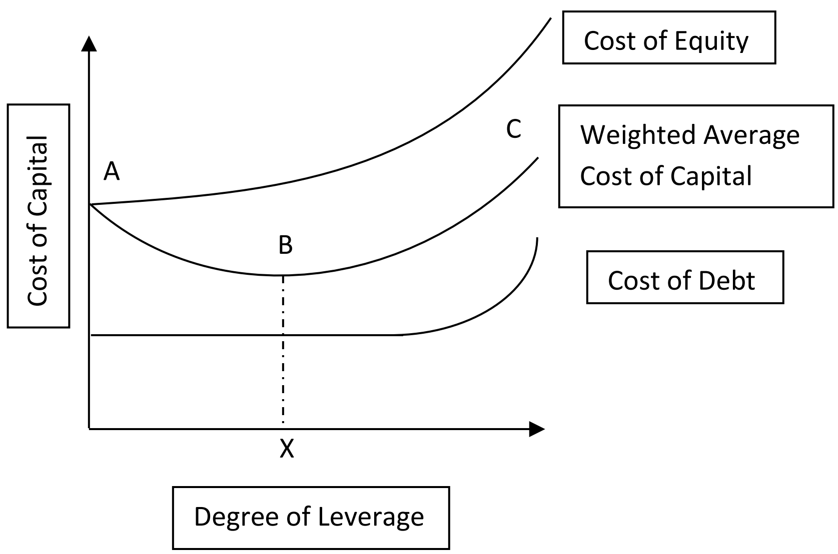
Below is the list of theories and hypothesis about capital structure:

- Traditional approach,
- Miller and Modigliani theory,
- Trade-off theory,
- Pecking order theory,
- Net income theory,
- Agency cost theory,
- Asymmetric information hypothesis (Afrasiabishani et al., 2012).

1.2.1. The Traditional Approach to Capital Structure

The traditional theory of capital structure develops the idea that there is a rational combination of debt and equity, which would ensure the minimal level of weighted average cost of capital and maximal firm value. The concept of this approach is graphically illustrated in Figure 1.

Figure 1: The traditional approach



Source: Watson D., Head A., 2007, p. 263

The traditional approach states that the cost of equity grows steeper while increasing the level of debt, as the latter raises the level of financial risk for the shareholders and thus shareholders' return becomes higher. Regarding the cost of capital, it decreases to some point along with increasing financial leverage, however, after some level of debt it starts to go up. The company which is financed only by equity can be located at point A in the Figure 1. With the usage of debt, it moves to the point B reaching its optimal capital structure, where the weighted average cost of capital is at its lowest value X in the Figure 1. With adding more debt, the higher cost of capital will nullify the benefit of using debt with lower cost and take the company to the point C on the Figure 1 (Watson D., Head A., 2007).

As Watson and Head (2007) summarize the idea of the traditional approach: there is an optimal mix of debt and equity for each company, which will have the minimal costs and raises the value of the company to the highest level.

1.2.2. The Modigliani-Miller Theorem

The most renowned and widely discussed theory of capital structure is the one proposed by Nobel prize awardees Franco Modigliani and Merton H. Miller in 1958. This model is a counterstatement to the traditional approach. Modigliani and Miller found their theory based on the following assumptions:

- The capital market is perfect, which assumes no transaction costs, rational behaviour by investors, information available equally for all the investors,
- There are no corporate taxes, consequently no benefit of tax shield
- There are no costs of financial distress
- The requirements and conditions of getting debt are equal for everyone for the capital market
- Managers are making decisions to the benefit of the shareholders, trying to maximize shareholders' wealth.
- The company's earnings are not expected to change over time (Jaros, J. and Bartosova V., 2015).

In their paper, Modigliani and Miller (1958) assume that in equilibrium in perfect capital market each share that has the same expected return should have the same price and the shares can be distributed in classes, where expected return per share should be the same for each share. And it can be demonstrated in the Formula 1:

$$(8) \quad p_j = \frac{1}{p_k} x_j$$

for each j company in class k, where

$1/p_k$ - the proportion between the price of a share in *k* class and it's expected return,

x_j - the expected return per share

p_j - the price of the *j*-th firm in class *k*.

From the equation above, the expected rate of return for each company in class *k* can be calculated and it is constant for the firms in the same class.

$$(9)\ p_k = \frac{x_j}{p_j}$$

But as the companies in the same class can have different debt-to-equity ratios and, therefore, they are subject to different levels of financial risk. Hence Modigliani and Miller (1958) follow some assumptions:

- All bonds and debts are supposed to earn a constant interest per a unit of time.
- All bonds are traded in a perfect market assuming that financial instruments with same characteristics should be traded in equilibrium.

From these assumptions, Modigliani and Miller (1958, p.268) presumed "*that all bonds are in fact perfect substitutes up to a scale factor and that they must all sell at the same price per dollars' worth of return, or what amounts to the same thing must yield the same rate of return*".

Using these assumptions Modigliani and Miller established two Propositions.

Proposition I: Without corporate taxes

The concept of the Proposition 1 is that "*the market value of any firm is independent of its capital structure and is given by capitalizing its expected return at the rate* P_k *appropriate to its class*" (Modigliani, F. and Merton, M. H., 1958, p. 268).

Formula 3 below serves as a mathematical explanation to the main idea of this proposition:

$$(10)\quad V_j = (S_j + D_j) = \frac{\bar{X}_j}{p_k}$$

for each j company in class k, where

V_j - the market value of the company,

S_j - the market value of the company's common shares,

D_j - the market value of the company's debts

$\bar{X}_j$ - the expected return on the assets of the company, to put it another way, expected profit before deducting the interest costs (Modigliani, F. and Merton, M. H., 1958).

The same statement has been proven by the authors with an alternative formula by using the firm' average cost of capital:

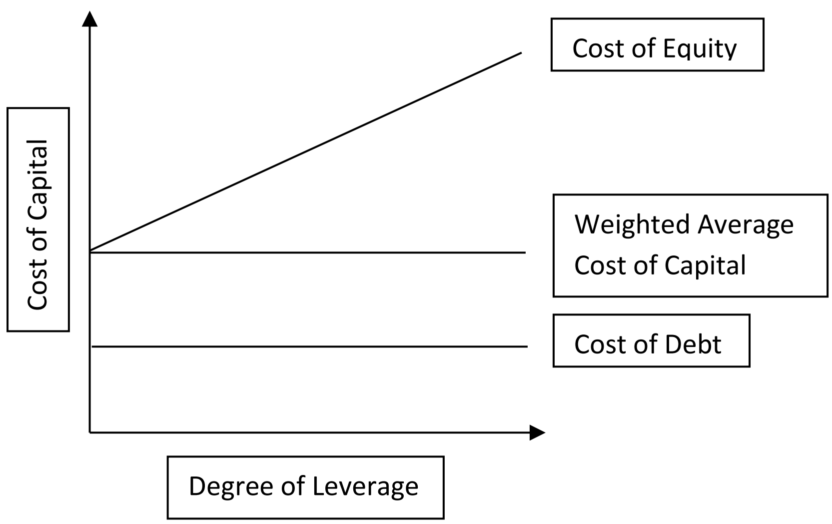
$$(11) \qquad \overline{\frac{X_J}{(S_J+D_J)}} = \frac{\bar{X}_j}{V_j} = p_k$$

From the formula, it can be concluded that "*the average cost of capital to any firm is completely independent of its capital structure and is equal to the capitalization rate of a pure equity stream of its class*" (Modigliani, F. and Merton, M. H., 1958, p. 268-269).

Following the concept of this theory the managers are supposed to be concerned more about the left part of the balance sheet, as assets are what can make a difference in the firm's value, while the proportion of debt and equity cannot (Jaros, J. and Bartosova, V., 2015).

The explanation of the main argument of this approach is illustrated in Figure 2.

Figure 2: Modigliani-Miller's Capital structure irrelevance principle



Source: Watson D., Head A., 2007, p. 264

Modigliani-Miller's approach assumes that a higher level of financial leverage will increase the risks of equity holders, consequently resulting in a higher cost of equity. Yet, the cost of debt remains unchanged while the level of debt is increasing, as there are no bankruptcy risks. The higher cost of equity will neutralize the advantage of the lower cost of debt, thus keeping the weighted average cost of capital (hereinafter WACC) constant (Watson and Head, 2007, 264).

Modigliani F. and Miller M. (1958) provide another explanation to their proposition, mentioning that if the model didn't work, then arbitrage process will take place in the market, which will eventually equalize the values of the firms. In other words, the if the value of a levered firm is higher, the investors would sell their shares and buy shares of a firm from the same class, which is financed only by equity, making their investment less risky. And at some point, this would lead to balanced values of both companies, thus proving the idea of the Proposition I.

Franco Modigliani's and Merton H. Miller's approach is also called the Modigliani-Miller's capital structure irrelevance principle and according to it there is no optimal capital structure for any firm that would increase the firm's value.

Proposition II: Without corporate taxes

The second proposition of Modigliani and Miller theorem is related to the expected rate of return on common stock for a partly levered company.

The authors put forward the view that "*the expected yield of a share of stock is equal to the appropriate capitalization rate* p_k *for a pure equity stream in the class, plus a premium related to financial risk equal to the debt-to-equity ratio times the spread between pk and* r" (Modigliani, F. and Merton, M. H., 1958, p. 271).

In order to give a more thorough explanation of their statement, the authors introduced the expected rate of return as the following:

$$(12) \quad i_j = \frac{\bar{X} - rD_j}{S_j}$$

where

i_j - expected rate on return of a common stock of j company in k class,

r - interest rate of the debt,

S_j – market value of equity,

D_j – market value of debt,

$\overline{X}_j$ – expected earnings before interest.

And as it was already discovered in the Proposition I, the $\overline{X}_j$ can be expressed as:

$$(13) \quad \bar{X}_j = p_k(S_j + D_j)$$

where p_k - market realization rate of expected return by an all-equity company in k class

From formulas 5 and 6, presented above, the main idea of this Proposition can be derived:

$$(14) \quad i_j = p_k + (p_k - r)\frac{D_j}{S_j}$$

This proposition can again be explained by the same Figure 2, where the required rate of return is illustrated as an upward sloping curve with a slope of (p_k - r), because of carrying a higher risk in case of having higher leverage. However, the WACC of the firm will remain unchanged (Modigliani, F. and Merton, M. H., 1958).

Many authors have criticised their approach and found some limitations that were not considered by Modigliani and Miller. Stiglitz J. E. (1969) has mentioned a few key drawbacks of Modigliani-Miller's approach, including that the approach required classification of the firms according to their expected return per share or that the theorem doesn't clarify if it is only for competitive markets or no. Brusov et al. (2011) mention in their research paper that the major drawback of Modigliani-Miller's approach was that they considered the life of a company perpetual, while according to the authors the finite lifetime of a company affects the cost of equity and the WACC, considering the corporate taxes. The approach developed by Modigliani and Miller lacked the consideration of corporate taxes, which is inevitable for the firms, transaction costs, bankruptcy costs, agency conflicts (Popescu, L. and Visinescu, S., 2009).

Modigliani-Miller's Propositions considering the corporate taxes

Acknowledging the fact that their model is not realistic enough to be applicable, the authors published another article in five years, where they had included the corporate taxes in their research, thus adjusting their findings to the real world's conditions, where companies must pay corporate taxes.

Modigliani and Miller (1963) introduced new variables in their formulas, including X_{τ}, which represents the after-tax return and X denoting the earnings before interests and taxes, which can be expressed as:

$$(15) \quad X = \bar{X} * Z$$

where $\bar{X}$ – expected value of X

Z – random variable, which is constant for all the firms in the same class.

Considering the tax benefits of debt, the authors have illustrated the calculation of after-tax return in the following formula:

$$(16) \quad X_{\tau} = (1 - \tau)(X - R) + R = (1 - \tau)X + \tau R = (1 - \tau)\bar{X}Z + \tau R$$

where τ - corporate income tax rate,

R – interest bill.

As the interest paid for the borrowed capital is deducted from the taxable income, the tax benefit of debt cannot be ignored. In order to get overall image of the after-tax value of a company which uses both equity and debt as parts of its capital, Modigliani and Miller (1963) suggest observing the value of each component separately.

To express the value of unlevered company the authors introduced a new variable p^{τ}, which denotes the market capitalization rate of unlevered equity. Thus, the Market value of a firm, which uses only equity, can be computed as:

$$(17) \quad V_U = \frac{(1-\tau)\bar{X}}{p^{\tau}}$$

The same should be determined for a firm, which has some level of leverage in its capital structure. For that the market capitalization rate of debts will be used.

$$(18) \quad r = \frac{R}{D}$$

In the next step the value of company, which has D debt is determined, can be determined by the following formula:

$$(19) \quad V_L = \frac{(1-\tau)\bar{X}}{p^{\tau}} + \frac{\tau R}{r} = V_U + \tau D_L$$

With this research, the authors validated the view that the value of the firm is reliant on the tax rate the leverage level. This is due to the tax advantage of debt, which "*was due solely to the fact that the deductibility of interest payments implied a higher level of after-tax income for any given level of before-tax earnings (i.e., higher by the amount τR since $\bar{X}_{\tau} = (1-\tau)\bar{X} + \tau R$)*" (Modigliani, F. and Merton, M. H., 1963, p. 438).

The authors have also proven that the after-tax earnings yield of a company depend on the leverage.

$$(20) \qquad \frac{\overline{X^{\tau}}}{V} = p^{\tau} - \tau(p^{\tau} - r)\frac{D}{V}$$

The same can be implied on the after-tax yield on equity capital, which can be expressed as a ratio of expected net profit after taxes, π^{τ}, to the value of shares.

$$(21) \qquad S = V - D = \frac{\pi^{\tau}}{p^{\tau}} - (1-\tau)\left(\frac{p^{\tau}-r}{p^{\tau}}\right)D$$

From where it can be derived that:

$$(22) \quad \frac{\bar{\pi}^{\tau}}{S} = p^{\tau} + (1-\tau)(p^{\tau} - r)\frac{D}{S}$$

Thus, the authors corrected their original approach making it more applicable to the companies in real markets, where they have to pay corporate taxes (Modigliani, F. and Merton, M. H., 1963).

To find the minimal cost of the capital, the authors again assessed the costs of the capital structure components separately. And as a result, they found that for a project, which financed by solely equity, the required rate of return on equity will be:

$$(23) \quad p^{S} = \frac{p^{\tau}}{1-\tau}$$

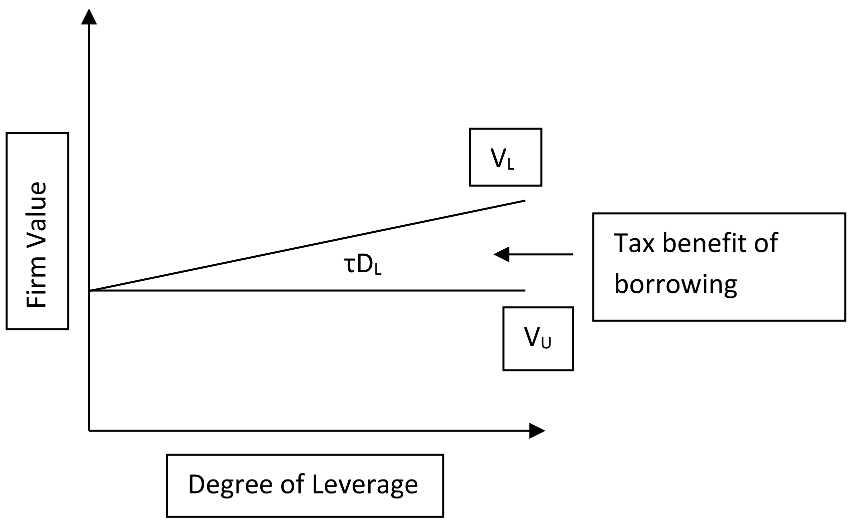
While, for a project entirely financed by debts the required rate on return on debt would be:

$$(24) \quad p^{D} = p^{\tau}$$

As can be seen above *"for borrowed funds (or any other tax-deductible source of capital) the marginal cost or before-tax required rate of return is simply the market rate of capitalization for net of tax unlevered streams and is thus independent of both the tax rate and the interest rate"* (Modigliani, F. and Merton, M. H., 1963, p. 441).

The graphical illustration of the value of a levered firm by Damodaran A. is given in Figure 3, which portrays the (19) equation.

Figure 3: Modigliani-Miller approach with taxes



Source: Damodaran A., 2014, p. 60

Summing up the results of their thorough research, Modigliani and Miller concluded that despite the tax advantage of debt it does not necessarily mean the firms should pursue the maximum feasible amount of debt in their capital structure, as companies might have possibility of using other cheaper financing options (for example retained earnings) when considering the personal income tax expenses for the investors for example retained earnings. Besides that, the lenders may impose some maximum levels of leverage, thus limiting the company's borrowings (Modigliani, F. and Merton, M. H., 1963).

Years later, in 1977, it was reported by Miller that even in case of including taxes in the model the capital structure irrelevance principle would be valid, if the taxes on personal income of investors would be involved in the analysis. Thus, the gain from leverage can be expressed as:

$$(25) \quad G_L = \left[1 - \frac{(1-\tau_C)(1-\tau_{PS})}{1-\tau_{PB}}\right] B_L$$

Where τ_C – corporate tax rate

τ_{PS} - personal income tax on income from common stock

τ_{PB} - personal income tax on income from bonds

B_L – market value of the firm's debt

It can be noted that when all the taxes are assumed to be zero, there will be no gain from leverage and the original Proposition I with no taxes will be established. In the case, when the tax rate on the income from bonds is the same as the one from common stock, then the gain from leverage will equal to $\tau_C B_L$. And when the tax rate on income from shares is less than that on income from bonds, the gain from leverage will be less than $\tau_C B_L$, and the investors should invest in bonds only if the before-tax income return on bonds is high enough to balance the tax difference.

However, Miller notes that the analysis, which includes the personal income tax of the investors, does not prove the capital structure irrelevance principle under all circumstances (Miller M. H., 1977)

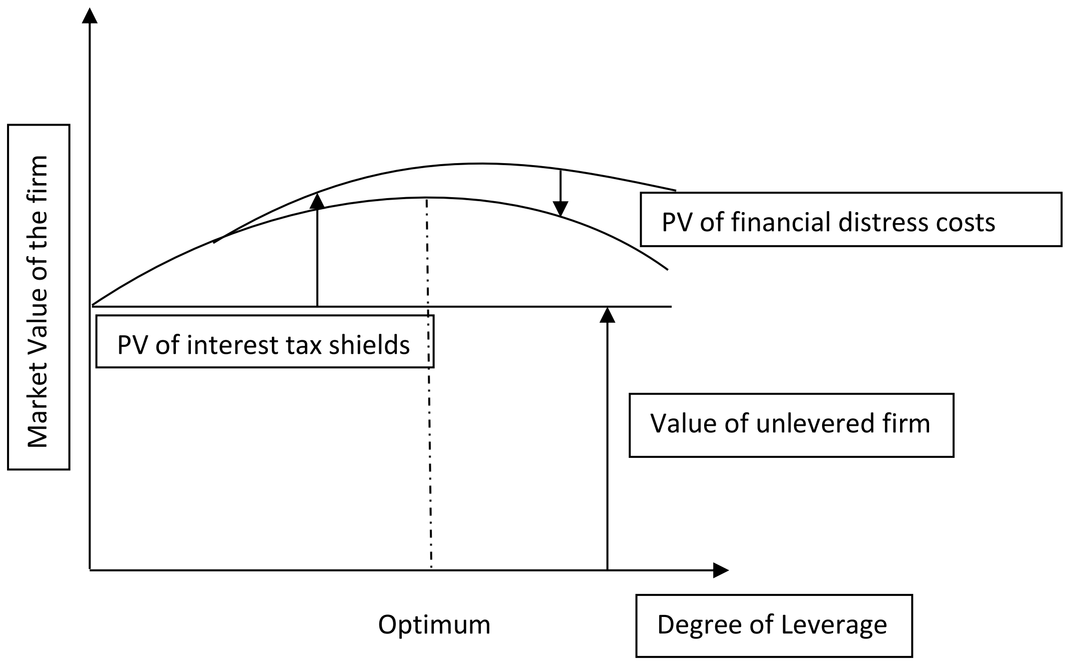
1.2.3. The Trade-off Theory

The main concept of the trade-off theory represents that optimal capital structure that can be obtained by offsetting the costs and benefits of the capital. As Kraus and Litzenberger (1973) state that companies should find an optimal debt-equity ratio for them, which would neutralize the deadweight costs of bankruptcy with the tax benefits of debt. In the literature, there are two different approaches of trade-off theory: static trade-off theory and dynamic trade-off theory.

Static Trade-off Theory

Explaining the static trade-off theory Myers defines that "A firm's optimal debt ratio is usually viewed as determined by a trade-off of the costs and benefits of borrowing, holding the firm's assets and investment plans constant. The firm is portrayed as balancing the value of interest tax shields against various costs of bankruptcy or financial embarrassment." (Myers, C., 1984, p. 577). He also states that the debt or equity should be replaced by the other until the firm will reach to its maximum value. This is graphically illustrated in Figure 4.

Figure 4: The static trade-off theory of capital structure



Source: Myers, C., 1984, p. 577

The results of the research conducted by Bradley et al. (1983), which considered the positive personal taxes on equity and bond income, non-debt tax shields and costs of possible financial distress, including bankruptcy and agency, showed that a company's optimal leverage level is inversely related to the anticipated financial distress costs and the non-debt tax shields.

Thus, the companies define their own target debt-equity ratio and try to stick to that ratio in order to maximize the firm value.

Dynamic Trade-off theory

As Frank M. and Goyal V. (2007) indicate, the static trade-off theory, being a single-period model, ignores the expectations and changes in the next period, while the dynamic trade-off model, also called target adjustment hypothesis, allows the firms to restructure in response to the expectations and changes in values when the adjustment costs can be balanced by the benefits (Fischer et al., 1989).

1.2.4. The Pecking Order Theory

Myers (1984) classifies two different approaches to the optimal capital structure, first of which is the static trade-off theory and the second one is pecking order. He defines the pecking order as a "*framework, in which the firm prefers internal to external financing, and debt to equity if it issues securities*" (Myers, S., C., 1984, p. 576). In contrast to the trade-off theory, the pecking order approach doesn't set a target capital structure for a company. There are several key ideas which form this approach:

1. Firms give strong preference to internal financing.
2. Despite the sticky dividend payout ratios, firms gradually adjust their dividend payout ratios depending on their investment opportunities.
3. If the generated cash flow is insufficient for the investment opportunities, the firm will firstly use the cash balance or marketable securities portfolio.
4. If the firm is in need of external financing, it will firstly use debt, then the hybrid securities, such as convertible bonds, and only in the last the company will issue equity.

The explanation of a company's preference to borrowing over issuing equity is given by Myers S. C. and Majluf N. in their research paper (1984) about making investment decisions under asymmetric information. Myers S. C. (1984) briefly summarizes the outcomes of their research on the pecking order theory:

1. The costs of using external financing: external financing requires some administrative and underwriting costs, but besides that there is possibility of issuing shares with an undervalued price, which can be caused by asymmetric information among the investors and managers. And this can cause that the managers will choose not to issue an undervalued equity, thus missing an investment opportunity, which has a positive net present value. Companies can avoid these costs, if they have enough internal financial resources to use the lucrative investment opportunities.
2. The privilege of debt over equity: when the company has depleted its internal financial resources, and needs to have external financing, it is better to issue debt than equity, considering debt as a less risky financial instrument.

This second assumption has been developed because of possible effects of asymmetric information. If the y will denote the net present value and ΔN the undervalued or overvalued part of the issued equity, then it is obvious that the firms will decide to issue equity and make the investment only if the following requirement is met:

$$(26) \quad y \geq \Delta N$$

Myers S. C. mentions that in order to lower ΔN the firms should issue "the safest possible security, securities whose future value changes least when the manager's inside information is revealed to the market" (Myers. S. C. 1984, p. 584). And in many cases the value of ΔN will be lower for debt than for equity, for instance in case of default-free debt, the value of ΔN equals 0.

The results of the analysis done by Lemmon M. L. and Zender J. F. (2010) validated that the pecking order theory can describe the financial behavior of different firms. For example, the inclination of small, high-growth firms to issuing equity is because of their high growth level and their limited debt capacity.

The pecking order theory gives explanation to low level of leverage in high profitable companies. This happens not because of their low target debt ratios, but because they are capable to finance their further investments with their internal funds and they don't need much of external financing. Another key fact worth to mention is that, in contrast to the trade-off theory, pecking order theory is able to explain the differences in capital structures of companies from different industries (Nielsen K. M., 2010).

1.2.5. Other Theories of Capital Structure

Besides the already discussed theories, there are some other approaches to the capital structure in the literature, which will be presented below.

The Net Income Approach

Net Income theory was developed by David Durand in 1952 and it develops the claim that the firm value is significantly influenced by the capital structure that is chosen for the company. This statement is explained by the fact that any change in the debt to equity ratio will cause a change in the cost of capital leading to a modification in the firm value. This approach has three assumptions underlying:

1. There are no taxes

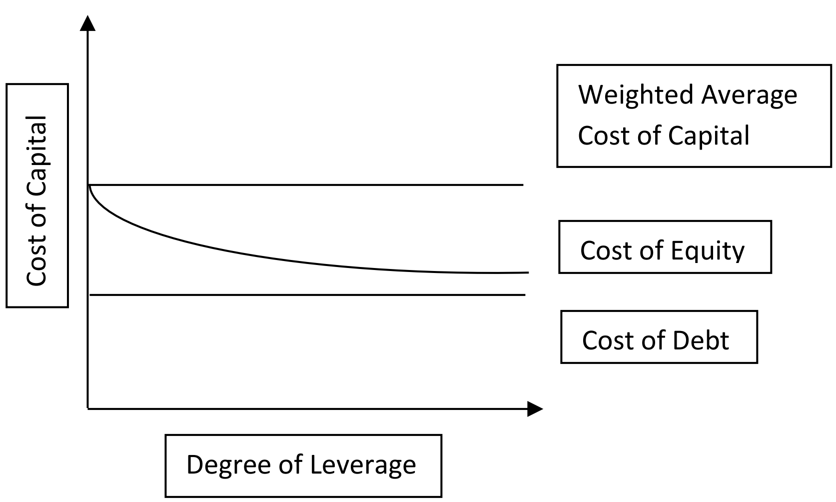
2. The cost of equity is greater than the one of debt

3. The leverage rate does not affect the risk perceptions of the investors, meaning that any change in the proportion of debt will not change the cost of neither debt nor equity.

Based on these assumptions the Net Income approach suggests that in case of increasing the firm's leverage, which, in this theory, means choosing a cheaper source of financing, will lead to a decrease in the WACC, thus resulting in a higher firm value (Khan, 2008).

The Net Income approach is graphically shown in Figure 5 (Deepa, 2012).

Figure 5: Net Income Approach



Source: Deepa, 2012

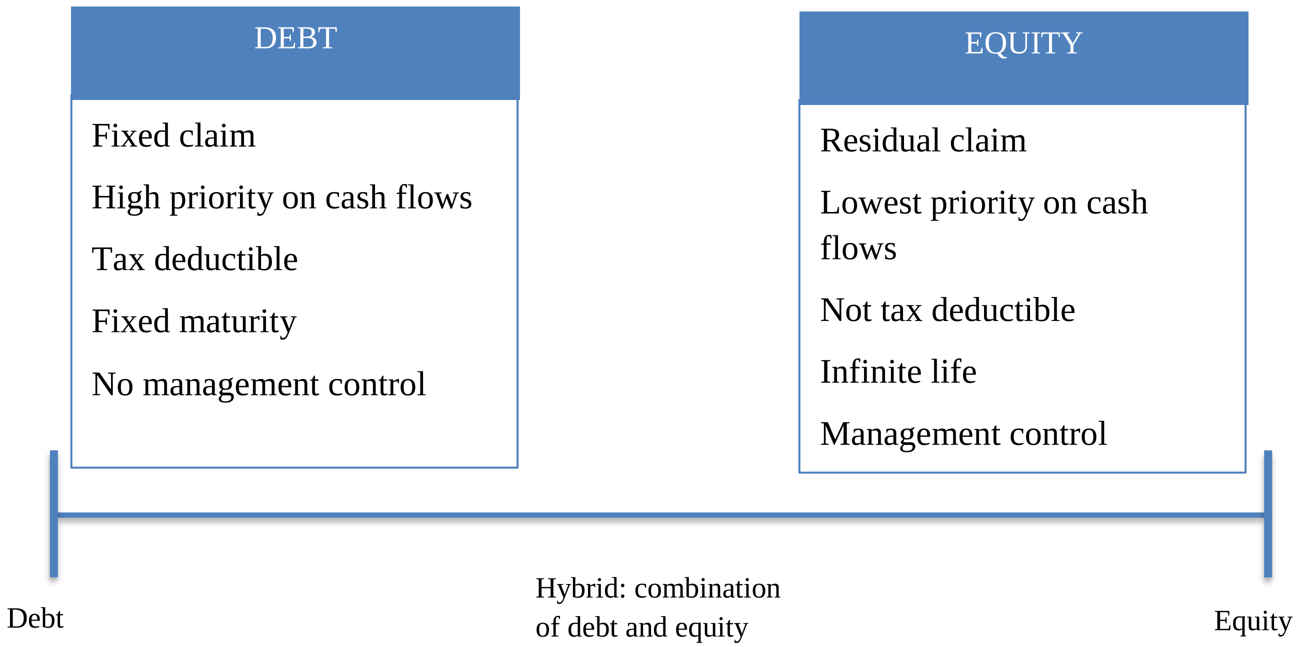
1.3. An Overview of a Firm's Financing Choices

To finance their investments, firms make a decision which source to use: equity, debt or their mixture. But these are too broad categories and includes different types of financial instruments with different characteristics. The main distinction between debt and equity is "*in the nature of their claims on the firm's cash flow*" (Damodaran A., 2001, p. 482). The issuer of the debt is entitled to receive the principal and the interest payments, as stated in the contract, while the equity holders are entitled to "*any cash flows left over after meeting all promised claims*" (Damodaran A., 2001, p. 482). The second important difference between debt and equity is the priority of the claims they can have. Debts give their issuers a prior claim on the money they are entitled to receive, if the company goes bankrupt, while equity holders will get only the residual assets of the company after covering the company's all liabilities. Another key distinction between these two categories is that equity gives its holder the right to take part in making decisions about the company's strategy and future plans, to have influence on how the firms is governed by the managed and so on, however they are the one who undertake the entrepreneurial risk (Parada L., 2014). Debt instruments differ from equity with their maturity date, which is the day when the principal and interest amounts set by the contract should be paid back, while equity doesn't have any maturity date (Green P. J. et al, 2013).

Besides the equity and debt instruments, firms can also issue hybrid instruments, which have characteristics typical to both debt and equity. Hybrid securities are attractive in the capital market, "*because they are considered an attractive, cost-efficient means of raising non-dilutive capital*" (Green P. J. et al, 2013, p. 1).

As presented by Damodaran A. the main characteristics of debt and equity is can be illustrated in Figure 6.

Figure 6: Debt versus Equity



Source: Damodaran A., 2001, p. 483

1.3.1. Equity Instruments

Depending on whether the firms are privately owned or publicly traded, they can have different equity financing alternatives.

Venture Capital

On their way to growth small private companies will be in need of financial resources, and some of them might choose to become publicly traded companies and issue common stock, while others can find venture capitalists, who would finance their investment options. Venture capitalists "*provide equity financing to small and often risky businesses in return for a share in ownership of a firm*" (Damodaran A., 2001, p. 484)

In contrast to traditional capital financing, venture capitalists are assumed to show interest in company's internal processes, thus helping the small companies, especially start-ups to develop in the industry (Hellman T. and Puri M., 2002). Hellman T. and Puri M. (2002) conducted an empirical research among 173 start-up companies in the US, results of which proved that especially in the early stages of a company's development venture capital plays an important role not only in terms of financing, but also in different aspects of company.

Common Stock

If the private companies choose issue common stock, they should first become a publicly traded company, which itself is quite costly, including transaction, underwriting and legal fees. This decision can be beneficial, as it makes easier to find financial resources for the growth of the firm, it also diversifies the company's capital by making it less dependent on a single venture capitalist or bank. Moreover, it also eases the valuation of the firms, gives the firm more recognition for new investors, trade partners and creditors (Tirole J., 2006). By issuing new shares "*the previous owners share their ownership of the company with the additional shareholders*" (Brealey et al, 2001, p. 281). Sales of new shares take place in primary markets. By acquiring the company's shares, the investors have the right to choose the board of directors and to vote for essential changes in the company. The riskiness of common stocks is expressed in the fact that in case the company will go bankrupt the investors are not guaranteed to receive their investment back, as they can claim their returns only when all the debts and liabilities of the company are covered.

1.3.2. Debt Instruments

With the decision to borrow money, the financial managers should also be clear about what type of debt instrument do they need and for what period should the money be borrowed. There is a variety of debt instruments that can be used for financing, including bank loans, bonds, which itself has several types, trade credit. And besides these options, leasing can be used as a way of financing.

Bank loans can be source of both short and long-term financing and can as well be used for borrowing small amounts of money. Taking loans from banks can be quite a simple procedure, while for issuing bonds companies need to have rating by rating agencies and thus bonds are usually issued by large companies. At the same time bonds can provide more favourable conditions, besides, they are characterised by economies of scale, having less expenses when a bigger amount of money is borrowed. There bonds can be differentiated according to their different characteristics, for example, there are bonds with or without coupon payments, or bonds with fixed or floating interest rate, secured and unsecured bonds (Damodaran A., 2001).

Trade credits, as a type of debt, is usually used for short-term borrowings. Trade credit assumes deferred payments to the supplier for the delivered goods or services, but is usually an expensive type of debt (Tirole J., 2006).

Leasing is an alternative option of borrowing, which assumes regular payments to the owner for using an asset. Depending on the type of the leasing contract, the ownership of the asset can be transferred or sold to lessee.

1.3.3. Hybrid Instruments

Companies can choose to finance their investments by using hybrid instruments, which have the combined features of bonds and equities. The most common types of hybrid securities are convertible bonds and preferred stock.

Convertible bonds have face value and conversion rate. The latter shows the amount shares to which each bond can be converted. The investors can convert the bond to some number of shares, if it doesn't happen, then the agreement will be a debt contract with the original face value. However, the investors will not always attempt to get shares, it is rational to convert only when the conversion value will surpass the call price (Stein J. C., 1992), where the conversion value is the current value of the shares.

Another example of hybrid securities is preferred stock, which entitles its holder to receive fixed amounts of money as dividends. However, despite being a stock and providing dividend payments, it does not give the holder the right to participate in the management of the company. It's similarities with equity are that it doesn't have a maturity date.

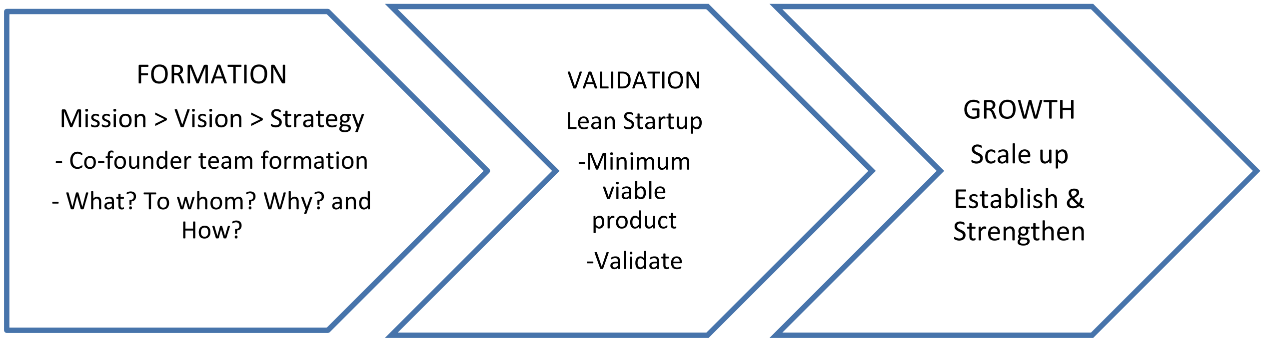
2. Financing Decisions for Start-ups, Financial Analysis of a Tesla, Application of Capital Structure Theories, Comparison of the Results

2.1. Start-up Companies, Capital Structure Decision for Them

There are different views on how a start-up company is defined by researchers or entrepreneurs. It can be referred to any new company, a company in tech industry or to a company having a growing vision. According to Eric Ries's definition, "*a start-up is a human institution designed to deliver a new product or service under conditions of extreme uncertainty*" (Binder S., 2013). Neil Blumenthal describes a start-up as "*a company working to solve a problem where the solution is not obvious and success is not guaranteed*" (Robehmed N., 2013). Summarizing different ideas, a start-up can be characterized by an innovative idea in the industry, but with uncertain growth expectations.

Start-up Commons Global presents the stages of development of a start-up company in Figure

Figure 7: Start-up development phases



Source: Startup Commons Global. 2017

Each phase of development presented in Figure 7 can be described by some processes, starting from ideating and concepting, which includes defining the initial idea of the potential product, the strategy and the mission of the company for the next few years. In the next stage the company develops the first example of the product or service, later on the key performance indicators should be identified and should take measures to attain growth of customers, revenues and the target market of the product. And only the last stage includes the establishing step, which assumes a steady growth of the company according to its strategic plan (Startup Commons Global, 2017).

It is strongly believed that privately held companies face much more difficulties when searching for sources to finance their growth, than the publicly traded companies do. This is mostly explained by the existing asymmetrical information for both the founders and the interested investors. This makes the capital structure decision making by start-ups a very difficult process (Coleman S. et al, 2016).

Nofsinger J. R. and Wang W. (2011) have researched the external financing of start-ups. To the authors' best knowledge, very few publications are available in the literature that address the issue of start-up financing in the preliminary stages. Nofsinger and Wang stress the impact of information asymmetry and the significance assessing the value of their project reasonably by the entrepreneurs. The authors mention the two possible groups of investors for start-ups: institutional investors, including venture capital funds, banks, government agencies, and individual investors, sometimes so called angel investors. Besides those two groups Nofsinger and Wang (2011) suggest considering one more group, informal investors, who include people usually affiliated with the entrepreneurs through different networks. However, institutional investors are more aware about the project they are investing and the problem of information asymmetry is smaller in this case.

As the tradeoff theory assumes finding the optimal debt-equity ratio balancing the tax advantage and bankruptcy costs, Coleman S. et al (2016) have researched how likely is that the start-up firms will benefit from the tax advantage of debt. And as a result, they concluded that since the start-ups usually make little or no profit in for several years, they will not make use of tax shield. Moreover, in their research conducted earlier, Coleman S. et al (2013) have found that start-ups are more prone to financial distress and failure than larger companies. Besides that, they are less diversified and are subject to substantial risk, which makes it difficult for them to find lenders. These findings serve as an evidence that start-ups raising debt is not the best decision for start-ups. As tradeoff theory assumes positive relation between the firm size and debt, then it can be said that larger start-ups, when need of external financing, will use debt, however, for small-sized startups will mostly have to find other sources for financing.

Coleman et al (2016) have also found relation between the owner's preference, risk tolerance and the capital structure decision, which is proven by the results of the research conducted by Ang et al. (2010), showing that "*owner's personal preferences account for 33 to 60 percent of variation in capital structure decision of small businesses owned by one individual*" (Coleman et al., 2016, p. 109).

2.2. Financial Analysis of Tesla

Overview of the company

Tesla was founded in 2003 in Silicon Valley by a Martin Eberhard and Marc Tarpenning, whose idea was to show the advantages of electric cars over the gasoline-powered cars. The company's mission is "*to accelerate the world's transition to sustainable energy*" (Tesla.com, 2017).

The models are built with an AC induction motor, which was discovered by Nicola Tesla in 1988, after whom the company is named now. The models of Tesla vehicles are manufactured in the factory situated in Fremont, California, which is capable to produce 2000 cars a week.

Tesla has released three models of electric cars so far, first of which was Tesla Roadster in 2008 and the production of the new Model 3 will start from mid-2017.

The first model, The Roadster, is a sports car, which had to be an expensive one, as an initial product of a startup company, which lacked economies of scale. However, the Model 3 is going to have a more affordable price and is expected to have high amount of sales.

The owners of Tesla vehicles can charge the batteries of their car at home, or at one of the 848 Supercharger free charging stations in various parts of the world. Another advantage of the Tesla cars is the very insignificant risk of the battery fire, in comparison with a large number of gasoline car fires.

The company's further projects were financed by Elon Mask, who invested 7.5 mln USD in 2004 and became the Chairman of the Board. In 2005 Elon Musk invested 13 mln USD more, which was contributed to the development of the first model, Tesla Roadster. Another 40 mln USD was invested in Tesla by Elon Musk in 2006, besides him there were other investments from different entrepreneurs. And in 2007 Tesla raised around 105 mln USD through private financing (Kumparak, Burns and Escher, 2015). Tesla was facing difficulties in raising money in 2009, as banks had stopped giving loans because of the financial crisis, and in the same year the company was awarded 465 mln USD low-interest loan from the US government, which was directed to the production of the new Model S vehicle (Riddell L., 2009). The loan was paid back in 2013, nine years early. A vital change in the company was held in 2010, when they announced the initial public offering of 13,300,000 shares with price of 17 USD per share (ir.tesla.com, 2010), thus the company raised 226.1 mln USD through equity financing.

As Elon Musk mentions, the Master Plan of Tesla consisted of four steps, which are in the final stages of completion. The first plan was to create an expensive car, which would have low sales volume, next was to use that money to create a more affordable car with medium sales level. The third step was to use that money for producing an even more affordable car high sales volume, and the last step of the master plan was to provide solar power (Musk E., 2016).

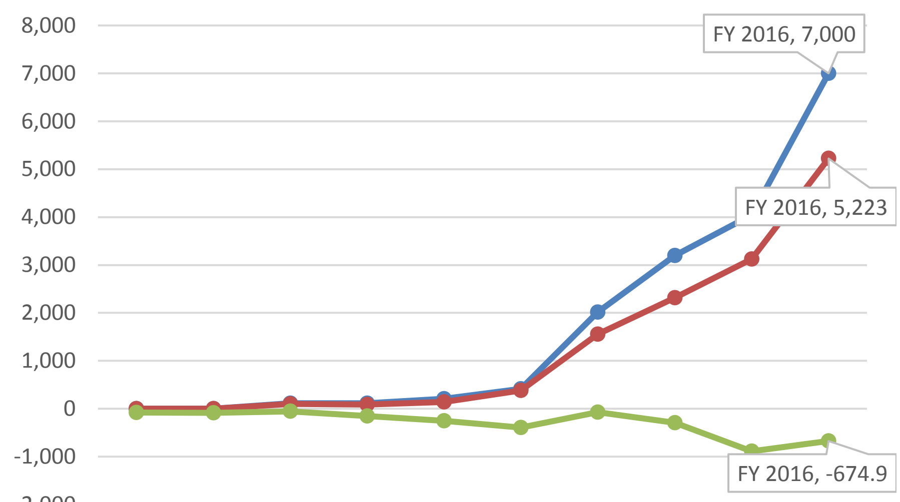
With the acquisition of SolarCity in 2016, the company is planning to sell a solar panel system, which can be installed on the roofs and would generate energy for the car battery. Besides the consumer vehicles, there are two other types of vehicles Tesla is planning to produce: heavy-duty trucks and high passenger-density urban transport, and both are still in the early stage of development (Musk E., 2016)

Financial Analysis

In order to assess the capital structure that Tesla has adopted within its life stages, financial results and ratios will be analyzed in the further steps.

To start the financial analysis of the company in the table below will be illustrated the dynamics of net income, costs of cars' production and services provided, total revenue.

Figure 8: The dynamics of total revenue, production and service costs, net income in the period 2007-2016, mln USD



	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Total Revenue	0	0	112	117	204	413	2,013	3,198	4,046	7,000
Cost of Products Sold and Services Provided	0	0	102	86	143	383	1,557	2,317	3,123	5,223
Net Income	-78.2	-82.8	-55.7	-154.3	-254.4	-396.2	-74.0	-294.0	-888.7	-674.9

Total Revenue — Cost of Products Sold and Services Provided — Net Income

Source: Bloomberg; TSLA US Income Statement: as reported

The revenues for sales have notably increased since year 2012, with the launch of the Model S. Yet, the net income of the company remains negative, caused by the excessive costs of implementing the innovative idea of electric cars, high technological investments in the production and continuous expansion of manufacturing facilities. Over two-thirds of the operating costs in 2011 were directed to the research and development sector, connected with ongoing costs of Model S and preparing the Tesla factories for the new models' production.

To get a better understanding about the profitability of the company in the Figure 9 will be presented the values of Return on Assets and Return on Common Equity for the period 2009-2016.

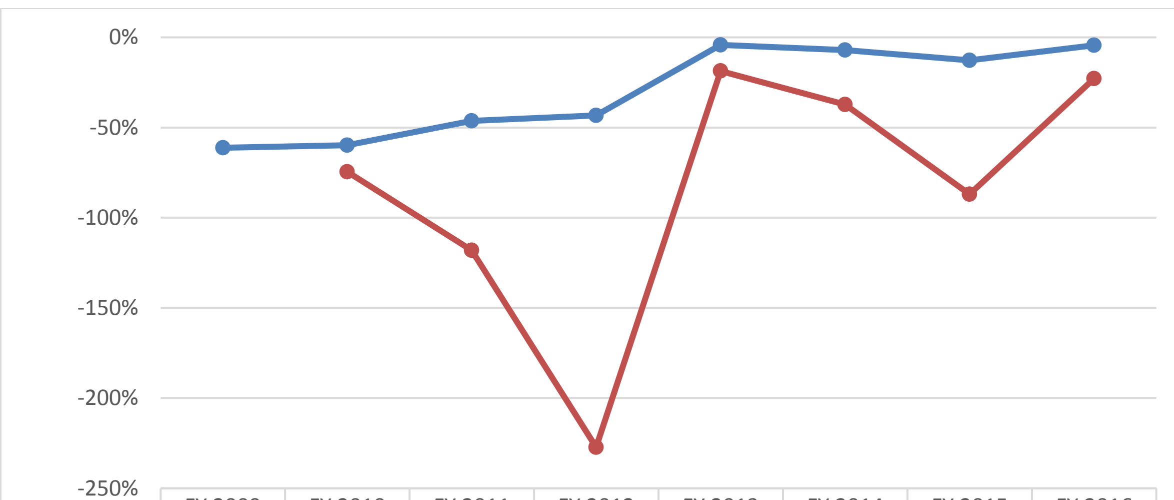
For the calculation of Return on Assets the following formula has been used:

$$(27) \quad ROA = \frac{Net\ Income}{(Total\ Assets\ Y1 + Total\ Assets\ Y0)/_2}$$

And the Return on Common Equity has been calculated according to formula (28), excepts the ratio calculated for year 2010, where the denominator is only the total common equity of 2010 instead of the average of two years, as the company didn’t have any common stock in 2009.

$$(28) \quad ROE = \frac{Net\ Income}{(Total\ Common\ Equity\ Y1 + Total\ Common\ Equity\ Y0)/_2}$$

Figure 9: Return on Assets and Return on Common Equity, 2009-2016



	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
ROA	-61%	-60%	-46%	-43%	-4%	-7%	-13%	-4%
ROE		-75%	-118%	-227%	-19%	-37%	-87%	-23%

Source: Bloomberg, TSLA US, Balance Sheet: standardized, Income Statement: GAAP

Because of the financial loss every year, the profitability ratios cannot be positive. The sharp decrease of ROE in 2012 is a result of substantial drop in retained earnings compared to year 2011, which led to a notably small amount of total common equity, thus decreasing the value of ROE, as it has a negative nominator. However, in year 2013 the net loss was one of the lowest numbers in the period analyzed, and at the same time the common equity has increased due to new common stocks issued, therefore the ROE reached its lowest negative amount in 2013. Regarding the dynamics of ROA, a gradual rise of its value can be noticed, which can be explained by the constant increase in total assets of the company. Tesla is still in the beginning stage of its growth, therefore has negative return on assets and equity, while its competitors show positive financial results.

In Table 1 and 2 will be shown the dynamics of total capital and its components from the year 2007-2016.

Table 1: The dynamics of Tesla's total capital and its components 2007-2011

In Millions of USD	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
	31/12/2007	**31/12/2008**	**31/12/2009**	**31/12/2010**	**31/12/2011**
Total Current Assets	22.31	31.43	100.56	235.89	372.84
Total Noncurrent Assets	12.53	20.27	29.87	150.20	340.61
Total Assets	**34.84**	**51.70**	**130.42**	**386.08**	**713.45**
Total Current Liabilities	51.30	87.94	57.49	85.57	191.34
Total Noncurrent Liabilities	0.21	62.30	7.23	93.47	298.06
Total Liabilities	**51.51**	**150.24**	**64.72**	**179.03**	**489.40**
+ Preferred Equity and Hybrid Capital	101.18	101.18	319.23	0.00	0.00
+ Share Capital & APIC	4.29	5.20	7.13	622.03	893.44
+ Common Stock	—	—	0.01	0.10	0.10
+ Additional Paid in Capital	—	—	7.12	621.94	893.34
+ Retained Earnings	-122.13	-204.91	-260.65	-414.98	-669.39
+ Other Equity	0.00	0.00	0.00	0.00	0.00
Equity Before Minority Interest	**-16.67**	**-98.54**	**65.70**	**207.05**	**224.05**
+ Minority/Non-Controlling Interest	0.00	0.00	0.00	0.00	0.00
Total Equity	**-16.67**	**-98.54**	**65.70**	**207.05**	**224.05**
Total Liabilities & Equity	**34.84**	**51.70**	**130.42**	**386.08**	**713.45**

Source: Bloomberg; TSLA US Balance Sheet: Standardized

Table 2 The dynamics of Tesla's total capital and its components 2012-2016

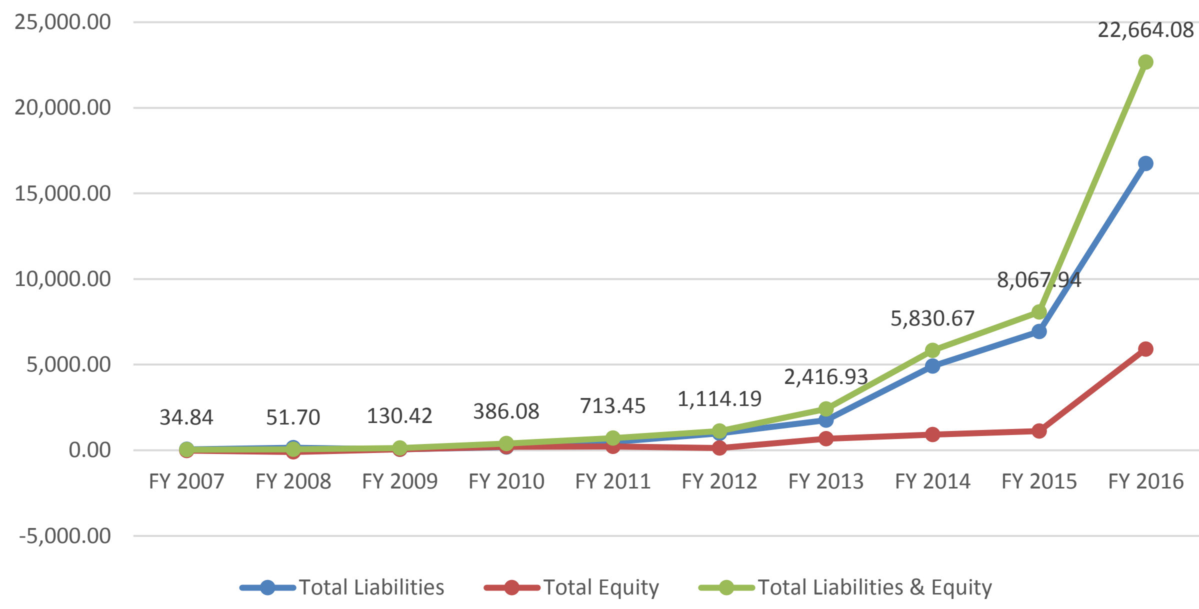
In Millions of USD	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
	31/12/2012	**31/12/2013**	**31/12/2014**	**31/12/2015**	**31/12/2016**
Total Current Assets	524.77	1,265.94	3,180.07	2,782.01	6,259.80
Total Noncurrent Assets	589.42	1,150.99	2,650.59	5,285.93	16,404.28
Total Assets	**1,114.19**	**2,416.93**	**5,830.67**	**8,067.94**	**22,664.08**
Total Current Liabilities	539.11	675.16	2,165.36	2,811.04	5,827.01
Total Noncurrent Liabilities	450.38	1,074.65	2,753.60	4,125.92	10,923.16
Total Liabilities	**989.49**	**1,749.81**	**4,918.96**	**6,936.95**	**16,750.17**
+ Preferred Equity and Hybrid Capital	0.00	0.00	0.00	0.00	0.00
+ Share Capital & APIC	1,190.31	1,806.74	2,345.39	3,409.58	7,773.89
+ Common Stock	0.12	0.12	0.13	0.13	0.16
+ Additional Paid in Capital	1,190.19	1,806.62	2,345.27	3,409.45	7,773.73
+ Retained Earnings	-1,065.61	-1,139.62	-1,433.66	-2,322.32	-2,997.24
+ Other Equity	0.00	0.00	-0.02	43.73	-14.96
Equity Before Minority Interest	**124.70**	**667.12**	**911.71**	**1,130.99**	**4,761.70**
+ Minority/Non-Controlling Interest	0.00	0.00	0.00	0.00	1,152.21
Total Equity	**124.70**	**667.12**	**911.71**	**1,130.99**	**5,913.91**
Total Liabilities & Equity	**1,114.19**	**2,416.93**	**5,830.67**	**8,067.94**	**22,664.08**

Source: Bloomberg; TSLA US Balance Sheet: Standardized

Tables 1 and 2 depict the gradual rise in the company's total assets, which is especially notable in the 2016, when it grew about 180 percent compared to 2015 and represent the investments in the expansion of Gigafactory 1, which was built in 2014, investments in maintaining Model 3 manufacturing capacity. At the same time the tables above outline the rise in total liabilities and total equity, as well as the final acquisition of SolarCity in 2016. It can also be noted that the rise of non-current assets is much more influential than that of the current assets, which is connected with high amount of investments in capital expenditures, directed to building and expanding the manufacturing facilities and equipment. Another key point is the equity raised during the analyzed period, which started in 2010, as the company became listed in initial public offering (hereinafter IPO). Comparing the change in total liabilities, it's visible that as of 31/12/2016 the total liabilities have increased approximately 257 times compared to the same indicator in 2009, while the total equity has increased 89 times only. Another point worth to mention is that in 2010 when Tesla went public, they converted the preferred stock to common stocks.

And to make the dynamics more visible, in Figure 10 will be presented the amount of total liability, total equity and their sum for the years 2007-2016.

Figure 10: The dynamics of total liabilities, total equity and total capital, mln. USD



Source: Bloomberg; TSLA US Balance Sheet: Standardized

It's obvious from the figure that the liabilities and equity of Tesla have increased substantially since 2012, showing the growth of which related to the costs of releasing and production of the Model S.

In Table 3 and 4 will be illustrated the change in the total liabilities and total equity compared to the previous years.

Table 3:Changes in total liabilities and total equity in the period of 2008-2011

In Millions of USD	***FY 2008***	***FY 2009***	***FY 2010***	***FY 2011***
	31/12/2008	**31/12/2009**	**31/12/2010**	**31/12/2011**
Net Change in Liabilities	98.73	-85.51	114.31	310.37
Net Change in Liabilities % of Total	585.52	-108.62	44.71	94.81
Net Change in Total Equity	-81.87	164.24	141.35	17.00
Increase In Equity % of Total	-485.52	208.62	55.29	5.19

Source: Bloomberg; TSLA US Balance Sheet: Standardized

Table 4: Changes in total liabilities and total equity in the period of 2012-2016

In Millions of USD	*FY 2012*	*FY 2013*	*FY 2014*	*FY 2015*	*FY 2016*
	31/12/2012	**31/12/2013**	**31/12/2014**	**31/12/2015**	**31/12/2016**
Net Change in Liabilities	500.09	760.32	3,169.15	2,017.99	9,813.22
Net Change in Liabilities % of Total	124.79	58.36	92.84	90.20	67.23
Net Change in Total Equity	-99.35	542.42	244.59	219.28	4,782.92
Increase In Equity % of Total	-24.79	41.64	7.16	9.80	32.77

Source: Bloomberg; TSLA US Balance Sheet: Standardized

From the tables above it can be noted that in every year, except for 2009 and 2010, when the company became listed in IPO, the change in liabilities is takes a bigger proportion of the total change in the capital rather than the change in equity does, meaning that the company has increased the debt more intensively than the equity in all the years, except for 2009 and 2010.

In the recent years, Tesla has gone through difficult periods, including the unfortunate case connected with death of a driver, who was using autopilot system on Tesla Model S and the acquisition of SolarCity, which was loaded with debts (Medhora N. and Sage A., 2016).

As a part of capital structure evaluation coverage ratios can be used to assess the financial health of the company, from the aspect of checking if the company is able to pay back its current liabilities from the operating cash flows. This ratio can be calculated by dividing operating cash flow over total current liabilities.

Table 5: Operating Cash Flow to Total Liabilities in 2007-2012

In Millions of USD	*FY 2007*	*FY 2008*	*FY 2009*	*FY 2010*	*FY 2011*
	31/12/2012	**31/12/2008**	**31/12/2009**	**31/12/2010**	**31/12/2011**
Cash from Operating Activities	-53.47	-52.41	-80.83	-127.82	-114.37
Total Current Liabilities	51.30	87.94	57.49	85.57	191.34
OCF/Total Current Liabilities in %	**-104.24**	**-59.60**	**-140.59**	**-149.38**	**-59.77**

Source: Bloomberg, TSLA US, Balance sheet, Income Statement

Table 6: Operating Cash Flow to Total Liabilities in 2007-2012

In Millions of USD	***FY 2012***	***FY 2013***	***FY 2014***	***FY 2015***	***FY 2016***
	31/12/2012	**31/12/2013**	**31/12/2014**	**31/12/2015**	**31/12/2016**
Cash from Operating Activities	-266.08	264.80	-57.34	-524.50	-123.83
Total Current Liabilities	539.11	675.16	2,165.36	2,811.04	5,827.01
OCF/Total Current Liabilities in %	**-49.36**	**39.22**	**-2.65**	**-18.66**	**-2.13**

Source: Bloomberg, TSLA US, Balance sheet, Income Statement

From the tables 5 and 6 it can be noted that the cash flow from operating activities is never sufficient to cover the liabilities. The operating cash flow was positive only in 2013, which was due to the sales of the Model S car, which was just released in the market. Yet, it could only cover the 39 percent of the company's current liabilities.

In the next stage of analysis, leverage ratios will be calculated in order to assess the capital structure. There can be used two versions of Debt to equity ratio, one of them is calculated as a ratio of total liabilities to the book value of the equity, and another one as a ratio of total liabilities to market capitalization. Another leverage ratio to express the capital structure is the debt to capital ratio, which can be calculated as ratio of total liabilities to total capital (using book value of equity).

Table 7: Leverage Ratios for the period of 2009-2012

In percentage	***FY 2009***	***FY 2010***	***FY 2011***	***FY 2012***
	12/31/2009	**12/31/2010**	**12/31/2011**	**12/31/2012**
Total Debt/Equity (Book Value)	98.51%	86.47%	218.44%	793.50%
Total Debt/Equity (Market Value)	98.51%	7.08%	16.39%	25.58%
Total Debt/Capital	49.62%	46.37%	68.60%	88.81%

Source: Bloomberg, TSLA US, Balance Sheet: standardized

Table 8: Leverage Ratios for the period of 2013-2016

In percentage	***FY 2013***	***FY 2014***	***FY 2015***	***FY 2016***
	31/12/2013	**31/12/2014**	**31/12/2015**	**31/12/2016**
Total Debt/Equity (Book Value)	262.29%	539.53%	613.35%	283.23%
Total Debt/Equity (Market Value)	9.45%	17.60%	21.99%	48.52%
Total Debt/Capital	72.40%	84.36%	85.98%	73.91%

Source: Bloomberg, TSLA US, Balance Sheet: standardized

After the first years of going public the company's debt to capital ratio has increased, reaching to its peak at 88.8% in 2012, when the debt-equity (Book Value) ratio was the highest as well, 793.5%. It should be outlined that in 2016, in comparison with 2015, Total Debt/Equity (Book Value) ratio has notably decreased, together with the Total Debt/Capital ratio. This is a result of increase in equity for about 5 times compared to the amount in 2015, while the total liabilities had increased around 1.4 times. A significant difference can be noticed between the debt-equity (Book Value) and debt-equity (Market Value) ratios, as the latter uses market value of equity, which has increased from 17 USD in 29th of June in 2010 to 213.69 USD on 31st of December in 2016. Therefore, it makes a substantial difference in the values of debt-equity ratios. As in 2009 Tesla had only preferred stock, thus the book value and market value of equity is equal, resulting in the same debt-equity ratios, however, as the value of stock increases the proportion of liabilities in the market capitalization becomes less than the one in book value of equity.

As Matthew Stover, a financial analyst, calls Tesla "*a company with no cash flow*" and adds that "*one hundred percent of the value of the shares is associated with some view of the future that has not manifested itself in the past*" (Lippert J., 2015).

Tesla's financial results have been only negative since its foundation, except for the only positive net income of 21.9 mln USD in the third quarter of 2016. The stock prices of Tesla had a growth of about 4 percent after publishing the reports of the quarter with positive financial results. Besides that, a profitable quarter in 2016 helped the company to confront the skeptics who suspected the ambitious plans of the company and that Tesla can ever compete with the leaders of the automobile industry (Hull M., 2016).

As Tesla produces zero emission vehicles (hereinafter ZEV), California's air pollution control and nine other states, which have implemented the same regulation, provides Tesla with ZEV credits for each electric car sold. These credits do not affect the asset values; however, they bring profit to the company when they are sold, thus they provide with cost-free margin, contributing to a higher gross profit margin (Petersen J., 2016). Matthew DeBord has introduced the view of critics about the 139 mln USD ZEV credits sold in the 3rd quarter of 2016, thus ensuring a positive financial result. However, no claim can be made against it, as it is not against any rules to sell the credits, and this additional profit will help the company to launch the Model 3 on time in 2017 (DeBord M., 2016).

Table 9: Tesla Inc.'s Enterprise Value 2009-2012

In Millions of USD	***FY 2009***	***FY 2010***	***FY 2011***	***FY 2012***
12 Months Ending	**31/12/2009**	**31/12/2010**	**31/12/2011**	**31/12/2012**
Market Capitalization	**—**	**2,527.41**	**2,985.39**	**3,868.44**
- Cash & Equivalents	69.63	99.56	280.33	201.89
+ Preferred Equity	319.23	0.00	0.00	0.00
+ Minority Interest	0.00	0.00	0.00	0.00
+ Total Debt	1.09	72.60	280.15	466.67
Enterprise Value	**—**	**2,500.45**	**2,985.21**	**4,133.21**

Source: Bloomberg, TSLA US, Enterprise Value

Table 10: Tesla Inc.'s Enterprise Value 2013-2016

In Millions of USD	***FY 2013***	***FY 2014***	***FY 2015***	***FY 2016***
12 Months Ending	**31/12/2013**	**31/12/2014**	**31/12/2015**	**31/12/2016**
Market Capitalization	**18,516.45**	**27,954.18**	**31,543.31**	**34,523.97**
- Cash & Equivalents	845.89	1,905.71	1,196.91	3,393.22
+ Preferred Equity	0.00	0.00	0.00	0.00
+ Minority Interest	0.00	0.00	0.00	1,152.21
+ Total Debt	606.88	2,488.08	2,649.02	6,854.55
Enterprise Value	**18,277.44**	**28,536.55**	**32,995.43**	**39,137.52**

Source: Bloomberg, TSLA US, Enterprise Value

It's obvious from the tables 9 and 10 that the enterprise value of Tesla has increased from 2010 till 2016, reaching its peak at 39,137 mln USD, which 1465% more than it was in 2010. According to critics the boost in the enterprise value is due to the growth in revenues. But the most dramatic change happened in 2013, when the enterprise value increased by 342 % compared to its level in 2012. The substantial change in market capitalization since fiscal year 2012 is a result of rapidly growing revenues of the company. The market capitalization as of 31/12/2016 is higher than the number as of 31/12/2013 by around 86 percent. And it is expected to keep growing in 2017 as well, with the successful launch of the new Tesla Model 3.

For researching the capital structure of Tesla, the analysis of WACC will give a better idea about the costs of each capital component. The WACC is the rate of return required by the stockholders and the cost of debt, weighted according to the proportion of each component in the total capital.

The general formula for calculating the WACC is the following:

$$(29) \quad WACC = \frac{E}{E+D} r_E + \frac{D}{E+D} r_D (1 - t_c)$$

Where E – the market value of the equity

D – the company's debt

r_E – the cost of equity

r_D – the cost of debt

t_c – corporate tax rate

As the WACC is calculated for only interest-bearing debt, thus the other liabilities are not included in the capital structure, it includes only the short and long term debts and equity. Bloomberg includes the preferred equity (if any) in the calculation separately. For calculating the cost of equity usually the Capital Asset Pricing Model is used (hereinafter CAPM).

$$(30) \quad CAPM = r_f + \beta (r_m - r_f)$$

Where r_f – risk free rate

β - Beta

r_m – expected market return

In the calculations of cost of debt by Bloomberg short and long term debts are considered separately and the formula for the cost of debt is given in (31) formula.

$$(31) \quad Cost\ of\ Debt = \left(\frac{SD}{TD} (TN * AF) + \frac{LD}{TD} (TB * AF) \right) * (1 - TR)$$

Where SD – Short term debt

LD – long term debt

TD – total debt

AF – debt adjustment factor

TN – average rate of treasury notes

TB – treasury bond rate

TR – tax rate

In the tables below will be shown the values of the WACC components for the years 2009-2016. As Tesla's net income has never been a positive number, thus the effective tax rate in the calculation of the WACC equals to 0.

Table 11: Tesla's WACC and its components, 2009-2013

In Millions of USD	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
	31/12/2009	**31/12/2010**	**31/12/2011**	**31/12/2012**	**31/12/2013**
Cost of Equity	10.65%	-0.16%	8.96%	11.27%	11.03%
Risk free rate	3.84%	3.29%	1.88%	1.76%	3.03%
Equity Risk Premium	6.81%	-3.45%	7.08%	9.51%	8.00%
Weight of Equity	17.02%	97.21%	91.42%	89.24%	96.83%
Cost of Debt	4.31%	4.53%	2.51%	2.18%	4.13%
Total Pre-tax cost of debt	3.12%	3.28%	1.82%	1.58%	2.99%
Debt Adjustment factor	1.38	1.38	1.38	1.38	1.38
Weight of Debt	0.28%	2.79%	8.58%	10.76%	3.17%
Cost of Preferred Equity	0.00%	0	0	0	0
Weight of Preferred Equity	82.70%	0.00%	0.00%	0.00%	0.00%
WACC	**1.82%**	**0.00%**	**8.41%**	**10.29%**	**10.81%**

Source: Bloomberg, WACC of TSLA US

As can be seen from Table 11, the WACC in 2009 was quite low, which is a result of having preferred equity as a biggest component of capital, for which no dividend had been paid. And as for year 2010 the expected market return was negative, it can be assumed that the WACC was 0%

that year. From year 2011, a gradual rise in WACC can be noted. In 2012 the rise was caused by the increasing cost of equity, while in 2013, even though there was a slight decrease in the cost of capital, the WACC was increased because of high proportion of equity in total capital.

Table 12: Tesla's WACC and its components, 2004-2017 Q1

In Millions of USD	***FY 2014***	***FY 2015***	***FY 2016***	***Q1 2017***
	31/12/2014	**31/12/2015**	**31/12/2016**	**31/03/2017**
Cost of Equity	10.08%	10.44%	11.78%	12.07%
Risk free rate	2.17%	2.27%	2.44%	2.35%
Equity Risk Premium	7.91%	8.17%	9.34%	9.72%
Weight of Equity	91.83%	92.25%	83.43%	84.84%
Cost of Debt	2.44%	2.73%	3.12%	3.06%
Total Pre-tax cost of debt	1.77%	1.98%	2.26%	2.22%
Debt Adjustment factor	1.38	1.38	1.38	1.38
Weight of Debt	8.17%	7.75%	16.57%	15.16%
Cost of Preferred Equity	0	0	0	0
Weight of Preferred Equity	0.00%	0.00%	0.00%	0.00%
WACC	**9.46%**	**9.84%**	**10.35%**	**10.71%**

Source: Source: Bloomberg, WACC of TSLA US

In 2014 the WACC has decreased due to both decreased cost of capital and debt. However, it didn't last long, as they gradually increased in 2015 and 2016. And in the end of the first quarter in 2017 the WACC was 10.71%, having the highest cost of equity compared to the previous years.

To give a more visible illustration of the changes in capital structure of Tesla in recent years, it will be graphically presented in the figures below. In the calculation of the capital components' proportions, market value of equity has been used. Therefore, the graphical illustrations show different results than the ones presented in tables 8 and 9 as total debt-capital ratios where the book value of equity has been used in the calculations.

In order to assess the optimality of the capital structure we can show the relation between the leverage ratio, the WACC and the stock price per share for the period of 2011- 2016. The leverage ratio equals to the company's total liabilities divided by the sum of the book value of equity and total liabilities.

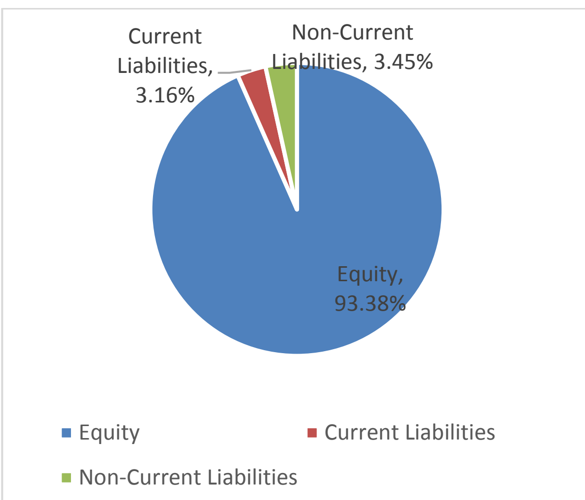
Table 13: The leverage ratio, WACC, Revenue Annual Growth and the Stock prices of Tesla 2011-2016

In USD	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
	31/12/2011	31/12/2012	31/12/2013	31/12/2014	31/12/2015	31/12/2016
Leverage ratio (book value)	69%	89%	72%	84%	86%	74%
WACC	8%	10%	11%	9%	10%	10%
Revenue Annual Growth	74.95	102.34	387.23	58.85	26.50	73.01
Stock Price per share	28.56	33.87	150.43	222.41	240.01	213.69

Source: Bloomberg, TSLA US, Balance Sheet: standardized, WACC, Stock price

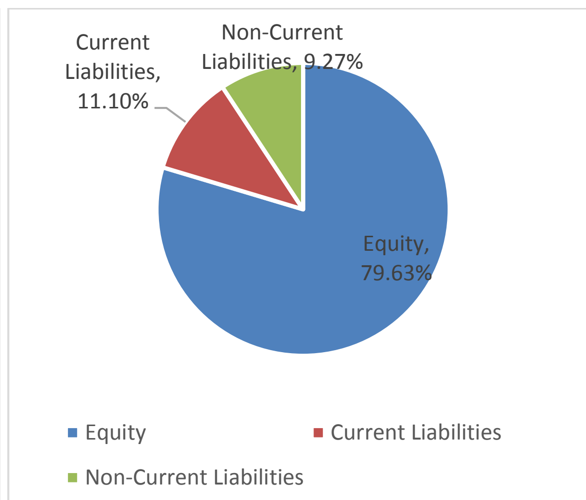
As it's accepted in the literature that the optimal capital structure is the one, which has the lowest WACC, we can analyze their relation. As can be seen from table 13 the WACC of Tesla has had slight fluctuation in the period of 2011-2016, however it is still much higher than the average cost of capital in Auto & Truck industry in US. Despite the high cost of capital, the company's revenues keep growing each year, which has influence on the rise of stock price per share.

Figure 11: The Capital Structure of Tesla in 2010



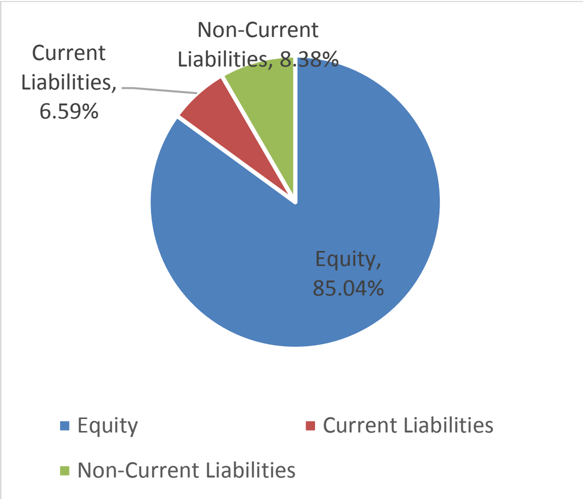
Source: Bloomberg, TSLA US, Balance Sheet: standardized

Figure 12: The Capital Structure of Tesla in 2012



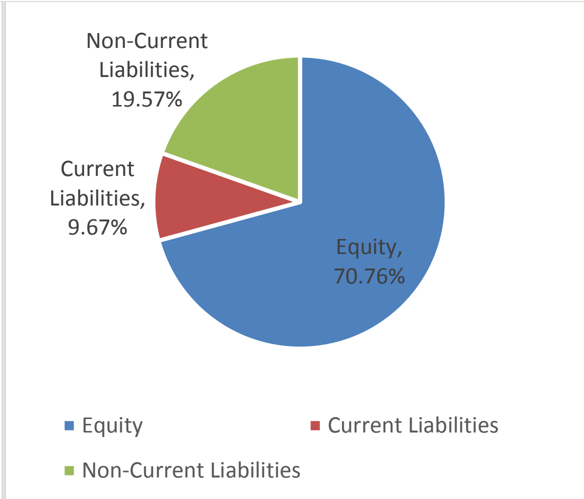
Source: Bloomberg, TSLA US, Balance Sheet: standardized

Figure 13: The Capital Structure of Tesla in 2014



Source: Bloomberg, TSLA US, Balance Sheet: standardized

Figure 14: The Capital Structure of Tesla in 2017 Q1



Source: Bloomberg, TSLA US, Balance Sheet: standardized

The figures above include other liabilities as a part of capital structure, thus expressing the overall image of the company's capital. Tesla had the highest proportion of equity in its capital in 2010, again connected with getting listed, while the lowest proportion of equity has been in 2016, with 67.4% of common stocks in the total capital.

2.3. Comparison of Tesla's financial ratios with the industry results

To analyse the efficiency of Tesla's financial ratios, they can be compared with the same ratio of US Automobile industry. Professor of Finance at Stern School of Business at New York State University, Aswath Damodaran, publishes his researches and calculations of various financial ratios and indicators for different parts of the world and for all industry sectors.

The Return on Equity ratio presented in Table 14 is calculated as a ratio of Net income and book value of equity. The calculation of Return on Capital is presented in the following formula:

$$(32)\ ROC = \frac{EBIT(1-t_c)}{Debt + Book\ Value\ of\ Equity - Cash}$$

The WACC is calculated according to the formula (22) presented above, and for the calculation of economic value added (hereinafter EVA) the (26) formula has been used.

$$(33)\ EVA = (Return\ on\ Capital - Cost\ of\ Capital) * Book\ Value\ of\ Capital$$

And the Debt/Capital ratio equals to the total liabilities divided by the sum of total liabilities and market capitalization.

Table 14 Key financial ratios of US automobile industry, Tesla and a few of its competitors as of 31/12/2016

	ROE	***ROC***	***WACC***	***Debt/Capital ratio (Market Value)***
Auto & Truck	**32%**	**6%**	**4%**	**60%**
Tesla Inc	-23%	-4%	10%	33%
General Motors	23%	8%	6%	78%
Ford Motor Co	16%	2%	3%	81%
Fiat Chrysler Automobiles	10%	12%	3%	84%

Source: Damodaran A., 2017. Debt Ratio Trade Off Variables by Industry for US companies, https://www.gurufocus.com/, Bloomberg, TSLA US

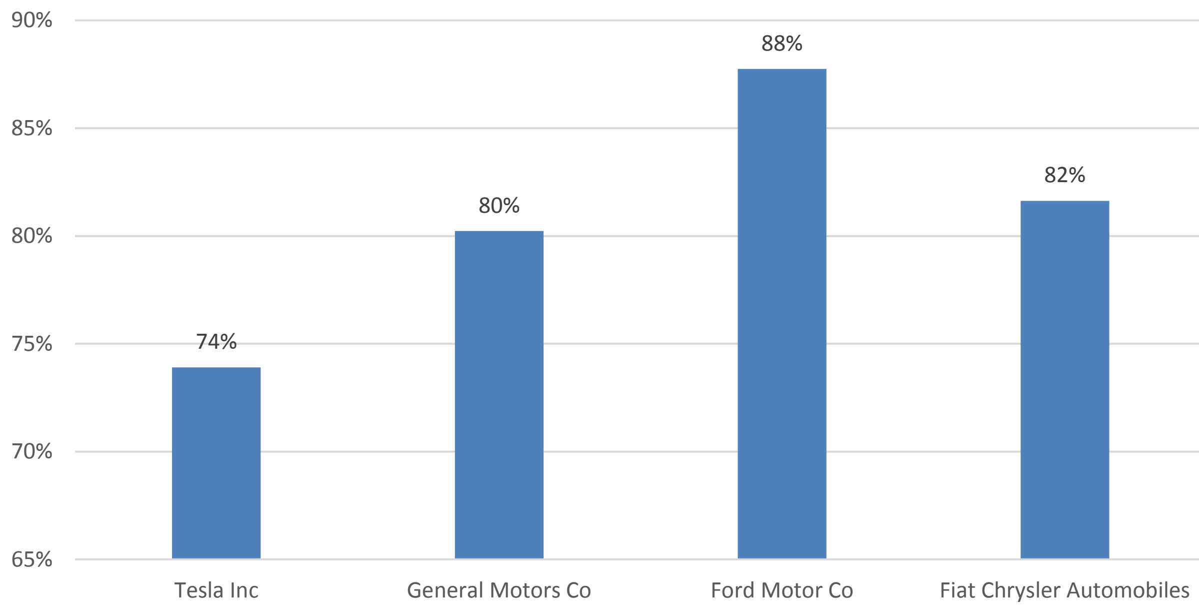
Comparing with the Auto & Truck industry numbers, Tesla's results are way from them, namely negative profitability ratios, high WACC, negative Economic Value Added.

Despite the current negative profitability ratios, the company is going to launch the production of a more vehicle in the middle of, which is expected to increase the sales of the company and lead to positive financial results. Moreover, in the analysis of Tesla conducted by J.P.Morgan some favourable assumptions were mentioned, including that the awareness of the advantages of the vehicles produced by Tesla could increase the demand of the product, and another assumption was that the possible growth in the gasoline prices could increase the interest in electric vehicles (J.P. Morgan, 2017)

The excessive cost of capital for Tesla can be explained by the high cost of equity. As a risky business in a newly developing and innovative industry of electric vehicles, the equity requires higher returns.

However, the Debt to Capital ratio is much lower for Tesla than for the industry average, as well as for its competitors General Motors, Ford Motors and Fiat Chrysler Automobiles. Furthermore, the same ratio has been calculated, but using the book value of equity instead of the market capitalization, and the results are still favourable for Tesla. In table 14 are presented the results of the debt-capital ratio (Book value).

Figure 15: Debt to capital ratio (Book Value) for Tesla and its main competitors in US Auto & Truck industry as of 31/12/2016



Source: https://www.gurufocus.com/, Bloomberg, TSLA US

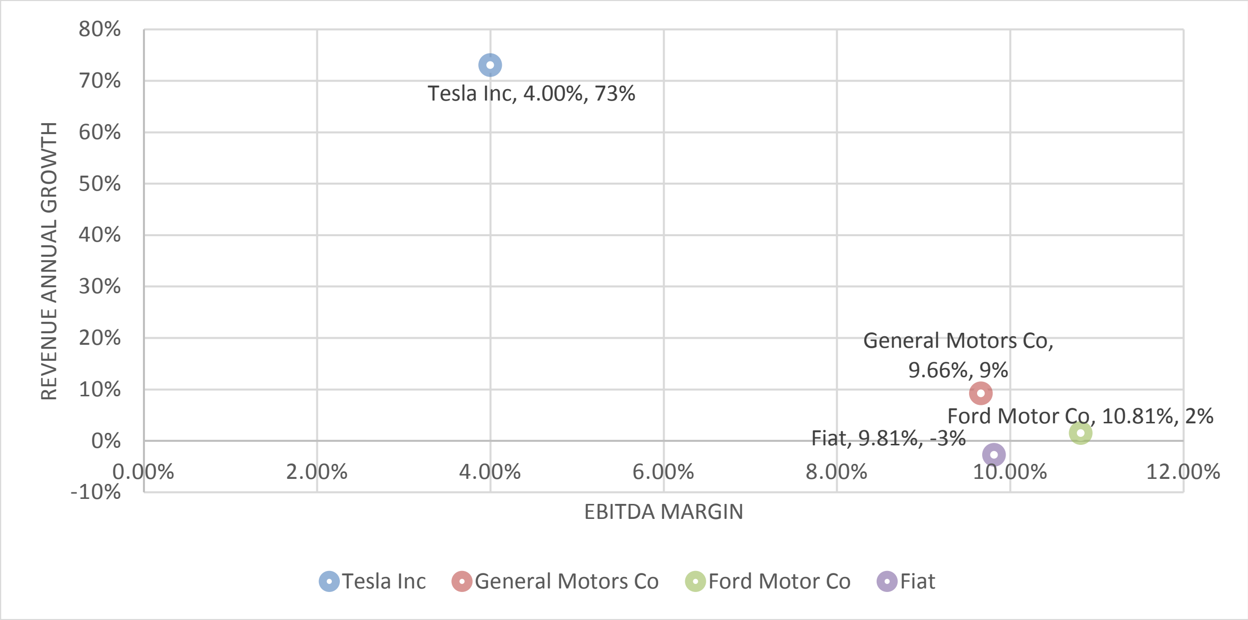
The values of the debt to capital (book value) ratio show that Tesla has a lower debt to capital ratio in comparison with its competitors, however, it still has much higher WACC.

Anyway, the company shows a high growth in revenues and its promising plans of a newmodel, as well as the new roof-solar system prove that it can turn to a lucrative business.

As mentioned by Jeremy C. Owens (2016) "Tesla's growth has been tremendous, especially for a car manufacturer starting from scratch, but it has burned through billions of dollars to get to this point, and Musk appears determined to push for ever expanding growth that will stand in the way of profitability".

The comparison of the annual growth of revenue and the EBITDA margin with the results of its competitors is illustrated in Figure 16.

Figure 16: The analysis of Revenue Annual growth and EBITDA margin of Tesla and its main competitors



Source: https://www.gurufocus.com/, Bloomberg, TSLA US

The table above shows the comparison of two indicators for Tesla and its main competitors. It is obvious from the table that the revenues of Tesla are growing significantly, and it is expected to grow even more, if the production of the Model 3 will go as planned. And the revenue annual growth is the highest one compared to its competitors, while regarding the EBITDA margin, which is calculated as a ratio of EBITDA and revenues, Ford Motor shows the highest results.

2.4. Assessment of Different Capital Structure Scenarios, Application of Capital Structure Theories in Practice

In order to assess the current capital structure of Tesla, other capital structures can be applied on the company. As companies facing more or less similar risks, the capital structure and the WACC of General Motors, Ford, Honda and Harley-Davidson will be applied to Tesla’s capital.

Table 15: The WACC and its components for Tesla's competitors and the industry average

In Percentages	Cost of equity	Weight of equity	Cost of debt	Weight of debt	WACC
General Motors	10.60%	38.20%	2.40%	61.80%	5.5%
Ford	10.40%	25.20%	1.90%	74.80%	4.1%
Harley Davidson	9.90%	60.10%	1.80%	39.90%	6.7%
Honda Motors	11.20%	43.10%	0.10%	56.90%	4.9%
Industry Average	7.26%	39.93%	2.1%	60.07%	4.2%

Source: Damodaran A., 2017. Debt Ratio Trade Off Variables by Industry for US companies, Bloomberg

For comparison of the results with different capital structures, the value of the firm will be used. For calculating the value of the firm, it is necessary to have the free cash flow to the firm, which can be calculated using the following formula.

(34) $$FCFF = Net\ Income + Depreciation + Interest * (1 - tax\ rate) - Long\ Term\ Investments - Investments\ in\ Working\ Capital$$

Using the data from the financial reports of Tesla, the Free Cash flow to the firm in 2016 can be calculate the free cash flow to the firm (hereinafter FCFF) for Tesla for different capital structures. To get the Value of the firm, we will need the FCFF in the next period, which means that the growth rate will be needed. The growth rate can be calculated as ROE times the retention rate, which in case of Tesla equals 1, as it does not pay any dividends, thus the FCFF in the next period can be calculated by decreasing the current FCFF with the percentage of ROE. After this step, the value of the firm can be calculated by using (28) formula.

(35) $$Value\ of\ the\ firm = \frac{FCFF_1}{1+WACC}$$

Afterwards the value of the equity can be calculated according to (29) formula.

(36) $$Value\ of\ the\ Equity = Value\ of\ the\ Firm - Market\ value\ of\ Debt$$

The results of the calculation of Tesla's value and its equity's value for different capital structures will be presented in the table below.

Table 16: Calculation of value of the firm and value of the equity for different capital structure scenarios

Capital structure adopted from	FCFF (2016)	ROE	FCFF (2017)	Value of the firm	Market Value of Debt	Value of the Equity
General Motors	-10,458.78	-3.28%	-10,801.88	-10,238.75	33,283.90	-43,522.65
Ford	-10,492.17	-4.97%	-11,013.93	-10,580.14	40,285.37	-50,865.51
Harley Davidson	-10,870.79	-2.09%	-11,097.46	-10,400.62	21,489.12	-31,889.74
Honda Motors	-11,226.95	-2.91%	-11,553.38	-11,013.71	30,644.88	-41,658.59
Industry Average	-10,578.20	-3.14%	-10,910.18	-10,474.45	32,352.16	-42,826.61

Source: Damodaran A., 2017. Debt Ratio Trade Off Variables by Industry for US companies, Bloomberg

The results of the value of the firm and value of the equity in different capital structure scenarios leads us to conclusion that for maximizing the value of the firm the capital structure of General Motors is recommended to adopt, while for maximizing the value of the equity, the capital structure of Harley Davidson is more beneficial. However, none of them ensures a capital structure with the lowest cost of capital.

And in order to consider the company specific-factors in the assessment of the capital structure, the analysis of firm value and equity value can be done using Tesla's capital structure over years.

Table 17: Tesla's WACC and its components for 2011-2015

FY	Cost of equity	Weight of equity	Cost of debt	Weight of debt	WACC
2011	8.96%	91.42%	2.51%	8.58%	8%
2012	11.27%	89.24%	2.18%	10.76%	10%
2013	11.03%	96.83%	4.13%	3.17%	11%
2014	10.08%	91.83%	2.44%	8.17%	9%
2015	10.44%	92.25%	2.73%	7.75%	10%

Source: Bloomberg, TSLA US, WACC

Using the data from table 17, the capital structure of Tesla from years 2011-2015 can be applied to its current capital, and following the same steps as it has been done above, the value of the firm and the value of the equity can be determined, which will be indicators of finding out the optimal capital structure, maximizing the firm value or the equity value.

Table 18: Calculation of value of the firm and value of the equity for different capital structure scenarios

Capital structure adopted from FY	FCFF (2016)	ROE	FCFF (2017)	Value of the firm	Market Value of Debt	Value of the Equity
2011	-11,141.55	-1.37%	-11,294.27	-10,418.42	4,620.42	-15,038.84
2012	-11,131.18	-1.40%	-11,287.50	-10,234.24	5,797.70	-16,031.94
2013	-11,187.07	-1.29%	-11,331.86	-10,226.30	1,709.17	-11,935.47
2014	-11,150.08	-1.36%	-11,302.24	-10,325.85	4,401.83	-14,727.68
2015	-11,143.59	-1.36%	-11,294.96	-10,282.83	4,172.56	-14,455.39

Source: Bloomberg, TSLA US, Balance sheet: standardized, Income Statement: GAAP

The application of Tesla's capital structure from previous years to the capital of 2016, shows the possible values of the firm and the equity in case of using the respective capital structure. Comparing the values of the firm, it is obvious that if Tesla would have the same capital structure as it had in 2013, namely consisting of 96.83% of equity and 3.17% of debt, with costs respectively 11.03% and 4.13%, then its value would be the highest in 2016 compared to all other scenarios, although there is not much difference in the values of firm in these scenarios. The same would be concluded, if the value of the equity would have been considered, though in this case the difference of the equity value compared to the other years' scenarios is much bigger. The actual capital structure of Tesla adopted in 2016 resulted in the firm value of – 10,099 and equity value of -19,021 mln USD as of 31/12/2016. And comparing with the the frim and equity value calculated above, it is obvious that using the capital structure of 2015, would have increased the value of the equity of Tesla by around 60%, reaching -11,935.47 mln USD.

A significant difference in the value of equity is obvious, if we compare the values of equity resulting from the capital structures of the competitors or the industry benchmark with the values from capital structures of Tesla from previous years. The reason is high proportion of debt in the capital structure, which notably decreases the value of the equity, while the capital structures adopted by Tesla in previous years do not have high percentage of debt and can ensure a higher value of the equity.

From the outcome of the research it can be concluded that the highest value of the firm and value of the equity would have been achieved, if the capital structure of 2013 would have been applied to Tesla's capital in 2016. This capital structure has the highest proportion of equity financing compared to all other structures investigated above.

Another way to assess the capital structure is applying the Modigliani-Miller theory. As the Proposition II assumes, that the WACC of the company will not change in case of changes in capital structure, we will suppose that all the assumptions stated as prerequisites for the Modigliani-Miller theory are met by the capital market and Tesla, in order this theory to be applicable.

The WACC of Tesla by the end of 2015 was 9.84%, which consisted of 92.25% equity and 7.75% of debt. In the next steps, we will assume that Tesla has adopted the capital structure of its competitors and the industry average capital structure in 2016, and according to the capital structure irrelevance theory, it would not change the WACC. According to the Modigliani-Miller theory the changes in capital structure would change the costs of capital components, thus maintaining the same level of WACC.

In the table below, will be presented the capital structure from its competitors and from the industry average, using the same cost of debt, as the benchmark companies had, but the cost of capital will be calculated from the formula of WACC, where the value of WACC would be the same in cases of all capital structures.

Table 19: The Changes in cost of equity, with capital structure of Tesla's competitors and the industry average, application of Modigliani-Miller Proposition II

Capital Structure adopted from	***Cost of Equity***	***Weight of Equity***	***Cost of debt***	***Weight of debt***	***WACC***
General Motors	21.88%	38.20%	2.40%	61.80%	9.84%
Ford	33.42%	25.20%	1.90%	74.80%	9.84%
Harley Davidson	15.18%	60.10%	1.80%	39.90%	9.84%
Honda Motors	22.71%	43.10%	0.10%	56.90%	9.84%
Industry Average	21.49%	39.93%	2.10%	60.07%	9.84%

Source: Damodaran A., 2017. Debt Ratio Trade Off Variables by Industry for US companies, Bloomberg

The results of the analysis serve as a confirmatory evidence for statements of Modigliani and Miller that higher leverage increases the risk for the company causing a higher cost of capital, thus the WACC will remain in the same level.

In Table 19 the cost of debt is taken from the companies' data; however, the cost of capital is calculated from the formula of WACC (29). The costs of equity would have increased dramatically, as the capital structures would change and the WACC would stay constant.

In order to assess these capital structure with their relevant costs, the value of the firm can be calculated, as it was done in the research above.

Table 20: The value of the firm and the value of the equity, application of Modigliani-Miller Proposition II

Capital Structure adopted from	FCFF (2016)	ROE	FCFF (2017)	Value of the firm	Market Value of Debt	Value of the Equity
General Motors	-10,458.78	-3.28%	-10,801.88	-9,833.94	33,283.90	-43,117.84
Ford	-10,492.17	-4.97%	-11,013.93	-10,026.99	40,285.37	-50,312.35
Harley Davidson	-10,870.79	-2.09%	-11,097.46	-10,103.03	21,489.12	-31,592.15
Honda Motors	-11,226.95	-2.91%	-11,553.38	-10,518.10	30,644.88	-41,162.98
Industry Average	-10,578.20	-3.14%	-10,910.18	-9,932.54	32,352.16	-42,284.70

Source: Damodaran A., 2017. Debt Ratio Trade Off Variables by Industry for US companies, Bloomberg

The results of the calculation are comparable to the value of firm and equity from table 16, where the same capital structure is applied with the cost of capital and debt from the benchmark companies. The values of the firm in case of using constant WACC are more favourable than different WACC. The same can be said about the value of equity. However, the difference, for example, of value of the firm when using the capital structure and WACC of General Motors is only about 4% higher than the value of the firm with capital structure of General Motors and constant WACC, while the difference in the value of the equity is just 1%.

The same analysis will be done with using the capital structure of Tesla from previous years, but with constant WACC from year 2016, which will lead to changes in cost of the capital. The values of cost of the capital in different capital structures will be presented in the Table 21.

Table 21: The Changes in cost of equity with capital structure of Tesla 2011-2015, application of Modigliani-Miller Proposition II

Capital Structure adopted from FY	Cost of Equity	Weight of Equity	Cost of Debt	Weight of Debt	WACC
2011	10.53%	91.42%	2.51%	8.58%	9.84%
2012	10.77%	89.24%	2.18%	10.76%	9.84%
2013	10.03%	96.83%	4.13%	3.17%	9.84%
2014	10.50%	91.83%	2.44%	8.17%	9.84%
2015	10.44%	92.25%	2.73%	7.75%	9.84%
2016	11.18%	83.43%	3.12%	16.57%	9.84%

Source: Bloomberg, TSLA US, WACC

Using the capital structures of Tesla from previous years, while keeping the level of WACC at 9.84% will not have a substantial impact on the cost of capital compared to the actual one, as there are no considerable changes in the capital structure. However, for the rational assessment of the capital structures, the value of the company and the value of the equity is needed.

Table 22: The value of the firm and the equity, capital structures of Tesla from 2011-2016, application of Modigliani-Miller Proposition II

Capital Structure adopted from FY	FCFF (2016)	ROE	FCFF (2017)	Value of the firm	Market Value of Debt	Value of the Equity
2011	-11,141.55	-1.37%	-11,294.27	-10,282.21	4,620.42	-14,902.63
2012	-11,131.18	-1.40%	-11,287.50	-10,276.04	5,797.70	-16,073.74
2013	-11,187.07	-1.29%	-11,331.86	-10,316.43	1,709.17	-12,025.60
2014	-11,150.08	-1.36%	-11,302.24	-10,289.46	4,401.83	-14,691.29
2015	-11,143.59	-1.36%	-11,294.96	-10,282.83	4,172.56	-14,455.39
2016	-10,979.34	-1.50%	-11,144.25	-10,145.63	8,921.74	-19,067.37

Source: Bloomberg, TSLA US, Balance Sheet: standardized, Income statement: GAAP

The findings of the research show that it is results in a higher firm and equity value, than in any other capital structures investigated with keeping the level of WACC at 9.84%. However, if Tesla would have used the capital structure of General Motors or the average capital structure of the US Auto & Truck industry, the value of firm and equity would not differ much.

Compared to the results of firm and equity value from Table 18, where the cost of capital and WACC is taken from respective year's results, the firm and equity values from Table 22 are slightly higher. However, the assumption by Modigliani and Miller that the WACC will remain the same if the capital structure will change, is valid for perfect capital markets, which is unrealistic to have.

Conclusion

The lack of finance can be one of the main obstacles for the growth and expansion of the company, especially in the earlier stages of business. However, firms can choose sources of financing, which would allow them to implement their investment projects. There is a number of views on which structure of capital will be the best for the firms or how it can influence on the value of the company, including Modigliani's and Miller's earlier conclusion that value of the firm is independent from the capital structure, which later on led to a new research with a broader scope of assumptions. In the new study, they acknowledged the impact of capital structure in the firm's value, if the company is paying corporate taxes. There are several other theories, including the pecking order theory, which declines the existence of optimal capital structure for firms. Each of those theories has its own scope of factors which are considered are important in a financial decision making process. Yet, the literature shows no consensus on the existing optimal capital structure for forms.

The big derivations from the industry average results and the continuous annual financial loss of Tesla are strongly connected with the lack of economies of scale, with the high costs of implementing the innovative technology of manufacturing electric cars.

In the research, the capital structures of Tesla's main competitors, as well as average capital structure of US Auto & Truck industry, have been applied to its capital, however, none of those capital structures were able to improve both the value of the firm and equity. Similar research has been done from another scope: the capital structure of previous years by Tesla have been applied to its capital in 2016. The results obtained indicate that if the company used the capital structure of 2013, it would have increased the value of equity by around 60%.

Analysing the capital structure of Tesla, it can be concluded that in the earlier stages of the company's lifecycle, when the company is facing a high level of risk, the financial ratios and determinants of capital structure may be diverged from the industry average results, which includes the results of main competitors with already established market share and with a much lower risk of failure.

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CAPM	Capital Asset Pricing Model
EBIT	Earnings Before Interest and Taxes
EBITDA	Earnings Before Interest, Taxes, Depriciation and Amortisation
EVA	Economic Value Added
FCFF	Free Cash Flow to the Firm
IPO	Initial Public Offering
NPV	Net Present Value
ROA	Return on Assets
ROC	Return on Capital
ROE	Return on Equity
WACC	Weighted Average Cost of Capital
ZEV	Zero Emission Vehicle

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Appendix 1 – Balance Sheet of Tesla Inc., Standardized, 2007-2016

Tesla Inc (TSLA US) - Standardized					
In Millions of USD except Per Share 12 Months Ending	FY 2007 12/31/2007	FY 2008 12/31/2008	FY 2009 12/31/2009	FY 2010 12/31/2010	FY 2011 12/31/2011
Total Assets					
+ Cash, Cash Equivalents & STI	17.21	9.28	69.63	99.56	280.33
+ Cash & Cash Equivalents	17.21	9.28	69.63	99.56	255.27
+ ST Investments	0.00	0.00	0.00	0.00	25.06
+ Accounts & Notes Receiv	0.06	3.32	3.49	6.71	9.54
+ Accounts Receivable, Net	0.06	3.32	3.49	6.71	9.54
+ Notes Receivable, Net	—	—	0.00	0.00	0.00
+ Inventories	2.11	16.65	23.22	45.18	50.08
+ Raw Materials	2.01	4.76	10.00	15.94	12.10
+ Work In Process	0.10	4.37	3.40	4.54	3.67
+ Finished Goods	0.00	7.52	7.04	20.13	26.12
+ Other Inventory	—	—	2.78	4.58	8.20
+ Other ST Assets	2.93	2.18	4.22	84.44	32.89
+ Prepaid Expenses	—	—	4.22	10.84	9.41
+ Derivative & Hedging Assets	—	—	0.00	0.00	0.00
+ Misc ST Assets	—	—	0.00	73.60	23.48
Total Current Assets	**22.31**	**31.43**	**100.56**	**235.89**	**372.84**
+ Property, Plant & Equip, Net	12.00	18.79	23.54	114.64	298.41
+ Property, Plant & Equip	15.20	25.62	36.27	136.63	330.64
- Accumulated Depreciation	3.20	6.83	12.73	21.99	32.22
+ LT Investments & Receivables	0.00	0.00	0.00	0.00	0.00
+ LT Receivables	—	—	—	—	—
+ Other LT Assets	0.53	1.48	6.33	35.56	42.20
+ Total Intangible Assets	—	—	0.00	0.00	0.00
+ *Goodwill*	—	—	*0.00*	*0.00*	*0.00*
+ *Other Intangible Assets*	—	—	*0.00*	*0.00*	*0.00*
+ Derivative & Hedging Assets	—	—	0.00	0.00	0.00
+ Misc LT Assets	0.53	1.48	6.33	35.56	42.20
Total Noncurrent Assets	**12.53**	**20.27**	**29.87**	**150.20**	**340.61**
Total Assets	**34.84**	**51.70**	**130.42**	**386.08**	**713.45**

Liabilities & Shareholders' Equity					
+ Payables & Accruals	5.37	14.18	29.62	49.90	88.25
+ Accounts Payable	5.37	14.18	29.62	49.90	88.25
+ Accrued Taxes	—	—	0.00	0.00	0.00
+ Interest & Dividends Payable	—	—	0.00	0.00	0.00
+ Other Payables & Accruals	—	—	0.00	0.00	0.00
+ ST Debt	0.08	0.34	0.29	0.28	8.98
+ ST Borrowings	0.00	0.00	0.00	0.00	0.00
+ ST Capital Leases	0.08	0.34	0.29	0.28	1.07
+ Current Portion of LT Debt	—	—	—	—	7.92
+ Other ST Liabilities	45.85	73.41	27.58	35.39	94.11
+ Deferred Revenue	—	—	1.53	4.64	2.35
+ Derivatives & Hedging	—	—	0.00	0.00	0.00
+ Misc ST Liabilities	45.85	73.41	26.05	30.76	91.76
Total Current Liabilities	**51.30**	**87.94**	**57.49**	**85.57**	**191.34**
+ LT Debt	0.21	57.49	0.80	72.32	271.17
+ LT Borrowings	0.19	56.60	0.00	71.83	268.34
+ LT Capital Leases	0.02	0.89	0.80	0.50	2.83
+ Other LT Liabilities	0.00	4.81	6.43	21.15	26.90
+ Accrued Liabilities	—	—	0.00	0.00	0.00
+ Pension Liabilities	—	—	0.00	0.00	0.00
+ *Pensions*	—	—	*0.00*	*0.00*	*0.00*
+ *Other Post-Ret Benefits*	—	—	*0.00*	*0.00*	*0.00*
+ Deferred Revenue	—	—	1.24	2.78	3.15
+ Derivatives & Hedging	—	—	0.00	0.00	0.00
+ Misc LT Liabilities	0.00	4.81	5.19	18.36	23.75
Total Noncurrent Liabilities	**0.21**	**62.30**	**7.23**	**93.47**	**298.06**
Total Liabilities	**51.51**	**150.24**	**64.72**	**179.03**	**489.40**
+ Preferred Equity and Hybrid Capital	101.18	101.18	319.23	0.00	0.00
+ Share Capital & APIC	4.29	5.20	7.13	622.03	893.44
+ Common Stock	—	—	0.01	0.10	0.10
+ Additional Paid in Capital	—	—	7.12	621.94	893.34
- Treasury Stock	—	—	0.00	0.00	0.00
+ Retained Earnings	-122.13	-204.91	-260.65	-414.98	-669.39
+ Other Equity	0.00	0.00	0.00	0.00	0.00
Equity Before Minority Interest	**-16.67**	**-98.54**	**65.70**	**207.05**	**224.05**
+ Minority/Non Controlling Interest	0.00	0.00	0.00	0.00	0.00
Total Equity	**-16.67**	**-98.54**	**65.70**	**207.05**	**224.05**
Total Liabilities & Equity	**34.84**	**51.70**	**130.42**	**386.08**	**713.45**

Tesla Inc (TSLA US) - Standardized

In Millions of USD except Per Share 12 Months Ending	FY 2012 12/31/2012	FY 2013 12/31/2013	FY 2014 12/31/2014	FY 2015 12/31/2015	FY 2016 12/31/2016
Total Assets					
+ Cash, Cash Equivalents & STI	201.89	845.89	1,905.71	1,196.91	3,393.22
+ Cash & Cash Equivalents	201.89	845.89	1,905.71	1,196.91	3,393.22
+ ST Investments	0.00	0.00	0.00	0.00	0.00
+ Accounts & Notes Receiv	26.84	49.11	226.60	168.97	499.14
+ Accounts Receivable, Net	26.84	49.11	226.60	168.97	499.14
+ Notes Receivable, Net	0.00	0.00	0.00	0.00	0.00
+ Inventories	268.50	340.36	953.68	1,277.84	2,067.45
+ Raw Materials	163.64	184.67	392.29	528.94	680.34
+ Work In Process	24.54	42.50	56.11	163.83	233.75
+ Finished Goods	62.56	69.32	397.32	476.51	1,016.73
+ Other Inventory	17.77	43.87	107.95	108.56	136.64
+ Other ST Assets	27.53	30.59	94.08	138.30	299.98
+ Prepaid Expenses	8.44	27.57	76.13	115.67	194.47
+ Derivative & Hedging Assets	0.00	0.00	0.00	0.00	0.00
+ Misc ST Assets	19.09	3.01	17.95	22.63	105.52
Total Current Assets	**524.77**	**1,265.94**	**3,180.07**	**2,782.01**	**6,259.80**
+ Property, Plant & Equip, Net	552.23	738.49	1,829.27	3,403.33	5,982.96
+ Property, Plant & Equip	609.77	878.64	2,121.86	3,974.46	6,980.44
- Accumulated Depreciation	57.54	140.14	292.59	571.13	997.49
+ LT Investments & Receivables	0.00	0.00	0.00	0.00	506.30
+ LT Receivables	—	—	—	0.00	506.30
+ Other LT Assets	37.19	412.50	821.33	1,882.60	9,915.02
+ Total Intangible Assets	0.00	0.00	0.00	12.82	376.15
+ Goodwill	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
+ Other Intangible Assets	*0.00*	*0.00*	*0.00*	*12.82*	*376.15*
+ Derivative & Hedging Assets	0.00	0.00	0.00	0.00	0.00
+ Misc LT Assets	37.19	412.50	821.33	1,869.78	9,538.88
Total Noncurrent Assets	**589.42**	**1,150.99**	**2,650.59**	**5,285.93**	**16,404.28**
Total Assets	**1,114.19**	**2,416.93**	**5,830.67**	**8,067.94**	**22,664.08**
Liabilities & Shareholders' Equity					
+ Payables & Accruals	343.18	414.35	1,050.40	1,338.95	3,070.37
+ Accounts Payable	343.18	303.97	777.95	916.15	1,860.34

+ Accrued Taxes	9.71	38.07	71.23	101.21	152.90
+ Interest & Dividends Payable	0.00	0.74	7.22	—	—
+ Other Payables & Accruals	-9.71	71.58	194.01	321.59	1,057.13
+ ST Debt	55.21	7.90	669.30	627.93	984.21
+ ST Borrowings	0.00	0.18	669.30	0.00	0.00
+ ST Capital Leases	4.37	7.72	—	15.45	35.50
+ Current Portion of LT Debt	50.84	—	—	612.48	948.71
+ Other ST Liabilities	140.72	252.90	445.67	844.16	1,772.43
+ Deferred Revenue	1.91	91.88	191.65	423.96	763.13
+ Derivatives & Hedging	0.00	0.00	0.00	0.00	0.00
+ Misc ST Liabilities	138.82	161.02	254.01	420.20	1,009.30
Total Current Liabilities	**539.11**	**675.16**	**2,165.36**	**2,811.04**	**5,827.01**
+ LT Debt	411.46	598.97	1,818.79	2,021.09	5,870.34
+ LT Borrowings	401.50	586.12	1,818.79	2,003.87	5,792.85
+ LT Capital Leases	9.97	12.86	—	17.22	77.48
+ Other LT Liabilities	38.92	475.68	934.81	2,104.82	5,052.83
+ Accrued Liabilities	0.00	0.00	0.00	0.00	0.00
+ Pension Liabilities	0.00	0.00	0.00	0.00	0.00
+ *Pensions*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
+ *Other Post-Ret Benefits*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
+ Deferred Revenue	3.06	181.18	292.27	446.11	851.79
+ Derivatives & Hedging	0.00	0.00	0.00	0.00	0.00
+ Misc LT Liabilities	35.86	294.50	642.54	1,658.72	4,201.04
Total Noncurrent Liabilities	**450.38**	**1,074.65**	**2,753.60**	**4,125.92**	**10,923.16**
Total Liabilities	**989.49**	**1,749.81**	**4,918.96**	**6,936.95**	**16,750.17**
+ Preferred Equity and Hybrid Capital	0.00	0.00	0.00	0.00	0.00
+ Share Capital & APIC	1,190.31	1,806.74	2,345.39	3,409.58	7,773.89
+ Common Stock	0.12	0.12	0.13	0.13	0.16
+ Additional Paid in Capital	1,190.19	1,806.62	2,345.27	3,409.45	7,773.73
- Treasury Stock	0.00	0.00	0.00	0.00	0.00
+ Retained Earnings	-1,065.61	-1,139.62	-1,433.66	-2,322.32	-2,997.24
+ Other Equity	0.00	0.00	-0.02	43.73	-14.96
Equity Before Minority Interest	**124.70**	**667.12**	**911.71**	**1,130.99**	**4,761.70**
+ Minority/Non Controlling Interest	0.00	0.00	0.00	0.00	1,152.21
Total Equity	**124.70**	**667.12**	**911.71**	**1,130.99**	**5,913.91**
Total Liabilities & Equity	**1,114.19**	**2,416.93**	**5,830.67**	**8,067.94**	**22,664.08**

Appendix 2 – Income statement, GAAP, Tesla Inc, 2007-2016

Tesla Inc (TSLA US) - GAAP					
In Millions of USD except Per Share	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
12 Months Ending	12/31/2007	12/31/2008	12/31/2009	12/31/2010	12/31/2011
Revenue	**0.07**	**14.74**	**111.94**	**116.74**	**204.24**
+ Sales & Services Revenue	—	—	111.94	116.74	204.24
+ Other Revenue	—	—	—	—	—
- Cost of Revenue	0.01	15.88	102.41	86.01	142.65
+ Cost of Goods & Services	—	—	102.41	86.01	142.65
Gross Profit	**0.06**	**-1.14**	**9.54**	**30.73**	**61.60**
+ Other Operating Income	—	—	0.00	0.00	0.00
- Operating Expenses	80.00	77.36	61.43	177.57	313.08
+ Selling, General & Admin	—	—	42.15	84.57	104.10
+ Research & Development	—	—	19.28	93.00	208.98
+ Other Operating Expense	—	—	0.00	0.00	0.00
Operating Income (Loss)	**-79.93**	**-78.50**	**-51.90**	**-146.84**	**-251.49**
- Non-Operating (Income) Loss	-1.89	4.18	3.82	7.32	2.43
+ Interest Expense, Net	-1.75	3.22	2.37	0.73	-0.21
+ Interest Expense	*0.00*	*3.75*	*2.53*	*0.99*	*0.04*
- Interest Income	*1.75*	*0.53*	*0.16*	*0.26*	*0.26*
+ Foreign Exch (Gain) Loss	0.00	0.00	0.00	0.00	0.00
+ (Income) Loss from Affiliates	—	—	0.00	0.00	0.00
+ Other Non-Op (Income) Loss	-0.14	0.96	1.45	6.58	2.65
Pretax Income	**-78.05**	**-82.69**	**-55.71**	**-154.16**	**-253.92**
- Income Tax Expense (Benefit)	0.11	0.10	0.03	0.17	0.49
+ Current Income Tax	—	—	-0.05	0.19	0.47
+ Deferred Income Tax	—	—	0.08	-0.01	0.02
+ Tax Allowance/Credit	—	—	0.00	0.00	0.00
Income (Loss) from Cont Ops	**-78.16**	**-82.78**	**-55.74**	**-154.33**	**-254.41**
- Net Extraordinary Losses (Gains)	0.00	0.00	0.00	0.00	0.00
+ Discontinued Operations	—	—	0.00	0.00	0.00
+ XO & Accounting Changes	—	—	0.00	0.00	0.00
Income (Loss) Incl. MI	**-78.16**	**-82.78**	**-55.74**	**-154.33**	**-254.41**
- Minority Interest	0.00	0.00	0.00	0.00	0.00
Net Income, GAAP	**-78.16**	**-82.78**	**-55.74**	**-154.33**	**-254.41**
- Preferred Dividends	0.00	0.00	0.00	0.00	0.00
- Other Adjustments	0.00	0.00	0.00	0.00	0.00
Net Income Avail to Common, GAAP	**-78.16**	**-82.78**	**-55.74**	**-154.33**	**-254.41**

Tesla Inc (TSLA US) - GAAP					
In Millions of USD except Per Share 12 Months Ending	FY 2012 12/31/2012	FY 2013 12/31/2013	FY 2014 12/31/2014	FY 2015 12/31/2015	FY 2016 12/31/2016
Revenue	**413.26**	**2,013.50**	**3,198.36**	**4,046.03**	**7,000.13**
+ Sales & Services Revenue	413.26	2,013.50	3,198.36	4,046.03	6,818.74
+ Other Revenue	—	—	—	—	181.39
- Cost of Revenue	383.19	1,557.23	2,316.69	3,122.52	5,400.88
+ Cost of Goods & Services	383.19	1,557.23	2,316.69	3,122.52	5,400.88
Gross Profit	**30.07**	**456.26**	**881.67**	**923.50**	**1,599.26**
+ Other Operating Income	0.00	0.00	0.00	0.00	0.00
- Operating Expenses	424.35	517.55	1,068.36	1,640.13	2,266.60
+ Selling, General & Admin	150.37	285.57	603.66	922.23	1,432.19
+ Research & Development	273.98	231.98	464.70	717.90	834.41
+ Other Operating Expense	0.00	0.00	0.00	0.00	0.00
Operating Income (Loss)	**-394.28**	**-61.28**	**-186.69**	**-716.63**	**-667.34**
- Non-Operating (Income) Loss	1.79	10.14	97.95	159.00	79.01
+ Interest Expense, Net	-0.03	32.75	99.76	117.34	190.28
+ *Interest Expense*	*0.25*	*32.93*	*100.89*	*118.85*	*198.81*
- *Interest Income*	*0.29*	*0.19*	*1.13*	*1.51*	*8.53*
+ Foreign Exch (Gain) Loss	0.00	0.00	0.00	45.60	26.10
+ (Income) Loss from Affiliates	0.00	0.00	0.00	0.00	0.00
+ Other Non-Op (Income) Loss	1.83	-22.60	-1.81	-3.95	-137.37
Pretax Income	**-396.08**	**-71.43**	**-284.64**	**-875.62**	**-746.35**
- Income Tax Expense (Benefit)	0.14	2.59	9.40	13.04	26.70
+ Current Income Tax	0.31	2.53	9.46	10.87	54.53
+ Deferred Income Tax	-0.17	0.06	-0.06	2.17	-27.83
+ Tax Allowance/Credit	0.00	0.00	—	—	—
Income (Loss) from Cont Ops	**-396.21**	**-74.01**	**-294.04**	**-888.66**	**-773.05**
- Net Extraordinary Losses (Gains)	0.00	0.00	0.00	0.00	0.00
+ Discontinued Operations	0.00	0.00	0.00	0.00	0.00
+ XO & Accounting Changes	0.00	0.00	0.00	0.00	0.00
Income (Loss) Incl. MI	**-396.21**	**-74.01**	**-294.04**	**-888.66**	**-773.05**
- Minority Interest	0.00	0.00	0.00	0.00	-98.13
Net Income, GAAP	**-396.21**	**-74.01**	**-294.04**	**-888.66**	**-674.91**
- Preferred Dividends	0.00	0.00	0.00	0.00	0.00
- Other Adjustments	0.00	0.00	0.00	0.00	0.00
Net Income Avail to Common, GAAP	**-396.21**	**-74.01**	**-294.04**	**-888.66**	**-674.91**