Master Thesis

Capital Structure Puzzle: “The effect of institutional ownership”

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Abstract

This study has examined the effect of institutional ownership on the capital structure of American large capitalization firms and whether or not this has changed because of the crisis. It is executed by using an ordinary least squares (OLS) regression model on a dataset comprising of the S&P 500 which are the largest firms listed in the United States of America.

There is a negative and significant relation between institutional ownership and leverage (measured as the firms' debt divided by total assets). This means that more institutional ownership results in less leverage. These results are in line and consistent with the argument that firms with a high percentage of institutional shareholders are more risk averse and hence borrow less than other firms (Santos, et al., 2014). Another explanation could be that institutional investment works as a substitute regarding monitoring by debt which mitigates the adverse selection cost of equity making equity more attractive than debt resulting in a lower leverage (Jensen and Meckling 1976; Grier and Zychowicz,1994).

To examine whether or not the influence of institutional ownership is significant different between the crisis and the pre- and the post-crisis period a Wald test is used. The regression results for the different time periods were the same as the total sample. Unfortunately, the Wald test is insignificant between the periods and therefore one cannot conclude that the relation between institutional ownership and leverage is significantly different in a crisis period.

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1. Introduction

The optimal composition of the capital structure has gained a lot of interest since the article of Modigliani and Miller (1958) and is for every firm an important decision to make. The capital structure can be defined as the relative proportion of debt, equity and other securities that an organization has standing out to be used for its operations and activities (Ross, Westerfield, & Jaffe, 2007). Between 2008 and 2011 major parts of the world suffered from a financial crisis. It all started in the United States where in a couple of weeks several financial corporations went bankrupt or were forced to merge. As a result of these incidents a credit crunch appeared where banks and investors were reluctant of lending their money to corporations[1].

Previous studies on the capital structure focused on the firm, industry -and or country specific determinants and whether its effect is positive or negative in relation to leverage (Rajan & Zingales, 1995, De Jong, Kabir & Nguyen, 2008). This study will examine the effect of institutional ownership on the capital structure of American large capitalization firms and whether or not this has changed because of the crisis. From the agency cost theory of Jensen and Meckling, (1979) it is known that more debt comes with more monitoring from outside investors and therefore more control on firm management. In this study it is expected that institutional investors also have a monitoring role on firm management in order to secure their investment (Shleifer & Vishny, 1986). This can be seen as a substitute for debt and hence the negative relationship with leverage.

This study will use a dataset comprising of the 500 largest companies listed in the United States (S&P 500) because large capitalization firms are heavily held by institutional owners. There has been a clear uptrend in institutional ownership in the S&P 500 in the last decade[2]. To measure for a crisis period this study will use the recent financial crisis that started in 2007 and ended in 2011 in the United States of America (appendix A). First by using an OLS regression analysis on the entire dataset the effect of institutional ownership on leverage is measured. To isolate the effects and prevent potential reverse causality this study will follow earlier work by lagging the firm-specific variables one year (Titman & Wessels, 1988; Deesomsak, Paudyal, & Pescetto, 2004). Secondly, to measure the effect of institutional ownership in times of a crisis period a Wald test is used. Instead

[1] https://www.treasury.gov/connect/blog/Pages/The-Financial-Crisis-Five-Years-Later.aspx
[2] http://www.spcapitaliq-corporations.com/

of using the entire dataset there will be a separation between a pre-crisis, a crisis and a post-crisis period.

This thesis tries to contribute to literature by providing an extensive analysis of the main theories of capital structure and its determinants. Next to that an overview over institutional ownership as a firm-specific determinant is described and how it relates to the capital structure. Finally, this thesis tries to give answer whether or not the institutional ownership and its effect on the capital structure of large capitalization firms has changed because of the recent financial crisis.

The next chapter starts with the existing literature about the main capital structure theories such as the Trade-off, Pecking order, Agency cost, Market timing and Signalling theory. As a follow up the firm, country -and industry specific determinants will be discussed. After that the recent financial crisis will be elaborated and previous work regarding this subject will be discussed. From that point several hypotheses are presented and what methodology and sample are being used in answering them. Finally, the results and its conclusion are presented.

2. Literature review

2.1 Capital structure theory

How do firms finance their operations and activities and how should they do it are very interesting questions, which have interested many researchers for a long time. Modigliani and Miller (1958) where the first who came up with a theory that the cash flows and the market value of the firm are independent of its capital structure. Their theory is also known as the financing irrelevance theory and for many researchers the starting point to test whether their theory holds in a more realistic world because they assumed that there's a perfect market (e.g. no taxes and transactions costs). In a later article Modigliani and Miller (1963) acknowledge that that there are some benefits from the use of tax shields for the interest payments made. From there on, several theories have been created that determines the capital structure. In the 70's and 80's the capital structure analysis was based on the static trade-off theory and the agency costs. From the early 80's the article of Myers and Majluf (1984) introduced the pecking order theory whereas more recently the market timing and signalling theory evolved.

2.1.1 Static Trade-off

The first theory about the optimal capital structure is the trade-off theory. A classic statement of the trade-off theory is that the optimal leverage is based by making a trade-off between the tax benefits of debt (DeAngelo & Masulis, 1980) and the deadweight costs of bankruptcy (Kraus & Litzenberger, 1973; Kim, 1978). The bankruptcy costs can either be divided in direct cost of going bankrupt, which includes the legal and liquidation cost but also the indirect, which refers to the premium a firm has to pay associated with the perception that a firm is in trouble and the lost in sales. The trade-off theory evolved after the article of Modigliani and Miller, where the corporate tax was added to the original irrelevance theory. Through the years there have been many debates about the empirical relevance of the trade-off theory. Miller (1977) for example questions the practicability of the trade-off theory, because he thinks that firms should have higher debts than firms do have in reality according to the theory because when taxes are large and certain and bankruptcy is rare. This would suggest that firms will have a higher proportion of debt because of the tax benefits and the low deadweight costs of bankruptcy. A more complete theory about the trade-off theory is provided by Myers (1984). Who states that a firm that follows the trade-off theory sets a target debt-to-value and will step-by-step move closer towards that target. For every

organization there is a different target debt-to-value. It is determined by equating the debt tax shields against the costs of bankruptcy.

2.1.2 Pecking order

Another theory is the pecking order theory of Myers and Majluf (1984), who state that there is no well-defined target debt ratio. This theory is among one of the most influential among concerning the corporate leverage. The most common motivation for the pecking order is adverse selection (Myers & Majluf, 1984). The key idea is that the manager of the firm knows the true value of the firm's assets and growth opportunities, whereas outside investors can only guess these values (The asymmetric information problem). If the manager is prepared to sell equity, an outside investor should ask why he is willing to do so. In almost all cases, the manager is more willing to sell equity when a firm is overvalued than if it is undervalued. According to Myers and Majluf (1984) retained earnings have no adverse selection problem, debt has a little adverse selection problem, and the equity is subject to serious adverse selection problem. Therefore, firms prefer internal over external finance, starting with their retained earnings, (less risky) debt, and only in extreme circumstances from issuing equity because of its higher costs and efforts.

2.1.3. Agency cost

The next theory discussed in this thesis about the capital structure of a firm is the Agency cost theory founded by Jensen and Meckling in 1976 and describes the different interests and goals of the principal (stockholders) versus the agent (firm management). The agency costs are the costs incurred by stockholders because of firm management. Agency costs can be subdivided in monitoring cost, bonding costs and residual costs. The monitoring costs are all the costs involved in reducing the possibility of firm management to prioritize their value over the value of the stockholders. Jensen and Meckling (1976) describe bonding costs as "it will pay the agent to expend resources (bonding costs) to guarantee that he will not take certain actions which would harm the principal (stockholder) or to ensure that the principal (stockholder) will be compensated if he does take such actions" (p.5). Due to bonding costs, firm management will be more reliable in the eyes of the stockholders. Finally, there are residual costs, which is the reduction in firm value due to the presence of a stockholder-manager (principal-agent) relationship.

Jensen (1986) states that the amount of debt can be used to control firm management if it is acting in its own interests. The reason behind it is because more debt comes with more monitoring from outside investors and therefore more control on firm management. Also, the higher proportion of outstanding debt, the lower the free cash available to firm management and imposes financial discipline with accepting projects in maximizing firm value (Jensen and Meckling, 1976; Fama and Jensen, 1983). Important to keep in mind is that firm management have strong incentive to invest in projects with high payoffs when successful but with high risk of failure. If an investment project turns out to be negative only the stock/debtholder suffers the cost but when the investment project turns out to be positive, both firm management and stock/debtholder earns the gain (Jensen & Meckling, 1979).

However, it is also important to mention that too much debt may lead to increased agency costs. This is the result of the conflict between debt holders and stockholders. According to Jensen and Meckling (1976) the conflict arises because the higher level of debt gives stockholders incentive to invest in high risk projects where shareholders capture most of the gain but when the project fails, the debtholders bears the costs. This is also known as the risk-shifting problem or asset substitution problem as Jensen and Meckling (1976) call it in their article.

2.1.4. Market timing

A more recent theory of the capital structure is the market timing theory (or windows of opportunity). It was first introduced by Baker and Wurgler (2002) and states that not only the asymmetric information problem that underlines the Pecking order theory or the optimal level determined by making a trade-off between costs and benefits of debt had to be taken as factor of capital structure but also the (over) undervaluation of the stock price. With their research they were the first that found evidence that equity market fluctuations have effect on the capital structure of firms.

Baker and Wurgler (2002) claim in their article that: “capital structure is the cumulative outcome of past attempts to time the equity market” (p. 1). So, this could be interpreted that firm management will issue equity when stock prices are overvalued and issue debt or repurchase equity when they think that the stock price is undervalued (Baker & Wurgler, 2002). As mentioned earlier only firm management knows the true value of the firm and therefore information asymmetry exist between firm management and investors. This can however be reduced when

firm management decides to release information. When positive information is released the stock price will rise and there's a possibility that overvaluation takes place. Another way of firms' overvaluation is by irrational investors' behavior were they constantly misprice the firms' share price. The Market timing theory was also investigated by Alti (2006) but he disproved the theory. According to him the market timing only last for a short period and has no impact or whatsoever on a firm's capital structure.

2.1.4. Signalling

The final theory discussed in this thesis is the signalling theory and is in line with the pecking order and market timing theory that it is based on the conception that managers have more information than outside investors. The signalling model assumes that financing decisions are designed basically to convey future prospects to outside investors (Ross, 1977)

The key idea behind the signalling theory is that the issuance of debt indicates a positive signal to (potential) investors whereas the issuance of equity could point out a negative signal. When firms decide to issue debt, they are obligated to make fixed interest payments to debt-holders over the term structure (Miglo, 2007). In case they default on fulfilling their debt obligations they immediate are forced into bankruptcy and liquidity needs and this would ultimately affect firm management because they could lose their job. As such, the signalling theory assumes that managers are aware of this and will only issue debt when it can fulfil their debt obligations. When comparing this to the issuance of equity. Firms usually pay dividend to shareholders as a reward for their trust but these payments are not mandatory. So, equity issuance could imply that firm management is less certain of the future forecasts of the firm (Miglo, 2007; Ross, 1977).

So, based on the signalling theory it is expected that high valued firms use more debt in their capital structure and therefore are higher leveraged than low valued firms. As discussed above this is based on the argument that any attempts to issue more debt would lead to a higher bankruptcy risk and its associated costs.

2.2 Determinants of capital structure

Many researchers tried to identify the determinants of the capital structure and several factors have been found in different studies and these factors can be classified in firm, industry -and country specific determinants. However, the capital structure puzzle is still unsolved as many other factors can influence the capital structure decision of firms.

From this point this thesis will further focus on the main theories such as the static trade-off, the pecking order and the agency cost theory. This is mainly because these theories are the most accepted and used in previous literature regarding the capital structure and party because there is not enough time to fully investigate them all. In the following paragraphs the main firm, industry –and country specific determinants will be discussed.

2.2.1. Firm-specific determinants

Previous literature has showed that there are many firm-specific determinants that can positively or negatively influence the capital structure decision. This study will focus on institutional ownership as a firm-specific determinant of capital structure. This is because the percentage of ownership by institutional investors has substantially grown in the last decades. There has been a clear uptrend in institutional ownership in the large cap S&P 500 from 73% in March 2004 until around 80% at the end of September 2017. That is approximately 22 trillion in dollars. Of the 10 largest U.S firms, institutions own between 70% and 85.8% and investment firms are the largest institutional owner of equities through mutual funds and other investment vehicles. Apple, the largest company by market capitalization, is the most widely held company by institutions, with Vanguard, BlackRock and State Street as the largest holders. From this perspective institutional ownership must have an impact on the capital structure decision of large capitalization firms. Prior studies of institutional ownership already found a significant relationship. After the main variables there will be a paragraph were institutional ownership as a determinant will be further elaborated and prior work will be discussed.

In addition to institutional ownership as a firm-specific determinant this study will incorporate the main determinants used and tested in previous literature such as “firm size, growth opportunities, firm profitability, asset tangibility, business risk and non-debt tax shields”. The next section will focus on these determinants according to the trade-off, pecking order and agency cost theory. It’s important to mention that these are generally the most consistent determinants of capital

structure (Harris & Raviv, 1991). Because of this and of time constraints this study won't incorporate all the other firm-specific variables that have correlated with leverage through the years.

Firm size

According to the agency cost theory, size is positively related to leverage because the bigger the firm, the more complex it will become and the agent (firm-management) will serve more in their own interest and as a result the principal (stockholder) will issue more debt to control the agent (Jensen & Meckling, 1976). The trade-off theory also suggests a positive relationship with leverage because larger firms have a lower chance of financial distress. First, because large firms are more diversified and have less risk on bankruptcy (Rajan & Zingales, 1995) and secondly, large firms have easy access to capital markets and can borrow at favourable interest rates (Titman & Wessels, 1988). Authors who also found a positive relationship were Frank and Goyal (2005). According to them: "larger firms tend to be more mature and therefore have a reputation in the capital markets and consequently face lower agency costs of debt" (p. 174).

The pecking order theory however suggest a negative relationship between size and leverage because of the information asymmetry. There's more information available of larger firms and therefore the true value of the firm can be better estimated. As a result, larger firms can issue equity at lower costs compared to smaller firms were the true value can only be guessed (Rajan & Zingales, 1995). Also, investors are more reluctant in offering capital to smaller firms compared to larger firms and ask a high premium for it (Ferri & Jones, 1979). In line with Titman and Wessels (1988) and Frank and Goyal (2005) a positive relation is expected.

Growth opportunities

According to the pecking order theory a positive relation between growth opportunities and leverage is expected. Firms with high growth opportunities have a higher demand for investments. These firms will turn to debt in the absence of retained earnings and only in extreme circumstances to equity because of the costs involved (Myers & Majluf, 1984). From the agency cost theory however, a negative relation is expected. As discussed in the agency cost theory from Jensen and Meckling (1976) the investments choices are made by the agent (firm management). There's considerable room for flexibility in financing positive Net Present Value (NPV) projects and when firm management decides not to execute (all) positive NPV projects because these (expected)

results has to be shared with debt holders. This will lead to the underinvestment problem and especially disastrous for high growth firms because they have so many positive NPV projects (Myers, 1977). In a later article Myers (1984) describes that although growth opportunities are capital assets which could be value enhancing, it cannot generate income. The growth opportunities are intangible and have value as long as the firm is alive. This suggests that the bankruptcy costs for firms with greater growth opportunities will be higher and will also contribute to a higher debt premium and makes debt therefore less attractive (Titman & Wessels, 1988). Next to the underinvestment problem there is also the risk-shifting problem or asset substitution which affects firms with growth opportunities because they anticipate more on high risk investments resulting in a higher premium for debt (Frank & Goyal, 2005). In line with the agency cost theory therefore this study will expect that growth is negatively related.

Firm profitability

The profitability of a firm is very important for creditors. If a firm is healthy and profitable, banks are more willing to lend them money. This gives banks a safer feeling and a higher chance that the borrower will repay his debt. From the agency theory also a positive relationship is expected but according to this theory it is due to the fact that the (high) amount of debt reduces the free cash flow available and ensures that firm management will not make investments that are suboptimal (Jensen, 1986). Also, from the static trade-off theory a positive relation is expected. According to the trade-off theory firms use debt to create a tax shield and enjoy tax deductibility of interest payments (Modigliani & Miller, 1963). So high profitability firms will have high debt levels to maximize this tax shield (Frank & Goyal, 2005).

On the other hand, as mentioned earlier the pecking order theory states that firms prefer internal over external finance (Myers & Majluf, 1984). The authors suggest that the reason firms prefer internal over external because of the costs of issuing equity. This would suggest that firms who have made high profitability in the past, and as a result have large amounts of retained earnings do not rely on external funds as much as firms with low profitability. According to Rajan & Zingales (1995) profitability is negatively related to leverage. Titman and Wessels (1988) also find a negative relationship between profitability and leverage because firms tend to repay their loans with excess cash flows.

Asset tangibility

Assets and especially tangible assets on a balance sheet are important according to the capital structure theories because these assets could be used as collateral in acquiring external finance. These tangible assets are physical assets a firm possesses. By creating a higher level of asset tangibility, the lender has lower risk and as a result lower agency costs of debt (Rajan & Zingales, 1995). Both the trade-off and agency cost theory predict a positive relationship between asset tangibility and leverage. From a trade-off perspective this is due to the fact that the higher the proportion of asset tangibility the higher the leverage because of the lower risk the lender has (Frank & Goyal, 2005). According to the agency cost theory tangible assets reduce the agency costs of debt by preventing firm management for selling collateral to pay dividend to shareholders, or to exchange low risk assets (collateral) for risky assets (Stulz & Johnson, 1985). So, in total, collateralized debt ensures that debt holders will claim a lower risk premium on debt because of the lower risk they have and this will result in higher levels of debt (Rajan & Zingales, 1995).

Compared to the agency cost theory and the static trade-off the pecking order theory however suggest a negative relationship with asset tangibility. This is because firms with a high asset tangibility have lower information asymmetry and this mean that their true value can be better estimated and resulting in lower cost of issuing equity (Harris & Raviv, 1991).

Business risk

Risk is inherent in every business, irrespective of its size, nature and structure. The riskier the firm, the higher probability of not meeting their debt obligations. According to Titman and Wessels (1988) these firms deal with a higher proportion of costs and will not turn to issue (new) debt. This will then lead that firms not fully benefit from the tax advantage of debt since the tax shield isn't fully being used. Based on these two arguments from the trade-off theory a negative relation with leverage is expected. Also, from the pecking order theory a negative effect on leverage is expected because debt holders will demand a higher risk premium from firms with a higher risk. This is in line with Schoubben and Hulle (2004) who found that debt holders incorporate the cost of default in their debt contracts. Also, DeAngelo and Masulis (1980) argue that debt holders charge a higher premium but it is also based on the information asymmetry between insiders and the outside investors. Therefore, it's difficult to estimate the future earnings for a particular firm. Following the pecking order theory and knowing that the riskier the firm, the higher the costs this will eventually mean that firms prefer internal funds rather than debt.

From the agency cost theory, a positive relation with leverage is expected. As Myers (1977) state in his article: “The impact of risky debt on the market value of the firm is less for firms holding investment options on assets that are risky relative to the firms’ present assets. In this sense we may observe risky firms borrowing more than safe ones” (p. 167). In addition to Myers (1977) there is also the article from Kim and Sorensen (1986) were they also tested the relation of business risk with leverage and they found support for Myer's argument that, in the presence of growth-induced agency problems, high operating variance may reduce the agency cost of debt, rather than increase it.

Non-debt tax shields

As discussed in the previous paragraph if interest payments on debt are tax-deductible, firms with positive taxable income have an incentive to issue more debt under the static trade-off theory (Modigliani & Miller, 1963). This is in line with the work of DeAngelo and Masulis (1980) who came up with a model to find the optimal capital structure while incorporating tax and non-debt tax shields. According to them firms are issuing more debt in order to use the interest payments as a tax-shield. However, these interest payments who serve as tax-shields can be substituted by non-debt tax shields such as depreciation and amortization. So, this means that the higher the non-debt tax shields the lower the leverage within a firm is (Deesomsak, et al., 2004).

Institutional ownership

An institutional investor cannot be seen as a ‘physical person’ but as a legally independent entity (Celik & Isaksson, 2013). The character, quality, and degree of institutional investors across the globe vary widely because of the different categories of institutional investors and different organizational and governance structures. Also, their investment horizon matters. The United States law defines several types of institutional investors, such as: states, (national/savings) banks, trust companies, insurance companies, A 1940 Act Investment company or business development company, employee benefit or pension plans, foundations, endowments, or a corporation, partnership or other entity with a net worth (exclusive of unfunded commitments from investors) of more than $ 10 million. Celik and Isaksson (2013) have analysed the landscape of institutional investors and classified them as either traditional (i.e., pension funds, investment funds including mutual funds, and insurance companies) or alternative (i.e., sovereign wealth funds, private equity, hedge funds, and exchange-traded funds). In their article they classified Asset managers as a separate class due to the rapid growth of outsourcing to asset managers. Asset managers are not

investing in their own name but of their client and based on their client investment policy. In this research institutional investors will include: banks, insurance firms, pension funds, trust funds, endowments, asset managers, mutual funds and investment firms. This is in line with earlier academic work.

Institutional investors in all their different forms have their own goals, strategies, and horizon for their investments. Next to that they invest in different asset classes. For instance, if they invest in firms listed on stock exchanges this will probably have effect on the firm's capital structure. One of the reasons is that they have a great incentive to push management to strive for an optimal leverage ratio. The key reason behind it is that firms with a healthy proportion of equity capital, as opposed to debt are more secure and has a higher probability of paying a higher dividend. This is in line with Zhang and Keasey (2002) who found a positive relation between dividend pay-out policy and institutional ownership. This suggests that institutional owners demand a certain dividend (semi-annually). Also, a financial healthy firm attracts more (institutional) investors and this drives up the stock price which then as result increases the investor's investment. The increase in institutional has also impact in other ways. For instance, Chung and Zhang (2011) found that the amount of shares of institutional investors is related with the quality of the governance structure. The idea behind this is that better corporate governance acts as a substitute for debt (Jensen, 1986). Cornett, Marcus, Saunders, & Tehranian, (2007) investigated and found a significant relation between a firm's operation cash flow returns and the percent of institutional ownership. Unfortunately, this can also be harmful for the markets because pressure from institutional investors on managers to achieve short-term results can come at the cost of long-term performance. In total this implies that institutional investors have a monitoring role in the firms they invest their money in. This is in line with Shleifer & Vishny (1986) who found that institutional investors as large shareholders have a great incentive to actively monitor a firm with the goal of increasing their investment.

Celik and Isaksson (2013) defined four broad categories of ownership engagement/monitoring. 1: No Engagement: Investors who do not monitor firms actively or engage in dialogue with firm management. 2: Reactive Engagement: Investors who rely on buying/selling advice and voting services (e.g. proxy voting) from external advisors. 3: Alpha Engagement: Investors who do monitor firms actively or engage in dialogue with firm management. Finally: inside engagement which includes fundamental analysis of the invested firm and try to influence the board actively. Also,

Mintzberg (1983) who defined two prime dimensions of ownership. First, there is involvement which can be separated into owners who influence firms' management and those who don't. Secondly, there is concentration, which can be separated in firms whose stocks are closely held from those whose stocks are widely held. Mintzberg (1983) found that when owners are more involved and their ownership is more concentrated the more power in influencing firms' management they have.

Monitoring can either be done actively or passively. Small shareholders, usually private, do not actively monitor because of the large costs involved (Coffee, 1991). Actively monitoring involves following the firm by going to their Annual General Meeting of Shareholders, collecting all sorts of data and trying to influence the decision making of firms' management. Monitoring can also be done passively through proxy voting or by the so called: "Wall street walk". The terminology introduced by Admati and Pfleiderer (2009) who described it as selling shares rather than becoming active and involved with the firm. As a result, this would lead to a downward pressure on the stock price and reason for management to change. The decline in stock price as a result of divestment by shareholders is a serious problem because it drives up their cost of capital. This shows that threatening to sell your shares in response of a firm's performance is a way to influence management. Monitoring can also be done by following the agency cost theory by Jensen and Meckling (1976) that issuing more debt comes with more monitoring from outside investors. This is in line with La Porta, Lopez-De-Silanes, Shleifer & Vishny (2000) who found that issuing more debt leads to lower management discretion. Pound (1988) states that institutional investors actively monitor firms' management. According to them institutional investors do have higher expertise in monitoring a firm on a daily basis and can perform it at lower costs compared to small investors. Next to that institutional investors do have because of their size and expertise more opportunities and resources available to influence firms' management (Cornett et al., 2007).

So, we can conclude that institutional investors have a monitoring role on firm's management but what are the effects on capital structure? Earlier work found that leverage is associated with institutional ownership (Grier & Zychowicz, 1994); Michaely & Vincent, 2013; Santos, Moreira, Vieira, 2014; Chung & Wang, 2014). Santos et al., (2014) found a negative relationship between institutional ownership and leverage in their article. According to the authors this was due to that institutional investors acts as a substitute for the monitoring and discipline role of debt. Their conclusion is in line with the work of Michaely and Vincent (2013) who also implies that

institutional investment works as a substitute rather than a complement in regarding monitoring by debt. Michaely and Vincent (2013) concluded in their research that the institutional monitoring reduces the cost of equity because of the lower conflict of interest between firm management and stockholders. Another study of the effect of institutional ownership on debt levels was that of Grier and Zychowicz (1994). They found that the debt level decreases when the percentage of ownership increases. According to them this was due to the monitoring role because this will mitigate the adverse selection cost of equity making equity more attractive than debt resulting in a lower leverage. This is in line with Myers and Majluf (1984) who stated that the active role of institutions in the market leads to a lower adverse selection. Finally, there is the study of Chung and Wang (2014), who examined the dynamic relation between institutional ownership and a firm's capital structure. They found that the firm's leverage decreases as the percentage of ownership increases. According to their study institutional investors not only monitor the firm's capital structure but also influence it by selling shares passively when dissatisfied with firms' management. So, based on these earlier studies a negative relation between institutional ownership and leverage is expected.

2.2.2. Industry-specific determinants

The capital structure can also be influenced by industry-specific factors. For instance: "industry regulations, technology, asset type, competition and business environment (Mackay & Phillips, 2005; Smith, Chen, Anderson & Cahan, 2015). Degryse, Goeij & Kappert (2012) found in their article that industry characteristics are important determinants of leverage for Small & Medium Enterprises (SME). Their results showed that firms in the retail and food/non-food have a significantly higher leverage ratio compared to firms in the manufacturing industries. According to the authors the retail industry is extremely competitive and this could be the reason why firms in this industry tend to have higher leverage ratios. Another result of their study is that firms in the construction industry tend to have lower leverage ratios. Indicating that firms in industries with low competition do not face the pressure to have their capital structure close to the optimal target. This optimal target is often used as a benchmark (MacKay & Phillips, 2005).

The Industry-specific factors as discussed above can have a direct effect but also an indirect effect. For example, start-ups, or young firms tend to have lower fixed assets on their financial statements compared to mature firms and hence have a lower leverage ratio. This is in line with the outcome of Miao (2005) who found that high growth industries have relatively lower leverage.

2.2.3. Country-specific determinants

There is growing literature that investigates the firm-specific determinants and compares it between different countries and showed that there are also the different institutional characteristics of each country that influence the capital structure. For instance, countries differ in terms of tax code, corporate governance, Gross Domestic Product (GDP) growth, laws, governance, capital markets, inflation, interest rates. The study of Rajan and Zingales (1995) observed the same firm-specific variables that influence leverage of US firms and compared it with the other G7 countries (Japan, Germany, France, Italy, the U.K and Canada). Their results were that the firm-specific variables that correlated with leverage in the US also correlated in the other G7 countries.

In a related study from Booth, Aivazian, Demirgüç-Kunt & Maksimovic, (2001) they examined the leverage of several firms in developing and developed countries. Their conclusion was that the leverage was affected in the same way and by the same firm-specific variables in developed and developing countries but the country-specific variables were different. As a follow- up on the study of Booth et al. (2001), there was the article of Giannetti (2003) who used a database which consists only of unlisted firms from eight European countries. Her study found significant differences between countries how leverage is determined. She concluded that firms have more debt in countries where the domestic stock-markets are underdeveloped. Next to that, the quality of the law enforcement and the lack of protection of the creditor rights are related to the short maturity of a firms' liability. However, in contrast to the paper of Giannetti (2003), the study of Fan, Titman & Twite (2012) found that taxes, inflation and the suppliers of capital also have an important role in the choice of capital structure. For example, they state that firms use less debt when the tax is low on dividends. Next to that firms use more short-term debt when the inflation is high.

There is also the article of De Jong et al. (2008), who found by comparing the firms' leverage choice in 42 countries that various country-specific factors can be divided in two types of effects. There is the direct and indirect effect of country-specific on the capital structure. First there is the direct effect, which suggests that creditor right protection, bond market development, and GDP growth

rate have a significant effect on the capital structure. Secondly, there are the indirect effects. According to De Jong et al. (2008) their study finds evidence that it is important to have a proper legal enforcement and creditor/shareholder right protection. Their findings showed that firms take more debt in countries which have a better legal environment and healthier economic conditions. Next to that the macro-economic measures such as capital formation and GDP growth rate are important.

Furthermore, there is the article of Alves & Fransesco (2014) who studied the impact of institutional variables on the capital structure of firms during the financial crisis. In line with De Jong et al. (2008) they concluded that the capital structure is affected differently across countries. However, they also found that this especially the case in times of financial crisis.

2.3 The Financial crisis and its effect on capital structure determinants

Until now this paper only discussed the capital structure theories and its determinants in economic stability and prosperity. However, the economic environment also has its effect on the capital structure of a firm. Variables such as GDP growth and the budget deficit of a country are important in understanding the choice for an optimal capital structure. In the following sections the financial crisis that started in 2007 in the United States and ended in 2010 (Appendix A) will briefly be discussed. Next to that there will be a discussion between prior studies that have focused on a crisis and its effect on the determinants of capital structure.

2.3.1. The Financial Crisis of 2008

The recent financial crisis - alternatively called the subprime crisis - was the largest and the most severe financial event since the great depression and reshaped the world of finance and investment banking. The US housing market is seen by many as the root cause to the financial crisis but factors that also caused and enhanced were the high degree of leverage of financial institutions, the usage of complex financial products such as Collateral Debt Obligations (CDO), weak financial regulation and poor risk management practices (Kenc and Dibooglu, 2010, Claessens, Dell'Ariccia, Igan and Laeven, 2013).

Since the late 1990, house prices grew rapidly in response to a number of contributing factors including persistently low interest rates, over-generous lending and speculation. Lending large

sums of money into the property market pushes up the price of houses along with the level of personal debt. Interest has to be paid on loans and with the debt rising quicker than incomes, eventually people were not able to keep up with the interest and repayments (probability of default). As a result, banks were reluctant in lending money to businesses and household (Ivashina and Scharfstein, 2010). The slowdown in lending caused prices in these markets to drop, and this means those that have borrowed too much to speculate on rising prices had to sell their assets in order to repay their loans. House prices dropped and the housing bubble burst.

In addition to the housing market one of the more complex and controversial corners of the bond world began to unravel because heavy losses were made in the collateralized debt obligations (CDOs) market. Collateralized debt obligations were created in 1987 by bankers at Drexel Burnham Lambert Inc. Within 10 years, the CDOs had become a major force in the so-called derivatives market, in which the value of a derivative is "derived" from the value of other assets. CDOs packages consist of corporate loans or mortgages. These packages were transformed into bonds, which were resold to investors. The problem with these products was that they were marketed and sold as investments with a defined risk and reward but no one knew the true value and risk of the underlying products. Investment banks went to rating agencies to determine the risk of these products and when one agency was too careful in giving favourable ratings (AAA, AA, A, BBB, BB, B) they just went to another agency. The link with the housing market is that many CDOs included derivatives that were built upon mortgages, including the risky subprime mortgages. The market of CDO's was in enormous and many hedge fund managers, commercial and investment banks, pension funds which had been big buyers of CDO's found themselves in trouble when the CDO market collapsed. In combination with the collapsing housing market and simultaneously crash in other asset bubbles such as the fall of the Lehman Brothers and near-failure of insurance giant AIG triggered the credit crunch and the creditworthiness of the worldwide financial system came at risk.

The US government implemented a series of political and financial actions such as the well-known 'Dodd-Frank wall street reform and consumer protection act' to control and to decrease various risks in the US Financial system. The overall effect of the financial crisis is that the lending conditions of banks were tightened which resulted that it is more difficult for firms to lend money.

2.3.2. Prior studies on crisis

Asian crisis

Earlier work that focused on the impact of a crisis on the capital structure and its determinants mostly used the Asian crisis of 1997. This crisis that started in Thailand is similar in a way to the financial crisis described above that it was also very difficult for firms to raise debt at the capital markets due to the high-risk premiums that were charged. Deesomsak et al., (2004) compared the capital structure factors and its effect on the capital structure of four countries (Thailand, Malaysia, Singapore and Australia) by using a pre –and post-crisis period. The firm-specific determinants such as firm size, non-debt tax shields and liquidity showed a significant change in relation to leverage and this was mainly due to the post-crisis period. According to the authors the significant relation between firm size and leverage in the post-crisis period could be the result that firms became more concerned about the risk of going bankrupt and therefore focused more on their capital structure decision. Another explanation could be that lenders of debt after the crisis only want to lend out money to larger firms in order to minimize the risk of default. In relation to non-debt tax shields, this could according to the authors be a result that firms are looking at alternative ways of minimizing tax. Finally, liquidity became also important after a crisis period. Another study that investigated the Asian crisis of 1997 is that of Ngah-Kiing Lim, Das and Das (2009). They investigated the influence of related and unrelated product diversification on a firm's level of debt financing in a stable and a dynamic environment. In their research they investigated 245 listed firms on the Singapore stock exchange in the period 1995-2000 and their conclusions were similar to that of Deesomsak et al., (2004).

Turkish crisis 2001

Next to the Asian crisis there are also researchers who focused on the 2001 crisis in Turkey. Mandaci (2009) for instance examined the determinants of the capital structure of 247 non-financial firms listed on the Istanbul Stock Exchange during the period 1996 – 2004. By splitting the period in a pre-crisis period and crisis period and performing a regression analysis on both of these periods he found that the effect of the risk factor (e.g. business risk, liquidity, bankruptcy) is particularly significant in relation to leverage in the crisis period.

Financial crisis 2008

In addition to the Asian crisis of 1997 and Turkish crisis of 2001 there is also considerable work that tested the determinants of capital structure during the (recent) financial crisis of 2008 in different regions. Yanwen and Xianling (2010) examined the effect of the crisis by conducting a multiple regression analysis on 40 Chinese listed real estate firms for the period 2006 and 2009. In addition, they performed a year by year regression to measure and identify changes in the determinants of capital structure over time. The results of the study of Yanwen and Xianling (2010) were that the way firms manage their capital structure rather conservative in a crisis period but in economic better times they act more radical. The article of Morri and Artegiani (2015) focused on the European Real Estate market where they used a fixed-effect panel regression analyses and a sample of firms that are included in the EPRA/NAREIT Europe Index. In line with the article of Deesomsak et al. (2004) the effect of the crisis is accounted for by a dummy variable. Morri and Artegiani (2015). Their first conclusion was that non-REIT firms are significantly more leveraged than REIT's. Next to that they found a significant and negative relation between operating risk and leverage which indicates that riskier firms try to adopt a conservative capital structure to reduce the uncertainty of the firm. Also, in line with Deesomsak et al., (2004) they found that larger firms tend to have more debt indicating that it is easier for them to borrow money.

Hoang et al., (2017) analyzed the impact of the financial crisis on the capital structure of French micro-enterprises. In their analysis they used a panel of 4945 firms and in line with Alves and Fransesco (2013) they divided the 11-year period in two periods (a pre-crisis and a crisis period). According to their study the micro-enterprises are relying mostly on their internal funds are going to survive in a crisis period. One of the ways is by selling tangible assets they do not use that much. Instead they focus on their intangible assets such as: "human skills, advertising, networking, brand name, and awareness." Finally, there is the paper of Alves and Fransesco (2013) that focused on three different crisis periods. By estimating a panel regression of leverage and debt and including a dummy variable for each of the different crisis periods the authors concluded that firms that are in a stressful period (crisis) increase leverage and mostly rely on short-term borrowings. This will then imply a greater financial distress for firms because of the rollover risk in recession periods.

In addition to the effect on its determinants there is also evidence that the recent financial crisis had its effect on a firm financing decision. This is because when the budget deficit of a country becomes larger this automatically results in a higher interest rate when government want to issue

debt and higher uncertainty in the monetary market. The recent crisis has showed this at the PIGS countries. These countries are: “Portugal, Italy Greece and Spain.” (Popov & Van Horen, 2013; Chen et al., 2013).

In general, it can be concluded that there has been some work available but in a way these studies have focused on the main firm-specific determinants of capital structure and whether or not these have changed during a crisis period but none included institutional ownership as a determinant and tested of this variable has changed in a crisis period.

3. Hypotheses

In the previous sections the main theories and determinants of the capital structure were elaborated. As was discussed many researchers tried to identify determinants of capital structure and are measured by several proxies. To test the effect of institutional ownership as a firm-specific determinant of capital structure and whether or not this has changed during a crisis period a set of hypotheses is needed. A hypothesis is used in an experiment to define the relationship between two variables (independent and dependent) or more. The purpose of a hypothesis is to find the answer to a question. From the literature review the following testable hypotheses are constructed.

As previous discussed large capitalization firms tend to be heavily held by institutional investors and there has been a clear uptrend since 2004. Earlier work found a negative relationship between institutional ownership and leverage. According to Santos et al., (2014) this was due that institutional investors acts as a substitute for the monitoring and discipline role of debt. Another reason for the negative relation between institutional ownership and leverage is that from the study of Grier and Zychowicz (1994) who concluded that the lower leverage was a result of the adverse selection cost of equity making it more attractive than debt. This is in line with who stated that the active role of institutions in the market leads to a lower adverse selection. Based on this earlier work a negative relation between leverage and institutional ownership is expected. Therefore:

Hypothesis 1: The increase of institutional ownership will lead to a decrease in leverage.

It's also interesting to know the effect of institutional ownership on capital structure during a crisis period. As mentioned above, large capitalization firms tend to be heavily held by institutional investors and the riskier the firm the higher premium debt holders demand (Schoubben and Hulle, 2004). In a crisis period it is expected that it is riskier for debt holders to lend out their money and as a consequence firms pay a higher premium for debt. Also, it is expected that Institutional investors will invest in larger firms because they have less risk on bankruptcy because of the information asymmetry. There is more information available of larger firms and therefore the true

value of the firm can be better estimated. As a result, large firms can issue equity at lower costs compared to smaller firms were the true value can only be guessed (Rajan & Zingales, 1995). In line with that investors are more reluctant in offering capital to smaller firms compared to larger firms and ask a high premium for it (Ferri & Jones, 1979). Finally, it is expected that institutional monitoring may intensify during a crisis because institutional investors have a great incentive to actively monitor their investment (Santos et al., 2014). Therefore:

Hypothesis 2: During the crisis the percentage of institutional ownership for large firms will increase and this will lead to a greater decrease in leverage.

4. Methodology

Through the years many authors have used different techniques in searching for determinants of capital structure. In this study the effect of institutional ownership as a firm-specific determinant of capital structure will be explored and to what extend this has changed in times of a crisis period. To be certain to use the correct research method this section first briefly explains research methods of previous literature. From that point the research method that will be used in this study will be explained.

4.1 Research methods

Many authors used the cross sectional ordinary least square regression (OLS) method to test the determinants of capital structure (e.g. Rajan & Zingales, 1995; Titman & Wessels, 1988; de Jong et al., 2008). The OLS method can be used to estimate the parameter of a linear regression model. OLS estimators minimize the sum of the squared errors. This can be explained as: "the difference between observed and predicted values." (Hair, Black, Babin, Anderson & Tatham, 2009). In other words: By using this method it's possible to measure if and to what extend (positive or negative) the dependent variable is influenced by the independent variables. The main advantages of the OLS method is that only by meeting on a couple assumptions a strong and reliable regression result can be achieved. These assumptions can be classified as: 1. Exogenous independent variables. 2. Homoscedastic error term. 3. Uncorrelated error term. 4. Normally distributed error term (Hair et al., 2009). Titman and Wessels (1988) also used the OLS regression method but they also lagged the independent variables one year in their regression model. By doing so are able to isolate the effects and prevent potential reverse causality. Next to that it also accounts for the independence of observations. To measure the effect of a crisis period on the firm-specific determinants Deesomsak et al. (2004) used the same method as described above but in line with Titman and Wessels (1988) they lagged the independent variables one year and calculate them as averages. Other authors who investigated the effect of a crisis period on the capital structure of firms used a fixed-effect panel regression analyses (Alves & Fransesco, 2013; Morri & Artegiani, 2015; Yanwen & Xianling, 2010; Hoang et al., 2017). The big advantage of fixed-effect analysis compared to the OLS method is that it accounts for individual heterogeneity. That is that it allows to control for variables that one cannot observe or measure like a crisis period, or difference in business practices across companies (industry/sector), or variables that change over time but not across entities (Hair

et al., 2009). The key insight is that if the unobserved variable does not change over time, then any changes in the dependent variable must be due to influences other than these fixed characteristics." (Stock and Watson, 2003, p.289-290). Although the fixed-effects model has some advantages against other statistical models it also has some limitations. For instance, the model cannot control for variables that vary over time (like income level or employment status). However, these variables can be included in the model by including dummy variables for time or space units. Unfortunately, the more dummy variables that are added to the model, the more 'noise' in the model is controlled for. This can ultimately result in a model that contains more useless information rather than useful information LaMotte (1983).

In conclusion, this study will follow the work of Rajan & Zingales (1995); Titman & Wessels (1988); de Jong et al. (2008) by using the OLS method. In the regression test the following equation will be used:

Leverage *i,t* = $\alpha + \beta 1$ (Institutional ownership i,t_{-1}) $+ \beta 2$ (Firm size i,t_{-1}) $+ \beta 3$ (Growth opportunities i,t_{-1}) $+ \beta 4$ (Profitability i,t_{-1}) $+ \beta 5$ (Tangibility i,t_{-1}) $+ \beta 6$ (Business Risk i,t_{-1}) $+ \beta 7$ (INDUSTRY i,t) $+ \varepsilon\ i,t$

In this equation ***Leverage*** is the dependent variable where *i* = entity and *t* = time. α is the unknown intercept for each entity (a scalar), β stands for the coefficients for the independent variable(s), X represents one independent variable, and ε is the error term.

4.2 Empirical test

To test the first hypothesis in line with previous literature an OLS regression analysis will be conducted on the entire dataset where institutional ownership and the main determinants (e.g. Firm size, Growth opportunities, Profitability, Tangibility, Business risk and Non-Debt Tax shields) will be tested. To isolate the effects and prevent potential reverse causality this study will follow Titman and Wessels (1988) and Deesomsak et al. (2004) by lagging the firm-specific variables one year. To provide more information this study will also test the same regression for every single

industry: Consumer Discretionary, Consumer Staples, Energy, Health Care, Industrials, Information Technology, Materials, Real Estate, Telecommunication Services, and Utilities.

While performing the analysis the absence of multicollinearity is assumed in the model, meaning that the independent variables are not too highly correlated (De Veaux, Velleman & Bock, 2008). Also, it is assumed that the variance of the error term will be constant across observations. This is called homoscedasticity (Hair et al., 2009). Before running the OLS regression analysis I will plot the residuals against the predicted values to check for heteroscedasticity. The assumptions will be further elaborated in chapter 6.2.

The second hypothesis will be tested by dividing the entire sample into a pre-crisis, a crisis and a post-crisis period. A Wald test is estimated to examine whether or not there has been a significant change in the role of the independent variables during the pre-crisis, crisis and post-crisis period. This is in line with the work of Deesomsak et al. (2004) who used the Wald statistic to test whether or not there was a significant change in the role of the (explanatory) variables due to the financial crisis of 1997. The Wald statistic for each variable is calculated by the formula described in the article of Engle, R.F. (1983):

$$\textbf{Wald statistic} = \frac{\text{Coefficient (period 1)} - \text{Coefficient (period 2)}}{\text{Standard Error of Coefficient (period 1)}}$$

The p value (significance of the test) is calculated in Excel by using the formula below, where W is the Wald statistic calculated by using the previous formula.

p-value = 2* (1 - NORMDIST (W , 0 ,1 , TRUE))),

4.2.1. Dependent variables

The dependent variable in this study will be the leverage ratio. There are many ways of measuring leverage but in line with earlier work in this study it will be measured as the firms' total debt divided by total assets (Rajan & Zingales, 1995; Alves & Fransesco, 2013; Chung & Wang, 2014). It is a broad definition of leverage but it does not include liabilities like untaxed reserves or accounts payable which could distort the results (Rajan, & Zingales, 1995).

For a robustness analysis I will also consider two other definitions of leverage in line with earlier work. The second way of measuring leverage is long term debt divided by total assets where long term debt is calculated as total debt – short term debt. Finally leverage will also be measured as total debt divided by total capital. This is probably the best representation of past financing decisions according to Rajan, & Zingales (1995). The results of the different methods will be compared and will be used in this study. Please find the table below for an overview of all the different dependent variables.

Dependent Variable	**Definition**
LEV1	Total debt / Total assets
LEV2	Long term debt / Total assets
LEV3	Total debt / Total Capital

Table 1: List of dependent variables

4.2.2. Independent variables

In this section the independent variables used in this study are elaborated. It's important to notice that all the variables are measured the same way as in previous literature.

Institutional ownership *i,t*	Measured as the percentage of total shares outstanding (with values between 0 and 100) (Chung & Wang, 2014)
Firm size *i,t*	Measured as the logarithm of net sales (Alves & Fransesco, 2013; Rajan & Zingales, 1995; Titman & Wessels, 1988)
Growth *i,t*	Measured by the difference in Total Assets in two subsequent years divided by total assets of the last year. (Titman & Wessels, 1988; Frank & Goyal, 2009)
Growth opportunities *i,t*	Measured by Tobin's Q (Deesomsak, et al., 2004)
Profitability *i,t*	Measured as EBITD divided by Total Assets (Alves & Fransesco, 2013; Deesomsak, et al., 2004; Titman & Wessels, 1988)
Tangibility *i,t*	Measured by Property, Plants, Equity (PPE) divided by Total assets (Alves & Fransesco, 2013; Rajan & Zingales, 1995)
Business Risk *i,t*	Measured by earnings volatility which is the logarithm of the standard deviation of change in earnings (EBIT) over three years. (Titman & Wessels, 1988; Chen & Jiang, 2001) *
Non-debt Tax Shields	Measured as the Annual Depreciation & Amortization divided by Total Assets (Titman & Wessels, 1988; Santos et al., 2014)

Table 2: List of independent variables

* The logarithm is used in order to control for outliers and linearity (Hair et al., 2009). The period of three years is in line with the work of Titman & wessels (1988). By using this time period it will give a proper insight in the earnings volatility of a firm.

4.2.3. Industry classification

This study will also make a breakdown in different industries based on the Global Industry Classification Standards (GIGCS) and all firms will be assigned to an industry. The GICS framework comprises 11 sectors (Consumer Discretionary, Consumer Staples, Energy, Financials, Health Care, Industrials, Information Technology, Materials, Real Estate, Telecommunication Services, and Utilities). Industries can be classed by what they produce or by the markets they operate in. Important notice is that GICS sectors are more market oriented than production oriented. For example: the distinction between consumer goods and consumer services are distinct into "Consumer Discretionary" and "Consumer Staples." Each of these can accommodate goods and services, but in this case, analysts can distinguish companies based on their expected response to changes in business cycles [3].

Code	Industry	No
10	Energy	308
15	Materials	232
20	Industrials	605
25	Consumer Discretionary	622
30	Consumer Staples	287
35	Health Care	583
40	Financials	0
45	Information technology	352
50	Telecommunication Services	33
55	Utilities	299
60	Real Estate	308
	Total	3629

Table 3: List of Industries

4.2.4. Crisis dummy variable

To test for the influence of the crisis a dummy variable is included were 1 equals a crisis period and 0 represents a period without a crisis. Also, in chapter 6.3 the sample is divided in a pre-crisis (2006-2007), a crisis (2008-2011) and a post-crisis (2012–2016).

[3] https://www.msci.com/gics

5. Data

This study will use a dataset consisting of 500 large capitalization firms in America. For a reference it will look at the Standard & Poor's 500 Index (S&P 500) which consists of firms with a market capitalization of + 6.1 billion US Dollar[4]. These firms are listed on the stock exchange in New York and together can be seen as the leading indicator of U.S. equities and a good reflection of the large-cap universe. As mentioned in chapter 2.2 the firms in the S&P 500 are heavily held by institutional investors and therefore a good dataset to use. To avoid biased results this study starts with 500 firms but will exclude financial firms because of their regulatory requirements which result in a different capital structure compared to non-financial firms (Rajan, & Zingales, 1995). Next to that this study will only select firms with at least ten years of data and eliminate all firms with unusable or missing data. Finally, this study will also check if the firms in the sample have reported a negative equity and if so they are excluded from the final sample. The reason for this is that this study will not include firms that are close to bankruptcy and therefore can bias our results. A schematic version of the sample data strategy can be found in table 3.

The data is derived from the BloomBerg terminal. It was launched in 1981, long before computers and the internet where available[5]. It enables finance professionals to access the financial markets where they can monitor, analyse real-time financial market data and place trades. The BloomBerg database is well-known to be the most trusted source when it comes to data [6].

For the sample an Excel spreadsheet with formulas is used which can be connected with BloomBerg to retrieve the (in)dependent variables which were discussed in the previous paragraph. This study will include all the 500 firms that are listed or were formally listed at the S&P 500. The investigated period will be 2005 until 2016 and can be subdivided in three periods. A pre-crisis (2006-2007), a crisis (2008-2011) and a post-crisis (2012–2016).

[4] https://www.investopedia.com/terms/s/sp500.asp
[5] http://www.BloomBerg.com/terminal
[6] https://www.bloomberg.com/distribution/products/data/

Data reduction steps	Number of firms in the sample
Starting dataset from BloomBerg (S&P 500)	500
Financial firms	*70*
Sample without financial firms	**430**
Firms with missing data points	*80*
Sample without firms with missing data points	**350**
Firms with negative equity	*20*
Number of firms in the sample	**330**
Number of years	11
Number of firms with observations	330*11=3630
Final number of firm and year observations	**3630**

Table 4: Data sample strategy

6. Empirical Results

In the following chapter the results of the OLS -and the Fixed-effects regression models will be presented and compared with each other. This chapter first starts with the descriptive statistics to provide more information about the observations and to measure for (inter)relationships between the variables.

6.1 Descriptive statistics

Descriptive statistics are used to describe the basic features of data. It helps describe, show or summarize data in a meaningful way such that outliers and or missing data points emerge and can be taken into account in further research steps. The three most common descriptive statistics are measures of: "central tendency, dispersion and association" (Hair et al., 2009). The mean and median are valid measures of tendency whereas the standard deviation is a proper measure of dispersion. The measure of association will be tested by using a Pearson correlation test between the variable. An overview of the descriptive statistics is presented in table 5.

	N	Min	Max	Mean	Median	Std. Dev
LEV1	3629	0	93.42	27.97	26.67	15.53
LEV2	3629	0	87.48	22.96	22.07	13.59
LEV3	3629	0	91.90	39.34	39.22	19.56
Institutional Ownership	3629	5.58	95.82	71.77	73.07	12.19
Growth (Tobin's Q)	3571	0.69	13.03	1.99	1.68	1.11
Profitability	3629	-105.27	57.45	12.33	11.67	8.99
Firm Size	3629	0.03	5.69	3.88	3.89	0.58
Asset Tangibility	3629	0.17	98.15	34.36	22.24	28.33
Business Risk	3629	-2.93	2.09	-0.74	-0.81	0.58
Non-Debt-Tax-Shields	3629	-1.24	26.90	3.81	3.43	2.17

Table 5: Descriptive results total sample

The N of 3629 in table 5 for LEV1 means that there are 300 firms with each 11 years of data points. When looking at table 3 you can see that the mean of the dependent variable LEV1 (Total Debt to Total Assets) is around 28 meaning that large capitalization firms are leveraged by debt by around 28%. This is line with Alves & Fransesco (2013) who also reported a mean of 28%. Chung & Wang (2014) however reported a mean of 38% which is much higher. This may be the result that this study only contains of 330 firms and Chung & Wang (2014) have incorporated almost 40,000 datapoints. This study focuses on the period 2005-2016 whereas the study of Chung & Wang 2014

has focused on the period 1985 -2002. Another study that used the same methodology for leverage was that of Grier & Zychowicz (1994). In their article they reported a mean value of 16% which is much lower compared to that of Chung & Wang (2014) and this study. The long-term debt to total assets reported in this study is as expected slightly lower with 22.96%. The mean percentage of institutional ownership is around 72% which is in line with the mean of the total S&P 500 across the years. [7]

As mentioned in the chapter 4 the firm size is measured as the log of net sales and therefore its minimum and maximum are 0.03 and 5.69 respectively. These numbers are in line with Alves & Fransesco (2013). The mean of 3.88% in this study is however different from that of them because they reported a mean value of 12%. When looking at the separate data points in firm size, Wallmart is the largest firm in the sample with net sales of 485.8 billion dollars in the year 2016. The smallest firm in the dataset is Alexion Pharmaceuticals who had a revenue of around 1 million in 2005. Profitability which is measured as the EBITD divided by total assets has a mean value of 12.33% which is in line with the mean of Alves & Fransesco (2013). Next to that the sample shows a minimum of -105% which indicates that the EBITD at that particular data point was negative. This data point belongs to the firm Chesapeake Energy Corp in the year 2015. The maximum data point of 57.45% belongs to Freeport-McMoRan Inc. The negative data points for profitability are not surprising since that there was a crisis period in the sample. Asset tangibility shows high outliers but these are all Real Estate firms such as Mid-America Apartment Communities. The mean of 34.36% is much lower than the 59% presented by Grier & Zychowicz (1994) but this might be due that the maximum in their article for the same variable is 151%.

Business risk shows a negative minimum and mean. This is due to the logarithmic transformation of the variable and therefore not strange. The mean -0.74 is in line with the study of Chen & Jiang (2001) who reported a value of -0,96. The -0,74 means that the mean standard deviation of the entire sample is equal to a standard deviation of 19%. Finally, there is the Non-Debt Tax shields were the mean is around 4 meaning that on average the depreciation/amortization expense is around 4% of total assets. This is in line with Santos et al. (2014) who reported a mean of 4.50%.

[7] http://www.spcapitaliq-corporations.com/

	N	Min	Max	Mean	Median	Std. Dev
LEV 1	660	0.00	84.27	25.97	23.87	15.99
LEV 2	660	0.00	70.89	20.21	18.49	13.09
LEV 3	660	0.00	90.34	36.58	35.71	19.64
Institutional Ownership	660	5.58	94.84	68.14	68.98	12.48
Growth (Tobin's Q)	648	0.720	10.980	2.15	1.82	1.19
Profitability	660	-42.83	57.45	13.55	12.59	8.26
Firm Size	660	0.03	5.54	3.75	3.79	0.65
Asset Tangibility	660	0.26	97.66	34.52	24.39	27.17
BusinessRisk	660	-2.37	1.37	-0.80	-0.88	0.59
Non-Debt-Tax-shields	660	0.37	16.73	3.82	3.42	2.03

Table 6: Descriptive results pre-crisis period

	N	Minimum	Maximum	Mean	Median	Std. Dev
LEV 1	1319	0.00	93.42	26.68	25.22	15.59
LEV 2	1319	0.00	79.50	21.98	21.57	13.25
LEV 3	1319	0.00	91.30	37.93	37.71	19.73
Institutional Ownership	1319	7.11	94.24	71.05	72.82	12.13
Growth (Tobin's Q)	1298	0.73	9.18	1.86	1.56	0.98
Profitability	1319	-64.07	51.04	12.31	11.80	8.92
Firm Size	1319	1.86	5.63	3.85	3.86	0.59
Asset Tangibility	1319	0.17	96.97	34.81	23.43	28.00
BusinessRisk	1319	-2.53	1.62	-0.73	-0.77	0.56
Non-Debt-Tax-shields	1319	-1.24	26.90	3.88	3.47	2.31

Table 7: Descriptive results crisis period

	N	Minimum	Maximum	Mean	Median	Std. Dev
LEV 1	1649	0.00	87.63	30.41	29.56	14.81
LEV 2	1649	0.00	87.48	25.52	24.46	13.61
LEV 3	1649	0.00	91.90	42.29	42.95	18.76
Institutional Ownership	1650	14.34	95.82	73.81	74.74	11.72
Growth (Tobin's Q)	1625	0.69	13.03	2.05	1.71	1.15
Profitability	1650	-105.27	48.71	11.86	11.25	9.29
Firm Size	1650	2.52	5.69	3.96	3.96	0.54
Asset Tangibility	1650	0.54	98.15	33.93	20.37	29.04
BusinessRisk	1650	-2.93	2.09	-0.73	-0.80	0.60
Non-Debt-Tax-shields	1650	0.26	19.23	3.77	3.37	2.11

Table 8: Descriptive results post-crisis period

To give more insight in the sample there are descriptive results for the three periods (Table 6 t/m 8). The first thing that comes to notice is that the mean percentage of institutional ownership is growing over time and especially during the post-crisis period. This could still be an after-effect of the crisis, so that institutional investors still put their invested money in large firms. Another explanation could be that pension funds, which are a large portion of the institutional investors, invest their money more often passively through index-trackers. These index-trackers mostly follow a broad index such as the S&P index.

For all the three different measures of leverage the same uptrend can be seen. This means that over time the large firms are more leveraged. Following the agency cost theory by Jensen and Meckling (1976) that more debt comes with more monitoring from outside investors. Looking at the other variables there is also a remarkable result at the mean profitability over the different. time periods. One would expect that profitability would rise again in the post-crisis period.

6.2 Assumptions

The S&P 500 consists of the 500 largest firms listed in the United States. Out of these firms, the financial institutions and utilities were excluded. Also, firms with missing values (data points) were excluded in further research. A multiple regression analysis with an expected effect size of .80 and a significance level of 5% requires a minimum sample of 50 and preferably 100 observations for most research situations. According to Cohen (1992) who investigated the power analysis the minimum ratio of observations to variables should be 5 to 1, but the preferred ratio is 15/20 to 1. In this study 1 dependent and 7 dependent variables are being used so therefore a minimum of 160 observations is needed. The total sample in this study consists of 330 firms and therefore meets the power analysis of Cohen (1992). This is an important step because maximizing the degree of freedom improves generalizability and addresses both model parsimony and sample size concerns. In the following paragraphs the assumptions for these models are tested.

6.2.1. Regression model assumptions

Before conducting a regression analysis several assumptions are made. Before we can run the tests, several assumptions are made. First, there needs to be a linear relationship between the independent and dependent variables. Next to that it is important to check whether or not there are outliers in the data because linear regression is sensitive to outlier effects. The first descriptive statistics, histograms, scatterplots showed that there is a linear relationship between the variables but showed also some outliers and therefore this study is winsorizing its data. This process can be best described as replacing a specified number of extreme values (outliers) with a smaller data value (Hair et al., 2009). Furthermore, the Cook's D statistic test was used on the data. Cook's D is a good way of identifying observations that have a high influence on the parameter estimates. If the predictions are the same with or without the observation in question (outlier), then the observation has no influence on the regression model and can be included. A general rule of thumb is that an observation with a value of Cook's D statistic over 1.0 has too much influence. As with all rules of thumb, this rule should be applied judiciously and not thoughtlessly. The Cook's D in this study is 0.059 and has therefore no influence on the data. The second assumption is the normality of the residuals distribution and is tested by using scatterplots and histograms. In line with this assumption all the variables are normally distributed. The third assumption assumes that there is little or no multicollinearity in the data. By using a pearson correlation statistic between the independent variables: "institutional ownership, firm size, profitability, growth opportunities, business risk, tangibility, non-debt tax shields and the dependent variables" it is possible to determine whether a statistical association exists between two variables. The results of this test can be seen in table 9.

We do not find correlations between the explanatory variable: institutional ownership and any of the dependent variables of leverage. Correlations are found between Asset tangibility and Leverage indicating that firms with high percentage of PPE have higher leverage levels. The same hold for profitability and growth opportunities (Tobin's Q) in relation with all leverage levels. Next to that there is a negative correlation between firm size and LEV1. There is also a negative relationship between profitability and business risk indicating that the lower the risk taken the lower the profitability will be. Next that there is a strong positive relation between asset tangibility and non-debt tax shields. This is not surprisingly because asset tangibility is measured as PPE divided by total assets and non-debt tax shields is being measured as depreciation divided by total

assets. Finally, there is also a positive correlation between Growth Opportunities (Tobin's Q) and profitability indicating that profits result in more investment opportunities. To summarize, we find some correlations between the variables but not enough to perform a factor analysis.

In addition to the pearson correlation test this study also checks the Variance Inflation Factor (VIF). With VIF > 10 there is an indication that multicollinearity may be present. The VIF factor is always around 1 indicating that there is no multicollinearity among the variables. The last assumption of the linear regression analysis is to be certain of homoscedasticity of the data. This means that the variance around the regression line is the same for all values of the dependent variables. This final assumption is checked by using scatterplots.

	LEV1	LEV2	LEV3	Inst. Ownership	Tobin's Q	Profitability	Firm Size	Asset Tangibility	Business Risk	Non-Debt Tax Shields
LEV1	1									
LEV2	.835**	1								
LEV3	.808**	.722**	1							
Inst. Ownership	-.075**	-.037*	-.074**	1						
Tobin's Q	-.210**	-.213**	-.253**	.067**	1					
Profitability	-.218**	-.196**	-.208**	-0.001	.357**	1				
Firm Size	-.211**	-.056**	0.003	-.046**	-.186**	.147**	1			
Asset Tangibility	.365**	.199**	.254**	-.151**	-.238**	-.144**	-.190**	1		
Business Risk	-.071**	0.003	-.084**	.038*	-.075**	-.309**	-.066**	0.006	1	
Non-Debt Tax Shields	0.013	.061**	-.044**	-.065**	-0.013	0.023	0.008	.405**	.181**	1

Table 9: Pearson Correlation Test

*, **, and *** denote significance at respectively the 10%, 5% and 1% level

6.3 Regression Results

6.3.1: OLS regression analysis on total sample

In table 10 the regression results with and without the explanatory variable: "Institutional Ownership" are presented. There are no major results in terms of t-statistic, standard error and coefficient with or without the variable: "institutional ownership." when looking at the regression analysis in relation to LEV1 there is a negative coefficient and it is significant at an alpha of 5%. The negative result of 0.037 in relation to LEV1 means that when institutional ownership increases with one unit, leverage decreases with 0.037. This means that more institutional ownership results in less leverage. These results are in line and consistent with the argument that large shareholders are more risk averse and hence borrow less than other firms (Santos, et al., 2014). Another explanation could be that institutional investment works as a substitute regarding monitoring by debt which mitigates the adverse selection cost of equity making equity more attractive than debt resulting in a lower leverage (Jensen and Meckling 1976; Grier and Zychowicz,1994).

The firm-specific control variables in relation to LEV1 all have significant impact at an alpha of 1%. Their relation however shows some mixed results. Asset Tangibility and Non-Debt tax shields show positive and significant results whereas the other firm specific control variables all have negative and significant coefficients meaning that the more of that particular variable leads to a decrease in leverage. The variable firm size shows the highest and negative coefficient in relation to debt meaning that the bigger the firm the lower the leverage is. Another remarkable result is that non-debt tax shields shows a minimal positive and significant coefficient in relation to LEV1 whereas Deesomsak, et al., (2004) and DeAngelo and Masulis (1980). Found a negative relationship. According to the authors the negative coefficients indicates that the higher the non-debt tax shields which consists of depreciation and amortization the lower the leverage is within a firm. When looking at the industry control variables we see that firms in the Energy sector have a significant negative relation with leverage whereas firms in the Real Estate have a significant positive relation with leverage.

Another important coefficient in table 10 is the adjusted R^2. It is the percentage of the dependent variable variation that a linear model explains. It is also called the coefficient of determination and it reflects the goodness of fit of the regression model (Hair et al., 2009). According to table 10 the R-squared for regression model LEV1 is near 0.308 meaning that 30.8% of the variance of leverage is explained by the model and 69.2% is unexplained.

As a robustness test this study also performed several regression analyses but with different dependent variables. Comparing the results of LEV2 with LEV1 we find that for LEV 1 the coefficient of Institutional ownership is negative whereas it is in relation to LEV2 positive. However, the positive relation with LEV2 is not significant. This is also the case for the relation between institutional ownership and LEV3. Comparing the firm-specific variables of LEV2 and LEV3 with LEV1 we find that firm size is positive but negative in relation to LEV1 and 2. Next to that, almost all the firm-specific variables are significant at a significance level of 1%. Only Business Risk in relation to LEV2 and Non-Debt-Tax Shields in relation to LEV3 are not significant.

	LEV 1		LEV 2		LEV 3	
Inst. Ownership		-0.037**		0.021		-0.016
t - statistic		-1.987		1.158		-0.652
Growth (Tobin's Q)	-1.394***	-1.389***	-.648***	-1.651***	-1.548***	-1.546***
t - statistic	-6.046	-6.025	-7.263	-7.277	-5.058	-5.05
Profitability	-0.222***	-0.223***	-0.213***	-0.212***	-0.403***	-0.404***
t - statistic	-7.615	-7.67	-7.423	-7.389	-10.436	-10.449
Firm Size	-1.827***	-1.838***	-1.680***	-1.674***	2.798***	2.793***
t - statistic	-4.124	-4.151	-3.856	-3.841	4.759	4.75
Asset Tangibility	0.177***	0.072***	0.044***	0.045***	0.051***	0.051***
t - statistic	5.296	5.211	3.261	3.306	2.786	2.756
Business Risk	-1.205***	-1.196***	-0.415	-0.420	-1.990***	-1.986***
t - statistic	-2.926	-2.905	-1.023	-1.036	-3.64	-3.632
Non-debt Tax Shields	0.251**	0.246*	0.443***	0.445***	0.006	0.005
t - statistic	1.976	1.942	3.547	3.567	0.039	0.027
Energy	-13.595***	-13.189***	-12.107***	-12.339***	-18.135***	-17.958***
t - statistic	-5.415	2.518	-4.901	-4.979	-5.441	-5.37
Materials	-2.146	-1.533	-2.693	-3.044	-1.285	-1.017
t - statistic	-0.845	2.557	-1.078	-1.209	-0.381	-0.300
Consumer Discretionary	-4.499**	-4.140***	-3.953*	-4.159*	-8.335***	-8.179**
t - statistic	-1.836	2.456	-1.64	-1.721	-2.562	-2.507
Consumer Staples	-0.067	0.304	-2.593	-2.806	-2.111	-1.949
t - statistic	-0.027	2.523	-1.047	-1.130	-0.632	-0.582
Health Care	-7.330***	-6.844***	-7.498***	-7.777***	-12.670***	-12.459***
t - statistic	-2.951	2.495	-3.068	-3.167	-3.843	-3.76
Information Technology	-8.573***	-8.182***	-9.144***	-9.368***	-13.576***	-13.405***
t - statistic	-3.432	2.505	-3.72	-3.800	-4.094	-4.03
Utilities	-0.424	-0.299	-0.702	-0.774	4.919	4.973
t - statistic	-0.165	2.572	-0.277	-0.306	1.441	1.456
Real Estate	12.636***	13.076***	-6.141**	-6.393***	5.406	5.598
t - statistic	4.701	2.696	-2.322	-2.409	1.515	1.563
Industrials	-5.707**	-5.188**	-6.674***	-6.972***	-8.065**	-7.839**
t - statistic	-2.324	2.468	-2.763	-2.87	-2.474	-2.391
N	3.569	3.569	3.569	3.569	3.569	3.569
Adjusted R^2	0.308	0.309	0.128	0.1.28	0.233	0.233

Table 10: The Ordinary Least Squares regression

This table presents the results from the different OLS regression analysis with and without the variable: Institutional Ownership . *, **, and *** denote significance at respectively the 10%, 5% and 1% level.

6.3.2: OLS regression analysis on different industries

To provide more information this study will also test the same regression for every single industry: Consumer Discretionary, Consumer Staples, Energy, Health Care, Industrials, Information Technology, Materials, Real Estate, Telecommunication Services, and Utilities. These results are presented in table 11 & 12. Previous studies showed that the leverage can be influenced by industry specific factors and that firms in the retail and food/non-food have a significantly higher leverage ratio compared to firms in the manufacturing industries (Degryse, Goeij & Kappert, (2012). According to the authors the retail industry is extremely competitive and this could be the reason why firms in this industry tend to have higher leverage ratios.

When looking at table 11 &12 the explanatory variable: institutional ownership is negative and significant in relation to LEV1 and LEV3 for the industries: Industrials and information technology and therefore we can conclude that with firms in these industries that more institutional ownership results in less leverage. However, the opposite is true for several other industries, because the coefficient is positive and significant in relation to all the leverage models for the industries: energy, materials and health care. It is also positive and significant in relation to LEV2 for the industry: Real Estate.

Important to keep in mind is that the adjusted R^2 for the industries: utilities and Health care are between 0.03 and 0.09 (3% - 9%) indicating that the goodness of fit of the model is not high. The other industries show an adjusted R^2 of around 20% which is in line with the total sample.

	Energy			Materials			Industrials			Consumer Discretionary			Consumer Staples		
	LEV1	LEV2	LEV 3	LEV1	LEV2	LEV3	LEV1	LEV2	LEV3	LEV1	LEV2	LEV3	LEV1	LEV2	LEV3
Institutional Ownership	0.130**	0.124**	0.157**	0.177***	0.102	0.256***	-0.240***	-0.074	-0.286***	0.006	-0.020	0.040	0.037	0.125*	-0.082
t - statistic	2.525	2.554	2.282	2.703	1.549	2.713	-4.271	-1.573	-3.662***	0.144	-0.475	0.734	0.469	1.845	-0.647
Growth (Tobin's Q)	0.626	-0.124	1.134	-0.926	-1.763	-2.270	-1.978**	-2.498***	-0.359	-0.164	-0.198	-0.175	1.647*	0.402	2.121
t - statistic	0.616	-0.130	0.837	-0.713	-1.354	-1.215	-2.045	-3.073	-0.267	-0.291	-0.362	-0.241	1.638	0.464	1.308
Profitability	-0.399**	-0.383***	-0.534***	-0.239**	-0.228**	-0.327**	-0.568***	-0.498***	-0.939***	-0.334***	-0.300***	-0.691***	0.293**	0.312**	0.546**
t - statistic	-7.9	-8.076	-7.931	-2.557	-2.436	-2.439	-4.143	-4.329	-4.934***	-3.763	-3.478	-6.057	1.998	2.463	2.306
Firm Size	-1.915*	-2.447**	-2.488*	1.181	2.025	7.913**	-0.095	-1.988**	8.841***	0.146	0.810	7.153***	-3.301**	-2.788**	-1.861
t - statistic	-1.884	-2.559	-1.835	0.558	0.956	2.604	-0.082	-2.034	5.468***	0.099	0.568	3.786	-2.065	-2.023	-0.722
Asset Tangibility	0.150***	0.137***	0.185***	0.083	0.150***	-0.068	-0.066***	-0.033	0.033	0.291***	0.287***	0.141***	0.085	0.055	0.088
t - statistic	4.274	4.153	3.947	1.485	2.69	-0.854	-2.628	-1.541	0.947	9.413	9.558	3.556	0.881	0.664	0.566
Business Risk	-1.605	-0.632	-2.655	-4.775***	-2.865**	-8.618***	-2.914***	-3.093***	-3.112**	0.031	0.324	-1.350	4.569***	4.921***	5.492***
t - statistic	-1.226	-0.513	-1.520	-3.791	-2.271	-4.762	-2.797	-3.533	-2.15**	0.029	0.312	-0.983	3.436	4.292	2.56
Non-debt Tax Shields	-0.865***	-0.676***	-1.364***	-0.760	-1.392**	-0.458	2.920***	2.755***	1.614***	-2.389***	-2.542***	-1.291**	0.293	0.357	0.910
t - statistic	-4.008	-3.332	-4.738	-1.171	-2.141	-0.491	8.084	9.078	3.216	-6.028	-6.611	-2.533	0.331	0.469	0.638
N	296			230			604			614			285		
Adjusted R^2	0.320	0.358	0.304	0.107	0.095	0.157	0.179	0.207	0.164	0.193	0.205	0.161	0.087	0.097	0.069

Table 11: OLS regression analysis per industry group

	Health Care			Information Technology			Telecom Services			Utilities			Real Estate		
	LEV1	LEV2	LEV 3	LEV1	LEV2	LEV3	LEV1	LEV2	LEV3	LEV1	LEV2	LEV3	LEV1	LEV2	LEV3
Institutional Ownership	0.126***	0.115***	0.192***	-0.098*	-0.060	-0.143*	0.185	0.187	0.341	-0.019	-0.018	0.099**	-0.080	0.347***	-0.072
t - statistic	2.721	2.634	3.494	-1.64	-1.023	-1.551	1.035	0.960	0.948	-0.520	-0.508	2.352	-1.097	3.553	-0.885
Growth (Tobin's Q)	-0.981**	-1.344**	-1.467***	-3.185***	-2.678***	-4.052***	-1.411	-5.233	2.849	6.662**	4.300	7.759**	-10.39***	-11.81***	-10.18***
t - statistic	-2.503	-3.623	-3.15	-4.94	-4.268	-4.086	-0.151	-0.515	0.151	2.045	1.427	2.121	-4.918	-4.167	-4.328
Profitability	0.024	-0.031	-0.181**	-0.138*	-0.120	-0.271**	0.643*	0.728*	1.730**	-0.547***	-0.635***	-0.361	-0.323	-0.398	-0.434
t - statistic	0.392	-0.540	-2.529	-1.672	-1.498	-2.135	1.958	2.042	2.62	-2.579	-3.237	-1.514	-0.745	-0.684	-0.899
Firm Size	-2.571***	-2.038**	2.614**	-3.499***	-3.066**	-0.541	-3.800	-3.727	2.875	1.165	1.428	3.362	-4.082*	-7.932***	-5.853**
t - statistic	-2.699	-2.26	2.31	-2.585	-2.327	-0.260	-1.236	-1.116	0.465	0.588	0.779	1.510	-1.824	-2.641	-2.348
Asset Tangibility	-0.024	0.017	0.005	-0.340**	-0.319***	-0.454***	-0.600	-0.616	-1.049	-0.102**	-0.099**	-0.170***	-0.007	-0.385***	-0.187***
t - statistic	-0.339	0.257	0.063	-3.603	-3.48	-3.13	-1.398	-1.320	-1.215	-2.004	-2.109	-2.98	-0.125	-5.123	-3.002
Business Risk	-1.414	-0.736	-1.334	-2.146*	-2.637**	-5.479***	6.871**	7.385**	12.477**	1.683*	1.679*	0.990	-7.269***	-4.364*	-7.563***
t - statistic	-1.381	-0.759	-1.096	-1.62	-2.046	-2.69	2.331	2.307	2.104	1.776	1.916	0.930	-4.068	-1.82	-3.801
Non-debt Tax Shields	1.066**	0.541	-0.099	1.682***	1.721***	1.884***	1.329	0.985	0.977	-1.386**	-1.120**	-0.408	2.179***	5.636***	3.607***
t - statistic	2.514	1.349	-0.197	4.499	4.729	3.275	1.119	0.763	0.409	-2.571	-2.247	-0.673	2.947	5.68	4.38
N	559			351			29			296			296		
Adjusted R^2	0.033	0.031	0.080	0.152	0.132	0.124	0.557	0.525	0.429	0.062	0.076	0.071	0.134	0.207	0.124

Table 12: OLS regression analysis per industry group (continued)

6.3.3: OLS regression analysis on separate time periods.

To give more insight in the different time periods there is also a regression analysis conducted for each of the periods: pre-crisis, crisis and post-crisis. The results are presented in table 13. In line with the regression analysis on the total sample the result on institutional ownership in relation with LEV1 during a crisis period is negative and significant at an alpha of 5%. This is however, also the case for the pre-crisis and post crisis period. A Wald test is used to examine whether or not the influence of institutional ownership is significant different between the crisis and the pre-crisis period but also between the post-crisis and crisis period. As can be seen in Table 13 the Wald test is insignificant for both periods and thus one can conclude that there are no changes in relation between Institutional ownership and LEV1 during the pre/post -and the crisis period. As a robustness test this study performed the same Wald test on the relation between institutional ownership and LEV2 and LEV3. The same results in terms of a negative coefficient are presented for the different periods. Next to that the Wald test between these periods is not significant and therefore no change in relation between institutional ownership and LEV2/LEV3 in terms of a crisis period.

When looking at the control variables we find some mixed results. Most of the control variables are significant and in line with the total sample. However Non-debt tax shields have a negative and significant relation with LEV1 in the pre-crisis period but a positive and significant relation in the post-crisis period. Also, the Wald test show a significant result indicating that there are significant changes in relation between non-debt tax shields and LEV1 in terms of a crisis Vs. a pre/post-crisis period. Next to that firm size is during the pre-crisis period negatively and significant related to LEV3 but during a crisis and post-crisis period the relation is positive and significant related to LEV3. This study also performed a Wald test for this relation and we can conclude that there are significant changes in relation between Firm size and LEV3 between a crisis and a pre/post-crisis period.

	Pre-Crisis	Crisis	Post Crisis	Pre-Crisis	Crisis	Post Crisis	Pre-Crisis	Crisis	Post Crisis
Institutional Ownership	-0.079**	-0.07**	-0.066**	-0.035	-0.009	-0.005	-0.035	-0.051	-0.052
t-statistic	-1.978	-2.366	-2.267	-0.899	-0.312	-0.189	-0.648	-1.251	-1.380
Wald-test		0.320	0.143		0.903	0.122		-0.386	-0.038
Growth (Tobin's Q)	-2.097***	-2.562***	-1.022***	-2.5***	-2.799***	-1.223***	-2.553***	-2.554***	-1.166***
t-statistic	-4.182	-6.260	-3.084	-5.138	-7.021	-3.700	-3.760	-4.537	-2.691
Wald-test		-1.135	4.644***		-0.750	4.767***		-0.002	3.203***
Profitability	-0.146**	-0.206***	-0.178***	-0.158**	-0.187***	-0.167***	-0.314***	-0.381***	-0.368***
t-statistic	-2.009	-4.534	-4.006	-2.240	-4.221	-3.778	-3.189	-6.106	-6.329
Wald-test		-1.321	0.626		-0.654	0.434		-1.086	0.234
Firm Size	-4.069***	-2.357***	-2.718***	-3.62***	-2.385***	-2.422***	-1.726***	1.83**	3.762***
t-statistic	-4.347	-3.402	-3.751	-3.987	-3.536	-3.353	-1.362	1.921	3.973
Wald-test		2.472**	-0.498		1.831*	-0.051		3.733***	2.040**
Asset Tangibility	0.104***	0.118***	0.018	0.063**	0.095***	-0.009	0.087**	0.147***	-0.05*
t-statistic	3.312	5.497	0.842	2.082	4.552	-0.428	2.046	4.994	-1.822
Wald-test		0.632	-4.759		1.506	-4.959		2.036**	-7.176
Business Risk	-2.434***	-2.019***	-0.623	-0.666	-0.948	-0.449	-2.915**	-2.302**	-1.986**
t-statistic	-2.726	-2.999	-1.013	-0.769	-1.445	-0.732	-2.412	-2.486	-2.470
Wald-test		0.616	2.269**		-0.430	0.814		0.662	0.393
Non-debt Tax Shields	-0.516*	0.068	0.866***	-0.180	0.233	1.077***	-0.335	-0.669***	1.037***
t-statistic	-1.743	0.375	4.128	-0.627	1.312	5.149	-0.836	-2.671	3.781
Wald-test		3.207***	3.802***		2.326***	4.035***		-1.334	6.221***
Energy	-10.649*	-11.551***	-13.649***	-9.719	-11.184***	-12.467***	-9.71***	-14.64***	-19.956***
t-statistic	-1.691	-2.939	-3.721	-1.591	-2.922	-3.409	-1.139	-2.708	-4.162
Wald-test		-0.230	-0.572		-0.383	-0.351		-0.912	-1.109
Materials	-2.544	0.495	-0.114	-4.692	-1.298	-1.187	0.217	2.727	0.435
t-statistic	-0.402	0.124	-0.030	-0.764	-0.334	-0.318	0.025	0.497	0.089
Wald-test		0.762	-0.162		0.874	0.030		0.458	-0.468
Consumer Discretionary	-4.237	-2.029	-3.462	-3.401	-2.620	-3.519	-3.687	-3.889	-8.82*
t-statistic	-0.688	-0.531	-0.967	-0.569	-0.704	-0.986	-0.442	-0.740	-1.886
Wald-test		0.578	-0.400		0.210	-0.252		-0.038	-1.054
Consumer Staples	0.774	2.190	1.346	-2.001	-0.213	-2.537	3.845	2.934	-3.237
t-statistic	0.123	0.558	0.366	-0.328	-0.056	-0.692	0.452	0.543	-0.673
Wald-test		0.361	-0.230		0.468	-0.633		-0.169	-1.283
Health Care	-5.497	-4.421	-6.344*	-5.644	-5.600	-7.55**	-6.181	-7.836	-13.633***
t-statistic	-0.883	-1.138	-1.746	-0.935	-1.480	-2.084	-0.734	-1.466	-2.870
Wald-test		0.277	-0.529		0.012	-0.538		-0.310	-1.220
Information Technology	-6.493***	-5.665***	-8.045**	-7.161	-7.276*	-9.368***	-9.996	-7.763	-14.333***
t-statistic	-1.036	-1.448	-2.208	-1.178	-1.910	-2.579	-1.178	-1.443	-3.010
Wald-test		0.211	-0.653		-0.030	-0.576		0.415	-1.380
Utilities	1.991	1.140	-0.066	1.644	0.468	-0.620	12.437	7.119	5.363
t-statistic	0.315	0.287	-0.017	0.269	0.121	-0.163	1.456	1.301	1.076
Wald-test		-0.214	-0.317		-0.304	-0.286		-0.971	-0.353
Real Estate	16.157***	15.089***	10.843***	-3.109	-4.655	-8.5**	11.139	6.728	5.804
t-statistic	2.472	3.610	2.711	-0.490	-1.144	-2.132	1.259	1.170	1.110
Wald-test		-0.256	-1.062		-0.380	-0.965		-0.767	-0.177
Industrials	-2.738	-1.610	-6.243*	-4.585	-3.589	-7.985**	-0.816	-2.822	-9.515**
t-statistic	-0.444	-0.419	-1.734	-0.767	-0.959	-2.225	-0.098	-0.534	-2.022
Wald-test		0.293	-1.287		0.266	-1.225		-0.379	-1.422
N	647	1.297	1.623	647	1.297	1.623	647	1.297	1.623
Adjusted R2	0.434	0.397	0.230	0.203	0.206	0.090	0.317	0.288	0.185

Table 13: The Ordinary Least Squares regression divided in three periods.

This table presents the results from the different OLS regressions divided in three periods: "pre-crisis, crisis and post-crisis period. A Wald test is used to determine whether or not the influence of the independent variables differ significantly between the pre-crisis, crisis and post-crisis period. *, **, and *** denote significance at respectively the 10%, 5% and 1% level.

7. Conclusion

Previous literature has showed that there are many firm-specific determinants that can positively or negatively influence the capital structure decision. This study has examined the effect of institutional ownership on the capital structure of American large capitalization firms and whether or not this has changed because of the crisis. The study is executed by using an ordinary least squares (OLS) regression model on the entire dataset consisting of 330 firms. We find a negative and significant relation between institutional ownership and leverage (measured as the firms' debt divided by total assets) meaning that when institutional ownership increases with one unit, leverage decreases between 0.037. This means that more institutional ownership results in less leverage. These results are in line and consistent with the argument that firms with a high percentage of institutional shareholders are more risk averse and hence borrow less than other firms (Santos, et al., 2014). Another explanation could be that institutional investment works as a substitute regarding monitoring by debt which mitigates the adverse selection cost of equity making equity more attractive than debt resulting in a lower leverage (Jensen and Meckling 1976; Grier and Zychowicz, 1994). For a robustness test this study also performed an OLS regression model but with two other definitions of leverage. Unfortunately, this study does not find a significant relationship between institutional ownership and these other definitions of leverage.

To give answer to the second hypothesis whether or not the effect of institutional ownership during a crisis will lead to a greater decrease in leverage the sample is divided in three periods: a pre-crisis period (2006-2007), a crisis period (2008 -2011) and a post crisis period (2012 -2016). Looking at the descriptive results. They show that the percentage of institutional ownership is rising over time. This could still be an after-effect of the crisis, so that institutional investors still putting their invested money in large firms. Another explanation could be that pension funds, which are a large portion of the institutional investors, invest their money more often passively through index-trackers. These index-trackers mostly follow a broad index such as the S&P index consisting of the 500 largest firms in the US. Another remarkable result which is that the percentage of leverage is also rising over the years. As concluded above one would expect that with the rise of institutional ownership the leverage would decrease. To explain this further this study also performed the same OLS regression on the different time periods. The regression results for the different time periods were the same as the total sample and therefore more institutional ownership results in less leverage.

To examine whether or not the influence of institutional ownership is significant different between the crisis and the pre- and the post-crisis period a Wald test is used. Unfortunately, the Wald test is insignificant between the periods and therefore one cannot conclude that the relation between institutional ownership and LEV1 is significant different in a crisis period. As a robustness test this study performed the same Wald test on the relation between institutional ownership and the two other definitions of leverage. Also, there were no significant relations measured between the two periods.

8. Limitations and future research

The sample with the entire S&P 500 firms was large enough but due to the fact that there were many firms that did not have data over the entire period (11 years) and there were also many financial firms in the sample decreased to 330 firms. For further research it is interesting to use a larger dataset. Also, this research only focused on the American large capitalization firms and for future research it would be interesting to perform the same study but then focusing on European or Asian large capitalization firms or combine it with small and midcap funds.

Also, the regression analysis performed based on LEV2, which is based on long term debt divided by total assets showed some different results from that of LEV1, which is total debt divided by total assets. Lastly, the adjusted R^2 in the regression analysis were low indicating that only a small portion of variance of leverage is explained by the model. For future research it would be wise to include more, or other independent variables that explain the variation better.

Literature

Articles used:

Admati, A. R. & Pfleiderer, P. (2009), "The "Wall Street Walk" and Shareholder Activism: Exit as a Form of Voice", *The Review of Financial Studies*, Vol. 22, no. 7. pp. 2445-2485

Alves, P., & Francisco, P. (2015). "The impact of institutional environment on the capital structure of firms during recent financial crises," *The Quarterly Review of Economics and Finance, Elsevier,* Vol. 57, pp. 129-146.

Alti A. (2006). How Persistent Is the Impact of Market Timing on Capital Structure?. *The Journal of Finance.* Vol. 61. pp. 1681 - 1710.

Antoniou, A., Guney, Y. & Paudyal, K. (2008), The Determinants of Capital Structure: Capital Market-Oriented versus Bank-Oriented Institutions. *Journal of Financial and Quantitative Analysis,* Vol. 43, pp. 59–92

Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *The journal of finance*, Vol. 57, pp. 1-32.

Booth, L., Aivazian, V., Demirgüç-Kunt, A., & Maksimovic, V. (2001). Capital structures in developing countries. *Journal of Finance,* Vol. 56, pp. 87-130.

Celik, S. & Isaksson M. (2013), "Institutional Investors as Owners: Who are they and what do they do?", *OECD Journal: Financial Market Trends*, Vol. 11 pp. 1-35

Chen, L. H., & Jiang, G. J. (2001). The determinants of Dutch capital structure choice. Research Report 01E55, University of Groningen, *Research Institute SOM (Systems, Organizations and Management).*

Chen, R., Milesi-Ferretti,.G., Tressel, T., (2013), External imbalances in the Eurozone. *Economic Policy, Vol. 28,* pp. 101-142.

Chung, K.H. & Zhang, H. (2011), "Corporate Governance and Institutional Ownership", *Journal of Financial and Quantitative Analysis,* Vol. 46, pp. 247-273.

Claessens, S., Dell'Ariccia, G., Igan, D., & Laeven, L. (2013). A cross-country perspective on the causes of the global financial crisis. *Elsevier / Academic Press* pp.737-752.

Coffee, J. & C. (1991), Liquidity versus control: the institutional investor as corporate monitor. *Columbia Law Review,* Vol. 91, pp. 1277–1368.

Cohen, J. (1992), Statistical Power Analysis. *Current Directions in Psychological Science,* Vol. 1, pp. 98-101.

Cornett, M.M., Marcus, A.J., Saunders, A., & Tehranian, H., (2007), The impact of institutional ownership on corporate operating performance. *Journal of Banking and Finance*, Vol. 31, pp. 1771-1794

Deesomsak, R., Paudyal, K., & Pescetto, G. (2004). The determinants of capital structure: evidence from the Asia Pacific region. *Journal of multinational financial management*, Vol. 14, pp. 387-405.

DeAngelo, H., & Masulis, R. W. (1980). Optimal capital structure under corporate and personal taxation. *Journal of financial Economics*, Vol. 8 pp. 3-29.

Duchin, R., O. Ozbas, & B.A. Sensoy, (2010), "Costly External Finance, Corporate Investment, and the Subprime Mortgage Credit Crisis," *Journal of Financial Economics* Vol. 97, pp. 418-435.

Engle, R.F. (1983), "Wald, Likelihood Ratio, and Lagrange Multiplier Tests in Econometrics". In Intriligator, M. D.; Griliches, Z. *Handbook of Econometrics. II. Elsevier*. pp. 796–801

Fama, E. F., & French, K. R. (1992), The cross-section of expected stock returns. *Journal of Finance*, Vol. 47, pp. 427–465

Fama E, & Jensen M (1983). Separation of ownership and control. *Journal of Law and Economics,* Vol. 26, pp.1-32

Fama, E. F. & French, K. R., 2002. Testing Trade-Off and Pecking Order Predictions about Dividends and Debt. *The Review of Financial Studies,* Vol 15, pp. 1-33.

Fan, J. P., Titman, S., & Twite, G. (2012). An international comparison of capital structure and debt maturity choices. *Journal of Financial and Quantitative Analysis,* Vol. 47, pp. 23-56.

Ferri, M.G., & Jones, W.H. (1979), Determinants of Financial Structure: a New Methodological Approach. *The Journal of Finance*, Vol. 34 pp. 631-644.

Flannery, M. J., & K. P. Rangan (2006), "Partial Adjustment toward Target Capital Structures." *Journal of Financial Economics*, Vol. 79, pp. 469–506.

Frank, M. Z., & Goyal, V. K. (2005). Trade-off and pecking order theories of debt. *Handbook of empirical corporate finance*, Vol. 2, pp. 135-202.

Frank, M. Z., & Goyal, V. K. (2009), Capital structure decisions: Which factors are reliably important? *Financial Management,* Vol. 38, pp. 1–37.

Grier, P. & Zychowicz, E. J. (1994), "Institutional Ivestors, Corporate Discilpine, and the Role of Debt", *Journal of Economics and Business,* Vol. 46, pp. 1-11.

Harford, J., Klasa, S., & Walcott, N. (2009), Do firms have leverage targets? Evidence from acquisitions. *Journal of Financial Economics,* Vol. 93, pp. 1–14.

Harris, M., & Raviv, A. (1991). The theory of capital structure. *The Journal of Finance*, Vol. 46, pp. 297-355.

Ivashina, V., & Scharfstein, D. (2010), Bank lending during the financial crisis of 2008, *Journal of Financial Economics,* Vol. 97, pp. 319-338.

Jensen M.C., & Meckling W.H. (1976), Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics,* Vol. 3, pp. 305-360.

Jensen, M., (1986), Agency costs of free cash flow, corporate finance and takeovers, *American Economic Review,* Vol. 76, pp. 323-339.

Jong, de A., Kabir, & R., Nguyen, T.T. (2008), Capital structure around the world: The roles of firm- and country-specific determinants, *Journal of Banking and Finance,* Vol. 32, pp. 1954 -1969.

Kayhan, A., & Titman, S. (2007), Firms' histories and their capital structures. *Journal of Financial Economics,* Vol. 83, pp. 1–32.

Kenc, T., Dibooglu, S. (2010), The 2007-2009 Financial Crisis, Global Imbalances and Capital Flows: Implications for Reform. *Journal of Economic Systems,* Vol. 34, pp. 3- 21

Kim, E., (1978), A mean-variance theory of optimal capital structure and corporate debt capacity. *Journal of Finance* Vol. 33, pp. 45-63.

Kim, W. S., & Sorensen, E. H. (1986). Evidence on the impact of the agency costs of debt on corporate debt policy. *Journal of Financial and quantitative analysis*, Vol. 21, pp. 131-144.

Kraus A. & Litzenberger R.H. (1973), "A State-Preference Model of Optimal Financial Leverage", Journal of Finance, Vol., pp. 911-922.

La Porta, R., Lopez-De-Silanes, F., Shleifer, A., & Vishny, R. (2000), Agency problems and dividend policies around the world. Journal of Finance, Vol. 55, pp. 1–33.

MacKay, P. & Phillips G.M. (2005), How Does Industry Affect Firm Financial Structure?, *The Review of Financial Studies,* Vol. 18, pp. 1433–1466,

Mandaci, P. E. (2009), Testing capital structure models for Turkish non-financial firms: the analysis of firm-specific financial factors and agency variables. *Investment Management and Financial Innovations*, Vol. *6*(1), pp. 231-241.

Miao, J. (2005), Optimal Capital Structure and Industry Dynamics. *The Journal of Finance,* Vol. 60 pp. 2621-2659.

Miller, M.H. (1977), Debt and taxes, Journal of Finance, Vol. 32, No. 2, pp. 261 –276.

Michaely, R., & Vincent, C. (2013), Do institutional investors influence capital structure decisions? Cornell University (Working Paper)

Modigliani F., & Miller M. (1958), The Cost of Capital, Corporation Finance and the Theory of Investment. The American Economic Review, Vol. 48, No. 3. pp. 261-297.

Modigliani, F., & Miller, M. (1963), Corporation income taxes and the cost of capital: A correction. American Economic Review, Vol. 53, pp. 433–443.

Morri G., & Artegiani A. (2015) "The effects of the global financial crisis on the capital structure of EPRA/NAREIT Europe index companies", Journal of European Real Estate Research, Vol. 8, Issue: 1, pp. 3-23,

Myers, S.C., & Majluf, N., (1984), Corporate financing and investment decisions when firms have information that investors do not have. Journal of Financial Economics Vol. 13, pp. 187-221.

Myers, S.C. (1977), Determinants of corporate borrowing, Journal of Financial Economics Vol. 5, No. 2 pp. 147–175.

Myers, S.C. (1984), The capital structure puzzle. The Journal of Finance, Vol. 39 (3), pp. 575-591.

Ngah-Kiing Lim, E., Das, S.S. & Das, A. (2009), Diversification strategy, capital structure, and the Asian financial crisis (1997–1998): evidence from Singapore firms. *Strategic Management Journal,* Vol. 30 pp. 577-594.

Nguyen, H.G., Nguyen, L., & Yin, X., (2015), Corporate Governance and Corporate Financing and Investment during the 2007-2008 Financial Crisis. Financial Management, Spring 2015, pp. 115 - 146

Popov, A., Van Horen, N., (2013), The Impact of Sovereign Debt Exposure on Bank Lending: Evidence from the European Debt Crisis. *De Nederlandsche Bank Research Department* Vol. 382 pp. 1-32.

Pound, J. (1988). Proxy contests and the efficiency of shareholder oversight. *Journal of Financial Economics,* Vol. 20, pp. 237–265.

Rajan, G.R., & Zingales, L., (1995), What do we know about capital structure? Some evidence from international data. J. Finance Vol. 50, pp. 1421–1460.

Ross, S. A. (1977). The Determination of Financial Structure: The Incentive-Signalling Approach. *The Bell Journal of Economics,* Vol. *8*, pp. 23-40.

Santos, M.S., Moreira, A.C., Vieira, E.S. (2014), "Ownership concentration, contestability, family firms, and capital structure." *Journal of Management and Governance,* Vol. 18, pp. 1063-1107.

Schoubben, F., Van Hulle C. (2004) The Determinants of Leverage; Differencess between Quoted and Non Quoted Firms, Tijdschrift voor Economie en Management Vol. 69, pp. 589-620.

Shleifer, A. & Vishny, R. W. (1986), "Large Shareholders and Corporate Control", The Journal of Political Economy, Vol. 94, no. 3, pp. 461-488.

Smith, D. J., Chen, J. , Anderson, H. D. & Cahan, S. (2015), The influence of firm financial position and industry characteristics on capital structure adjustment. *Account Finance,* Vol. 55 pp. 1135-1169.

Stulz, R., & Johnson, H. (1985). An analysis of secured debt. *Journal of Financial Economics*, Vol. *14* (4), pp. 501-521.

Titman, S., & Wessels, R. (1988), The determinants of Capital Structure Choice. The Journal of Finance, Vol. 43 (1), pp. 1-19.

Yanwen, L., & Xianling, J. (2010). Financial Crisis and the Capital Structure of Listed Company-Empirical Research on Chinese Real Estate Industry. In *Management and Service Science (MASS), 2010 International Conferenc.e* pp. 1-4.

Zhang, H., & Keasey, K., (2002), The link between dividend policy and institutional ownership. Journal of Corporate FinanceVolume Vol. 8, Issue 2, 2002, pp. 105-122

Books used:

De Veaux, R.D., Velleman, P.F. & Bock, D.E. (2008), *Stats Data and Models*, USA: Pearson Education.

Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., & Tatham, R.L., Multivariate Data Analysis: A Global Perspective. 7th ed. Upper Saddle River: Prentice Hall, 2009. Print.

LaMotte, L. R. (1983). Fixed-, random-, and mixed-effects models. In Encyclopedia of Statistical Sciences, ed. S. Kotz, N. L. Johnson, and C. B. Read, pp. 137–141.

Miglo, A., (2011). Chapter 10 "Trade-Off, Pecking Order, Signaling, and Market Timing Models". in H. Kent Baker, Gerald S. Martin. Capital Structure and Corporate Financing Decisions: Theory, Evidence, and Practice. (Wiley and Sons) Mar 31, 2011, pp 171-191

Stock, J.H., Watson, M.W., Introduction to econometrics. 2nd ed., Boston: Pearson Addison Wesley, 2007. print

Ross, S. A., Westerfield, R. W., & Jaffe, J. (2007), Modern Financial Management (8th ed.). London, United Kingdom: McGraw-Hill Education - Europe.

Websites used:

Reyes, A. (2013). The financial crisis five years later: response, reform and progress in charts. Visited on June 10th, 2017 on: https://www.treasury.gov/connect/blog/Pages/The-Financial-Crisis- Five-Years-Later.aspx

Gibbs, E. (2014). Who is the smart money now? Types of institutional ownership could indicate outperformance. S&P Capital IQ. Visited on December 14th on www.spcapitaliq-corporations.com

US Law (2017) Visited on December 15th on https://definitions.uslegal.com/i/institutional-investor/

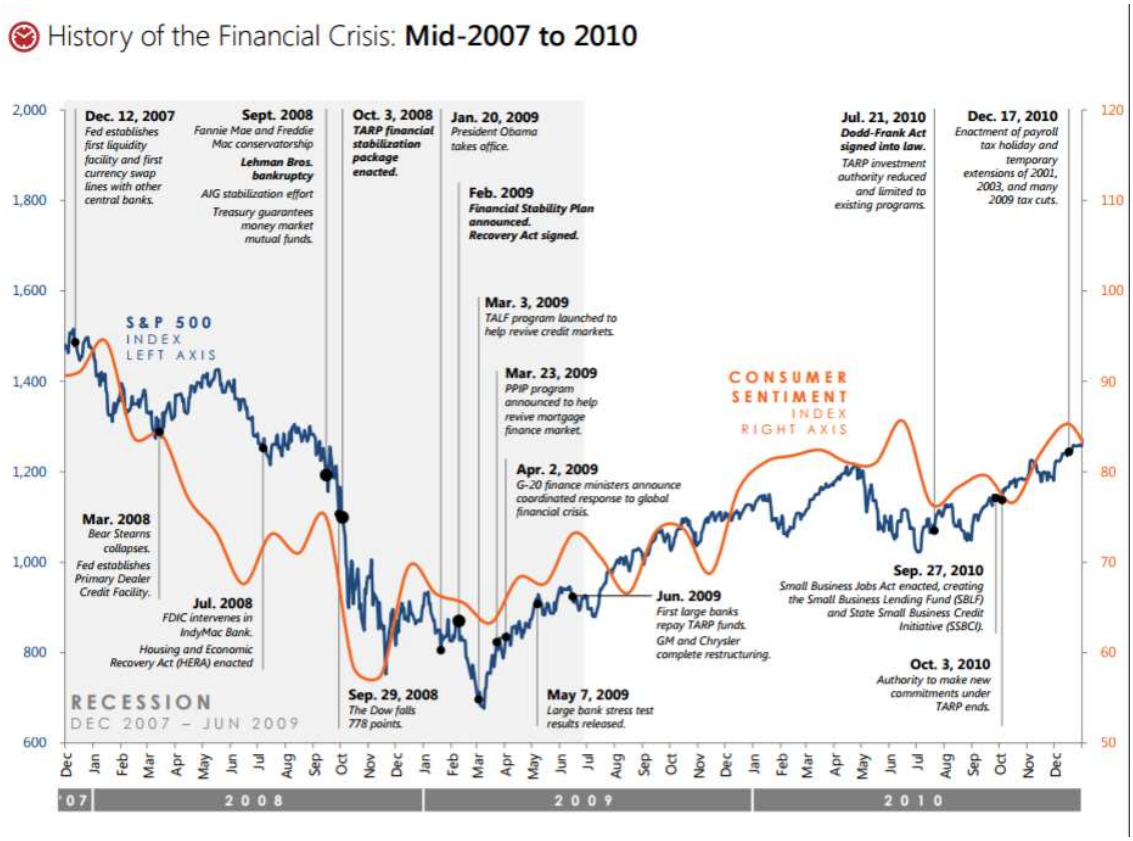
Nasdaq Stock Exchange (2017) http://www.nasdaq.com/symbol/aapl/institutional-holdings (visited on December 15th)

http://www.BloomBerg.com/terminal (visited on December 22th)

https://www.msci.com/gics (visited on December 22th)

Appendices

A: History of the Financial Crisis



Source: https://www.treasury.gov/connect/blog/Pages/The-Financial-Crisis-Five-Years-Later

Appendix B. Different measures of leverage and corresponding pros and cons

Table 1. Different measures of leverage and corresponding pros and cons, according to Rajan and Zingales (1995).[4]

	Leverage measure		Pros and cons
1	Total liabilities / Total assets	+	The broadest definition of leverage; proxy for what is left for shareholders in case of liquidation.
		–	Not a good indication of whether the firm is at risk of default in the near future. May overstate leverage since total liabilities includes items like accounts payable, untaxed reserves etc.
2	Total debt / Total assets	+	Does not include liabilities like untaxed reserves or accounts payable (for transaction purposes); more appropriate measure of leverage than (1) above.
		–	Affected by level of trade credit[5] (i.e. unpaid bills; makes up bulk of accounts payable).
3	Total debt / Net assets	+	Not influenced by trade credit. (Net assets = total assets – accounts payable – other liabilities).
		–	Still affected by factors that have nothing to do with financing, e.g. assets held against pension liabilities.
4	Total debt / Capital	+	Probably the best representation of past financing decisions (capital = total debt + equity).
		–	
5	EBIT / Interest expense	+	Measure of the risk that equity holders will not be able to make fixed payments and will have to give up control. Appropriate measure if investments equal in magnitude to depreciation needed to keep the firm a going concern.
		–	Based in assumption that short-term liabilities like accounts payable and short-term debt will be rolled over. Very sensitive to income fluctuations.
6	EBITDA / Interest expense	+	Measure of the risk that equity holders will not be able to make fixed payments and will have to give up control. Appropriate if no such investments as in (5) are needed.
		–	Same as for (5).

Note: EBIT = Earnings Before Interest and Taxes. EBITDA = EBIT + Depreciation.

Source: Rajan & Zingales, 1995