The Relation Between Earnings Quality, CEO Compensation and Capital Markets

Abstract: To comprehend the relationship between earnings quality (restatements), CEO compensation and stock market reaction, this paper employs a research during a time period between 1995 till 2015 with a total of 1897 observations. Stock market reaction is measured by cumulative abnormal returns, while restatements are broken down to errors and irregularities. The overall results indicate that the stock market reacts negatively following a restatement caused by an irregularity than an accounting error. Above that, the stock market reacts even more negatively if CEOs earn more than their peers in the same industry.

Author: Muhammed Gelen
Student Number: 341988
Supervisor: Ying Gan
Co-reader: Thomas Keusch

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Erasmus School of Economics
Accounting Auditing and Control

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1. Introduction

After and during the credit crash of 2008, the question was raised again, namely are top executives overpaid? Some even argued that it was one of the reasons for the financial crisis that eventually did not have much media coverage. During the crisis, the public was outraged when the bankers decided to overpay their executives around a billion dollars. Therefore, it was not surprising when US government decided to implement restrictions if they decided to bail out these firms. The Troubled Asset Relief Program (TARP) enabled US government to buy assets from these firms. One of the conditions was that senior executives who received TARP aid will have a limited salary of 500.000 USD per year (Shearman & Sterling LLP, 2009).

Executive compensation is a research field which ignited the interest of researchers. There are several studies done on the both sides of this discussion. Some researchers argue that compensation is enough for the work that executives are performing, while the other group argue that executives are overpaid. Also, it is argued that overpayment will arguably have some side-effects. The results of this thesis should be of relevance to this discussion. It will show whether the executive payment will lead to more financial restatements.

The purpose of this thesis is to examine the relation between financial restatements, executive compensation and capital market reaction. More specifically, it examines the relation between restatements and the size of executive compensation and whether this relation has effect on capital market returns. Thus, the research question is:

RQ: Do restatements relate to executive compensation and how does the capital market react to it.

This research relates to multiple streams of literature. First of all, it relates to the literature which argues that executives are not overpaid. Early long run study from 1936 till 2005 shows that from the 70s salaries and incentive payments for CEOs have increased dramatically (Frydman & Saks, 2010). On the other hand, different literature argues that CEO payments I actually sufficient (Core, Guay, & Thomas, Is U.S. CEO Compensation Broken?, 2005). In 2013, Kaplan argues that even though the compensations are declining, it is still higher than the average. (Kaplan, 2013).

Secondly, this research contributes to different relevant discussions and to relevant literature as follows. There is a discussion going on whether executives are overpaid or simply paid enough. This study contributes to this question by showing significant evidence that when CEOs are overpaid, the stock market will react more negatively. This will in turn have negative effect on the stock market performance of the said firm. On the other hand, Core et al. argues that weak corporate governance allows executives to maximize their own profit (Core, Holthousen, & Larcker, 1999). I argue that when CEOs maximize their own profit, they will take more risks to make sure that they will receive their compensation. This could in its own turn lead to more restatements and as a result negative stock market reaction would occur. So eventually, bad corporate governance could lead to more restatements.

From 1995 till 2015, I have compiled various data such as restatements, cumulative abnormal returns and CEO compensations. By dividing restatements into two categories, namely accounting errors and irregularities, I find that cumulative abnormal returns react more negatively for restatements due to irregularities, which contains fraud and SEC investigation. Above that, I present significant evidence that when CEOs are overpaid (stock options), stock markets would react even more negatively following a restatement due to irregularities.

The remainder of this study is structured as follows. The following chapter contains relevant literature for this study. Section 3 elaborates on various theories which are crucial to this study and contains the hypothesis development. Section 4 goes more into detail on data and how the research is performed. Empirical results and conclusion with suggestions on future research is presented in section 5.

2. Literature Review

As introduced before, salaries and incentive payments for CEOs have increased from the 1970s (Frydman & Saks, 2010). Above that, researchers found evidence that the above-normal growth of CEO payments is necessary due to the risks that executives are taking with equity-based incentives (Core, Guay, & Thomas, Is U.S. CEO Compensation Broken?, 2005). Later study argues that CEO compensation increased through the 1990s, it shows a rather decline in the payments but is still higher than the long-term average (Kaplan, 2013). Weisbach emphasize this by a review on the book of Bebchuk and Fried (Weisbach, 2007).

The author argues that there is a persuasive evidence that executives who have influence over the board will maximize their own compensation (Kuang & Qin, 2015). In relation with high executive compensation, Cheng and Warfield argue that executives with high equity incentives will eventually start managing earnings in the hope of gaining more personal wealth (Cheng & Warfield, 2005).

Jensen and Meckling define the self-interest behaviour of managers and executives with agency theory. Agency theory describes the problems that arises when goals of principal (shareholders) and agents (executives/managers) are dissimilar from each other. When these interests conflict with each other, managers will extract personal wealth. Consequently it is expected that, when managers try to enhance their own personal wealth, they manipulate the earnings to make sure that their own profits will be higher (Jensen & Meckling W, 1976). It is evident that shareholder may influence the behaviour of managers and executives by increasing their welfare and taking more risk which could lead to low earnings quality.

2.1. CEO compensation and Capital market reaction

While authors argue whether the compensation is sufficient or not, other researchers have done work on the possible effects of CEO compensation. Attaway looks into this body of research by asking whether CEO compensation influences performance in the electronics industry. Different proxies for performance is used by Attaway to form a comprehensive understanding on the influence of CEO compensation on performance. CEO compensation is defined as the salary of CEO and the bonus received. Results suggest that there is a positive relation between firm performance and CEO compensation. While there is a positive significant relation, author adds that the relation is not strong (Attaway, 2000).

Coughlan and Schmidt contribute to the literature by examining the effects of CEO compensation in the light of managerial control. Coughlan et al. look whether there is a positive relation between the changes in executive compensation and abnormal stock price performance. For the years 1978, 1979 and 1980 the authors examined 249 firms for abnormal stock performance. Hereby is the compensation defined as the salary plus bonus for the whole year. By using regression analysis, authors present evidence that is consistent with the hypothesis as described above. This study then suggests that capital markets react positively to news concerning the executive compensations (Coughlan & Schmidt, 1985).

Also, another study which studies the effects of CEO compensation is performed on firms in Germany. Langmann focuses on stock option plans issued by firms. The author chose the announcements of stock option plans between 1996 and 2002 and covers 17 announcements. Langmann uses event study method to map out abnormal stock returns around announcement day of stock options. While total observations are low, author finds significant stock market reaction on the announcement of stock market plans for CEO in Germany. The positive reaction also precedes the announcement day and starts one-day prior the announcement day. According to the author, capital market seems to associate stock option plans with positive reaction and this association changes their behaviour (Langmann, 2007). Instead of short term compensation packages, Brickley et al. studies the effects of long term compensation of executives on capital markets. This study differentiates from other studies by segmenting the long term compensation plans and perform tests whether different compensation plans have different reactions on stock markets. From 1979 till 1982 Brickley employs an event study to test the hypothesis on a sample of 175 firms. Authors confirm that there is a positive abnormal reaction between board meeting date and SEC stamp date. It is however important to note that no particular long range compensation plan is better than the other plan in terms of increasing shareholder wealth (Brickley, Bhagat, & Lease, 1985). Literature suggests that positive share price reaction to the announcement of stock options plan is actually in line with the belief that it aligns the interests of the management with share and stock holders. But it could also lead to more risks taken by executives which could lead to the benefit of executives in expense of shareholders.

Defusco et al. studies this relation while also looking for the reaction of the bond markets. From 1978 till 1982 and performing a study on a total sample of 641 Defusco et al. finds evidence that implicit share price variance and stock variance increases after the approval of an executive stock plan. This goes together with a significant positive stock market reaction but also a negative bond market reaction. These results imply that managers will take on more risks and that the wealth will shift from the bondholders to stock holders (Defusco, Johnson, & Zorn, 1990). In summary, prior research has found convincing evidence that capital markets react positively on the remuneration of executives. While some of the authors argue that there is non-significant relation among executive compensation and stock market reaction, majority of the literature provides evidence that no matter the distinction between remuneration (salary, bonus stock option) or the period (short term, long term), there is a positive stock market reaction. This reaction may be attributed to Agency theory.

The remuneration is actually used to align the interests of shareholder with the executives. But as Defusco et al. suggested, this could lead to more risk taking behaviour by executives. The risk taking behaviour by executives could lead to more restatements and in that sense to lower degrees of reporting quality. Accounting irregularities could damage the firm's reputation and not the least could lead to scandals in which the company in the end cease to exist (ex. Enron scandal). To link executive compensation with reporting quality, thus with restatements, following body of research is important.

2.2. CEO compensation and Restatements

Elayan et al. develops empirical evidence on the relation between accounting irregularities and executive compensation. Hereby is the term materiality important. Authors show that irregularities are around 470m USD. Also, these restatements are typically revenue enhancing irregularities. From 1980 till 2004, Elayan et al. compiles a total sample of 170 firms. The study shows that firms who have a greater proportion of equity based compensations are more prone to commit accounting irregularities. These irregular firms actually show greater stock price volatility (Elayan, Jingyu, & Meyer, 2008). The possible effects of aggressive accounting due to CEO compensation forms the basis for the research by Burns and Kedia. The relation between CEO compensation and restatements is studied from 1995 till 2002 with a total sample of 215 restating firms. Authors find a significant positive evidence that restated years are associated with higher incentives from stock options.

The incentives to misreport are stronger with stock options in comparison with other compensation packages. This is due to the fact that the convexity in CEO wealth introduced by stock options limits the downside risk on the discovery of misreporting. Above that, stock options allow CEOs to pool with other executives that exercise for liquidity and diversification reasons. This evidence suggests that CEOs who receive compensation packages will likely adopt aggressive accounting practices which in the end will lead to restatements (Burns & Kedia, 2006). Efendi et al. complements the study of Burns and Kedia by performing the same tests and extents it by asking whether substantially overvalued stock options adds to the likelihood of misstatements. Authors choose the sample period from 2001 till 2002.

The reason is that the research is focused whether incentives had any influence on restated financial statements at the end of market bubble of 90s. Sample period compiles a total of 190 firms.

This study confirms that the ratio of stock options to salary for CEOs at restated firms are significantly higher than matched firms. Specifically, firms who have CEOs who own substantial stock options are more likely to issue financial statements with accounting irregularities. The results of this study is actually in the same line as the study performed by Burns and Kedia (Efendi, Srivastava, & Swanson, 2007). Another view on reporting quality which is influenced by equity incentives as a means of remuneration for CEOs is used for the study by Bergstresser and Philippon.

While most of the articles discussed here take restatement as a proxy for reporting quality, Bergstresser and Philippon decide to use discretionary accruals as a measure for reporting quality. This study is actually a welcome addition to this body of research because it adds a new light on the possible side effects of (excessive) CEO compensation. With a total 4671 observations, discretionary accruals are regressed against CEO compensations. First of all, authors find evidence that accruals are more actively used at firms where CEO compensation is closely linked to the value of stock. The active usage of accruals could be an indication for earnings management. Additional tests are performed to confirm this hypothesis. Study concludes with significant evidence that CEOs, which have compensation that is sensitive to company share prices, lead firms with higher degree of earnings management. This study complements the previous studies done on restatements by showing that incentivized compensation also has a negative effect as earnings management (Bergstresser & Philippon, 2006). Research done by Institute for Policy studies have conducted over twenty years of research on the behaviour of CEOs who receive high levels of compensation. The report from 2002 shows the relation between corporate scandals, thus firms under investigation, and CEO compensation. Companies under the investigation for their accounting practices had CEOs who earned more than 70 percent more than the average for all the leading executives in that period. While the CEOs pocket their earnings the shareholder face loss due to the fact that during the same period (2001, 2002) the shareholder value dropped about 73 percent (Klinger, Hartman, Anderson, & Cavanagh, 2002). To recap, literature suggest that CEO compensation may lead to more risk taking by the executives.

To build further on this assumption, several authors have done research on possible side effects of CEO compensation. The focus lies foremost on restatements. Burns and Kedia suggests that CEOs will adopt aggressive accounting policies which most likely will lead to restatements. Several authors build on this assumption and found evidence that executive compensation

(salary, bonus, stock options) do lead to more restatements. In comparison with the bonus and salary, the biggest incentive to misstate financial statements is related to stock option plans. Complementing study has been performed to look at whether different measures (accruals) lead to earnings management. The use of accruals is high for firms which value compensation by stock value.

2.3. Studies on Restatements

This paper is related to restatements caused by firms. There are several reasons why a restatement is needed. Hence, I will briefly go through related studies which distinguish different restatements and what the characteristics of restating firms are. Many of the studies performed on restatements hypothesize on what the causes or the consequences are.

These studies most of the time rely on databases such as General Accounting Office (GAO) and use keywords to search databases. Hennes et al. argue that the power of these studies can be improved by focusing on simple aspect of restatements. Research can be significantly improved if there is a distinction between errors and irregularities. If there is an assumption that the misstatement is intentional, then it is better to focus on irregularities instead of error. Secondly, investors and regulators view irregularities much severe than errors. To test whether the irregularities are empirically more useful in accounting research, authors collected from 2002 and 2005 a total sample of 188 restatements. The market reactions around restatements caused by irregularities are significantly negative than restatements caused by errors. Also there is evidence that majority of irregularities result in class action lawsuits. Not only is the capital market affected but also the executives. CEO/CFO turnover is significantly higher for restatements caused by irregularities than for errors (Hennes, Leone, & Miller, 2008). In line with Hennes, Desai et al. perform a similar study to conduct a research at the consequences of restatements for higher management. Authors sample a total 146 restatements from 1997 till 1998. There is significant evidence that managers of restating firms are more likely to lose their job. Above that, the restating managers face discipline from external labour market.

The re-employment time takes longer than controlling groups and quality of the new employment is poorer that their previous jobs (Desai, Hogan, & Wilkins, 2006). While there is a focus on consequences and reasons for restatements, it is important to identify what kind of firms usually end up restating their financial statements.

Study performed by Kinney and McDaniel focuses on the particulars of restating firms. From 1976 till 1985, they have collected a total sample of 1171 firms. This study shows that there is a significant evidence that restating firms are typically smaller firms which are less profitable. These firms are also highly leveraged and are, in comparison, more slowly in growth (Kinney & McDaniel, 1989). In contrast with Kinney, research done by Richardson et al. shows different results for restating firms. From 1971 till 2000, with 225 restating firms, the authors find that restating firms are highly leveraged but on the other hand the firms are actually firms with high growth (Richardson, Tuna, & Wu, 2002). In summary, previous literature suggests that many studies have been performed on restatements. To get more power out of the research it is beneficial to focus on restatements caused by irregularities than restatements caused by error. Authors in earlier years had hard time to gather data on restatements purely on the fact that they were using keywords and the differentiation would become costly. Nowadays WRDS have made it easier to distinguish between irregularities and error. Therefore, in this research I am focusing on restatements caused by irregularities which also contains financial fraud and misrepresentation, thus purely focus on intentional misrepresentation.

Also, to identify control variables for the regression I am using in this paper, previous literature shows the way. The most important characteristics of restating firms are that they are: highly leveraged, smaller, less profitable and are growing slowly in comparison with other firms. Richardson adds to list that the firms are actually characterized as high growing. The conclusion of this paper, will as a result, be in line with one of these two streams. Proxies for these control variables is discussed under the Methodology part. The consequences for executives and managers who restate their financial statement is severe. Not only is the executive turnover high following a restatement, the executives and managers have hard time finding a new job and the jobs they have found are not on the level of their previous employment.

3. Theoretical Background & Hypothesis

3.1. Agency Theory

Jensen and Meckling define the self-interest behaviour of managers and executives with agency theory. Agency theory relates two important questions which keep managers and shareholders in a troublesome relationship. First of all, problems that arises when the goals of principals and agents differ from each other. Secondly, when it is difficult or expensive for the principal to monitor the agents.

When these interests conflict with each other, managers will extract personal wealth. So, it is expected that, when managers try to enhance their own personal wealth, they will manipulate the earnings to make sure that their own profits is higher (Jensen & Meckling, Theory of the firm: Managerial behavior, agency costs and ownership structure, 1976). In order to expect from executives to manage the firm in an efficient way, there must be a meaningful link between the compensation and the firm's performance. As Jensen and Murphy stated in their study "is it any wonder then that so many CEOs act like bureaucrats rather than the value-maximizing entrepreneur's companies need to enhance their standing in world market". Authors put emphasis on the need for a sufficient but a correct way of compensating of CEOs (Jensen & Murphy, 1990)

Agency theory is divided into two diverse lines. These two are positivist and principal-agent (Jensen M. , 1983). Positivist agency theory describes the situations in which the agent and the principal has conflict and explores governance mechanisms that limits the agent's self-serving behaviour. Jensen and Meckling propose two governance solutions for the agency problem. First one is that outcome based compensation may be used to effectively curb the agent's opportunistic behaviour. Second proposition is that the use of information systems could lead to less opportunistic behaviour by agents.

Essentially, first proposition is of interest for this research which eventually states that: "When the contract between the principal and agent is outcome based, the agent is more likely to behave in the interest of the principal". Stock option plans are essentially the rights granted to CEOs to purchase or sell stock at a predetermined price within a certain period (Eisenhardt, 1989).

Although agency theory provides a realistic solution to conflict of interest between the principal agents, the agency theory have already been empirically proven by Coughlan and Schmidt (Coughlan & Schmidt, 1985). Markets react positively on the fact that the interests of shareholder and managers are aligned. But again, previous literature also suggests that high stock option plans will lead to accounting irregularities.

3.2. Prospect Theory

Agency theory argues that for countering misalignment of interest between the principal and the agents, executive compensation is a preferred. However, prospect theory presents an alternative look on choices of individual under risk which could question the choice for executive compensation.

It gives four possible explanations on the issue of CEO compensation. Firstly, the prospect theory suggest that people tend to overweigh outcomes that are assured in comparison to outcomes which are probable. If stock prices are in a certain place which CEO consider the level of that current price as a certainty and a higher stock price as a probability, CEO will use a strategy which holds on to the stock price until the vesting date of the stock option. In this case it is clear that the interest of shareholders and the CEO are not aligned. Essentially, CEO does not take any risk to reach a higher stock price, due to the fact he thinks that extra risk is not worthy because he is already assured of a pay-out that is not underwater (Aaron, Harris, William, & CLine, 2014).

Secondly when options are out of money (you are essentially making loss if you exercise the option) there are two ways in which a CEO may react. First, in the hopes of getting the stock prices up, CEO may become too risky in its own attempt to increase the stock price and in this way to get "in money" for its own stock option plan. This risky behaviour may also involve aggressive accounting. On the other hand, when executive sees that options are out of money, he/she could accept its losses and would not try to increase the stock prices. In both cases interests between shareholders and CEO is misaligned (Aaron, Harris, William, & CLine, 2014). Thirdly as Kahneman and Tversky stated, the preference for the level of risk a person is taking is highly dependent on that person's individual reference income level (Kahneman & Amos, 1979). Reference income is the level of income an individual will compare future gains of losses he or she will accept.

This reference level plays an important role on the decision of CEO when he or she considers the movement of stock prices as a reduction of gain or as a loss. Finally, prospect theory implies that individuals derive value from gains and losses relative to reference point and not to the absolute value of wealth. According to the S-Shape of the prospect theory, this would also imply that an individual would be more risk seeking below the reference point and it would also be risk averse above the reference point (Aaron, Harris, William, & CLine, 2014).

Eventually, Jensen and Meckling suggests that stock option plans are a good way to counter the agency problem. Whereas, the prospect theory argues that stock options plans could lead to more risk seeking behaviour by CEOs. Which, eventually could lead to more aggressive accounting or even fraud to save stock options.

3.3. Efficient Market Hypothesis

This paper studies the relation between restatements and CEO compensation and combined effect of both variables on capital markets. To discuss the degree of effect of these variables, it is most common to apply a theory. I am using the Efficient Market Hypothesis (hereafter: EMH) as a foundation for the test that it is performed in this paper. The EMH is introduced by Eugene Fama in 1970. This theory is closely related to the question on what affects the prices in capital markets and how these prices change. When an investor is looking for a profitable investment, it is obvious that an investment in undervalued stock is preferred. With forecasting techniques and valuations, these investors hope they can make great profits and outperform the market. EMH counters this assumption by stating that during any time on the capital markets, the prices fully reflect all available information on the markets. Therefore, the efficient workings of capital markets prohibit the outperforming of markets.

The EMH states that all information is processed in security prices. However, there is a classification of the sort information which influence the security prices. These versions have been categorized in three different versions of EMH (Fama, 1970):

- Weak Form Efficiency: The weak form of efficiency concerns itself with the source of information, namely historical public information. Thus, this form of EMH uses historical information to predict prices on the stock market.

All these information is already publicly available; it is assumed that future prices cannot be used to acquire excess returns by using historical data. In the end, weak form suggests that technical analyses based on historical data is not useful in predicting prices in the future.

- Semi-strong Form Efficiency: Stricter version of the weak form, semi-strong form assumes that all publicly available information is incorporated in the security prices. This implies that not only historical information is reflected but also information that is given on the financial statement of companies. Thus, no one should be able to have excessive returns on the capital market by using information that is already publicly available.

- Strong Form Efficiency: In the most rigorous form of the EHM, this form suggests that not only publicly available information is reflected in stock prices, but also the private information which is acquired by investors.

3.4. CEO compensations

While the above stated theories have distinct meanings for CEO compensation, in this part, I give more insight on CEO compensations itself. CEO compensations include variety of remunerations to make sure that the CEO stays motivated which in the end would increase the firm's performance. These remunerations include, for example, bonuses, stock options and salaries. Stock options plans are directly influenced by the movements of the stock market. Thus, it implies that when the stock prices drop, that the remuneration of CEO also drops. If the CEO choose stock options value as a reference point, as stated in the prospect theory, he or she would value the losses greater than achieving more gains. While there are different streams of research done on the remunerations of CEOs and the propensity to misstate, the biggest incentive to misstate the financial statements is due to stock option plans (Burns & Kedia, 2006) (Efendi, Srivastava, & Swanson, 2007) (Bergstresser & Philippon, 2006). With respect to prospect theory and previous literature, I am employing stock compensation plan as the proxy for executive compensation. Stock option plans are categorized as long-range compensation plan. Difference with short term compensation plans is that it is a measure of performance designed to be measured over a longer period of time.

Stock options is a compensation given by firms to their executives which enables them the purchasing of given number of shares at a specific price (exercise price) within a given time period (exercise period). Unlike performance plans, stock option plans reward the CEOs based on stock market price of the company.

Therefore, the exercise price is equal to the stock price at the date the option is granted. According to the Code of Federal Law in the United States, stock options have a legal limit of 10 years (Smith & Ross, 1982).

3.5. Restatements

Most important task of preparing and publishing a financial statement is that it informs share- and stakeholders about the true financial health of the firm. Financial statements are sometimes manipulated for personal gain of managers or executives. The auditor is tasked by finding these errors or frauds. General Accountability Office (GAO) describes a financial restatements as "A financial statement restatement occurs when a company, either voluntarily or prompted by auditors or regulators, revises public financial information that was previously reported" (United States General Accounting Office, 2002).

Prospect theory and agency theory would lead to a possible conclusion in which the CEO could use aggressive accounting or other accounting measures for its own gain for a granted stock option. These accounting measures could lead to a restatement. A possible restatement of a financial statement implies that financial statement contains errors or irregularities such as fraud. It is possible that not all restatements are inherently bad. A restatement could also take place when there is an unintentional error or when there is a positive change such as the revaluation of assets or inventory which is actually found higher. On the other hand, there are irregularities such as fraud or intentional misstating of the financials for the sole purpose of misleading the investors. While restatements have far more reaching economic consequences such as the misallocation of resource and job losses, the stock market reacts more significantly on restatements caused by fraud and irregularities (Hennes, Leone, & Miller, 2008) (Kedia & Philippon, 2009).

4. Hypothesis Development

Relation between shareholder, capital markets, and CEO forms the basis for this thesis. Accordingly, the Agency theory is important. Agency theory shows that relation between principals and agents may be aligned by introducing compensation packages. On the other hand, Prospect theory states that when there is risk involved in a certain setting, CEO may act in a way that is not preferred by shareholders or act more aggressive which in the end could lead to restatements. Effect of this relation is then reflected on the stock market. The assumption I make is that all information is reflected into stock prices.

To justify this assumption, I am using the Efficient Market Hypothesis as a foundation. In fact, this assumption is necessary due to the fact that every information regarding the CEO compensation and restatements must be reflected on the security prices.

First, before including CEO compensation into the equation, I am studying the relation between restatements and capital market reaction. I hypothesize that restatements which are caused by irregularities such as fraud will have negative stock market reaction and more negative than accounting errors. Above that, it is noteworthy that some restatement could cause investigation by the SEC. Consequently, the first hypothesis is formulated as:

H1: Stock markets react negatively following the filing of a restatement caused by accounting errors and irregularities such as fraud, restatements investigated by SEC.

Following the conclusion of the first hypothesis, I am testing the relation between restatements and CEO compensation and its effect on the stock market. According to Prospect Theory, people tend to take more risk when their own remuneration is in danger and will not act in the interest of shareholders. Above that, EMH, assumes that all information is reflected on stock market prices. Consequently, I hypothesize that firms who pay their CEOs higher than the industry median, will have negative market reaction following a restatement. Second hypothesis is formulated as:

H2: The stock market reacts even more negatively if CEO compensation is higher than the industry median.

5. Data and Methodology

5.1. Data Description

The data for this research is gathered from Wharton Research Data Services. AuditAnalytics from WRDS provides data on restatement. There is no distinction between firms, the selection encompasses all the firms between 1995 and 2015. Restatements by their causes are also provided by the database. Data on restatements due to accounting error, fraud and SEC investigation is available. To make data analysis more accurate, I have chosen to group these particular restatements by their severity. Restatements due to accounting errors is grouped as (ACCOUNTING ERROR). Other two restatements, fraud and SEC investigation, is grouped as irregularities (ACCOUNTING IRREGULARITY).

To do an inquiry on stock market reactions, I make use of the event study tool provided by WRDS. The service, titled, WRDS Daily Event Study, provides event study with selected risk models and estimation parameters. By using company identifiers from AuditAnalytics, I have identified the same firms and used the above said event study tool to download cumulative abnormal returns (hereafter: CAR). The methodology behind CAR method is explained under Methodology.

While the observations on restatements is more than sufficient, it is important to make sure that there are enough observations on market returns to produce reliable CARs. Therefore, I have set the limit of minimum of valid returns on CAR to 40 observations. After merging the data, there is a final sample of 1897 observations between 1995 and 2015. Table 1 shows that the large portion of restatements is due to accounting mistakes. 1765 of total observation is due to accounting errors. Above that, 132 of the observations is due to irregularities containing fraud and SEC investigation.

Leading to 2000, the total restatements filed by these companies only make up 2% of the total sample. Table 2 illustrates after the millennium, there is a steady rise in restatements. The erroneous financial statements keep rising till 2011. From 2011 till 2015 the restatements almost make up the half of the total. It could be expected that after the financial crisis, companies should have had reliable financial statements, so they could avoid restatements.

Table 1: Reasons of Restatement

Cause of Restatement	N
Accounting Errors	1765
Irregularities	132

Table 2: Distribution of Restatements by year

Year	Frequency	Percentage
1995 - 2000	41	2%
2001 - 2005	391	21%
2006 - 2010	550	29%
2011 - 2015	915	48%
Total	1897	100%

The last 5 years, the restatements increased dramatically. This could be an indication that after the financial crisis, the controls on financial statements were increased. This attributes to stricter controls on financials by auditors as well as stricter rules enforced by trendsetters. While this study does not go deeper into the causes of increasing restatements, I hypothesize that stricter and cautious control on companies may have had a role in the restatements. Table 3 indicates that most of the restatements occurred in the Manufacturing Industry. Likewise, the top three of industries almost make up 76% of all total restating industries. Table 3 displays that more than 50 percent of all restatements are clustered around certain industries. The composition of these industries are relevant. Top 3 restating industries are composed of firms which involve large asset investments or firms which are specialized in services. Firms investing in large assets also require distinct accounting treatments regarding the depreciation and amortization of assets. Most of the red flags during an audit concern the determination of how to depreciate or amortize assets. I assume that it is likely that most of the restatements occur in these industries due to the fact that assets depreciation and amortization demands a certain degree of discretion. This may be misused by managers. There is a total of 1897 identified restating companies in these industries, which left no unidentified firms.

Previous literature indicates the various characteristics for restating firms. Kinney and McDaniel (Kinney & McDaniel, 1989) discuss that restating firms are actually smaller, less profitable and have higher debt. Contrary to Kinney et al., Richardson et al. have found significant evidence that restating firms are actually firms with high growth (Richardson, Tuna, & Wu, 2002). Hanlon, argues that cash compensation can be invested outside the firm and therefore lowering the managers expected risk-aversion via better diversification, thus reducing the need to grant more stock options. This implies that higher cash remuneration would lead to fewer risky projects by CEO (Hanlon, Rajgopal, & Shevlin, 2003). To see whether higher cash compensations lead to less stock options and consequently restatements, I am including cash compensation as salary plus bonus. As last, I am including stock owned by the CEO as a control variable. As argued before, the interests of shareholders and CEOs need to be aligned. To make sure that it is the case, shareholders may grant the CEO more stocks. I am controlling for this relation by including the percentage of stock ownership by the CEO (Cheng & Farber, 2008).

Table 3: Restatements per industry

Industry	#
Manufacturing	853
Services	322
Transportation, Communications, Electric, Gas & San. Services	268
Retail Trade	172
Mining	141
Wholesale Trade	70
Finance, Insurance & Real Estate	40
Construction	29
Public Administration	2
Agriculture, Forestry & Fishing	0

Table 4: Descriptive statistics of the controlling variables

Variable	Mean	Median	Std.Dev	Min.	Max
LOGMVE	6,527	6,561	1,832	0,368	10,89
ROA	0,007	0,042	0,157	-1,049	0,317
LEVERAGE	1,688	1,040	2,264	0,048	23,12
MARKET-TO-BOOK	2,933	2,000	3,142	-0,055	26,20
Cash Compensation	444,6	0,000	612,3	0,000	2783
CEO Ownership	0,851	0,000	3,074	0,000	21,61
Working Capital	2,447	1,846	2,105	0,316	13,93
Stock Return	0,137	0,063	0,606	-0,851	3,133

These variables are acquired from Compustat.

Table 5: Descriptive statistics of CEO compensation from restating firms

	Mean	Median	Std.Dev	Skew.	Kurtosis
Stock market options	323,1	0,000	1177	10,22	172,4
Bonus	113,6	0,000	522,4	15,44	378,6
Salary	346,8	0,000	434,7	0,979	3,327

Following these control variables, I include two more to make sure that most of the characteristics of restating firms are captured. Ahmet et al. have included working capital as a proxy for liquidity of restating firms (Ahmed & Goodwin, 2007). Which is calculated as current assets divided by current liabilities. Qiang et al. argues that there is a positive relation between stock returns and CEO compensation. I am including stock returns which is the common stock return for the fiscal year in which the restatements occurred (Cheng & Farber, 2008).

I am controlling for the following characteristics: firm size, profitability, debt, growth, cash compensation, CEO stock ownership, working capital and stock market return. I am using the logarithmic market value of equity (LOGMVE) as proxy for the size of the companies. As illustrated by Table 4, the median of market value of equity is 6,57 while the median is 6,56. Profitability is measured as net income divided by total assets, which is labeled as Return on Assets (ROA). Mean for ROA has the value of 0,01 and the median for ROA is 0,04. To control for firms which have high debt ratio, I use leverage (LEVERAGE) as total debt divided by common equity. The leverage for firms in the sample have a mean of 1,69 while the median is 1,04. Growth of companies is controlled with market to book ratio (MARKET-TO-BOOK). Mean of MTB is 2,93 while median is 1,99. Market to book ratio is defined as market value of equity divided by book value of equity. The mean for total cash compensation (CASH COMPENSATION) for CEOs is 444 and the median is 0,00. Total stock ownership percentage of CEOs (OWNERSHIP) has the mean of 0,85 while the median is 0,00. Liquidity for the firms in the sample is controlled with working capital (WORKING CAPITAL). The mean is 2,45 while the median is 1,85. As last, the stock returns for all the firms is controlled with Stock market return (STOCK RETURN). The mean is 0,14 while the median is 0,06.

Descriptive statistics on control variables shows that restating firms in the sample, on average, have high debt ratio. Additionally, the profitability, measured by ROA is on average very low, while the maximum is at 32%. Mean of the logarithmic market value of equity of restating firms is 6,57, this implies that the restating firms are actually not small. As last, descriptive statistics shows that the sample of restating firms have an average market-to-book ratio of 2,93. This implies that the growth of the firms in the sample is actually high.

Table 6: Ratios of CEO compensation grouped by industry

Industry	Options-to-salary	Options-to-bonus	Options-to-total
01-09 Agriculture, Forestry & Fishing	0,000	0,000	0,000
10-14 Mining	0,945	2,270	0,667
15-17 Construction	0,167	2,307	0,155
20-39 Manufacturing	1,169	3,899	0,900
40-49 Transportation, Communications, Electric, Gas & San. Services	0,478	1,057	0,329
50-51 Wholesale Trade	0,595	1,201	0,496
52-59 Retail Trade	0,847	1,941	0,576
60-67 Finance, Insurance & Real Estate	0,622	3,339	0,524
70-89 Services	0,943	4,601	0,783
91-99 Public Administration	0,000	0,000	0,000

Table 7: Descriptive statistics of CEO compensation grouped by industry (x1000)

Industry	Salary			Bonus			Stock Options		
	Mean	Median	Obs	Mean	Median	Obs	Mean	Median	Obs
01-09 Agriculture, Forestry & Fishing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
10-14 Mining	319,6	0,000	141	133,1	0,000	141	302,1	0,000	141
15-17 Construction	175,4	0,000	29	12,67	0,000	29	29,22	0,000	29
20-39 Manufacturing	319,5	0,000	853	95,81	0,000	853	373,6	0,000	853
40-49 Transportation, Communications, Electric, Gas & San. Services	368,3	0,000	268	166,6	0,000	268	176,1	0,000	268
50-51 Wholesale Trade	282,6	0,000	70	56,44	0,000	70	168,0	0,000	70
52-59 Retail Trade	549,2	594,2	172	239,6	0,000	172	465,1	0,000	172
60-67 Finance, Insurance & Real Estate	268,0	0,000	40	49,93	0,000	40	166,7	0,000	40
70-89 Services	346,5	0,000	322	71,01	0,000	322	326,8	0,000	322
91-99 Public Administration	0,000	0,000	2	0,000	0,000	2	0,000	0,000	2

Table 8: Test of means between remunerations

Compensation	N	t-statistic	Mean difference
Group 1 Salary Bonus	3794	14,94*	233,2
Group 2 Salary Stock Options	3794	0,822*	23,71
Group 3 Bonus Stock Options	3794	-7,081*	-209,5

** Significant at 0.05 level. The CEO remunerations are divided into categories. The means of different groups are compared to make sure that the CEO compensation samples are significantly different from each other. T-statistics show that every remuneration is significantly different from each other at 0.05 level.*

As mentioned in theoretical background, due to difference in incentives for the risk taking by the CEOs, most appropriate proxy for CEO compensation is stock option plans. Data on stock option plans is retrieved from ExecuComp which is a part of CompuStat database provided by WRDS. While the focus for testing lies on stock market incentives, I am tabulating the total CEO compensations on Table 5. The reason is that by looking at the total picture, the incentives of CEOs and disparity between compensations are clearer. Overall, average stock market options are higher than other incentives. This is in accordance with previous literature and theories. Due to stock market options, CEOs tend to take more risk. Likewise, agent theory advocates that firms pay high remuneration to their CEOs to make sure that their interests are aligned.

Descriptive statistics further indicate that restating firms have on average lower bonus than salary. Standard deviation of stock market options implies that the variance in stock options is much higher than other compensation (1177). The bonus is mostly dependent on the performance of the company itself, so it is expected that the bonus should vary between different firms. Thus, high variance is expected (522,4). Moreover, the salary for CEOs have the lowest variance of all the compensation (434,7). Low variance for salary implies that the population's salary is not so distinct between these firms.

These remunerations are all from restating firms and in accordance with previous literature. Which documented that stock market incentives are the foremost reasons why CEOs take risk, therefore it proofs that between three compensation forms, the stock market incentives are the highest. Consequently, the statistical evidence further authenticate the choice made to use stock option plans as a proxy for CEO compensation. I have calculated the ratios between stock options, salary, bonus and total remuneration. Table 6 shows the ratios between these compensations. In most of the industries, the ratio of options-to-salary is higher than 60%. This indicates that stock market options are close to the salary that CEOs receive. Options to bonus is in all of the industries above 100%. In the top 3 restating industries, the options to bonus is almost 300% to 400%. Stock market options to total compensation ratio also shows that option are relatively higher for industries which have more restatements than other industries. Table 8 indicates statistical tests on CEO compensations. The variables are grouped into three different groups. Group 1 contains salary and bonus paid to the CEO of restating firm. It shows that there is a significant difference between the remunerations (14,94).

The same also goes for the second group which consists of salary and stock options (0,822). Third group shows the same significant difference between bonus and stock option plans (-7,081). As a result, I am assuming that there is a significant difference between the means of the remunerations for my sample. Table 7 shows the descriptive statistics to clarify the statistical tests. The CEO salary of restating firms, are on average the same as the average of restating firms. The same goes for bonus as well. In some cases, average bonus of restating firms is higher but overall it does not have significant difference. However, stock options show a significant discrepancy. Essentially at all industries, the average stock options of restating firms are higher.

5.2. Methodology

For this thesis the most appropriate way of conducting research is by doing an empirical archival research, more specific, an event study. As it was done before by (Ball & Brown, 1968), information content of an event is studied by looking into security prices. Bowman has structured the use of event study. This thesis is utilizing the same method as introduced by (Bowman, 1983). I will argue the research design for this thesis by using the methodology as argued by Bowman. The event of interest for this research is the restatement of financial statements by firms who pay more than median CEO compensation in an industry. More specifically, I will calculate the industry median of CEO compensation through a given sample period. The reason for the use of median is that median is more robust to outliers than the mean. By taking the abovementioned variables into consideration, I hypothesize that the market reaction for restatements will be negative for all the firms.

Whether there is an influence of high CEO compensation will be empirically proven at the end of this thesis. For the proxy of stock market reaction, this thesis is using abnormal returns. Abnormal returns are straightforward defined as:

Abnormal Return = Actual Return – Normal (estimated) Return.

For the estimation of normal return, the literature suggests the use of Constant Mean Return Model or the Market Model. I prefer the use of Market Model (MM). The reasoning is that MM assumes linear relation between market return and security return. Above that, it is easy to find market returns such as S&P 500 and CRSP.

And the improvement above Constant Mean Return Model is that the variance is less for abnormal returns with MM (Mackinlay, 1997). For testing whether the stock market reacts negatively following the filing of a restatement, I am using an OLS regression. The model is as follows:

$$CAR: \alpha + ß1ACCOUNTING\_ERROR + ß2ACCOUNTING\_IRREGULARITIES + ß3LOG(MVE) + ß4ROA + ß5LEVERAGE + ß6MARKET\text{-}TO\text{-}BOOK + ß7CASH\_COMPENSATION + ß8OWNERSHIP + ß9WORKING\_CAPITAL + ß10\ STOCK\_RETURN + \varepsilon$$

Where:

CAR: Cumulative Abnormal Returns for restating firms within -3:3 event window. Calculated using the market model which uses abnormal return according to CAPM.

ACCOUNTING_ERROR: Dummy variable. Takes the value of 1 if the restatement is due to an accounting error, elsewise takes the value of 0.

ACCOUNTING_IRREGULARITY: Dummy variable. Takes the value of 1 if the restatement is due to irregularities, elsewise takes the value of 0.

LOG(MARKET VALUE EQUITY): Logarithmic value of market value of equity. Calculated by multiplying the common shares outstanding with the market value of shares.

ROA: Ratio of net income divided by total assets.

LEVERAGE: Calculated as total debt divided by total equity.

MARKET-TO-BOOK: Market-to-book ratio, calculated as market value of equity divided by book value of equity.

CASH_COMPENSATION: Total cash compensation of the CEO. Calculated as total salary plus total bonus.

OWNERSHIP: Percentage of stock ownership by the CEO of restating firm.

WORKING_CAPITAL: Working Capital, control variable for liquidity. Calculated as current assets divided by current liabilities.

STOCK_RETURN: Common stock return for the restating firm in the same fiscal year.

First hypothesis is the foundation to which hypothesis 2 builds upon. After answering H_1, I then look further into the consequences for firms who pay higher than the industry median while restating their financial statements. I employ the same method, namely the OLS regression.

The model is:

CAR: α + ß1ACCOUNTING_ERROR + ß2ACCOUNTING_IRREGULARITIES + ß3LOG(MVE) + ß4ROA + ß5LEVERAGE + ß6MARKET-TO-BOOK + ß7CASH_COMPENSATION + ß8OWNERSHIP + ß9WORKING_CAPITAL + ß10 STOCK_RETURN + ß11CEO_OPTION ε

Where:

> *CEO_OPTION*: Takes the value of 1 if the restated firm has a CEO which has stock option compensated higher than the industry median. Otherwise takes the value of 0.

The expectation on the results is that the beta values of H_1 should be negative, if not, more negative for irregularities than accounting mistakes. The thought behind is that not all accounting mistakes are bad. It could be that the valuation on certain post will be changed after the restatement. The new values may show favourable figures for the investors. Then it is coherent if the stock market reacts positively. Therefore, the sign of coefficient for accounting restatements could be positive as well. However, following the restatements due to irregularities, it is reasonable to expect negative stock market reaction. Firstly, irregularities show that financial statement was used to mislead the investors. Secondly, investors may expect accounting errors if the firms are operative in an industry or market segment which uses complicated accounting. But the prospect of fraud is not what the investors regularly prepare themselves. For the testing of H_2, the beta value of (ACCOUNTING ERROR) and (ACCOUNTING IRREGULARITY) should differ from the regression results of H_1. If the CEO compensation is higher than the industry median, I expect the beta values to be more negative. Last but not least, the companies in the sample with the SIC code between 60xx and 67xx are excluded from the regression testing. Financial firms do not have the clear separation between financing activities and operating activities in their financial statements. The inclusion of financial firms could distort the final results.

6. Empirical Results

Table 9 indicates the results for the regression model. It includes control variables discussed in the previous chapters. Table 9 shows the regression results for all restating firms between 1995 and 2015. It indicates the stock market reactions for different kinds of restatements such as errors (ACCOUNTING ERROR) and irregularities (ACCOUNTING IRREGULARITY). The coefficient on restatements due to accounting errors is (0.011) and non-significant. Restatements due to irregularities such as fraud and SEC investigation are more negative and significant than accounting restatements at 1 percent level (-0,039). These findings support the conclusion of (Hennes, Leone, & Miller, 2008). Which stated that irregularities induce heavier reactions from the stock market than accounting errors. While the stock market reaction to accounting error is positive, it is very low and non-significant. On the other hand, the stock market reaction for accounting irregularities is negative and significant. I am concluding that following a restatement, stock market does react negatively. Thus, Hypothesis 1 is not rejected.

Profitability of restating firms, which is measured by (ROA) shows positive non-significant result. Hennes et al. had similar results regarding the profitability of restating firms. In a short window CAR measurement to define the severity of different restatements, Hennes et al. saw that ROA has negative non-significant result (Hennes, Leone, & Miller, 2008). Table 9 indicates that debt value of firms (LEVERAGE) is negative non-significant at zero. These values are also in line with the research of Ahmet et al. who did a research on earnings restatement on Australian firms and found that debt value is also negatively non-significant (Ahmed & Goodwin, 2007).

Growth is measured by the market-to-book ratio (MARKET-TO-BOOK). Which shows a positive non-significant result. Previous literature such as Ahmet et al., found that restating firms are actually high growth firms, while on the other hand Cheng et al. found that restating firms are actually low growth firms (Cheng & Farber, 2008). My result is in line with Ahmet et al. due to positive coefficient but it has no significant effect on the model used. Logarithmic market value of equity shows a positive non-significant result. This implies that restating firms in my sample are actually bigger, but do not have significant effect. The result is in line with the research of (Hennes, Leone, & Miller, 2008).

Table 9: Tabulated regression results using Cumulative Abnormal Returns (CAR) as dependant variable

CAR: α + ß1ACCOUNTING_ERROR + ß2ACCOUNTING_IRREGULARITY + ß3LOG(MVE) + ß4ROA + ß5LEVERAGE + ß6MARKET-TO-BOOK + ß7CASH_COMPENSATION + ß8OWNERSHIP + ß9WORKING_CAPITAL + ß10 STOCK_RETURN + ε

Panel A: Regression results for restating firms and control variables

	Coefficient	Std. Error
Accounting Error	0.011	(0.011)
Accounting Irregularity	-0.0391***	(0.010)
ROA	0.018	(0.017)
Leverage	-0.000	(0.001)
Market-to-Book	0.000	(0.001)
Log(Market value Equity)	0.002	(0.002)
Cash Compensation	0.000	(0.000)
Ownership	-0.000	(0.001)
Working Capital	0.003*	(0.001)
Stock Return	0.231***	(0.005)
Industry and year fixed effects	Yes	
Constant	-0.039***	(0.107)
Observations	1,836	
F-statistics	2.530	
Adjusted R-squared	0.030	

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Standard Errors are clustered at the firm level.*

Table 10: Tabulated regression results using Cumulative Abnormal Returns (CAR) as dependant variable

CAR: α + ß1ACCOUNTING_ERROR + ß2ACCOUNTING_IRREGULARITY + ß3LOG(MVE) + ß4ROA + ß5LEVERAGE + ß6MARKET-TO-BOOK + ß7CASH_COMPENSATION + ß8OWNERSHIP + ß9WORKING_CAPITAL + ß10 STOCK_RETURN + ß11CEO_OPTION ε

Panel A: Regression results for restating firms and control variables

	Coefficient	Std. Error
Accounting Error	0.010	(0.011)
Accounting Irregularity	-0.0393***	(0.010)
ROA	0.018	(0.017)
Leverage	-0.000	(0.001)
Market-to-Book	0.000	(0.001)
Log(Market Value Equity)	0.002	(0.002)
Cash Compensation	0.000	(0.000)
Ownership	-0.000	(0.001)
Working Capital	0.003	(0.001)
Stock Return	0.231***	(0.005)
CEO Option	0.011	(0.007)
Industry and year fixed effects	Yes	
Constant	-0.041	(0.107)
Observations	1,875	
F-statistics	2,530	
Adjusted R-squared	0.031	

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Standard Errors are clustered at the firm level.*

For the testing of the second hypotheses, whether the stock market reacts more negatively if stock options for CEOs are higher than industry median, table 10 provides the results for the regression. The results for the control variables is the same as table 9, which was expected due to the results of previous literature. Stock market reaction following restatements due to irregularity shows a coefficient of (-0,0391). If I control for the stock market option which takes the value of 1 if it is greater than the industry median, which is in this case 0, the regression results gives the value of (-0,0393). The increase in negative reaction may be small, but nonetheless it provides evidence that stock markets do react negatively if CEO is compensated more than the industry median.

To look further and see whether this reaction is more negative with higher stock option compensation, I employ the use of higher industry stock market option mean to inquire more about the negative reaction. Table 11 shows the results. It indicates that when the mean is higher than the industry median, the coefficient (-0,40) is more negative than the initial reaction. Above that, the control variables such as size, growth, leverage or others stated in the regression, is not significant. When there is a restatement and the CEO earn much higher in the same industry, the reaction will be more negative. Hypothesis 2 is not rejected and therefore I am concluding the following: The stock market reacts more negatively if CEO compensation (stock options) is more than the industry median or mean.

Table 11: Tabulated regression results using Cumulative Abnormal Returns (CAR) as dependant variable

CAR: α + ß1ACCOUNTING_ERROR + ß2ACCOUNTING_IRREGULARITY + ß3LOG(MVE) + ß4ROA + ß5LEVERAGE + ß6MARKET-TO-BOOK + ß7CASH_COMPENSATION + ß8OWNERSHIP + ß9WORKING_CAPITAL + ß10 STOCK_RETURN + ß11CEO_OPTION ε

Panel A: Regression results for restating firms and control variables

	Coefficient	Std. Error
Accounting Error	0.010	(0.011)
Accounting Irregularity	-0.040***	(0.010)
ROA	0.016	(0.017)
Leverage	-0.000	(0.001)
Market-to-book	0.000	(0.001)
Log(Market Value Equity)	0.002	(0.002)
Cash Compensation	0.000	(0.000)
Ownership	-0.000	(0.001)
Working Capital	0.003	(0.001)
Stock Return	0.231***	(0.005)
CEO Option	0.011	(0.007)
Industry and year fixed effects	Yes	
Constant	-0.411	(0.107)
Observations	1,836	
F-Statistics	2,520	
Adjusted R-squared	0.031	

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Standard Errors are clustered at the firm level.*

7. Conclusion

Using data ranging from 1995 till 2015, I use different databases from WRDS, such as AuditAnalytics (restatement data), Execucomp (remuneration data), and Compustat (control variables data) Event Study Tool (CAR data) for this research. I conducted a research to see whether restating firms induce a negative stock market reaction. Eventually, these data are used to look more into detail whether CEO compensation, in this case, stock market options would get more negative stock market reactions. I studied different kinds of restatements such as accounting error and irregularities which contains fraud and SEC investigations. Descriptive statistics show that restating firms are firms with high debt ratio, low profit and high growth firms. Above that, in the top three restating industries, stock options were relatively higher compared to other industries.

Results of the regression indicate that stock market reacts positively to accounting errors but the reactions are not significant. On the other hand, Cumulative abnormal returns for irregularity are negative and highly significant on 1% level. This indicates that irregularities do induce more negative stock market reactions. Which is actually anticipated due to the fact that accounting error should not always be negative news. It could happen that restated financial statement could be in favor of shareholder due to, for example, higher assets value or inventory. However, fraud is always negative news because the sole purpose of fraud is to mislead the investors. The second model looks further into this relation. First of all, I take the CEO incentives (options) from the equity portfolio of the CEOs. This compensation is then put into the model to look further how stock markets react. Specifically, how do the coefficients of Accounting Restatements and Accounting Irregularities behave. I expect that when the CEO stock options are high, stock markets react negatively following a restatement. I found evidence that when stock options of CEOs are higher than their industry peers, the stock market reaction is more negative. Thus, one could say that high compensation paid to CEOs to align their interests, made sure that earnings quality got lower (more restatements). Share- and stakeholder, conceivably, reacted in the most expected way.

For share- and stakeholder, my outcomes advocate that if the CEO is compensation is more than the customary, the stock prices will drop following a restatement. Which in its turn affects the share- and stakeholders. Restatements are normally seen as a measure of earnings quality. If the stock market incentives are excessive for CEOs we could expect the decrease of earnings quality. To uphold the earnings quality and therefore decreasing the amount of restatements, I suggest that compensations for CEOs should not be too high and the total package of the CEO compensations, such as salary and bonuses, should be in equilibrium with each other. This assures that CEOs do not take excessive measures to preserve its stock option reward and decrease the earnings quality.

As said before, CEO compensations is an interesting field of research. For future research I recommend a more explorative look into CEOs who earn more than their industry peers. With questionnaires it should be possible to draw a conclusion how these CEOs perceive risk when there is a certain amount of remuneration is at stake, and how they behave following these risks.

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