

ERASMUS UNIVERSITY ROTTERDAM

MASTER THESIS

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# **How does Board Structure influence CEO Compensation?**

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## Abstract

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I study the association between the structure of the board of directors and CEO total compensation. My results indicate that the way that the board of directors is structured has a significant impact on the total compensation that CEOs earn. I find evidence that CEO duality has no effect on the level of CEO total compensation. Moreover, I observe that the percentage of inside directors on the board has a negative effect on CEO total compensation. In addition, I find significant evidence that a positive relation exists between the percentage of outside directors on the board and CEO total compensation. Finally, I provide evidence in support of the view that the 2007-2008 financial crisis had a significantly negative impact on CEOs' total compensation.

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## 1. Introduction

The main objective of this empirical work is to investigate the relation between board structure and CEO compensation. The Board of Directors, is defined as a group of people that oversees the activities of a corporation. The members of the board, are elected by the shareholders of the firm during the annual general meeting and their most important responsibility is to effectively govern the firm and to ensure that the interests of shareholders are met (Johnson et al., 1996, Adams et al., 2010). Consequently, each director is held liable for the implications that the company's actions, policies and failures have on the firm's overall performance. Furthermore, the choice of an appropriate and effective board structure has a significant impact on the effectiveness of the board in meeting its major obligations against shareholders (Harris & Raviv, 2008). Observers typically divide directors into insiders and outsiders. Specifically, a director who is a full time employee of the firm is characterized as an insider, while a director whose primary employment is not within the firm is defined as an outsider. Outside directors are believed to be more independent than insiders (Fama & Jensen, 1983). However, some outside directors are of dubious independence, those are broadly known as 'affiliated' directors (Adams et al., 2010)

At the same time, a CEO is an executive who is responsible for the company's overall operations and performance, while his main task is to implement the corporate policy that is initiated by the board. By definition, CEO compensation reflects the financial payments and non-monetary benefits provided to the CEO in exchange of offering his services on behalf of the company. CEO pay packages contain five basic components: salary, annual bonus, payouts from long-term incentive plans, restricted option grants and restricted stock grants (Frydman & Jenter, 2010).

Furthermore, board structure is considered to be a strong determinant of CEO compensation (Core et al., 1999; Chhaochharia & Grinstein, 2009). Indeed, the board is the main body that forms and approves the structure and level of the CEO pay package (Jensen, 2010). Therefore, its role in setting the appropriate amount of CEO pay is critical. However, the ability of the board to set the right level of CEO compensation always depends on the influence the CEO has on it and the extent to which he can affect its decisions concerning his pay. In general, there are some board structures that make it easier for the CEO to extract extra rents. For instance, Core et al. (1999) observe that CEO duality, board size, the percentage of outside directors appointed by the CEO, the ratio of grey and interlocked outside directors as well as the percentage of busy and over-aged outside directors all have a positive impact on CEO compensation. Shareholders that attend the annual meetings, in the context of which CEO compensation is determined, are aware of this issue and try to adjust

the board structure in such a way so as to increase its monitoring ability over the CEO and as a consequence prevent him from manipulating the board in order to inflate his compensation. Indeed, Core et al. 1999 found that CEO compensation was greater in companies with lower levels of board monitoring quality.

The fact that the CEO may be able, under specific board structures, to exert extra rents from the firm and excessively increase his pay is believed to be a major problem that corporations are facing. The main party that is negatively affected by this unacceptable practice of the CEO is shareholders, since they invest capital in the corporation and anticipate that the company's board and executives will manage their money effectively by investing in activities and assets that will boost firm's profitability and consequently increase stock price. However, excessive and unjustifiable CEO compensation leads to a misallocation of these funds. Specifically, capital that could have been invested in value enhancing projects is used for the inflation of CEO pay. Inevitably, this misappropriation of funds costs money to shareholders, since they do not receive the return that they should from their investment in the firm (Faleye, 2007; Bebchuck & Fried, 2006). Additionally, when it comes to CEO compensation there are some important issues that have not been thoroughly addressed and explained yet. More specifically, it is pretty vague how these CEO pay packages and their components are determined, as well as the managerial incentives that each element of CEO total compensation creates. Furthermore, there are some doubts on how directors assess the ability of a CEO and if some discretionary factors are taking the lead in the process of forming the appropriate CEO compensation. Last but not least, there is a growing need to investigate and determine whether these bonus or equity based incentives have a significant impact on the CEOs' motivation as a whole and whether they incentivize them to be more productive and effective in their job.

Overall, this thesis will investigate the association between board structure and CEO compensation in an attempt to answer the following research question:

RQ: How does board structure influence CEO compensation?

I expect to find a significant relation between board structure and CEO compensation since as discussed above the problem of groundless amounts of CEO compensation is more than present in public corporations in the USA (Fortune Magazine, 2011; Core et al., 1999). That fact, unfortunately leads to decreasing shareholders' value, thus shareholders seek to stop the occurrence of such actions against their interest. The only mean that shareholders can utilize in order to achieve their goal to deteriorate the CEOs' influence over the board when it comes to CEO pay is their right to elect the board members in the annual shareholder meetings. In this way, they can adjust board's composition in a manner that promotes

monitoring efficiency and consequently mitigates the issue of extra rent extraction by the CEO. The rationale is that these board structure choices significantly impact total CEO compensation (Yermack, 2010).

In this empirical investigation, I also aim at answering a sub question which is related to how the years of the financial crisis (2007-2008) affected the association discussed above. More precisely, during financial crises shareholders' value reaches levels that are exceptionally low. In response to this adverse situation, they promote cuts in firm's expenses. In fact, CEO compensation is a major outlay of a firm. For this reason, shareholders impose unprecedented pressure over the directors to perform their obligation to set the right CEO pay and reduce the possibility that extra unjustified rents are extracted by the CEO, by reaching very high standards of efficiency in these tasks. Therefore, during financial crises all board members despite their special characteristics (e.g. whether they are outsiders or insiders) are forced to substantially enhance their monitoring role over CEO compensation, thus it becomes even more difficult for the CEO to extract extra rents from the firm.

The main contribution of this research is that it adds to the previous discussion on the relation between board structure and CEO compensation by employing a more recent sample of observations. The data that I will use in my empirical analysis refer to the 2007-2015 time period. Previous research such as that of Chhaochharia & Grinstein in 2009 and Guthrie et al. in 2012, has mainly focused on the time frame before 2005. During these years board regulations were not as developed as they are nowadays. Especially before 2001, when the Enron scandal led to the introduction of new rules, mainly associated with board composition, the legal framework related to the function of the board of directors was relatively weak and vague. However, during the following years (after 2005) boards became more "mature" and significantly increased the level of their monitoring quality, since they were consistently integrating these essential legislations by adjusting their boards accordingly. Therefore, I believe that the period that I will employ is more relevant for the examination of the relation between board structure and CEO pay, since there are no external shocks introduced (new rules), previous legislations are completely adopted by the boards and boards of directors are sufficiently regulated. As a consequence, this setting forms the perfect environment to test this causal relation and get updated results.

In addition, this thesis has the objective to provide useful insights and recommendations on shareholders and other practitioners that deal with the problem of unjustified rent extraction from the CEO. Indeed, this thesis offers to shareholders details on which board structure adjustments they should promote in order to overcome the issue of disproportionately high CEO compensation. At the same time, by examining the relation of board structure and CEO compensation during the 2007-2008 financial crisis, when every extra outlay makes the difference in terms of profitability, it presents to shareholders a

rational strategy that they should follow to choose the most effective directors in terms of monitoring and subsequently counteract CEO's ability to manipulate the board and inflate his compensation.

The sample that I employ in this empirical research consists of publicly listed USA firms, while the time period spreads from 2007 to 2015. The USA financial market is considered to be the most developed worldwide. As a consequence, the boards of directors are also structured in a way that promotes efficiency since they were forced to comply with drastic regulations that were promoted by the government in order to maintain market's transparency. Moreover, the time frame that I use reflects a period that is characterized by stability, due to the absence of new board legislations, and a very high level of compliance of boards with pre-existing rules. All these factors, lead to a comprehensive and reliable sample which strengthens the validity of the final results. When it comes to more technical details, the mechanism that creates a relation between the two constructs is as follows. First of all, board structure affects the monitoring ability of the board which in turn has an impact on CEO compensation. Board structure ("X") is operationalized by three measures. Namely, CEO duality (a dummy that equals one if the CEO is also a chairman of the board), the percentage of inside directors and the percentage of outside directors. With regard to the dependent variable, it will be measured by employing total CEO compensation which consists of fixed and non-fixed compensation. Non-fixed compensation is dependent on the bonus, the total value of restricted stock granted, the net value of stock options exercised and the long-term incentive payouts). For the purpose of dealing with other factors that may affect the causal relationship that is examined, control variables are included. Namely, firm size, firm performance, firm growth opportunities, CEO's tenure and a dummy for the years of the crisis. Last but not least, is essential to mention that board composition and CEO compensation are endogenously determined. As a consequence, is important to bear in the back of our mind the implications that this fact may have on our empirical analysis.

In the next chapter, the main literature that has been employed as a base for this thesis is discussed. After this, the hypotheses development section is introduced, in this part of the thesis the main hypotheses are formulated. In chapter 4, the research design is thoroughly discussed. The main focus of chapter 5 is the validity and reliability of the research. Chapter 6, is dedicated to the empirical findings and the validation of the hypotheses. Eventually, this leads to the conclusions which are based on the results and are presented in chapter 7.



## 2. Literature Review

### 2.1 Introduction

In this chapter, prior literature that is related to the association between board structure and CEO compensation is discussed. Specifically, in the beginning there is a review of motivation theories, while an extra focus is put in extrinsic and intrinsic motivation. Then, the agency theory is presented and analyzed in depth. After that, some insights on the composition of the board of directors are given. More precisely, extra attention is given to the presence and the role of inside and outside directors, while at the same time the existence of CEO duality within a board is discussed. Finally, in the last section the different components of CEO compensation are specified, while extensive literature on fixed and non-fixed CEO compensation is cited.

### 2.2 Motivation Theories

According to Ryan & Deci, 2000, "To be motivated means to be moved to do something". Therefore, an individual who is not inspired to act is considered to be unmotivated, while a person who is activated towards an end is perceived as motivated. Everyone who engages in an activity has some sort of motivation, however practitioners are mainly keen on determining the amount of motivation that is related to a specific action. Most theories of motivation characterize it as a unitary phenomenon, one that varies from low to extremely high levels of motivation. Nevertheless, contemporary studies underline that people do not only have differences in terms of their level of motivation but also in terms of the orientation of their motivation. The orientation of motivation is associated with the underlying attitudes and goals that initiate action. (Ryan & Deci, 2000). In 1985, Deci & Ryan came up with the Self-Determination-Theory in which they categorized different types of motivation by relying on the different reasons that lead to a specific action. The main distinction that they proposed was between intrinsic and extrinsic motivation. Intrinsic motivation, refers to doing something because it is intrinsically fascinating, while extrinsic motivation refers to doing something because it results in a desirable outcome for the individual who takes an action.

When it comes to intrinsic motivation, an individual is incentivized to act for the sake of the challenge that is associated with an action rather than because of external forces and rewards. In accordance with extrinsic motivation, the ability of people to develop interests in certain areas and be self-motivated by these interests is a factor that has a significant impact on individuals' future achievements inside and outside the professional context. Because of the fact that intrinsic motivation is affected by both the person and the task, some authors have defined intrinsic motivation in terms of the task's attractiveness while others in terms of the pleasure that an individual gains by engaging inherently in a task. This distinction, was the result of two previous theories. Namely, the operant theory which was developed by Skinner in 1953 and supported the notion that all behaviors are initiated by rewards (e.g. money) and

the learning theory which was developed by Hull in 1943 and asserted that physiological drives incentivize all behaviors. Moreover, in 1985 Deci & Ryan presented the Cognitive Evaluation Theory with the purpose of determining the factors in social contexts that yield to variability in intrinsic motivation. Specifically, this theory supports that interpersonal events and structures induce feelings of competence during an action and can have a positive impact on the motivation for the action since they satisfy the psychological need for competence (Ryan & Deci, 2000). However, for intrinsic motivation to be increased, individual's perceived competence is not enough, because people should also experience that their behavior is self-determined. (Reiss, 2004; Bénabou & Tirole, 2003)

Despite the fact that intrinsic motivation is an important mean of incentivizing people, the vast majority of the actions that individuals undertake are not intrinsically motivated. Therefore, these actions are mainly promoted by extrinsic motivation. As reported by Ryan & Deci, 2000, extrinsic motivation “is a construct that pertains whenever an activity is done in order to attain some separable outcome”. Based on the rationale that most of the activities that individuals are required to perform in the context of their job are not so interesting as to boost intrinsic motivation, a central question is how individuals can be incentivized to be productive in such activities. The Self-Determination-Theory suggests that lies in fostering the internalization and integration of values. Internalization, is the procedure of taking in a value or regulation, whereas integration relates to the process that an individual follows in order to fully assimilate a value or regulation. High levels of internalization are in line with greater quality of engagement. Additionally, another theory that is associated with extrinsic motivation is the Organismic Integration Theory. This theory, was introduced in order to elaborate on the contextual factors that promote or undermine integration and internalization of the values and regulations related to certain behaviors. The organismic Integration Theory, divides the different kinds of motivation in terms of the degree to which the motivation emerges from one's self. To begin with, we have “amotivation” which is the state in which an individual lacks the intention to act. After “amotivation” comes another form of extrinsic motivation and that is called “external regulation” which induces behaviors that are performed to please an external call or acquire an externally imposed reward. A second type of extrinsic motivation is the “introjected regulation” which presents a type of internal regulation that forces people to execute specific actions with the feeling of pressure in order to stay away from guilty thoughts or satisfy their ego and pride. Then, the theory proceeds with types of extrinsic motivation that are more self-determined. In accordance with this theory, there are two extrinsic kinds of motivation that are considered to be more autonomous. The first one, is the “regulation through identification” and the second one is the “integrated regulation”. In the case of the “regulation through identification”, the individual has realized the personal significance of an action and has accepted the action's regulation as

his or her own, while in line with “integrated regulation”, integration takes place when the identified regulations have been completely assimilated to one’s self (Bénabou & Tirole, 2003).

### 2.3 Agency Theory

The aim of Agency Theory is to explain the difference between the principals and the agents in the context of a business. During the 1960s and 1970s, economists discovered and further elaborated on the concept of risk sharing among individuals and groups, as a result they generated some really interesting and insightful papers. The rationale behind these papers (e.g., Arrow, 1971; Wilson, 1968) is that the risk-sharing problem arises when cooperating parties have differences in the way that they perceive risk and their willingness to bear risk in general. Agency theory, is a follow-up on this initial empirical work and it adds to it by including the so-called agency problem which appears when the cooperating parties have different views on the goals and division of labor (Jensen & Meckling, 1976; Ross, 1973). Moreover, Agency theory is concerned with giving solutions to two major issues that can appear in agency relationships. “The first is the agency problem that arises when (a) the desires or goals of the principal and agent conflict and (b) it is difficult or expensive for the principal to verify what the agent is actually doing” (Eisenhardt, 1989).

The most common agency problem is the one that arises between shareholders and company executives. The agency problem between shareholders and managers happens because executives tend to act in a way that helps them to achieve their own goals but at the expense of shareholders. More specifically, executives may not put extra effort in maximizing shareholders’ wealth since they may be concerned about the fact that lower proportion of the extra profitability that the firm produces is going to be distributed to them. The most ordinary agency problems between shareholders and executives are related to management myopia, empire building and opportunistic behavior.

Modern finance theory is based on the intuition that the purpose of a business is to maximize the value of shareholders. So, managers of corporations are responsible and should seek to maximize the value of ordinary shares in the long term. However, when it comes to real world cases managers may not be willing to work towards this direction. Most of the times that happens because there is a difference in the time horizon between executives and shareholders. Under current circumstances managers have incentives to adopt a myopic value enhancing strategy in order to maximize their own value. These incentives are affected by the structure of executives’ compensation packages. When their compensation includes bonuses that are dependent on short-term performance or share options that are about to mature, it is in their benefit to make short-term decisions that promote short-term profitability (Pozen, 2014; Mizik, 2010). This behavior of executives is broadly known as management myopia and has an adverse impact on shareholders’ value. In response to this major problem, practitioners

have proposed some solutions. Specifically, they suggest that management rewards be linked to long-term performance and to the general strategic goals of the corporation. They also propose that a “loyalty dividend”, that is higher to the one given to ordinary shareholders, should be given to shareholders that hold their shares for a longer time period. Finally, they propose strong corporate governance structures and changes in taxation that make short-term investment less appealing to investors (ACCA Global).

Furthermore, a second major agency problem is that of empire building. By definition, empire building is the act of enhancing an organization’s power and influence (Hope & Thomas, 2008). In the context of a business, that attitude is observed when executives are mainly focused on increasing the size of the firm and the firm transactions, the number of employees and the value of assets under their control, instead of promoting policies and plans of action that benefits shareholders. Empire building is considered to be really harmful for companies since managers put more emphasis on acquiring resources than allocating the existing resources in the most effective and value-enhancing way (Kanniainen, 2000).

To conclude, another main problem associated with agency theory is that of opportunistic behavior. In general, opportunistic behavior relates to managers acting on expediency by putting unethical values such as wealth and power above ethical values such as integrity, honesty and responsibility. Consequently, executives try to deceive shareholders by promoting improper ways of enhancing firm’s value (Chen et al., 2002). According to Williamson, 1985, “Opportunism often involves subtle forms of deceit ... More generally, opportunism refers to the incomplete or distorted disclosure of information, especially to calculated efforts to mislead, distort, disguise, obfuscate, or otherwise confuse. It is responsible for real or contrived conditions of information asymmetry, which complicate problems of economic organization.” (Williamson, 1985).

#### 2.4 Insiders

An inside director is a member of the board that is an employee, officer or is a stakeholder in the corporation. Inside directors, act as a link between the executives of the firm and the board of directors since they are individuals who held or still hold important and key positions inside the firm (Drymiotis, 2007). As a consequence, they have a deep knowledge of the company’s functions and operations and their suggestions, insights and recommendations are considered to have a positive effect on the final decisions of the board. Despite the fact that their know-how and ability offers valuable inside information to the board meetings, they seem to lack the ability to be effective monitors, since they have personal relations with firm’s top executives (Bebchuk et al., 2002). Therefore, there is a high likelihood that if an executive acts improperly or against the firm’s regulations they will look the other way and avoid reporting his wrongdoings during the board gatherings (Hermalin & Weisbach, 2001). Indeed, according to Jensen (1993) boards should primarily consist of non-

executive directors, because that will ensure greater compliance with decisions that are in favor of shareholders. In addition, Baysinger & Butler (1985) found evidence that the participation of non-executives in a firm's board of directors ensures more effective monitoring of top manager's actions. However, there is a part of the literature that opposes the notion that insiders are not efficient monitors. More precisely, in his 2007 paper, Drymiotes supports that a less independent board, one that to some extent promotes the interests of the CEO, can execute its monitoring responsibilities more effectively than a fully independent board, since according to his theory if the board believes that the CEO supplied high effort it has incentives to trick the CEO by stating that his high productivity was the outcome of excessive monitoring effort by the board. As a result, the author shows that the existence of insiders on the board better aligns the interests of the agent and the board and counteracts the issues of the board shortchanging the agent, while increasing the monitoring quality of the board as a whole. Furthermore, Bedard et al. (2014) find a negative relation between CFO board membership and internal control weaknesses.

## 2.5 Outsiders

An outside director, is a member of the firm's board of directors who does not have a stake at the company and he is not an employee of the company (Byrd & Hickman, 1992). Despite the fact that inside directors provide the board with valuable insights on the firm's activities and operations, outside directors add to the process of judging the decisions of the CEO by providing expertise and objectivity. Therefore, outside directors are perceived as the best monitors of the CEO and those that guarantee that the CEO does not act against shareholders' interests. More specifically, in a survey that was conducted by McKinsey and Corp. in 2000 the company found evidence that investors are willing to pay a premium in order to own shares in firms that have a majority of outsiders in their board of directors. Therefore, the market believes that well-governed firms offer greater protection to investors.

Indeed, outside directors are more motivated to be better monitors of the CEO since they are really concerned about their reputation and their commitment to protect shareholders from greedy and deceiving activities of the management team (Fama & Jensen, 1983; Ricardo-Campbell, 1983). In addition, prior literature has highlighted the benefits that outside board members provide to shareholders. Brickley & James, (1987), in a study focused on the banking industry, find that the presence of outsiders on the board prevents managers from consuming perks. At the same time, boards that mainly consist of outsiders are more likely to fire the CEO after a period of poor firm performance (Weisbach, 1988). In agreement with the previous evidence, the appointment of an extra outside director on the board has a significantly positive impact on the firm's stock price (Core et al., 1999; Rosenstein & Wyatt, 1990). Moreover, much research has underlined that the monitoring role of outside directors can efficiently prevent companies from issuing deceitful financial

statements (Garcia-Meca & Sanchez-Ballesta, 2009; Peasnell et al., 2005; Klein, 2002; Maug, 1997; Beasley, 1996). Additionally, previous papers find that shareholders benefit more from tender offers for bidders and in hostile takeover threats when independent outside directors have control of the board (Gibbs, 1993; Byrd & Hickman, 1992).

However, it is interesting to mention that the board of directors of Enron Corp. mainly comprised of outside independent directors. Consequently, there are some scholars (e.g., Ozkan, 2006; Core et al., 1999) who challenge the notion that outsiders are the most efficient monitors within the board of directors. For instance, critics support that managers dominate the board by appointing outsiders and providing them with the information that they need in order to assess the managers' performance and actions (Shivdasani & Yermack, 1999). Moreover, there is a high number of researchers who propose that there is no significant association between the percentage of outside directors on the board and firm performance (Bhagat & Black, 2002; Klein, 1998).

## 2.6 CEO Duality

By definition, CEO duality occurs when the individual who holds the position of the CEO within a firm is also the one who chairs the board meetings (Rechner & Dalton, 1991). In general, there are two empirical views when it comes to the functioning of CEO duality and its influence on the board's effectiveness. On the one hand, it is believed that CEO duality leads to CEO entrenchment, while it has a negative impact on the board's effectiveness to monitor and discipline (Mallette & Fowler, 1992). On the other hand, there are those who support the notion that CEO duality leads to a unity of command at the top of the corporation, by giving explicit power to the CEO in terms of leadership. As a consequence, proponents of this theory conclude that this unambiguous power of the CEO improves the decision making process and the way that the firm operates (Finkelstein & D'Aveni, 1994).

However, most of the empirical research is in favor of the rationale that the drawbacks of CEO duality outweigh the benefits that it can potentially have on a corporation. For instance, CEO duality is perceived as the main obstacle that does not allow directors to efficiently monitor top management actions and decisions, while it promotes CEO entrenchment (Baliga et al., 1996). Indeed, independently of whether they are chairmen or not, CEOs have strong incentives to mislead the board and limit its ability to monitor by shifting the directors' focus away from their supervisory role. This opinion is supported by a large number of empirical papers. More precisely, Conyon & Peck (1998) show that CEO pay is affected by the dual role of the CEO as chairman. Moreover, Davidson et al. (2004) prove that CEO duality goes in parallel with earnings management, at the same time Cannella & Lubatkin (1993) elaborate on the excessive CEO power that is associated with CEO duality and the fact that CEO duality weakens the supervisory role of the board.

Additionally, Tuggle et al. (2010) find unequivocal evidence that duality has an adverse influence on the way that the board allocates its attention to monitoring. In practice, it seems that a large number of firms in the USA has realized the need for change in the way that the boards are structured. More specifically, public corporations in the USA seem to understand that CEO duality causes a lot of problems and does not promote transparency within the company. To conclude, in accordance with Lublin (2009), in 1998, 84 percent of S&P 500 firms had a CEO who also served as chairman of the board, while in 2008 this percentage declined to 63%.

## 2.7 CEO Compensation

### 2.7.1 Fixed Compensation

The fixed compensation of the CEO is the salary that is provided to him as a reward for offering his services to the firm. According to Oxford Dictionaries, salary is defined as “a fixed regular payment, typically paid on a monthly basis but often expressed as an annual sum, made by an employer to an employee, especially a professional or white-collar worker.” In general, top managers prefer to have fixed cash compensation instead of variable compensation which depends on firm’s performance, since managers are risk-averse (Harris & Raviv, 1979). Therefore, they want to reduce the risk that is related to their compensation, thus a fixed pay gives them the opportunity to ensure that their compensation is not influenced by external factors.

There is a significant number of scholars, who strongly believe that equity-based compensation is more beneficial to shareholders than fixed compensation. Most of these individuals, justify their point of view by stating that a pay package which is mainly comprised of stock-based compensation better aligns the interests of managers with those of shareholders (Shleifer & Vishny, 1997; Hirshleifer & Suh, 1992; Smith & Stultz, 1985). As a result, it is broadly accepted that variable pay is better than fixed pay when it comes to CEO compensation. Nevertheless, a smaller part of the literature underlines the potential benefits that fixed compensation can have on the incentives of an individual. The findings of Gneezy & Rustichini (2000) are really insightful in this respect, since they find that even though higher incentive rates boost effort, the effort of employees under a fixed pay scheme is always higher than the effort of employees under a pay-for-performance pay scheme. In line with Gneezy & Rustichini view, Fehr & Gächter (2000) find that incentive contracts are less efficient in motivating agents than fixed wage contracts are.

Last but not least, it is also important to mention a groundbreaking article which was published in 2016 by London Business School Review and cited the opinion of two well-known professors, Dan Cable & Freek Vermeulen. In their unconventional article, the two famous researchers proposed that CEO compensation be 100 percent fixed. More precisely, they identify 5 issues associated with performance based compensation. Firstly, they state that

performance based pay is only useful in routine tasks where learning is unnecessary. Secondly, they support the notion that putting excessive attention on performance can weaken it. Furthermore, by employing the results of 128 independent studies they reach the conclusion that financial incentives given to executives in order to enhance their extrinsic motivation cause significant damage to intrinsic motivation, while performance-based pay forces executives to cheat. To conclude, they believe that the measurement of success and performance is subjective and cannot be accurately determined.

### 2.7.2 Non-Fixed Compensation

The accounting based measures, are widely used in the compensation contracts of executives. In most of the cases, companies link accounting performance measures with the annual bonus plans of employees who are considered to have a role within the corporation which is of significant importance. There are a lot of items on the financial statement of a firm which can potentially be used to determine the degree to which a manager is productive or not and whether he implements a corporate strategy which creates value for shareholders. However, practically, the items that are employed with the highest frequency are earnings, EBIT (Earnings Before Interest and Tax) and sales. Additionally, ratios that utilize the accounting information that is provided through the financial statements are applied in order to evaluate the ability of an executive and set a level of compensation which is adequate of the effort that he puts in place. Return on Assets (ROA), Return on Equity (ROE), Earnings per Share (EPS) and Economic Value Added (EVA) are the most commonly used ratios when it comes to bonus based pay (Murphy, 1999; Healy, 1985).

Nevertheless, it is observed that the primary measure that is employed in the bonus plans of executives is accounting profits (Murphy, 1999). There is a lot of dispute among practitioners and researchers on whether accounting profits are informative in terms of an executive's effort. Those that are in favor of the deployment of accounting profits in bonus plans justify their opinion by stating that earnings are associated with factors that are more under management's control. On the contrary, those who challenge the usefulness of accounting earnings argue that they are backward looking and promote profitability in the short run, therefore managers have incentives to dismiss investment plans that will create future value for the firm because their short-term profitability is significantly less than their long-term profitability (Dechow & Sloan, 1991). Secondly, they mention that earnings can be manipulated through earnings management. Indeed, Healy (1985) finds that the accrual policies that are implemented by executives are dependent on the incentives that their bonuses create and that the revisions of the accounting processes that the firms follow are related to adjustments of the executives' bonus plans.



Equity compensation, is a way of remunerating executives for offering their services to a firm, basically it is a non-cash payment which transfers to managers' part of the firm's equity. Options, restricted stock and performance shares are tools that are incorporated in top executives' compensation contracts in order to better align the interest of shareholders with those of managers (Hall, 2003). The main function of this kind of pay is that executives will enjoy a higher salary if the firm's price increases, as a result they will invest in activities which boost the value of shareholders. Additionally, a compensation package with an equity based component enhances corporate productivity and leads to the attraction and retention of an effective management team. According to Lambert & Larcker (1987), firms put more weight on market performance on executive compensation contracts when: the variance of the accounting measures of performance is higher than the variance of the market measures of performance, the assets and sales of the company are facing substantially high growth rates and the firm manager's stock ownership is considerably low.

Moreover, there are some other reasons, except for those that were discussed above that force firms to compensate their top executives with equity. For instance, because of the fact that stock options and restricted stocks require no short-term cash payouts, corporations that face liquidity problems and run out of cash reserves promote equity based remuneration instead of cash (Core & Guay 2001; Core & Guay, 1999). Furthermore, the tendency of firms to use equity based pay can also be driven by tax motivation. For example, when an increase in future corporate tax rates is expected, the future tax deduction which is induced by deferred compensation of executives can be more beneficial to the firm compared to the instant tax deduction which the firm derives from cash compensation. At the same time, Bryan et al. (2000) observe that companies with lower marginal tax rates capitalize more on the use of stock options as a mean of paying executives. Last but not least, corporations may be more inclined in employing equity based compensation instead of other forms of executive pay because of the accounting treatment of options. Stock option grants are most of the times not expensed, while cash pay and restricted stocks are recorded as expenses in the Profit & Loss statement. Therefore, the firm may have strong accounting incentives to compensate top management with equity (Core & Guay, 2001).

However, there are voices that challenge the notion that equity-based compensation is the best way of compensating executives. Hall & Murphy (2000), believe that paying a risk averse executive with stocks or options may be more costly for the firm than offering the executive cash compensation. For instance, Graham & Harvey (2005), find that the vast majority of executives would abandon a positive NPV project if it caused a miss of earnings targets. Additionally, equity based compensation discourages truth telling from the part of the CEO since an action like this could potentially lead to a significant decline of the stock price and as a consequence a sharp decrease in the CEO's compensation. Moreover, there are

empirical evidence which support the view that stock-based compensation is related to earnings management, misreporting, fraudulent accounting and restatements of financial statements (Kedia & Philippon, 2010; Johnson et al., 2009).

To conclude, there is a very important factor which affects the efficiency of equity-based compensation in incentivizing executives and should be given extra attention by practitioners who determine top executives' pay, this factor is the ability of executives to understand how stock options work. Lambert & Larcker (2001), provide some really insightful evidence on this problem. Specifically, they show that the value that is assigned from middle-level executives to their stock options caps the Black & Scholes value by 50 to 200 percent. As a consequence, a significant number of managers who are also option holders lacks the capacity to grasp the underlying price distribution, as a result there is a high risk that managers are also unable to perceive the motivation and incentives that are provided to them through stock options.

## 2.8 Summary

In this section of the thesis the main literature related to my empirical investigation was discussed. More precisely, a review of motivation theories and agency theory was provided. Additionally, literature on inside directors, outside directors and CEO duality was presented. Finally, prior literature on CEO compensation and its components was introduced.

### 3. Hypotheses Development

#### 3.1 Introduction

The aim of this section is to develop the hypotheses which are going to be tested in this thesis. More specifically, relevant prior literature is cited and thoroughly discussed. The different results are presented and then the whole process ends up by introducing each of the three hypotheses, the outcome of which is the main point of interest in this empirical investigation.

#### 3.2 Hypothesis 1

Core et al. (1999), investigated whether a relation exists between CEO compensation and the degree to which a firm's corporate governance is effective. The outcome of their empirical research is that the characteristics of the board of directors and the ownership structure of the board have a cross-sectional association with total CEO compensation. They find this result after controlling for economic determinants that affect the level of CEO compensation.

The sample that the authors utilize, is made up of 495 observations over a period of three years for 205 US publicly traded corporation. Furthermore, they measure CEO total compensation as the sum of salary, annual bonus and their valuation for stock options, restricted stock, phantom stock and performance plans. In the paper, the authors also control for the economic determinants of CEO compensation. Specifically, they proxy for firm size, complexity and investment opportunity, while they also proxy for firm performance and firm risk. Additionally, they measure the monitoring effectiveness of the board of directors by employing eight measures, namely: CEO duality, board size, the percentage of inside directors, outside directors appointed by the CEO, gray outside directors, interlocked outside directors, outside directors over age 69 and busy outside directors. Regarding the ownership variables they use CEO percentage stock ownership, the existence of a Non-CEO insider who owns at least 5% of the firm's outstanding shares, the percentage of stock ownership per outside director and the existence of an outside block holder who owns at least 5 % of the firm's outstanding shares. Finally, for the purpose of testing their hypothesis the authors utilize a cross sectional multiple regression.

To conclude, Core et al. (1999) find some really insightful results. More specifically, they prove that the proxies for firm size, complexity, investment opportunity and firm performance have a positive impact on CEO total compensation, while the proxies for firm risk have a negative impact on CEO compensation. With regards to the board structure variables, they find that CEO duality has a positive impact on CEO total compensation, the percentage of inside directors has a negative impact on CEO total compensation and the percentage of outsiders on the board positively affects CEO total compensation. Finally, the

researchers find that all the board ownership variables discussed above have a negative effect on CEO total compensation.

Moreover, Boyd (1994) elaborates on the importance of the board of directors in terms of its control function of setting the appropriate CEO compensation. Based on solid theory, he mentions that it is in the CEO's best interest to circumvent the board in order to maximize his compensation. Therefore, it is intuitive that a CEO who has excessive power over the board and dominates it has more chances of receiving a higher level of total compensation. By relying on this rationale, the author provides evidence that CEO compensation is inversely related to the levels of board control.

To perform his analysis, he gathers data from 193 US firms from 12 industries. The author operationalizes CEO compensation by using total cash compensation which is defined as the sum of salary and bonus, while he states that total cash compensation is an efficient proxy of measures which contain deferred income. Concerning the measurement of board control, the researcher employs several proxies. Particularly, he utilizes CEO duality, the ratio of insiders on the board, board stock ownership, the number of directors who represent ownership groups and the level of director compensation, while he controls for firm size and firm profitability. In this paper, the statistical model that is used by the author to test his hypothesis is the LISREL VII.

Finally, Boyd (1994) observes that the level of board control has a negative association with CEO compensation. More specifically, he proves that CEO duality negatively affects board control and as a consequence has a positive impact on CEO compensation. At the same time, he shows that the ratio of insiders on the board positively affects the level of board control and as a result it has a negative effect on CEO compensation. Furthermore, the researcher finds that the board stock ownership and the number of directors that represent ownership groups have a positive impact on board control, whereas the level of directors' pay decreases the level of board control. To conclude, both firm size and firm profitability have a significantly positive effect on CEO compensation.

In addition, Lin (2005) performs a study which has two main objectives. On the one hand, he wants to investigate the influence of the level of board control and large external shareholders on CEO compensation. On the other hand, his second goal is to elaborate on both agency and stewardship theory to investigate the association between the control mechanisms of the board and CEO compensation, and to observe which theory is more relevant. The author justifies the existence of an association between the board of directors and CEO compensation by referring to the corporate law which clearly states that the board has the power and the right to hire and fire the CEO as well as set the level and structure of CEO compensation.

Switching our focus on the sample that the author employed, he manages to pool data of Taiwan listed corporations throughout the years 1997 to 1999. The result, is the accumulation of a sample of 485 firms, of which 74 employ a CEO who also holds the position of chairman and 411 firms in which the position of the CEO and board chair are occupied by different individuals. CEO compensation is measured as the sum of salary, bonuses and performance based bonuses. Moreover, the variables that are utilized in order to proxy for board control are the board stock ownership, the ratio of inside directors in the board and CEO duality. With respect to the operationalization of the construct of the presence of outside block holders the paper contains two variables, the number of outside block holders and the sum of shareholdings from outside block holders, respectively. Furthermore, control variables are also included in this analysis. More precisely, the author controls for firm size, firm performance, investment opportunity and CEO power. Finally, the researcher tests his hypotheses by making use of two LISREL models

The empirical results of Lin (2005) paper support the notion that there is a negative association between the control quality of the board and CEO compensation. In detail, the ratio of insiders on the board has a negative impact on board control and consequently a positive association with CEO compensation, while CEO duality positively affects board control and as a result has a negative impact on CEO compensation. However, the findings are against the second hypothesis that there is negative relation between large external shareholders and CEO compensation. Eventually, the researcher finds evidence in favor of his assumption that the predictability model which does not focus on companies with CEO duality is more effective than the one that incorporates both firms in which CEO duality and non-duality exist.

Conyon & Peck (1998), investigate how the level of management compensation is affected by board control and the presence of a remuneration committee. For that reason, they develop some hypotheses which they empirically test in order to give an answer to the question discussed above.

The authors, employ a sample of 94 firms to test their hypotheses. The data are obtained from the U.K Financial Times top 100 corporations by market value (FT-SE 100). The sample period spreads from 1991 to 1994. Each firm that is incorporated in the sample has compensation, size, performance, and governance data from 1991 to 1994. CEO compensation is measures as the sum of salary, bonus and miscellaneous earnings awarded to the top management team. Equity based pay is not included in the calculation of CEO compensation since information related to the executives' equity holdings are not available in UK from 1991 to 1994. Moreover, the existence of a remuneration committee and CEO duality is determined by the utilization of two dummy variables. In addition, the researchers use some controls in their analysis. Specifically, they proxy for the presence of a nomination

committee in a firm, board size, off-board shareholdings, as well as performance and firm size.

Concerning the methodology used, the panel data econometric method is utilized since this methodology helps the researchers to deal with the issue of omitted variables by including firm-specific fixed effects. Furthermore, for the purpose of testing their hypotheses the authors employ OLS and Fixed Effects Models. Moving on to the results, in their first hypothesis the authors state that firms with more outside directors on their board are having lower top management compensation, however they find little evidence that support this statement. Besides, they find that management compensation is positively related to the existence of a remuneration committee and the higher proportion of outsiders on it. In this paper, there are also little evidence which support the notion that CEO duality has a positive association with top managers' compensation. Moreover, the percentage of outsiders on the board does not appear to play a role in the determination of executives' pay, while the authors obtain some evidence, that the percentage of insiders on the board positively affects top management compensation. To conclude, the researchers find that their hypothesis, that management compensation and firm performance are better aligned in firms where outsiders are the majority of the board and the number of outsiders in the remuneration committee outweigh that of insiders, is supported by the results of the regressions that they performed.

Based on the previous discussion, I anticipate that the percentage of insiders on the board of directors is negatively associated with CEO total compensation. Therefore, I hypothesize the following:

H1: The percentage of inside directors on the board of directors is negatively associated with total CEO compensation.

### 3.3 Hypothesis 2

Additionally, Cordeiro & Veliyath (2003) examine how CEO compensation is affected by strategic variables, firm risk, governance mechanisms and ownership structure. The authors, generate a set of well-structured hypotheses in order to test their research question, while they control for firm size, firm performance and CEO tenure.

In the paper, a panel of 222 US corporation over the years 1992 to 1995 is applied. Concerning CEO compensation, it is important to mention that the authors use both cash and total compensation. In order to test their hypotheses, the researchers employ a pooled time-series cross-sectional regression analysis, while the authors rerun their regressions by replacing CEO cash and total compensation with their logarithms respectively. With regards to the results of their empirical analysis, they find that the ratio of outsiders on the board has a

positive impact on CEO cash compensation but has no relation with CEO total compensation, while surprisingly they observe that CEO duality does not affect CEO cash and total compensation. What is more, they find that inside director ownership negatively affects CEO cash compensation but has no impact on CEO total compensation. At the same time they find that the number of block holders on the board negatively affects CEO cash compensation, but has no impact on CEO total compensation. With respect to the last two hypotheses, the researchers find evidence in support of the view that the degree of diversification affects CEO compensation, however this relation holds only for CEO cash compensation. To conclude, they observe that CEO cash and total compensation is positively influenced by total risk.

In summary, from the papers which were analyzed in this chapter two find undisputed evidence in support of the argument that CEO duality has a positive impact on the level of CEO total compensation. Nonetheless, there is a third paper which finds a negative relation between CEO duality and CEO total compensation and a fourth paper which does not detect any relation between the two constructs. Due to the fact that the majority of the papers provide evidence in favor of the positive relation between CEO duality and CEO total compensation. I assume that the two constructs are positively associated. Therefore I hypothesize the following:

H2: CEO duality is positively associated with total CEO compensation.

### 3.4 Hypothesis 3

Moreover, Ozkan (2006) investigates how CEO compensation is influenced by the board structure and the ownership structure of firms. The author elaborates on his research question by using a sample of 414 UK firms for the years 2003 and 2004. The researcher, defines CEO cash compensation as the sum of salary and annual bonus, while he measures CEO total compensation as the sum of salary, annual bonus, LTIP awards and the value of stock options at the grant date. The author determines the value of the stock options by utilizing the Black & Scholes formula which he adjusts for dividends that are paid in a continuous way.

In his research, the author estimates cross-sectional regressions in which he uses CEO cash, equity-based and total compensation as dependent variables. Additionally, he applies a number of control variables in his analysis. Therefore, he uses proxies for firm size, growth opportunities and firm performance, while he includes industry fixed effects and mitigates the problem of simultaneity by employing lagged values of the explanatory variables. With regards to the results, they indicate that firm performance measured as the stock return does not affect the level of CEO total compensation. Moreover, firm size and the firm's growth

opportunities have a positive and statistically significant impact on CEO total compensation. In addition, board size and the percentage of outsiders on the board are positively associated with CEO total compensation. Finally, the author also observes that institutional shareholdings negatively affect CEO total compensation, but whereas as the ownership of the block holders rises the CEO total compensation decreases.

With reference to the papers that were discussed in this chapter, there are some mixed evidence concerning the impact that the percentage of outside directors on the board has on CEO total compensation. Indeed, two papers find a significantly positive relation between the ratio of outsiders and the level of CEO total compensation, while at the same time one paper finds weak evidence of a negative relation between the two variables. Finally, one of the papers also finds no evidence of a relation between the percentage of outsiders on the board and CEO total compensation. Based on those insights, I hypothesize the following:

H3: The percentage of outside directors on the board of directors is positively associated with total CEO compensation.

### 3.5 Summary

In summary, this section provided an elaborative discussion on previous papers that are related to this thesis. Moreover, the most important sections of each paper were introduced and extra focus was put in the results and conclusions part. Finally, the main hypotheses which will be investigated were established based on the discussion concerning the final outcomes of each paper.



## 4. Research Design

### 4.1 Introduction

This part of the thesis focuses on the research design and methodology which is utilized in order to obtain the final results. In the first subsection, the main model is presented, while the main variables of interest are explained. After that, an extensive analysis of the data and some general information about the sample that is employed in this research, follows.

### 4.2 Model

In this research, I make use of a general panel data regression model. By doing so, I am able to get rid of any unobservable heterogeneity among the firms in my sample. Moreover, after thoroughly examining and analyzing the prior literature on the association between board structure and CEO total compensation and elaborating on the models that these previous papers employ, I estimate the following model in order to test my hypotheses:

$$\begin{aligned} \text{Log}(\text{CEO Total Compensation}_{it}) = & \alpha_i + \alpha_t + \beta_1 \text{CEO Duality}_{it} + \beta_2 \text{Percentage of Inside Directors}_{it} + \\ & \beta_3 \text{Percentage of Outside Directors}_{it} + \beta_4 \text{Log}(\text{Sales}_{it}) + \beta_5 \text{ROA}_{it} + \\ & \beta_6 \text{Tobin's Q}_{it} + \beta_7 \text{CEO Tenure}_{it} + \beta_8 \text{Crisis}_{it} + \varepsilon_{it} \end{aligned}$$

In the model above, CEO Total Compensation is measured as the sum of the annual salary, bonus, other annual compensation, the total value of restricted stock granted, the total value of stock options granted (using the Black & Scholes formula), the long-term incentive payouts and all other total compensation. Furthermore,  $\alpha_i$  and  $\alpha_t$  stand for industry and year fixed effects, respectively. More precisely, I control for industry fixed effects by using the Standard Industrial Classification Code (SIC) in its four digit form, while it is crucial to include year fixed effects since the years of the crises are incorporated in my sample. When it comes to the main independent variables, CEO Duality is a dummy variable which takes the value of 1 if the chairman of the board of directors is also the firm's CEO and 0 otherwise, while the Percentage of Inside Directors is defined as the percentage of the board members of the firm that are insiders. In addition, the Percentage of Outside Directors denotes the percentage of the board members of the firm that are outsiders.

With reference to the control variables of the model, I proxy for firm size by using the variable  $\text{Log}(\text{Sales})$ , which is defined as the logarithm of net sales of each firm for each year. I choose to employ the logarithm of net sales as a proxy of firm size, since it is a measure that is broadly used in prior literature (Ozkan, 2006; Lin, 2005; Core et al., 1999). In line with Lin (2005), Cordeiro & Veliyath (2003) and Core et al. (1999), I control for firm performance by employing the Return on Assets ratio (ROA), measured as the ratio of net income to total assets. I also proxy for the growth opportunity of each firm for each year by utilizing the Tobin's Q ratio, calculated as the ratio of the total value of the firm to the firm's

total assets (Ozkan, 2006). Furthermore, I include the CEO tenure variable, which I form after taking the difference between the year of each firm-year observation and the year that the CEO was hired by the firm, in order to control for CEO's power over the board of directors (Lin, 2005). Last but not least, I also incorporate in my model the variable Crisis which is a dummy that takes the value of 1 if the firm-year observation lies between the years of the financial crisis (2007-2008), while  $\varepsilon_{it}$  denotes the error term.

For the sake of both research and robustness, I estimate the main model that I represented in the beginning of the chapter by adjusting the specification of some control variables. Specifically, I use the log of total assets, instead of the log of net sales as a proxy for firm size (Lin, 2005). Furthermore, I use Return on Equity (ROE), defined as the ratio of net income to shareholders' equity, instead of Return on Assets (ROA) as a measure of firm performance (Lin, 2005; Boyd, 1994), while I utilize firm's year end Market to Book ratio (MTB), specified as the ratio of the market value of the firm to the book value of the firm, as a proxy of firm's growth opportunity (Lin, 2005; Core, 1999). In addition, I also perform my regressions by using winsorized data, for the purpose of checking the robustness of my final results. More precisely, I winsorize CEO tenure at a 2% level at the right side of the distribution, while Tobin's Q needed to be winsorized at 1% level at the right side of the distribution. Finally, the return on assets (ROA) had to be winsorized at a 1% level in the left part of the distribution. Finally, in my last robustness test I test my model for alternative measures for industries, using 2 and 3 digit SIC codes instead of 4 digit SIC codes. At this point, is also necessary to make clear that I will test all of the models that were discussed previously in this chapter by using the Ordinary Least Squares (OLS) method of estimation.

#### 4.3 Data

The sample, consists of 3940 firm-year observations, for a total number of 764 companies, over a nine-year period from 2007 to 2015. The firms that are incorporated in the sample are all US based and apply to a range of different industries (SIC codes). The fact that I have managed to pool a large dataset of firm-year observation enhances the reliability of my analysis and the external validity of my final results.

The data on board structure, were obtained through the Institutional Shareholder Services (ISS) database, while data on executive compensation were derived from the Execucomp database which is part of the Compustat-Capital IQ database. Additionally, I employed Compustat-Capital IQ and more specifically the North-America-Daily database to compute the control variables which I used as a proxy for firm size, firm performance and firm's growth opportunity. After I gathered the datasets which incorporated the variables that I was interested in, I merged them in order to obtain my final sample. Table 1, gives some details on how I processed my data and how I managed to reach my final sample. All the data sources that are mentioned in this paragraph are available to the university students through

the Wharton Research Data Service system, which is a well-established and credible source and as a consequence that fact gives me the ability to provide reliable empirical outcomes.

It is also important to mention that I processed my data in a way that only US based firms are included in my sample, while I excluded firm-year observations which had missing values in at least one of the variables that I include in the models that I test throughout this thesis, for the purpose of obtaining reliable estimates.

**Table 1: Data Process**

<b>Initial Data</b>		<b>n</b>
	Board Structure Dataset	13312
	Compensation Dataset	7026
	Controls Dataset	64279
<b>Merging Process</b>		
	Compensation Dataset and Board Structure Dataset Merged	4221
	Compensation Dataset, Board Structure Dataset and Controls Dataset Merged	3940
<b>Final Data</b>		<b>3940</b>

#### 4.4 Summary

This section of the thesis presented some technical information and details related to the research design that is implemented throughout this empirical research. In detail, it introduced and analyzed the basic model which is employed in this thesis, while it also provided insights on how the initial data were processed and how the final sample was formed.

## 5. Validity and Reliability

### 5.1 Introduction

When it comes to empirical research, validity and reliability play a very important role and determine whether the conclusions of an empirical investigation are reliable and can be generalized to the population. In this section, the applicability of these concepts on my research is investigated.

### 5.2 Reliability

The concept of reliability stands for the degree to which a measurement provides consistent estimates. That means that if we perform our research several times the coefficients are always going to be the same. Therefore, its impact on the quality of the final results is crucial (Morse et al., 2002). The measures that I employ in order to operationalize the constructs, the relation of which I investigate, are broadly used in academic research on the relation on board structure and CEO compensation and always provided reliable results, while the same holds for the control variables that I employ (Ozkan, 2006; Lin, 2005; Cordeiro&Veliyath, 2003; Core et al., 1999; Conyon&Peck, 1998; Boyd, 1994).

### 5.3 Validity

The concept of validity stands for the degree to which a conclusion, concept or measurement is well grounded and corresponds accurately to the real world (Morse et al., 2002). The impact of validity on the quality of the research is significant since it gives evidence on whether its implications can be generalized to the whole population and on whether it is relevant in real world cases.

#### 5.3.1 Internal Validity

Internal validity is the degree to which a causal relation which is the outcome of a research can be guaranteed and that is determined by the extent to which the systematic error associated with the research is minimized. In general, experimental studies have higher degrees of internal validity since the researcher has full control of his sample and can implement several adjustments and strategies in order to verify that the relation between the constructs that are tested is indeed correct and is not affected by other factors. For instance experimental designs are associated with random selection, reliable instruments and reliable manipulation processes. However, conclusions which rely on correlations and association only allow for lesser degrees of internal validity. Based on the previous discussion and the fact that this thesis does not follow an experimental design it is intuitive that it lacks internal validity since there is a high possibility that the relation between the main concepts may be affected by other factors that are not within the reach of the researcher (Roe & Just, 2009).

### 5.3.2 External Validity

External validity illustrates the degree to which the results of an empirical research can be generalized to the whole population. In most of the cases, experiments are related to low levels of external validity, since the researcher has absolute control over the situation and as a consequence can randomly assign groups of observations to different conditions and eliminate the impact of extraneous variables. Therefore, the situation becomes artificial and is not in line with real life. However, in my thesis the data are collected from a major database and cannot be manipulated since the research is not conducted in the artificial environment that can be created in a laboratory. Consequently, this empirical investigation has high levels of external validity and can be extended to the population (Roe&Just, 2009; Lucas, 2003).

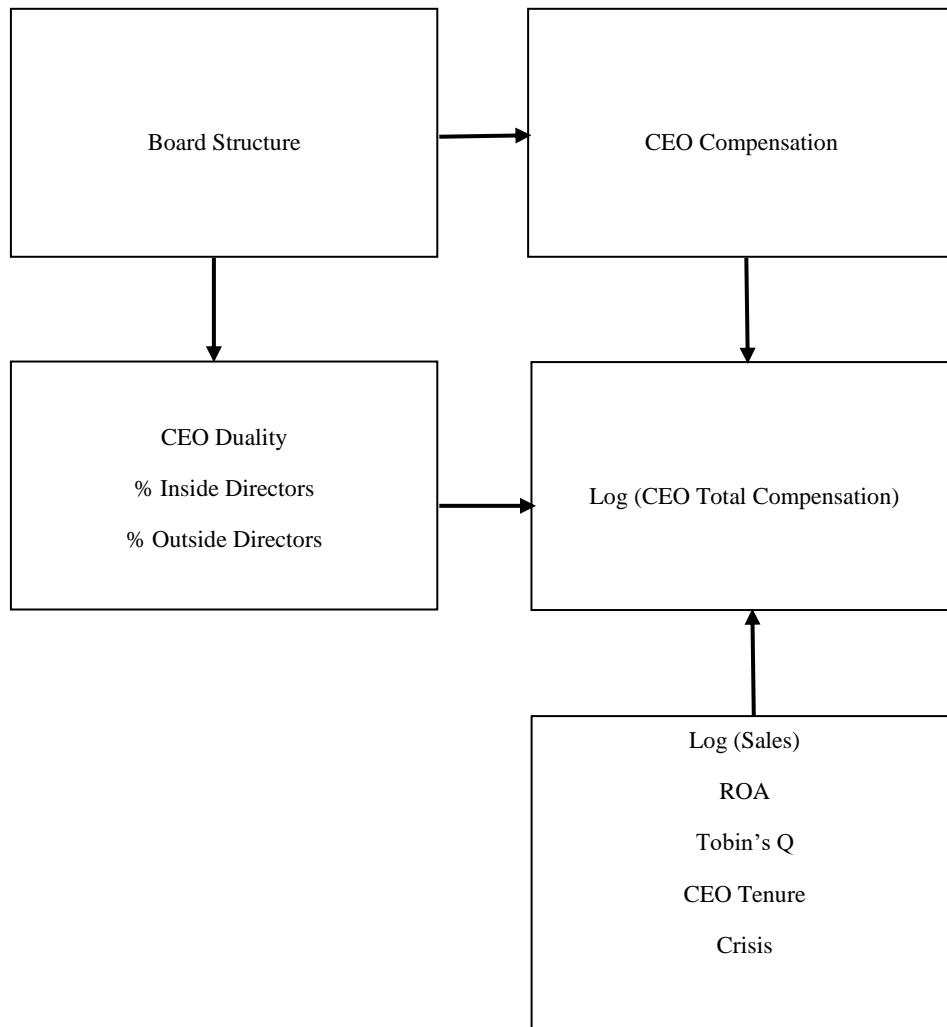
### 5.4 Endogeneity Problem

At this point is also very important to discuss whether this research is prone to some endogeneity issues. Despite the fact that the variables which are employed in this thesis seem to be the most relevant for testing the causal relation between board structure and CEO compensation, since they were chosen after an elaborative review of prior literature and a detailed assessment, it is not possible to eliminate the probability that there are other variables which I do not include in my research and have a significant effect on the relation between board structure and CEO compensation. Consequently, there is a high likelihood that this research may suffer from the omitted variable bias. The potential presence of this problem can undermine the reliability of my final conclusions, as a result readers should always bear in mind that the omitted variable bias may be present in this empirical investigation.

### 5.5 Summary

This section provided some insights on the validity and reliability of this thesis by putting extra focus on the internal and external validity. In addition, endogeneity issues were cited and analyzed. The Libby Boxes were also incorporated in order to specify the concepts the relation of which is tested and show how the two constructs are operationalized through specific operational measures.

**Figure 1:** *Libby Boxes*



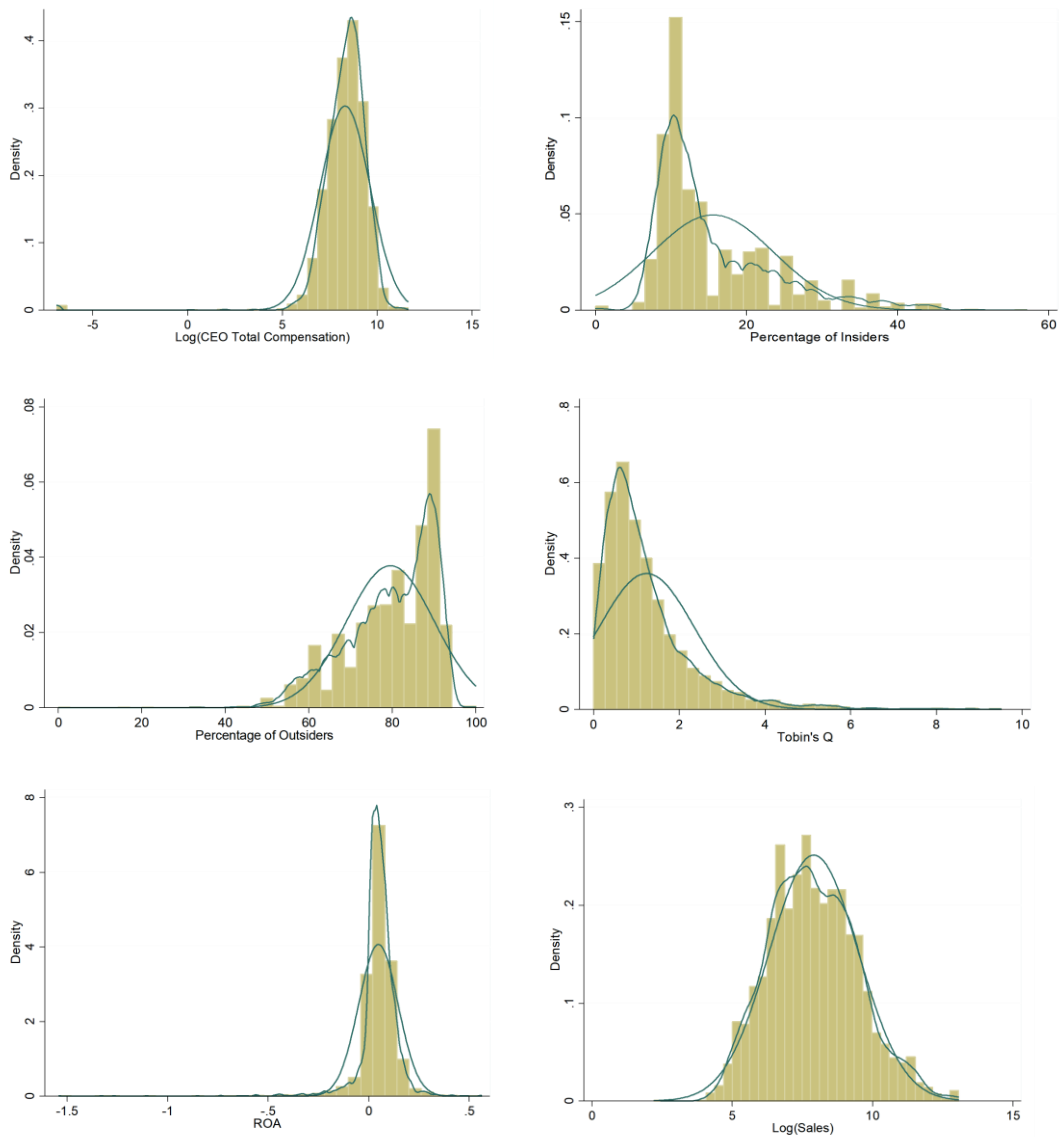
## 6. Empirical Findings

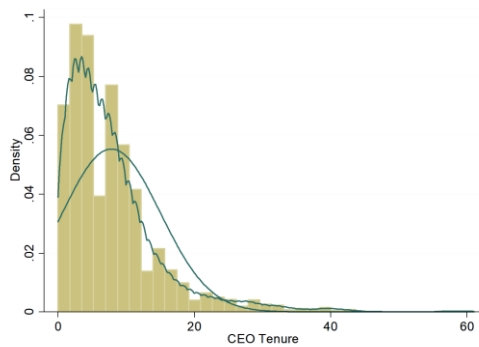
### 6.1 Introduction

In this part of the thesis, I elaborate on my empirical findings. More specifically, I put extra focus on the potential statistical problems that may be present in my model. In addition, I provide descriptive statistics and I cite the results of my main regression findings. Last but not least, I perform several robustness checks in order to test whether my results are consistent to different specifications of my model.

### 6.2 Graphs and Potential Statistical Problems of the Model

#### 6.2.1 Histograms





The histograms above give some information on the distribution that each of the main variables that are used in this thesis follow. They also give an idea of the frequency with which each observation appears. More precisely, the natural logarithm of CEO total compensation and ROA seem to be in line with the normal distribution, but they seem to have greater kurtosis compared to the normal distribution. Moreover, the logarithm of sales completely follows the normal distribution. In addition, the percentage of insiders has positive skewness and has greater kurtosis compared to the normal distribution, while the same holds for Tobin's Q and CEO tenure. At the same time the percentage of outsiders appears to have negative skewness and to have greater kurtosis than the normal distribution.

The boxplots, which are cited in section 9.1 of the appendix, offer some insights on the minimum and maximum value that a variable takes. Consequently, they illustrate the range within which the values of the variable are observed. Additionally, they cite the median of the distribution of each variable of interest, while they cite the thresholds of the 25<sup>th</sup> and 75<sup>th</sup> percentile and the observations that are within this range. Therefore, they capture and clearly present the distribution that each variable follows by providing some additional information.

Another important information that can be extracted by the boxplot is the existence of outliers. Indeed, most of the variables that I employ seem to have a significant number of outliers according to their boxplots. In detail, all the variables except for the logarithm of sales seem to suffer from the presence of outliers. The issues related to outliers can be encountered by winsorizing the data. However, I prefer not to set in place the winsorization procedure, since that would manipulate my data and would not allow me to obtain results that are consistent with reality. Nevertheless, I winsorize the data after running the regressions with my initial data just for the reason of checking the robustness of my final results.

The scatterplots, that are presented in section 9.2 of the appendix, are really useful and informative if they are interpreted properly, since they provide some initial information on whether the problem of multicollinearity is present in my model. Multicollinearity exists when the independent variables of the model seem to be highly correlated with each other



(e.g.  $\text{Log}(\text{Sales}) = 5 \text{ ROA}$ ). Therefore, if I observe a strong relation between two independent variables in my model that means there is an issue of multicollinearity in my model and I have to exclude one of these variables in order to solve it.

By thoroughly examining the scatter plots of section 9.2 which depict the association between the independent variables of the model I conclude that my model is not affected by the problem of multicollinearity since I did not find any correlation between the independent variables which is so strong as to allow me to admit that the problem of multicollinearity is present in my model.

In addition, the scatterplots that depict the correlation between the dependent variable and the independent variables, as those introduced in section 9.2 of the appendix, are really effective in giving a feeling on whether the problem of heteroscedasticity affects my model. The issue of heteroscedasticity appears when the variance of the error term is not constant. Despite the fact that these graphs give a lot of information they do not offer me unequivocal evidence on whether heteroscedasticity exists or not in my sample. However, I deal with the potential existence of heteroscedasticity and autocorrelation by using robust standard errors in my regressions and that fact makes them robust to autocorrelation and heteroscedasticity. As a consequence, my results are not affected by the problems of heteroscedasticity and autocorrelation.

### 6.3 Descriptive Statistics

Table 2, presents descriptive statistics on the main variables that are used in this thesis, consequently it gives us an idea of what to expect in the empirical part of it when the hypotheses are going to be tested by performing several regressions.

More specifically, the mean value of CEO total compensation in the USA is equal to \$ 6.434.186 with a median value of \$ 4.625.828. This does not come as a surprise since the last couple of years the level of executives' total compensation has soared to excessively high amounts, while there is a lot of dispute on whether these exceptional levels of compensation are justified or not. For the sake of research, in the regressions that I perform I use the natural logarithm of CEO total compensation which has a mean value of 8.312 and a median of 8.44. A really strange outcome is that the minimum logarithm of CEO total compensation is negative and equals -6.91. However, that is indeed true since the founder and CEO of Apple Corp., Steve Jobs, was awarded with only \$ 1 for the years 2007 to 2011 (Business Insider, 2010).

When it comes to the board structure variables, the mean percentage of inside directors is approximately 15.6%, coupled with a median value of 12.5%. These numbers, give us some insights on how the American corporations are dealing with the quotas of insiders on the board. It is obvious that the ratio of insiders within the board has decreased significantly during the last couple of years. There are two possible explanations for that, firstly, the low

ratio of insiders within the board may be due to the fact that firms are affected by the suggestions of practitioners and scholars who promote the efficiency of outside directors compared to inside directors, secondly, the sample period of this thesis is within 2007-2015 so the firms have fully complied with the regulations of the Sarbanes-Oxley Act concerning the existence of a higher number of outsiders within the board of directors. In line with the previous discussion, the percentage of outsiders in the board of directors has a mean of 79.575% while its median is equal to 81.82 %.

Shifting our attention to control variables, the return on assets has a mean value of 0.05 which indicates that on average the firms that are incorporated in the sample are not so effective at using their assets in order to generate earnings. The mean of the Tobin's Q ratio is around 1.2 which implies that the average company is in a good position concerning its growth opportunities. Furthermore, the average CEO in my sample has served on the board of directors for approximately 7.8 years which clearly shows that US based firms are prone to retaining their CEOs and CEO turnover is not so frequent except for situations in which the replacement of the CEO is the only choice. At the same time, the fact that the maximum of CEO tenure is 61 years seems to be rather unusual. Nevertheless, this is true since the CEO of Cubic Corp., Walter J. Zable, founded the company in 1951 and remained CEO of the firm until 2012. To conclude, the sample consists of firms that display average sales of about \$10.8 million and an average natural logarithm of 7.91.

**Table 2:** *Summary Statistics*

	Mean	Median	Standard Deviation	Minimum	p. 25%	p. 75%	Maximum
Log(CEO Total Compensation)	8.312	8.44	1.317	-6.908	7.731	9.024	11.63
Duality	0.565	1	0.496	0	0	1	1
Percentage of Insiders	15.56	12.5	8.063	0	10	20	57.143
Percentage of Outsiders	79.575	81.818	10.555	0	72.727	88.889	100
Log(Sales)	7.908	7.797	1.587	2.215	6.746	8.964	13.07
ROA	0.048	0.05	0.098	-1.541	0.018	0.089	0.56
Tobin's Q	1.24	0.934	1.109	0.002	0.529	1.582	9.51
CEO Tenure	7.844	6	7.207	0	3	10	61
Crisis	0.226	0	0.418	0	0	0	1

The correlation matrix, which is depicted in table 3 reports the correlations between the variables that are employed in this thesis. The correlations between the variables give some initial evidence on the association between them and a feeling on what to expect in our final results.

More specifically, CEO duality, the percentage of outsiders on the board of directors, the natural logarithm of sales, return on assets and the post crisis dummy are all positively correlated with the natural logarithm of CEO total compensation. At the same time, the percentage of insiders on the board of directors, CEO tenure and the crisis dummy appear to have a negative correlation with the natural logarithm of CEO total compensation.

The negative correlation between the variables Crisis and the logarithm of CEO total compensation makes clear that the financial crisis had an adverse impact on CEO compensation. Surprisingly, Tobin's Q seems to have a negative correlation with the logarithm of CEO total compensation, but it is not statistically significant. In addition, it is intuitive that the correlation between the percentage of insiders and outsiders is strong and positive (-0.720) since as the ratio of outsiders increases that of insiders decreases and vice versa. To conclude, it is also necessary to mention that the correlation matrix also validates the statement that my model is not prone to multicollinearity issues, since there are no strong correlations between the independent variables.

**Table 3: Pairwise Correlations**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Log(CEO Total Compensation)	1.000								
(2) Duality	0.080***	1.000							
(3) Percentage of Insiders	-0.189***	-0.115***	1.000						
(4) Percentage of Outsiders	0.192***	0.141***	-0.720***	1.000					
(5) Log(Sales)	0.453***	0.167***	-0.231***	0.212***	1.000				
(6) ROA	0.082***	0.040**	0.032**	-0.002	0.124***	1.000			
(7) Tobin's Q	-0.017	-0.045***	0.117***	-0.052***	-0.141***	0.437***	1.000		
(8) CEO Tenure	-0.134***	0.229***	0.218***	-0.172***	-0.118***	0.010	0.043***	1.000	
(9) Crisis	-0.047***	0.049***	0.038**	-0.073***	0.004	-0.031**	-0.039**	-0.064***	1.000

Note. \*p<0.1 \*\*p<0.05 \*\*\*p<0.01.

#### 6.4 Main Regression Findings

Table 4, illustrates the results of the main regressions. In model 1, a simple regression with robust standard errors is performed in order to get a feeling of how my dependent and independent variables are associated. As can be observed, the coefficients are statistically significant and their signs are in line with the hypotheses that I developed previously. However, it is not possible to count on this model's outcomes since it does not take into account other variables that may have an effect on the relation that is investigated in this empirical research. Models 2 and 3 offer a more comprehensive approach since the control variables are also incorporated while year fixed effects are taken into consideration. Once again, the signs of the coefficients verify my hypotheses, but some of them lose their significance.

Despite the fact that the models that are discussed in the previous paragraph are really helpful and informative they are not dealing with all the aspects of the research, therefore for the purpose of accepting or rejecting my main hypotheses I employ model 4 of table 4 which includes all the control variables, year and industry fixed effects, as a consequence it seems to be the most appropriate one for testing my hypotheses.

Moving on to the interpretation of the results of model 4, it seems to be clear that the percentage of insiders is negatively associated with the natural logarithm of CEO total compensation. More precisely, if the percentage of insiders on the board of directors increases by 1% the CEO's total compensation decreases by 0.8%. This conclusion, is intuitive for

several reasons. First of all, most of the times inside directors have the belief that their behavior and activities are closely monitored by the outside directors who evaluate them. Therefore, they do not want to be the ones who always stand by the side of the CEO and support his views. As a consequence, they enhance their monitoring role over the CEO and that leads to the CEO's inability to extract extra unjustified rents (Boyd, 1994; Mizruchi, 1983).

Another reason that motivates inside directors to efficiently monitor the CEO is the fact that inside directors and especially those of them that consider themselves as possible successors of the CEO do not want to be seen as individuals who always stand up for the interests of the CEO instead of those of the firm, since that would affect their potential of being promoted to the CEO position in the future (Boyd, 1994). Moreover, legal obligations and professional reputation prevent inside directors from supporting the CEO. Finally, since the compensation of top management is closely related to that of the CEO inside directors may try to reduce CEO compensation just to avoid being appeared as having a self-serving behavior (Baysinger&Hoskisson, 1990).

Therefore, given the results of model 4 of table 4 and the interpretation above I accept my first hypothesis which states that the percentage of insiders on the board of directors has a negative impact on CEO total compensation.

With reference to my second hypothesis, as can be noticed from the results of model 4 of table 4 the coefficient of CEO duality is positive, thus when the position of CEO and chairman in a firm is occupied by the same person that initially tends to affect the total compensation of the CEO in a positive way. More accurately, it seems that if CEO duality exists within a firm the total compensation of the CEO increases by 0.7%. The rationale behind this conclusion is that when the CEO has this double role can set the agenda of the annual board meetings and promote his interests, since he has excessive power over the board and can entrench himself. One of the consequences of this behavior is that the CEO can set his own payment and therefore can extract excessive compensation which is not justified (Lin, 2005; Core et al., 1999; Conyon&Peck, 1998).

However, the coefficient of CEO duality is not statistically significant as can be seen in table 4, consequently there are not enough evidence to support that CEO duality positively affects CEO total compensation. Nevertheless, the fact that the coefficient is statistically insignificant leads to the conclusion that CEO duality does not affect the CEO total compensation. This result can be explained by the fact that the CEOs put extra attention to the way they are perceived from the different stakeholders that are part of the firm (e.g. shareholders, employees). They do not want to have the bad reputation of an individual who does not care about the company as a whole but only for his personal compensation, because that would undermine their ability to manage the firm. In other words, imagine a firm where

everyone involved with it believes that the CEO and chairman takes advantage of his position and is unreliable. This event would lead to the absence of trust between the different members that interact within the company and that would negatively affect the firm's profitability and the next step would be that the CEO would face the risk of being dismissed. Accordingly, it does not seem that extra rent extraction is preferred by CEOs who also serve as chairmen since the costs of this action outweigh its benefits.

Hence, I reject my second hypothesis that CEO duality is positively associated with CEO total compensation, since I do not find significant evidence in favor of this statement.

Moving on to my third hypothesis, I find that the coefficient of the percentage of outside directors on the board is positive and statistically significant. In detail, as can be observed in model 4 of table 4, if the percentage of outsiders on the board of directors goes up by 1% the CEO total compensation also goes up by 0.8%. This conclusion, is not in line with the generally acceptable statement that outside directors are better monitors than inside directors. Interestingly, my results provide support for the view that outsiders do not always act independently of the CEO and in favor of shareholders. A rational explanation of this rather challenging conclusion is that usually the CEO and the outside directors develop special relations with each other which are based on the exchange of favors, since the outside directors can be bankers, politicians and CEOs of other firms (Adams et al., 2010). As a consequence, there are always cases in which the CEO promotes an agenda which indirectly benefits those directors and they always express their gratitude to him by entrenching him and allowing him to extract excessive extra rents which most of the times are not analogous of his effort.

Therefore, I accept my third hypothesis that the percentage of outside directors on the board is positively associated with total CEO compensation, since I find unequivocal evidence in support of this hypothesis.

Furthermore, it is also really important to mention some insightful information that can be extracted from the conclusions of my model. First of all, the positive and statistically significant coefficient of the natural logarithm of sales illustrates the influence that the size of the firm can have on CEO total compensation. Specifically, if sales increase by 1% CEO total compensation increases by 0.35%. This is really intuitive since the greater the size of the firm, the more demanding the management of its operations becomes and given that the CEO is the one responsible for the management of the firm he has to be compensated for the extra effort that he has to put in place in order to keep running the business effectively.

What is more, CEO tenure appears to have a negative impact on the natural logarithm of CEO total compensation. More precisely, if CEO tenure increases by 1 year, CEO total compensation decreases by 1.4%. A possible explanation may be that the older the CEO gets the less productive he becomes, since his creativity and productivity are not as they were

before. The board of directors and the firm in general take into account this reality and set the CEO compensation package accordingly.

Last but not least, my results show that indeed the period of the financial crisis affected the level of CEO total compensation in a negative way. That can be observed by the negative and statistically significant coefficient of the dummy of crisis that I include in my model. There are two prominent explanations for this outcome. Firstly, during the 2007-2008 financial crisis firms were trying to cut costs in order to endure the difficult financial situation that they were facing. Decreasing the CEO's cash compensation, which is a components of his total compensation, was an easy and fast way of reducing costs since the bad financial condition was always used as an excuse for compensation cuts at the time. Secondly, during the financial crisis the whole economy of the USA was in a downturn, as a result firms' value was decreasing and that had a significantly negative impact on the stock options and the bonus plans of CEOs.

**Table 4: Results of the Main Regressions**

Dep. Var	Log(CEO Total Compensation)			
	[1]	[2]	[3]	[4]
Duality	0.139*** 3.3	0.045 1.22	0.067* 1.73	0.007 0.15
Percentage of Insiders	-0.017*** -4.29	-0.005* -1.77	-0.005* -1.85	-0.008** -2.09
Percentage of Outsiders	0.014*** 4.64	0.008*** 2.94	0.007** 2.53	0.008*** 3.11
Log(Sales)		0.354*** 21.81	0.353*** 21.67	0.355*** 21.93
ROA		0.114 0.56	0.115 0.56	-0.077 -0.36
Tobin's Q		0.057** 2.00	0.055* 1.89	0.034 1.44
CEO Tenure		-0.014*** -2.69	-0.015*** -2.93	-0.014*** -4.39
Crisis		-0.147*** -3.34	-0.309*** -3.61	-0.216** -2.48
Robust std error	Yes	Yes	Yes	Yes
Year fixed effects	No	No	Yes	Yes
Industry fixed effects	No	No	No	Yes
Constant	7.407*** 26.77	4.993*** 16.35	5.225*** 16.20	5.179*** 17.34
R-squared	0.045	0.2244	0.2277	0.3874
Obs.	3940	3940	3940	3940

Note. \*p<0.1 \*\*p<0.05 \*\*\*p<0.01. Model 1, is a regression of the dependent variable against the main independent variables with robust standard errors, while the control variables are not included. Models 2, 3 and 4 include the control variables and control for year fixed effects, industry fixed effects or both. Model 4 is the main model for testing the hypotheses. For industry fixed effects 4-digit SIC codes are employed.

## 6.5 Robustness Checks

In the previous subsection the main regression results were discussed and interpreted, while the acceptance or rejection of my hypotheses followed. In this part of the thesis, the results of the robustness tests that I performed are cited. Robustness tests are really important since they provide evidence on whether the main conclusions of the research hold for alternative conditions and different specifications of the main model.

Initially, I test my main model, which is the model 4 of table 4, by utilizing different specifications for industries. More precisely, I use 2 and 3 digit SIC codes instead of 4 digit SIC codes to investigate whether my final results hold for these alternative measures for industries. As can be observed in table 5, my results appear to be consistent with those of model 4 of table 4 for alternative specifications of industries. In detail, CEO duality keeps having a positive coefficient which is not statistically significant, while the percentage of insiders on the board has a negative impact on CEO total compensation. At the same time, the percentage of outsiders has a positive and statistically significant coefficient. Moreover, the logarithm of sales continues to be positive and statistically significant, while the variables CEO tenure and Crisis are negative and significant. These results, hold for both 2 and 3 digit SIC codes as can be seen in Table 5. Consequently, my main results appear to be robust to alternative measures for industries.

When it comes to my second robustness check, I test the models 2, 3 and 4 of table 4 by using winsorized data. To give some technical details, I winsorize the data of CEO tenure at a 2% level at the right side of the distribution, while Tobin's Q needed to be winsorized at 1% level at the right side of the distribution. Finally, the return on assets (ROA) had to be winsorized at a 1% level in the left part of the distribution. The results are depicted in table 6. As can be observed, the results of my main model, which is model 4 of table 4, continue to hold after the utilization of winsorized data. By having a quick look at model 3 of table 6 we find that CEO duality keeps being insignificant, whereas the percentage of insiders and the percentage of outsiders continue to have a negative and positive effect on CEO total compensation, respectively. Additionally, the natural logarithm of sales is positive and significant, while CEO tenure and the Crisis dummy have negative and statistically significant coefficients as in model 4 of table 4. Therefore, my results continue to hold under the use of winsorized data.

To conclude, in my final robustness test, I use different measures of firm size, firm performance and firm growth opportunities. More specifically, I use the natural logarithm of total assets instead of total sales, ROE instead of ROA and the MTB ratio instead of Tobin's Q. Then, I run the regressions of models 2, 3 and 4 of table 4 for the different specifications of the constructs discussed above. With regards to model 3 of table 7, we can observe that CEO duality remains insignificant and at the same time the percentage of outsiders keeps

being positive and statistically significant. Moreover, the percentage of insiders continues to have a negative coefficient but has lost its significance. In order to investigate why the percentage of insiders lost its significance after using the logarithm of total assets, ROE and MTB ratio, I run a regression in which I employ the percentage of insiders as the dependent variable and the logarithm of total assets, ROE and MTB as independent variables to check whether there is a strong correlation that justifies this outcome. Indeed, I find that there is a negative and statistically significant association between the logarithm of total assets and the percentage of insiders. Consequently, the problem of multicollinearity may have led to this absence of significance. When it comes to CEO tenure and the Crisis dummy they both remain negative and significant, whereas the logarithm of total assets is positively associated with the CEO total compensation.

#### 6.6 Summary

This section of the thesis mainly focused on the empirical findings of this empirical investigation. In detail, extra focus was put on some really important and informative graphs which made me able to investigate whether my model is prone to some statistical problems (e.g. multicollinearity). Additionally, descriptive statistics were cited and the main regression findings were thoroughly analyzed and interpreted. Finally, robustness tests were performed in order to verify that my results hold for different situations and specifications of my model.



## 7. Conclusions

### 7.1 Introduction

In this part of the thesis a general review of the main findings of this empirical research is taking place, while special emphasis is given to the way that the main conclusions of this research can be interpreted in an intuitive way.

### 7.2 Conclusions and Implications

This thesis is dedicated in providing some evidence on how board structure affects the total compensation of the CEO. Consequently, it offers insights on how these two constructs are associated. Therefore, its conclusions can be really helpful to practitioners who seek to understand how the level of CEO compensation is set and how this amount can be affected by the way that the board of directors is structured.

With reference to my main findings, CEO duality does not seem to affect the CEO total compensation. This conclusion is opposing the findings of the existing literature, which supports the view that CEO duality is positively associated with CEO compensation and makes the case that this double role gives excessive power to the CEO over the board and that fact makes him able to set his own payment as he wishes (Lin, 2005; Core et al., 1999; Conyon&Peck, 1998; Boyd, 1994). However, my finding concerning CEO duality is more in line with that of Cordeiro & Veliyath (2003). A rational explanation of my finding is that there are some reputational issues that do not allow the CEO to take advantage of the exceptional power that this double role offers him. For instance, if he is thought by those involved in the firm as someone who abuses his power only for his interest that would have a negative impact on the trust within the firm. As a consequence, this lack of trust could undermine the firm's operations and his future as CEO.

When it comes to the impact of the percentage of insiders on the board on CEO total compensation, my results indicate that the percentage of insiders is negatively associated CEO total compensation. As was discussed in the empirical findings section, the fact that the insiders' independence is always evaluated by outsiders, the potential of insiders being promoted to CEOs, the existence of legal obligations and professional reputation and matters of self-image make insiders better monitors and as a consequence they try to prevent the CEO from extracting extra unjustified rents from the firm. Therefore, my conclusion concerning the role of insiders in setting CEO total compensation is the same as that of Core et al. (1999) and Boyd (1994).

Another important implication of my thesis, is the fact that the percentage of outsiders appears to have a positive impact on the level of CEO total compensation. Of course this finding challenges the general notion that insiders are the best monitors and are completely independent of the CEO, therefore they prevent him from extracting unjustified rents from the firm. An intuitive explanation of this finding is that the involvement of bankers, politicians

and CEOs of other firms on the board of directors as outsiders creates an environment which is based on the exchange of favors between them and the CEO. Therefore, if the CEO promotes an agenda that satisfies their own interests they reward him by accepting an exceptionally high CEO total compensation as rational and justified.

In addition, firm size measured as the natural logarithm of sales has a positive effect on CEO total compensation. Consequently, the larger the firm, the more responsibilities the CEO bears. Therefore, the CEO has to be compensated for these extra responsibilities. Interestingly, I observe that CEO tenure has a negative effect on CEO total compensation, this result can be explained by the fact that the productivity of the CEO decreases as he gets older and that has an adverse impact on his total compensation.

To conclude, my research provides significant evidence that support the view that the 2007-2008 financial crisis hugely affected the total compensation of CEOs in the USA. It seems that the financial downturn significantly decreased the level of CEO total compensation. Therefore, my thesis also adds to the discussion on whether the financial crisis affected the CEOs' compensation or not. The cost cuts that were introduced by the firms at this period and the declining value of the USA firms, which affected CEOs' stock options and bonus plans in a negative way, appear to be the most prominent explanations of the decrease in compensation that CEOs faced during the period of the financial crisis.

### 7.3 Summary

This last section of the thesis was focused on interpreting and analyzing the main conclusions of this research as well as giving a rational explanation to the results that were observed when performing my basic regressions.

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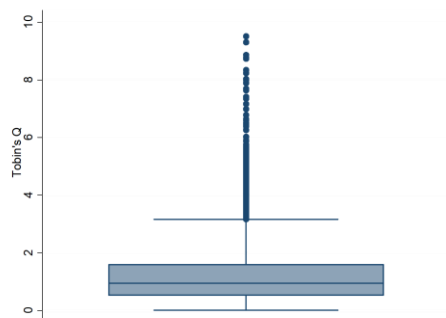
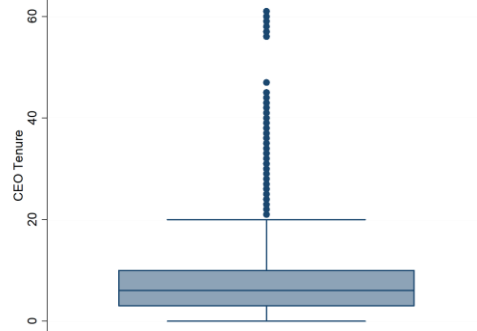
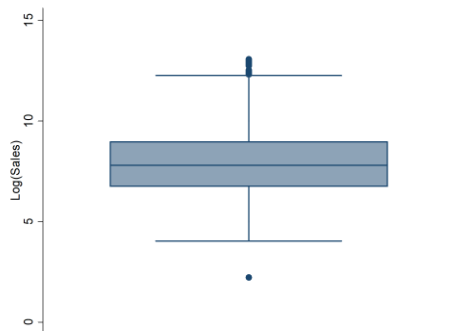
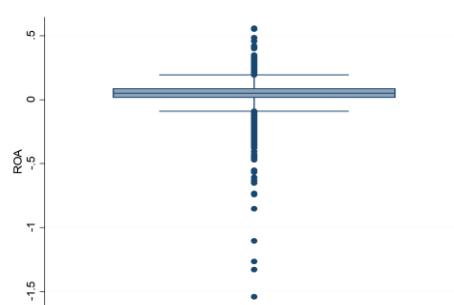
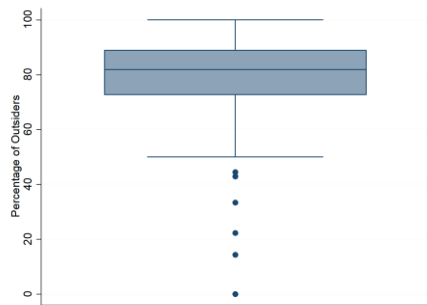
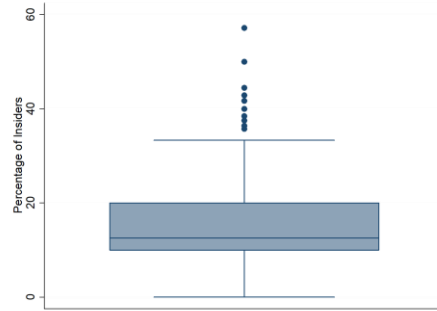
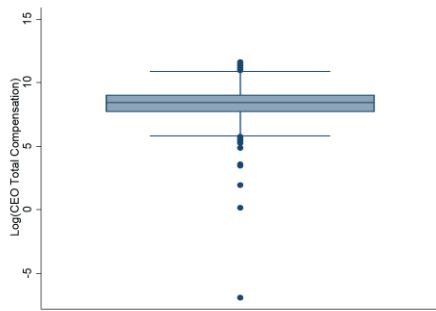
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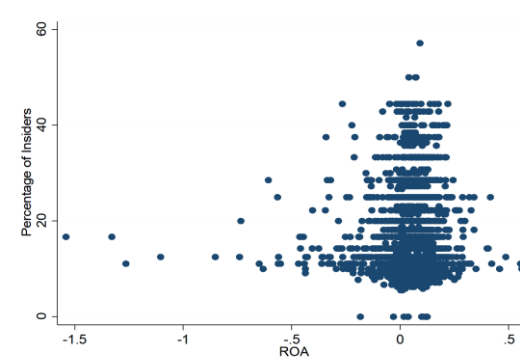
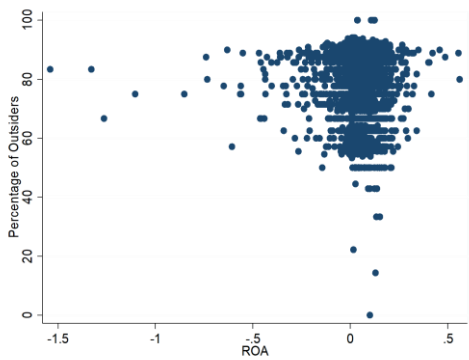
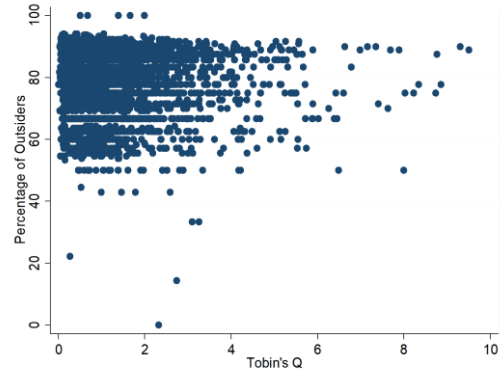
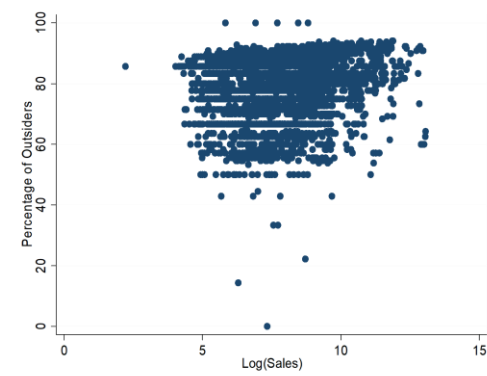
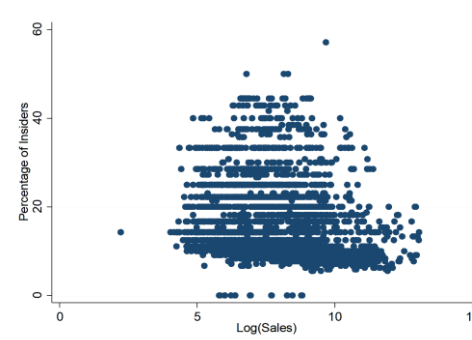
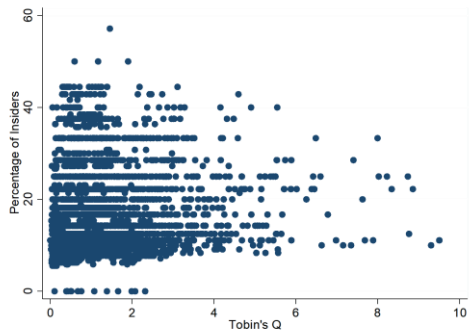
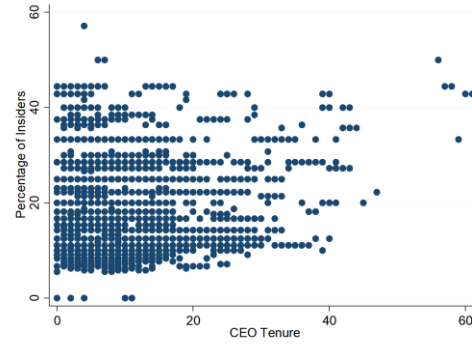
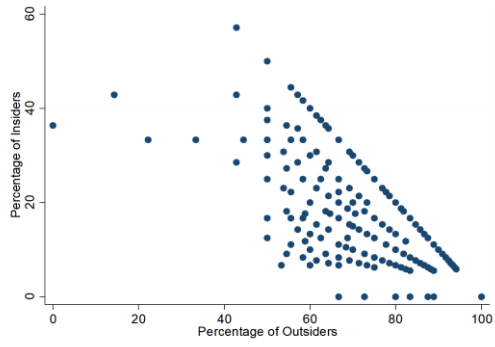


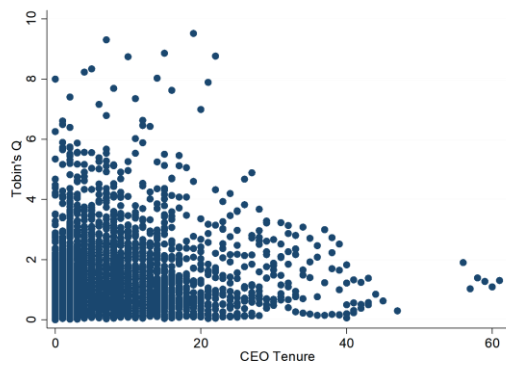
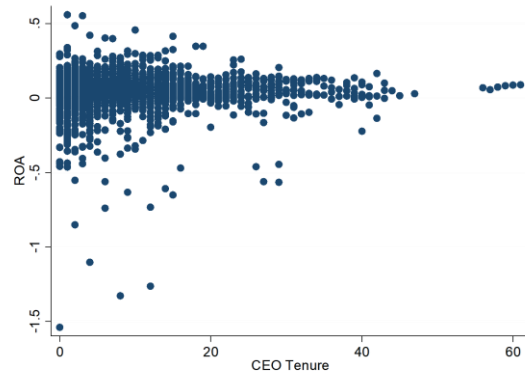
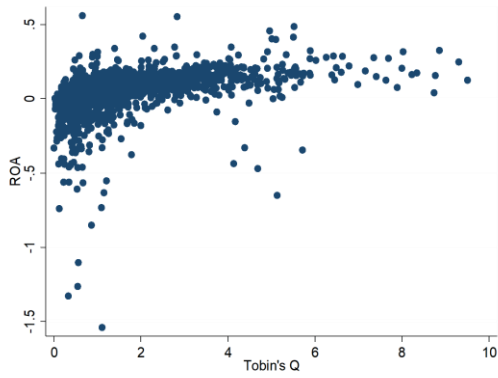
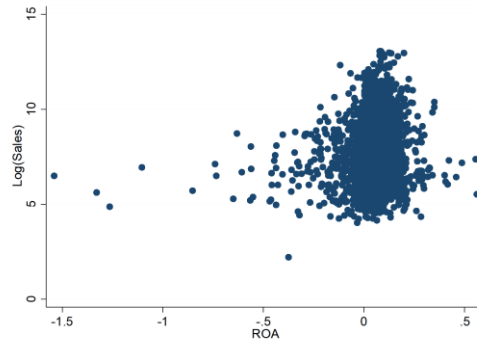
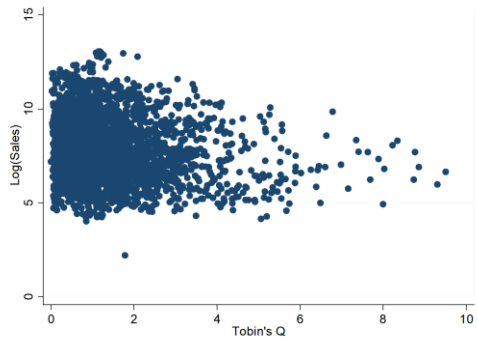
## 9. Appendix

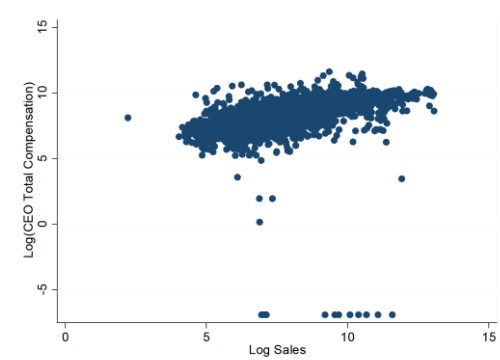
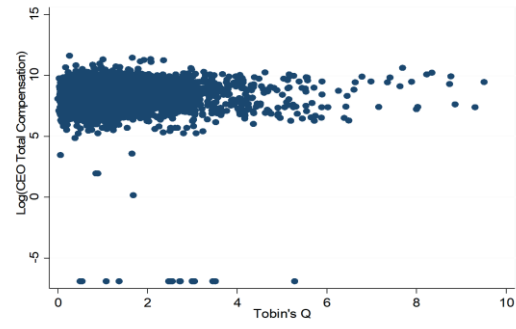
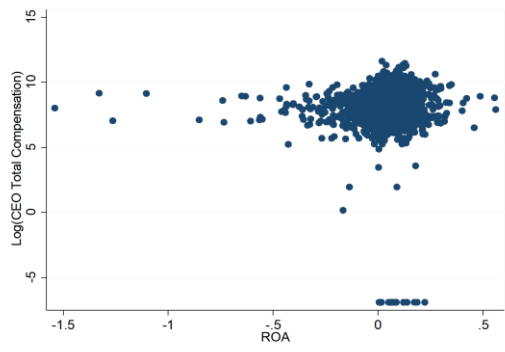
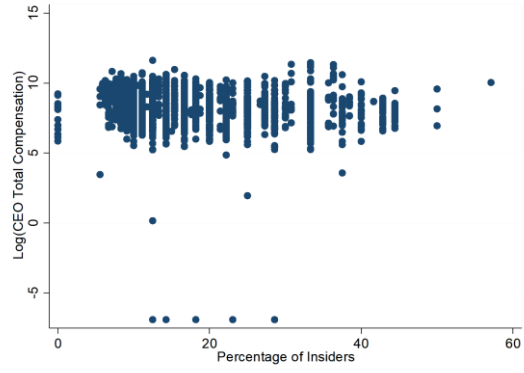
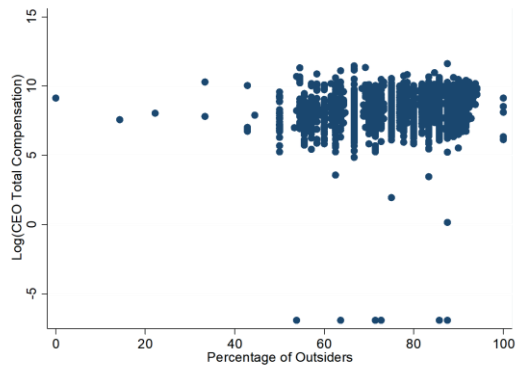
### 9.1 Boxplots



## 9.2 Scatterplots







### 9.3 Tables of Robustness Checks

**Table 5: Alternative Measures for Industries (2 and 3 digit SIC)**

Dep. Var	Log(CEO Total Compensation)	
	[1]	[2]
Duality	0.002	0.004
	0.05	0.10
Percentage of Insiders	-0.008**	-0.008**
	-2.21	-2.22
Percentage of Outsiders	0.008***	0.010***
	3.10	3.55
Log(Sales)	0.367***	0.344***
	26.32	22.22
ROA	0.102	0.096
	0.47	0.44
Tobin's Q	0.040*	0.038
	1.88	1.64
CEO Tenure	-0.015***	-0.013***
	-5.05	-4.31
Crisis	-0.229**	-0.217**
	-2.55	-2.45
Robust std error	Yes	Yes
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Ind. fixed effects (2 dig)	Yes	No
Ind. fixed effects (3 dig)	No	Yes
Constant	5.091***	5.161***
	18.29	17.65
R-squared	0.2736	0.3311
Obs.	3940	3940

Note. \*p<0.1 \*\*p<0.05 \*\*\*p<0.01. Model 4 of Table 4 is tested for alternative measures for industries (2 and 3 digit SIC).

**Table 6: Results of Regressions using Winsorized Data**

Dep. Var	Log(CEO Total Compensation)		
	[1]	[2]	[3]
Duality	0.032	0.055	-0.008
	0.87	1.39	-0.18
Percentage of Insiders	-0.006*	-0.006**	-0.009**
	-1.90	-1.98	-2.29
Percentage of Outsiders	0.008***	0.007***	0.009***
	3.05	2.64	3.21
Log(Sales)	0.351***	0.350***	0.350***
	21.19	21.01	21.51
ROA	0.464	0.454	0.280
	1.61	1.56	0.98
Tobin's Q	0.040	0.037	0.010
	1.14	1.07	0.38
CEO Tenure	-0.012**	-0.013***	-0.012***
	-2.51	-2.79	-3.35
Crisis	-0.145***	-0.312***	-0.215**
	-3.28	-3.61	-2.47
Robust std error	Yes	Yes	Yes
Year fixed effects	No	Yes	Yes
Industry fixed effects	No	No	Yes
Constant	5.003***	5.240***	5.205***
	16.18	15.98	17.37
R-squared	0.2227	0.2259	0.3860
Obs.	3940	3940	3940

Note. \*p<0.1 \*\*p<0.05 \*\*\*p<0.01. Models 2, 3 and 4 of table 4 are tested by employing winsorized data.

**Table 7: Alternative Measures of Firm Size, Firm Performance and Firm Growth Opportunities**

Dep. Var	Log (CEO Total Compensation)		
	[1]	[2]	[3]
Duality	0.065*	0.091**	0.012
	1.77	2.35	0.26
Percentage of Insiders	0.001	0.001	-0.006
	0.27	0.18	-1.56
Percentage of Outsiders	0.011***	0.010***	0.009***
	3.65	3.22	3.41
Log(Total Assets)	0.302***	0.302***	0.358***
	20.18	20.14	23.42
ROE	0.004	0.004	0.006
	0.63	0.66	0.54
MTB	0.001	0.001	0.0001
	1.04	0.99	0.10
CEO Tenure	-0.018***	-0.019***	-0.015***
	-3.58	-3.85	-4.67
Crisis	-0.118***	-0.235***	-0.175**
	-2.68	-2.74	-2.04
Robust std error	Yes	Yes	Yes
Year fixed effects	No	Yes	Yes
Industry fixed effects	No	No	Yes
Constant	5.092***	5.308***	4.957***
	18.48	18.33	16.70
R-squared	0.1967	0.2003	0.3498
Obs.	3940	3940	3940

Note. \*p<0.1 \*\*p<0.05 \*\*\*p<0.01. Models 2, 3 and 4 of table 4 are tested by employing the natural logarithm of total assets instead of that of total sales, ROE instead of ROA and the MTB ratio instead of Tobin's Q.