To what extent does the compensation of CEOs of Dutch listed firms depend on firm performance?

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Abstract

The relationship between Chief Executive Officer (CEO) compensation and firm performance has been studied by multiple researchers worldwide and is also a hot topic in society. This study examined the widespread belief that firm performance positively affects variable CEO compensation. The sample used in this study consisted of Dutch listed firms over the period 2016-2018.

The results show that to state whether or not firm performance positively affects CEO variable compensation it highly depends on whether the effect of firm performance is studied on short-term or long-term variable compensation, how firm performance is measured, how compensation is measured, if contemporaneous or lagged performance variables are included and if sub-samples based on industry classifications are used. Overall, there is a statistically significant and robust positive effect of accounting-based firm performance on short-term incentive compensation for firms located in the other services sector. However, there is no unambiguous statistically significant and robust positive effect of market-based firm performance on long-term incentive compensation. Moreover, results show that firm size, the presence of a compensation committee and concentrated owners are related with CEO variable compensation.

Keywords: CEO variable compensation, firm performance, corporate governance, listed firms, the Netherlands.

Table of contents

1. Introduction

1.1. Background

During the past decades, the relationship between executive compensation and firm performance has been researched extensively. One of the most famous theories regarding the pay-performance relationship of executives is the agency theory. According to this theory, so-called agency problems can arise when two parties who are cooperating have different goals and division of labour. Agency problems can occur when one party, the principal, delegates work to the other party, the agent. In most cases is the principal the owner (shareholder) and the agent the manager. When this is the case, ownership and control are separated within the organization. As a consequence of this separation, conflicts can arise. According to the theory, one way to reduce these conflicts is to make use of income-based contracts. Such contracts co-align the interests of principals with those of the agents. This is due to that the rewards for both of them depend on the firm performances. As a result, the conflicts of self-interest between the owners and managers are reduced (Eisenhardt, 1989).

Although the agency theory suggests that the compensation of executives should be positively correlated with the performance of the organization, research in the past showed some unequal findings. Some researchers did indeed find a positive relationship between executive pay and firm performances, whereas others did not find a significant and positive relationship. There are even researchers who found negative relationships. Therefore, this topic is still relevant and is still under research by many researchers. A possible reason for the inconsistency in the results is that researchers used different methods and variables to investigate the effect of firm performance on executive compensation (Smirnova & Zavertiaeva, 2017).

Executive compensation is not only a hot topic within the research field but also in practice. A recent example is that when the supervisory board of KLM in 2020 announced that they intended to increase the variable compensation of its Chief Executive Officer (hereafter abbreviated as CEO) with 75% to a maximum of 100% of the base salary, they received attention from both politicians as well as from the citizens. The attention they got was due to that KLM proposed to increase the compensation of their CEO while the firm received financial support of the Dutch government to survive the difficult time caused by the COVID-19 virus. However, the supervisory board of KLM thought it was justified to increase the compensation of their CEO due to that compared to the compensation of similar-sized organizations, their CEO was underpaid. However, due to the pressure KLM received from both the politicians as well as the citizens, the supervisory board decided to recall the proposal for higher compensation (AD, 2020). Another recent example is the CEO compensation of Royal Dutch Shell. Shareholders of the organization criticized the CEO of Shell over the size of his

compensation. In 2018, the compensation of the CEO of Shell doubled to over €20 million. Compared to the average Shell employee, the CEO earns more than 143 times the average employee (Industry Europe, 2019).

Due to the scandals that have been occurred by organizations during the past decades, corporate governance has received a lot of attention. Examples of recent scandals are the Volkswagen case, the Facebook-Cambridge Analytica scandal and the Enron and Ahold scandals. The biggest disadvantages of these scandals are for the shareholders of the organizations. As a consequence of such scandals, the share price of the certain organization will drop significantly. Through good corporate governance, the performances of organizations will increase and shareholders' interests will be protected (Core, Holthausen, & Larcker, 1999). During the last decades, several governments entered corporate governance protocols/laws to oblige organizations to be more transparent. For instance, the government of the Netherlands introduced the so-called ''Code Tabaksblat'' in 2004 to improve the corporate governance for Dutch listed firms. The US introduced in 2002 the so-called ''Sarbanes-Oxly'' law. There are various ways of how corporate governance can be used to align the interests of the shareholders and the managers. Examples are ownership characteristics, board characteristics and compensation package (Eisenhardt, 1989).

In this thesis, it will be investigated to what extent the compensation of CEOs of Dutch listed firms depend on firm performance. As will be shown in section 2.4.4., it is also possible to investigate the reversed pay-performance relationship. With the reversed relationship is meant that executive compensation affects firm performance. This means that executive compensation is the independent variable and firm performance the dependent variable. However, it is important to be aware that in this study, the effect of firm performance on CEO compensation will be investigated. So, in this study, firm performance will be the independent variable and compensation the dependent variable. The choice to study this relationship is based on the inconsistent findings in the past and the belief of the agency theory that interests of principals and agents can be co-aligned by depending the rewards of both parties on the firm performance. Besides, the reversed relationship has recently been studied by Weenders (2019), a former student of the University of Twente, who also focused on Dutch listed firms. Replicating this study would make no sense due to the short time that has passed since. Furthermore, it is important to be aware that this study focuses on the compensation of CEOs, whereas studies in the past also focused on executives in general, or top management team, for example.

1.2. Research objective and – question

During the past years, several researchers investigated the pay-performance relationship. Researchers researched both the effect of firm performance on executive pay and the effect of

executive pay on firm performance, which is also called the reversed relationship. As mentioned above, it is important to be aware that in this study the effect of firm performance on CEO pay will be researched. In general, researches in the past were based on the agency theory which shortly has been described in the introduction section. As previously mentioned, one way to reduce these agency conflicts is to make use of income-based contracts. Such contracts co-align the interests of principal with those of the agents. This is due to that the rewards for both of them depend on firm performance. The executives have the motivation to maximize the firm's performances since their compensation partly depends on firm performance. As a result, the conflicts of self-interest between the owners and managers are reduced (Eisenhardt, 1989). Therefore, based on the agency theory, it is expected to find a positive effect of firm performance on executive compensation. However, despite several researchers investigated this relationship, ambiguity still exists among the results. In line with the agency theory, Smirnova & Zavertiaeva (2017), investigated the relationship between firm performance and executive compensation for large European firms in both directions and concluded that firm performance has a positive effect on executive compensation.

Another famous theory with regards to the pay-performance relationship is the managerial power theory. In contrast to the agency theory, expects the managerial power theory a negative effect of executive compensation on firm performance. This theory believes that executives can misuse its power to extract additional rents at the costs of the shareholders (Bebchuk, Fried, & Walker, 2002). Empirical evidence that supports this theory is, for example, the results of the study of Duffhues & Kabir (2008), who investigated the pay-performance relationship of Dutch listed firms. Their most important finding was that based on their analysis, there was not enough evidence to confirm the suggested positive effect of performance on executive compensation. Diverse tests even indicated a significantly negative relationship. Possible reasons for this negative relationship are suggested to be due to attract, retain and motivate executives and to establish a long-term relationship with the rest of the organization. More recently, van Essen, Otten, & Carberry (2015) conducted a meta-analysis on a US sample and also confirmed the managerial power theory in showing that executives can and do influence their own compensation contracts.

Besides the positive and negative effects that have been found, some researchers found no significant relationship between executive pay and firm performance. For example, van der Laan, van Ees, & van Witteloostuijn (2010) did not find a relationship between pay and performance for CEOs, but only for other executives, with regards to Dutch listed firms. The same goes up for the results of research of Fernandes (2008), based on a sample of Portuguese listed firms.

Based on the information above, there are three main reasons why this study contributes to the existing literature. First of all, as mentioned before, there is still no clear relationship between firm performance and its effect on executive compensation. As mentioned above, research in the

past showed positive, negative or even no relationships significant relationships. Second, although Duffhues & Kabir (2008) and van der Laan, van Ees, & van Witteloostuijn (2010) for instance, did investigate this relationship before based on a Dutch sample, it is useful to investigate this relationship again due to that either their sampling period was (partially) before the implementation of the before mentioned ''Code Tabaksblat'' or the code has been revised in the meanwhile (Monitoring comissie corporate governance code, 2016). Besides, several years have been passed since the sampling period they used. The relationship they concluded could have been changed in the meanwhile. The research question which will be investigated in this study to achieve the above-mentioned aims is:

To what extent does the compensation of CEOs of Dutch listed firms depend on firm performance?

1.3. Contributions

Conducting this study has both theoretical as well as practical contributions. Firstly, this study contributes to theory in the sense that as mentioned above, there is still ambiguity in the literature about the sign of the relationship between firm performance and executive compensation. Research in the past showed positive, negative or no significant relationships. Secondly, this study takes into account the role pensions play. As will be discussed, pensions have become an important part of the compensation of CEOs. However, previous Dutch-based studies did not consider pensions as a form of compensation.

This study contributes to practice in the sense that it has been a while since the Dutch Corporate Governance Code has been implemented in 2004 and been revised since. Due to that in this study, the sampling period will contain compensation data of the period 2016-2018, this study can show how effective the implementation and the revisions of the Corporate Governance Code has been.

1.4. Outline

This thesis is structured as follows. Chapter two contains a literature review on theories related to the pay-performance relationship. Besides, this literature review contains a review of the empirical evidence of the pay-performance relationship. The chapter ends with the formulation of the hypotheses tested in this thesis. The third chapter explains the methodology of the thesis. Chapter four provides a description of the sample and the data collection method. Next, in chapter five the results of the OLS regression analyses and the robustness checks are described. Lastly, chapter six contains the conclusions regarding the results of the analyses. Moreover, it presents the limitations of this study and provides recommendations for future research.

2. Literature review

This chapter describes a comprehensive literature review on the relationship between executive pay and firm performance which will be investigated in this study. The literature review will start with a review of the concept ''executive compensation''. This will clarify from which components executive compensation is built. In the second part of the literature review, the main theories regarding the pay-performance relationship will be described. The third part will contain a review on how executive compensation is set/determined e.g. which factors influence executive compensation according to empirical evidence. Next, in the fourth section, empirical evidence will be given on the effects of firm performance on executive pay. In the fifth part, an international comparison will be made. In the last section, hypotheses will be formulated.

2.1. Components of executive compensation

There are different ways to measure executive compensation and there are different ways to distinguish the components of executive compensation. Some researchers used only cash and total compensation (Duffhues & Kabir, 2008), for example, whereas others distinguished salary, bonuses, other benefits and total pay (Smirnova & Zavertiaeva, 2017). Yet, although it is not exactly clear of which components executive compensation is built from, key review papers in the past on executive compensation concluded that most compensation packages consist of four components. These four main components are the base salary of executives, the short-term incentives (bonuses), long-term incentives (such as stock-options) and lastly, other benefits (Frydman & Jenter, 2010; Murphy et al., 1999). All of the four mentioned main components will be described below separately.

2.1.1. Base salary

Base salaries of executives are, viewed from a general perspective, determined through comparing the salaries of executives of other organizations in the same industry. This is also called ''benchmarking''. Thus, the base salary of executives does depend on the specific industry and other organizations in that industry (Murphy, 1999). Until the 1980s, the base salary was the largest component of the total executive compensation. However, during the 1980s and afterwards, stock options (which will be discussed below) became the largest component of executive pay (Frydman & Jenter, 2010). However, although the base salary has become a smaller component of total compensation, viewed from a relative perspective, it is still a very important component for executives. There are different reasons for executives to support this. The first reasons is that base salaries are a fixed component and guarantee the executive of a fixed income. Therefore, especially risk-averse executives do prefer base salary to variable compensation. Next, most of the other main components of executive compensation, which will be discussed below, depend on the amount of

base salary. Short-term incentives, for example, are most often expressed as a percentage of the amount of base salary. As a consequence, every dollar increase in base salary has its consequence for all other components which are related to the base salary (Murphy, 1999). Due to that, the base salary is fixed, it is not expected to have high sensitivity towards performance-related measures (van der Laan et al., 2010).

2.1.2. Short-term incentives

Together with base salaries, short-term incentives, also called bonuses, have been an important part of executives' total compensation during the largest part of the 20th century. As mentioned above, since the 1980s, the long-term incentives became a more important component of the total compensation (Frydman & Jenter, 2010). Bonuses are determined at the end of the year and depend on both financial- and non-financial goals, which are often set at the beginning of the year. Examples of these non-financials goals are customer satisfaction and plant occupancy. Generally speaking, bonuses are paid out in cash. The goal of these short-term incentives is to motivate executives (van der Laan et al., 2010). These short-term incentives are based on single-year firm performance. Some parts of the short-term incentives depend on the individual performance of the specific executive. Similar to the general goals, also these individuals goals are set at the beginning of the year. A possible downside of short-term incentives is that it could be argued that due to that short-term incentives are focused on short-term firm performances, executives only make decisions and undertake actions focused on the short-term. As a consequence, they might lose the focus on long-term firm performance (Murphy, 1999).

2.1.3. Long-term incentives

Similar to the short-term incentives, long-term incentives are also a form of variable compensation. The difference between the two is that whereas short-term incentives are focused on one-year goals/performance, long-term incentives are focused on goals set for a period of multiple years (Frydman & Jenter, 2010). Typically, the period varies between the three- or five-year cumulative performance (Murphy, 1999). Examples of long-term incentives are stock options, restricted stocks and stock appreciations rights (van der Laan et al., 2010). A possible fourth long-term incentive might be pensions. All these examples will be described below.

2.1.3.1. Stock options

Stock options are contracts which give executives the right to buy shares or stocks at a pre-specified exercise price for a pre-specified term. These options generally become exercisable over time and are thus not exercisable immediately (Murphy, 1999). The main reason for shareholders to give executives the possibility to reward them with stock options is that via this way they give executives

a greater incentive to work and act in the interests of the shareholders. Stock options make this possible due to that they provide a clear and direct link between the company stock price performance and the realized compensation (Hall & Murphy, 2003). Namely, changes in share prices do have consequences to the compensation of executives. Therefore, stock options can be seen as an instrument to motivate executives. Another advantage for the firm is that by making use of stock options, it is not necessary to directly spend cash to motivate the executives. According to Frydman & Jenter (2010), stock options have become the largest component of executive total compensation packages during the 1990s of S&P 500 firms.

However, some researchers criticized the use of stock options. Accounting scandals in the past, such as the Enron scandal, have been linked to excessive risk-taking on stock prices, resulting in the escalation in option grants (Hall & Murphy, 2003). Another limitation is that regarding stock options, executives do benefit in case of share price increasing. However, if share prices decrease, executives do not lose money (Murphy, 1999).

2.1.3.2. Restricted stocks

Restricted stocks are stocks that are not free to be sold by executives, like options are (Hall & Murphy, 2003). In other words, they are restricted in transferability and subject to vesting (Larcker & Tayan, 2015). Restricted stocks have become popular especially after the stock market decline of 2000-2001. During that time, the aforementioned stock-options became less popular and were replaced by restricted stocks (Frydman & Jenter, 2010).

Restricted stocks have several advantages compared to stock options. As mentioned above, one of the disadvantages of stock options is that in case of a decreasing share price, executives have nothing to lose. However, restricted stocks require executives to hold the stocks. As a consequence, restricted stocks are quite stable incentives. In the case of stock options, organizations with options that have stocks with lower market prices compared to exercise prices have the problem to motivate their executives. This is also called to ''underwater-options'' problem. Restricted stocks are also more favourable for firms compared to stock options due to that in case of out-of-the-money options, executives will take riskier investment to try to increase the market price of the stocks, whereas investment incentives are more or less independent of stock prices for executive who already have stocks (Hall & Murphy, 2003).

2.1.3.3. Stock appreciation rights

Stock appreciation rights (SAR) provides the opportunity for executives to receive either cash or a specific number of shares equal to the value of the cash they could receive (Carpenter, 1998). The difference between stock options, restricted stocks and stock appreciation rights is that whereas with stock options and restricted stocks it is about stocks, stock appreciation rights provide also the

possibility to be paid out in cash (Carpenter, 1998). However, similar to stock options and restricted stocks, stock appreciation rights are also a form of equity incentive pay that can be profitable towards executives in case of increased stock prices. Thus, SAR's also aim to link stock prices to executive compensation (Weenders, 2019).

2.1.3.4. Pensions

The above mentioned long-term incentives can be seen as equity-based compensation. However, executives can also be paid with debt. An example of this debt are pensions which most often are unsecured and unfunded claims against the organization and can therefore be classified as a form of so-called inside debt (Sundaram & Yermack, 2007). This inside debt decreases risk-shifting issues by equalizing the executives' incentive with the claims of other creditors (Frydman & Jenter, 2010). Pensions can officially be classified as an important component of ''other benefits'' which will be discussed below. However, due to its increasing importance and increasing amounts during the last years, it has been chosen to describe pensions in a separate section in this study. Furthermore, with regards to pensions, firms are only obliged to make payments at the retirement of the CEOs (Yixin Liu, Mauer, & Zhang, 2014). Therefore, in this study, the choice has been made to classify it as a form of long-term incentive. The increasing attention regards pensions in the literature can be explained due to that since 2006, listed firms are required to report information about pensions in its annual reports.

According to recent studies, pensions (inside debt) have become a significant component of the compensation of CEOs (Yixin Liu et al., 2014). For example, the median pension value for firms that have pensions plans, is about $15 million when CEOs retires, corresponding with about 35% of CEO's total compensation during its tenure (Frydman & Jenter, 2010). In addition, Lee & Tang (2011), mentioned that of US firms, CEO pensions represent 42% of total cash compensation. These numbers show that ignoring pension payments can result in underestimating a very important part of the executive pay.

2.1.4. Other benefits

In addition to the before-mentioned, base salary, short-term incentives, and long-term incentives, executives do also receive other benefits. Examples of these additional benefits are severance payments and various perquisites (Frydman & Jenter, 2010). As mentioned in the previous section, pensions could also be classified as a form of other benefits, however in this study is has been chosen to mention pensions in a separate section. Other benefits are kinds of benefits that have often been labelled as forms of compensation that provide executives to extract rents unnoticed (Bebchuk & Fried, 2003; Jensen & Meckling, 1976). Perquisites contain different kinds of goods and services provided to the executives. Examples of these goods and services are a company car, health and life

insurance, company cell phone, and loans at below-market rates (Frydman & Jenter, 2010). Examples of severance payments are the so-called ''golden handshake'' or ''golden parachute''. Executives receive these payments in case of losing their job as a consequence of their firm being acquired by another company (Frydman & Jenter, 2010).

2.2. Theories on pay-performance relationship

2.2.1. Agency theory

The agency theory is one theory most often referred to when the pay-performance relationship is the topic of the research (Murphy, 1999). Agency problems arise when there is a separation between ownership and control of a firm. In other words, an agency relationship can be defined as a situation in which the principal delegates work to the agent and pays him for that. It is expected from the agent to perform some services/activities on behalf of the principal (Jensen & Meckling, 1976). This theory assumes that managers are risk-averse, rational actors and motivated by self-interest. As a result, it reasonable to assume that both the principal and the agent strive for their own maximum result, resulting in that the agent will not always act in the best interest of the owner/principal (Jensen & Meckling, 1976). It can be stated that in the case of agency problem cooperating parties have different goals and that there is a division of labour (Eisenhardt, 1989). See figure 1 for an overview of the agency theory. As can be seen in the figure and as mentioned above, the problem

Agency Theory Overview

Key idea	Principal-agent relationships should reflect efficient organization of information and risk-bearing costs
Unit of analysis	Contract between principal and agent
Human assumptions	Self-interest Bounded rationality Risk aversion
Organizational assumptions	Partial goal conflict among participants Efficiency as the effectiveness criterion Information asymmetry between principal and agent
Information assumption	Information as a purchasable commodity
Contracting problems	Agency (moral hazard and adverse selection) Risk sharing
Problem domain	Relationships in which the principal and agent have partly differing goals and risk preferences (e.g., compensation, regulation, leadership, impression management, whistle-blowing, vertical integration, transfer pricing)

Figure 1: Overview agency theory (Eisenhardt, 1989)

domains are the different goals of the principals and agent and the information asymmetry. Furthermore, it can be seen that the agency theory has the assumptions that managers are risk-averse and act in self-interest. Besides, the unit of analysis in the agency theory is the contract between the principal and agent. According to Jensen & Meckling (1976), agency problems exist in all kind of organizations and every level of management in firms. For example, agency problems exist in government authorities, in unions, in listed firms and universities.

As mentioned above, two main problems arise when agency problems occur. The first problem arises when the principal and agent do have different goals and it is difficult for the principal to monitor/control the actions of the agent. Or it is very expensive for the principal to verify these actions. The second risk concerns problems due to that the principal and agent could have different attitudes towards risk preferences. As a consequence, both parties may prefer different actions that are conflicting (Eisenhardt, 1989; Jensen & Meckling, 1976). There are several ways how the principal can reduce so-called agency problems. One of the most used ways is to make use of optimal contracts (optimal contracting approach). Within those optimal contracts, the principal establishes incentives for the agent to reduce the conflicts. Examples are linking bonuses to firm performances or to make use of stock options. Other possibilities to reduce the agency problems are auditing, making use of formal systems and budget restrictions, for example (Eisenhardt, 1989). However, all possible ways to reduce agency problems will entail costs.

Many research conducted in the past does confirm the beliefs of the agency theory. Smirnova & Zavertiaeva (2017), for example, researched this theory on a sample of large European firms and concluded that accounting-based (AB) measurements of firm performance do indeed positively affect the bonuses and total pay of executives. In addition, Conyon & He (2012), investigated these beliefs on a sample of Chinees listed firms and did also find that firm performance positively affects executive compensation. The above two mentioned papers show that firms do indeed connect executive compensation to firm performance, showing that they believe in optimal contracting to reduce agency problems.

Criticasters of agency theory argue that the agency theory does have some limitations. One of these limitations is that the agency theory assumes that the board or compensation committee who is responsible for designing the compensation packages are independent and do work according to the best interest of the shareholders (Bebchuk & Fried, 2003). Therefore, this board or compensation committee should design compensation packages to maximize shareholders' interests. However, due to that the members of the board or compensation committee most often would like to be a member of the board for a longer period, it is reasonable to assume that those members do not always act in the best interests of the shareholders, resulting in agency conflicts (Bebchuk & Fried, 2003). Managers of listed firms often do have the power to influence the appointments of

board members. Another limitations according to Bebchuk & Fried (2003), is that the agency theory automatically assumes that managers do have different goals and interests compared to the shareholders. Lastly, Eisenhardt (1989), does also mention that it is recommendable to not only focus on the agency theory to understand the big picture but to also take into account other theories.

2.2.2. Managerial power theory

A second famous theory regarding the pay-performance relationship is the managerial power theory. This theory suggests that board and compensation committees do not design executives' compensation packages at arms-length, as suggested by the agency theory. Instead, this theory believes that executives have the power to influence their own compensation packages. As a consequence, they can use their power to extract rents. Moreover, the importance of hiding these rent extractions could lead to not optimal incentives, resulting in decreasing shareholders value (Bebchuk et al., 2002).

Similar to the optimal contracting approach, the managerial power theory also recognizes the agency problems between principal and agent (Bebchuk & Fried, 2003; Bebchuk et al., 2002). The difference between the optimal contracting approach and the managerial power theory is that the managerial power theory does not see executive compensation as the entire solution to the agency problems (Bebchuk et al., 2002). As mentioned above, the optimal contracting approach assumes that the boards of firms design compensation packages with the goal to reduce the agency problem between principal and agent. On the other hand, managerial power theory considers executives using their power to provide themselves rents as a part of the agency problem.

One of the limitations of the optimal contracting approach mentioned in the previous sections was that managers of large firms do have some noticeable power. The managerial power theory states that most of the directors are connected to executives. This could be the case via collegiality, affinity or by bonds of interest (Bebchuk et al., 2002). In the case of a bad performing CEO, these directors might want to replace this particular CEO. However, in case of a good performing CEO, these directors probably support the CEO. Due to that it is reasonable to assume that the CEO and other executives do have their influences over the board, members of the board most often do not bargain with the CEO about the compensation package at the ideal arms-length (Bebchuk et al., 2002). In contrast, it is more common that executives cooperate with the board and use their power to increase their compensation. The extra amount of pay that executives get compared to the optimal-contracting situation, is called excess pay. This excess pay often concerns rents. According to the managerial power theory, there is a positive correlation between the power of the executives and the rents (Bebchuk et al., 2002). The power of the executives (managerial power) depends on ownership characteristics. There is a positive correlation between the number of

shares owned by the executives and the influence on director appointments/elections. In addition, the power of the executives also depends on board characteristics. Examples of these board characteristics are the number of inside directors and the number of independent directors (Bebchuk et al., 2002).

Another factor which determines the amount of excess pay is the amount of outrage the compensation package of the executive creates. If the proposed compensation package is far more beneficial to the executives compared to the optimal contracting situation, outsiders (such as other employees) would be angry. It is important for the executives that they could justify their compensation package. Furthermore, the executives ultimately need the approval of the board for their compensation package. Besides, a huge amount of excess pay of the executives could have negative consequences to the reputation of the board members due to that board members are expected to be professional (Bebchuk et al., 2002). Therefore, it is important to both the executives and the directors to ''camouflage'' the excess pay.

Many researchers in the past provided empirical evidence which supported the managerial power theory. Van Essen, Otten, & Carberry (2015), conducted a meta-analyse on US-based studies and concluded that in most situations where CEOs were expected to have power, they also received a higher amount of total cash and total compensation. Contractionary, in studies where boards were expected to have more power, CEOs received less compensation. Similar results have been found by the study of (Brick, Palmon, & Wald, 2006).

Just as the above described optimal contracting approach, the managerial power theory has some limitations. One of these limitations according to van Essen et al. (2015), is that their study showed that the managerial power theory particularly explained the total level of compensation instead of the pay-performance sensitivity.

2.2.3. Tournament theory

A third theory concerning the pay-performance relationship is the so-called tournament theory. Similar to the previous theories, the Tournament theory also offers an important approach to how compensation packages within firms are structured (Eriksson & Lausten, 2000). This theory believes that executives are not only motivated by the amount of their compensation and the design of their compensation contracts. Besides, executives are also motivated by the possibility to get promotion to the CEO function in the future (Carpenter & Sanders 2002; van der Laan et al., 2010; Lazear & Rosen, 1979). More specifically, according to Carpenter & Sanders (2002), the large differences in pay between CEO and other executives are present with the goal of motivating the other executives to reach the level of pay the CEO has.

Literature provides some empirical evidence which (partially) supports this approach.

Eriksson (1999), tested this approach on a Danish sample and the results of this study confirmed the beliefs of the tournament theory. In addition, also the study of Conyon, Peck, & Sadler (2001) supports the tournament theory. The results of their study, based on a UK sample, show that the gap between the compensation of CEOs and other executives is positively related to the number of executives in the organization. In other words, the more steps between the CEO and the other executives exist, the larger the differences are.

2.2.4. Human capital theory

The human capital theory is a theory that has its own approach towards the compensation of executives. There is no one clear definition of what human capital exactly contains, however, one definition of human capital is that human capital consists of the expertise, experience, knowledge, skills and reputation of a person (Haynes & Hillman, 2010). According to Peng & Luo (2000), besides the above-mentioned concepts, social capital is also part of human capital. Social capital can be defined as a resource which is the outcome of a person's network relationships. By making use of its own human capital, persons can use its human- and social capital to improve the firm performances and manage the external resource dependencies (Peng, Sun, & Markóczy, 2015).

Due to that executives are aware of their human capital, and that their human capital adds value to the firm, the challenge for firms is to satisfy these executives. Executives on the other hand, of course, want to maximize their compensation. According to Greve & Sti (2010), there is a positive correlation between human capital and compensation. Therefore, boards or compensation committees of firms, need to decide how much they want to compensate and pay their executives for their human capital (Peng et al., 2015). In addition, Haynes & Hillman (2010), argue that differences in the characteristics of the executives could lead to different firm strategies. Whereas others measure it based on the employee's educational level and working experience (Greve & Sti, 2010).

There is empirical evidence in the literature that do confirm the belief that more experienced managers do receive higher compensation. Custódio, Ferreira, & Matos (2013), for example, conducted research on a US sample. Their results showed that executives with more general skills do receive higher compensation compared to more specialized executives. With more general skills, they meant executives who have been employed in firms who operated in different industries, whereas specialized skills are gathered when being employed in a specific industry for a long time. In addition, their results showed that executive pay increases especially when firms switch from specialized executives towards executives with more general managerial skills (Custódio et al., 2013).

2.3. Determinants of executive compensation

The structure of the compensation contract of executives is determined by the supervisory board of the firm. More specified, if present, this is done by the remuneration committee (RC) of the firm who operates for the supervisory board (Larcker & Tayan, 2015; Murphy, 1999). This committee consists of two or more outside directors. The remuneration committee of the firms proposes the remuneration policy to the supervisory board (in the Netherlands called the RvC). After the supervisory board have approved the policy, the next step is to get the approval of the annual general meeting (Monitoring commissie corporate governance code, 2016). Another task of the remuneration committee is to monitor the efficiency of the current remuneration policy. The committee monitors if the policy works in the best interests of the shareholders (Murphy, 1999). However, besides the determination of the compensation contracts by the remuneration committee, there are several other factors which can influence the structure and design of these contracts. Examples are executive factors, firm factors, industry factors, corporate governance factors, and country factors. All of them will be discussed below.

2.3.1. Executive characteristics

Educational level

The first executive characteristic that might influence executive compensation is the educational level of the executive. As mentioned before, the human capital theory believes that there is a positive correlation between educational level and executive compensation (Greve & Sti, 2010; Peng et al., 2015). This positive assumed relationship between educational level and executive compensation has been supported by the study of Banghøj et al. (2010). The results of this study showed that for every improvement in educational level, executives earn 5,7% more (Banghøj et al., 2010). Also, Green & Riddell (2001), supports this positive relationship showing that each additional year of education increases executive's compensation by 8%.

However, some studies did not find this positive relationship. Smirnova & Zavertiaeva (2017), for example, tested the agency theory on a sample of large European firms and did not find a positive relationship. They tested whether executives who own an MBA degree receive significantly more money compared to executives who did not have an MBA degree. The results showed that possessing an MBA degree did not influence the compensation of executives. Moreover, the study of Alves, Couto, & Francisco (2014), indicated even a negative relationship.

Tenure

The second executive characteristic that might influence executive compensation is CEO tenure. CEO tenure can be defined as the number of years the executive has been CEO (Ozkan, 2011). According

to the human capital theory, just as with educational level, a positive relationship is assumed between CEO tenure and executive compensation. This assumed positive correlation has been supported by many researchers. The results of the study of Smirnova & Zavertiaeva (2017) showed that tenure has a significantly positive effect on compensation. However, it usually has a U-shaped influence (Smirnova & Zavertiaeva, 2017). Besides, some other studies also supported this positive relationship (Eriksson & Lausten, 2000; Ozkan, 2011).

However, some studies did not find a significant positive effect of tenure on compensation. Banghøj et al. (2010), who did find a positive relationship of education on compensation, could not confirm a significant positive relationship of tenure on compensation. The same goes up for Van Essen et al. (2015) whose sample was based on US studies.

Age

A third characteristic which possibly influences the compensation of executives is the age of the CEO. Similar to the educational level, the human capital theory also assumes a positive relationship between the age of the CEO and the compensation of executives. The reasoning for this is that the older someone is, the more experience the person got, resulting in higher human capital (Greve & Sti, 2010). Studies in the past do support this positive relationship. Conyon & He (2012) showed that there indeed is a significant positive relationship between CEO age and compensation (Conyon & He, 2012). Besides, also the study of Ozkan (2011), based on a UK sample, showed that CEO age has a significantly positive effect on executive cash compensation but not on total compensation.

In contrast to the previously mentioned studies who all showed a positive linear relationship, Finkelstein & Hambrick (1989), showed a curvilinear positive relationship. They mentioned that people at the age of 59 starts to earn less money compared to the years before. A possible explanation for this decline is that after this age, people have fewer concerns regarding cash needs (Finkelstein & Hambrick, 1989). However, just as with the above-mentioned CEO tenure and educational level, some studies did not find a significant positive relationship. An example is a meta-analytic study based on US studies. The results of this study showed that CEO age negatively affects executive compensation (van Essen et al., 2015).

Gender

A fourth possible characteristic that might influence compensation is gender. Some research in the past showed that gender can make differences in executive compensation. Some researchers argue that male executives do receive higher compensation compared to women, whereas others showed that there is no difference. The results of the study of Mohan & Ruggiero (2007), showed that CEOs who are women, receive less total compensation if stock options are included in the total

compensation. Besides, they also showed that gender does not affect the base salary (Mohan & Ruggiero, 2007). According to them, a possible explanation is that women are less skilful in negotiating compared to men. However, Conyon & He (2012), showed that there is no significant effect of gender on compensation. Similar to the study of Conyon & He (2012), Adams, Gupta, Haughton, & Leeth (2007) also did not find a significant effect of gender on compensation for CEOs and concluded that men and women receive equal compensation.

Other factors difficult to measure

Besides the above-mentioned executive characteristics are there also some characteristics who are quite difficult to measure. One of these characteristics is (over)confidence of the executives. Some scientists researched the influence of overconfidence of the CEO on compensation and firm performance and their results are complementary to each other. Cooper et al. (2016), for example, found that overconfident CEOs receive high excess pay.

In the sequel to the above-mentioned overconfidence characteristic, is risk-aversion of the CEO is another characteristic which is difficult to measure. In contrast to Cooper et al. (2016), the results of the study of Page (2018), showed that less risk-averse CEOs receive higher compensation and do increase both shareholders' value and firm value. The most important conclusions of his study were that when removing risk-aversion from the CEO, long-term incentive pay increases by about 426%, while cash compensation decreases by about 55%. Besides, the value of the firm increases by about 19% and shareholders' value by about 16% (Page, 2018). These results confirm the belief of the agency theory that managers are risk-averse and that they have to be motivated to be less risk-averse by making use of long-term incentives, for example.

In the same study, Page (2018) also investigated the effect removing the influence of CEOs on the board on the compensation structure. These results are in line with the managerial power theory. This statement can be substantiated by showing that removing excess board influence resulted in a decrease of about 38% in long-term incentives. This resulted in an increase of 1,74% of shareholders' value (Page, 2018). Based on this, it can be stated that excess board influence does have a quite significant impact on the compensation structure, however, the impact on shareholders' value is not that significant. These results show that the managerial power theory that executives can extract additional rents can be confirmed.

2.3.2. Firm characteristics

Firm performance

The first firm characteristic that might influence executive compensation is firm performance. As previously mentioned in this study, the compensation of executives should depend on firm

performance, according to the agency theory (Eisenhardt, 1989). There should be a positive correlation between these two variables to align the interest of the managers with those of the shareholders (Jensen & Meckling, 1976). As mentioned before, a lot of research has been conducted to investigate the relationship between firm performance and executive compensation. The results are quite ambiguous. Research in the past show positive, positive, negative and no significant effects. All of these are discussed extensively in section 2.4.

Firm size

A second firm characteristics that might influence executive compensation, according to the literature, is the size of the firm. The thought behind this assumed relationship is that bigger firms are more difficult to monitor, viewed from the shareholders perspective. As a consequence, executives should receive more compensation (and incentives) to align the interests of executives and shareholders. On the other hand, it can be argued that bigger firms need executives with higher human capital, resulting in higher compensation levels. Multiple researchers investigated this assumed positive relationship and the findings are quite similar, generally speaking.

A study focused on European listed firms showed that the size of the firm has a large significant effect on total pay, salary and bonus of executives (Smirnova & Zavertiaeva, 2017). To further extend the information above, Tosi, Werner, Katz, & Gomez-Mejia (2000), reviewed 137 articles who researched the effects of firm size and performance on compensation. The results of their study were that firm size account for more than 40% of the variance in total CEO pay. Moreover, previous research focused on Dutch samples showed that firm size is an important and popular determinant to include in the research model when investigating pay-performance relationship or corporate governance in the Netherlands (de Jong, DeJong, Mertens, & Wasley, 2005; DeJong, De Jong, Mertens, & Wasley, 2001; Duffhues & Kabir, 2008).

Leverage

Another possible determinant of executive compensation is leverage. Several studies in the past argued that leverage can be seen as a manner to mitigate the agency problems between principal and agent. Key papers in the past based on Dutch samples regarding pay-performance relationship and corporate governance also included leverage as a variable (de Jong et al., 2005; Duffhues & Kabir, 2008; van Beusichem, de Jong, de Jong, & Mertens, 2016). Duffhues & Kabir (2008), mentioned that holders of debt probably closely monitor the activities and performances of managers. Therefore, a negative correlation is expected (Duffhues & Kabir, 2008). Raithatha & Komera (2016), supports this negative relationship with stating that debt financing, with fixed contractual obligations as characteristic, acts as a tool to mitigate the agency problems. However, although Duffhues & Kabir

(2008) expected a negative relationship, their results showed that leverage has a significant positive effect on executive pay. A possible explanation for this is that leverage increases the risk of the firm, resulting in higher executive compensation (Duffhues & Kabir, 2008). In contrast, the results of the study of Raithatha & Komera (2016), did show that leverage has a very significant negative effect on compensation. This negative relationship has been confirmed by the study of Banghøj et al. (2010).

Firm type

Another potential factor that influences executive compensation is the type of the firm. Most studies available in the literature are based on public listed firms due to that the data of privately held firms have not been assessable (Banghøj et al., 2010). However, Banghøj et al. (2010) decided to investigate this relationship on a sample of privately held firms due to that in Denmark more than 99% of all firms are privately held (which is quite similar in other countries). Because privately held firms have characteristics which are different from publicly held firms, they believed that this could have a consequence for the design of compensation packages. The results of their study confirmed these beliefs. The results show that executive compensation in privately held firms is less dependent on firm performance compared to executive compensation of listed firms in Denmark (Banghøj et al., 2010). Moreover, the results show that privately held firms do make less use of long-term incentive compensation compared to listed firms. However, because this study only focusses on listed firms, this firm characteristic is less relevant for this study.

2.3.3. Industry characteristics

Another possible determinant of the structure and amount of executive compensation could be the industry in which the firm is located. Especially Duffhues & Kabir (2008), showed some interesting results regarding differences between industries. Without distinguishing between industries, their results showed that firm performance has a significant negative effect on executive compensation, in case of three of the four measurements of firm performance (Duffhues & Kabir, 2008). However, in addition to these results, they decided to investigate whether it would make a difference when distinguishing between industries. They made a distinction between four industries; manufacturing sector, transportation-, trade- and service sector, information and technology sector, and lastly, the financial sector. Their results showed that regards the manufacturing sector, all performance measurements remain significantly negative. Also, all measurements for the transportation-, trade- and service sector remain negative. However, their main finding was found within the financial sector. In contrast to the previously mentioned sectors, showed the results of the financial sector that firm performance had a positive effect on executive compensation, instead of a negative effect (Duffhues & Kabir, 2008). In addition, the study of Ely (1991), showed that firms in the electric industry use less annual bonuses and LTIP compensation compared to other industries. Moreover,

the banking industry uses annual bonuses the highest, view from a relative perspective. Additionally, the results of the study of Aggarwal et al. (1999), showed that firms located in industries with high stock price volatility have lower pay-performance sensitivity compared to firms in industries with lower stock price volatility.

2.3.4. Corporate governance characteristics

The efficiency of alternative ownership structures and board characteristics are examined by corporate governance (Banghøj et al., 2010). As suggested by the literature, corporate governance mechanisms could help to reduce agency conflicts between principal and agents, and thus could have an impact on the compensation policy of a firm (Ozkan, 2007). Below, different ownership- and board characteristics will be described.

2.3.4.1. Ownership characteristics

Ownership concentration

The first corporate governance characteristic that could influence executive pay is ownership concentration. Ownership concentration can be defined as the percentage of ownership that is owned by a small number of shareholders (Jensen, 1993). Ownership concentration can be seen as a tool for monitoring executives (Ozkan, 2007). Besides, concentrated owners decrease the power of executives, which should help to reduce agency conflicts. Therefore, according to the literature, a negative correlation is assumed between ownership concentration and executive pay (Ozkan, 2007). There is a lot of empirical evidence that supports this negative correlation. A study on Chinees listed firms showed that ownership concentration has a significant negative effect on CEO stock holdings and equity grants (Conyon & He, 2012). Also, Ozkan (2011), confirmed the suggested negative effect of ownership concentration on compensation for UK non-financial firms. This negative relationship between ownership concentration and executive compensation is also confirmed by other researchers (Core et al., 1999; Cornett et al., 2008).

However, Banghøj et al. (2010), did not confirm this relationship. Their study, however, was based on privately held firms instead of listed firms. The results of their study showed a positive effect of ownership concentration on executive compensation, although not all of their results were significant (Banghøj et al., 2010). Based on the empirical results, it can be concluded that especially regarding listed firms, a negative relationship between ownership concentration and executive compensation can be expected.

Ownership identity

A second corporate governance characteristic that might affect the level and structure of executive compensation is the type of owner(s)/shareholder(s) the firm has. For example, a firm can have

institutional owners, owners who are family members, corporate owner or just owners who are individuals. According to Ozkan (2011), institutional investors have become important and dominant shareholders. The benefit of institutional owners is that they often are large shareholders and that they, therefore, can exert high pressure on executives (Ozkan, 2011). According to a study based on a US sample, it can be stated that institutional investors do influence the design and structure of executive compensation packages (Jay Hartzell et al., 2003). As previously mentioned, institutional owners do negatively affect executive compensation (Ozkan, 2011; Sur, Magnan, & Cordeiro, 2015)

On the other hand, the holding of shares of family members of the CEO could have a positive impact on the level of the compensation of the CEO. This could give the CEO additional power. This is the case, due to that the stronger position of the family in the firm, the stronger the power of the CEO (Finkelstein & Hambrick, 1989). Furthermore, in case of underperformance of the CEO, family members as shareholders may be less watchful as other shareholders might be (Finkelstein & Hambrick, 1989). Therefore, a positive effect of family shareholders on executive compensation can be assumed. However, the results of the study of Finkelstein & Hambrick (1989) and Sur et al. (2015), showed contradicting results. A possible explanation of the contradicting result is that family-members perhaps wants to give a signal to other stakeholders of the firm, in best of their own interests.

Priority- and preference shares

Other possible important corporate governance determinants to include in this study are the presence of priority- and preference shares because this study focuses on a Dutch sample. According to a key paper in the past regarding corporate governance structure in the Netherlands, is the presence of some legal protective tools for most of the Dutch firms an important characteristic of the Dutch corporate governance structure (DeJong et al., 2001). These tools have two functions; they function as hostile takeover defences, and owners of ordinary shares have limited control (DeJong et al., 2001). As a result of these tools, managers are more in control.

One of these tools is the so-called ‘’structured regime’’. Firms that have more than 100 employees and a book value of shareholders’ equity of more than €11.4 million have this structured regime (van Beusichem et al., 2016). If this is the case, the supervisory board is granted the rights of the ordinary shareholders, with the exception of voting on acquisitions, mergers and dividend policy (de Jong et al., 2005). Examples of tasks which will be taken over are the election of the management board and the supervisory board itself, and the establishment and approval of the annual accounts (de Jong et al., 2005). The study of de Jong et al. (2005), showed that during the period 1992-1999, 47,3% of the Dutch listed firms did have a structured regime.

Another tool can be the presence of so-called priority shares. These are additional type of

shares which give the holder special and additional rights, compared to ordinary shareholders. An example is that priority shareholders have the right to nominate members for the management and supervisory board (DeJong et al., 2001). The results of the study of van Beusichem et al. (2016) shows that during the period 1997-2007, on average 33,9% of the non-financial listed firms in the Netherlands made use of priority shares.

A third tool which is common for Dutch listed firms is the presence of preference shares. The management of the firm can issue such extra shares to for example a friendly outside investor during a hostile takeover. By floating these additional shares, the existing shares will have less voting rights which makes the hostile takeover more difficult (de Jong et al., 2005; DeJong et al., 2001). Another benefit of these shares is that the investor only has to pay 25% of the amount upfront (de Jong et al., 2005; van Beusichem et al., 2016). During the period 1997-2007, on average 67,3% of the non-financial Dutch listed firms made use of preference shares (van Beusichem et al., 2016). Because this study focuses on Dutch listed firms, and key papers in the past on Dutch samples did control for priority shares and preference shares, this study will also include them in the research model.

2.3.4.2. Board structure

Board size

According to the literature, board size might be a fourth corporate governance characteristic which could affect executive compensation. According to the human capital theory, the larger the board size, the more knowledge within the board is present (Haynes & Hillman, 2010). As a result of this amount of knowledge, a larger board should result in a more effective way of monitoring executives. Therefore, according to the human capital theory, a negative relationship is expected between board size and executive compensation. However, Jensen (1993), argue the opposite. The scientist argues that in the case that the number of board members gets beyond seven or eight, the board gets less effective. As a result, the board is easier to control for the CEO (Jensen, 1993). A possible cause of the assumed positive effect of board size on executive compensation by Jensen (1993), is that problems might occur regarding communication, coordination, and decision-making within the board when board size increases (DeJong et al., 2001; Ozkan, 2007).

This suggested positive effect of board size on executive compensation by Jensen (1993) is supported by several researchers. For example, the results of the study of Core et al. (1999), confirmed this suggested positive relationship by showing a significant positive effect. Moreover, they showed that every increase in board members resulted in an increase of $30601 in CEO compensation (Core et al., 1999). This positive effect has also been found by other researchers (Banghøj et al., 2010; Ozkan, 2007, 2011).

In contrast to the above-mentioned papers, some papers did not find a significant positive

correlation. Examples are the studies of Buck et al. (2008) and Conyon & He (2012) who both researched the effect on a sample of Chinees listed firms.

Board independence

The next corporate governance characteristic that might influence executive compensation is the independency of the board. The board structure of firms differs between countries. Firms within countries could have a one-tier board structure or a two-tier board structure. In the one-tier board structure, there is one board which is made up of both executives and non-executives directors. Furthermore, the board is comprised of outside and inside directors. Examples of countries in which large firms have a one-tier board structure are the US and the UK (Conyon & Schwalbach, 2000). In contrast to countries with a one-tier board structure, firms in countries with a two-tier board structure do have two boards within the firm; the management board (in the Netherlands called the ''Raad van Bestuur) and the supervisory board (in the Netherlands called the ''Raad van Commissarissen). The tasks of the management board are the formulation and implementation of the strategy, and the day-to-day decision making (de Jong et al., 2005). Members of the management board are chosen by the supervisory board. The supervisory board has the task to monitor the management board and they ultimately determine the compensation packages of the executives (Conyon & Schwalbach, 2000; de Jong et al., 2005). Commonly, half of the members of the supervisory board are chosen employees' representatives, whereas the other half are members elected by the shareholders and most often are outside directors. In countries in which listed firms have a two-tier board structure, the supervisory board is classified as independent (de Jong et al., 2005; DeJong et al., 2001; van Beusichem et al., 2016). Examples of countries in which listed firms have a two-tier board structure are Germany and the Netherlands (Conyon & Schwalbach, 2000; Monitoring commissie corporate governance code, 2016).

Because CEOs/executives might have the possibility to influence the inside directors of the board(s), it is expected that a higher percentage of inside directors results in higher executive compensation. In contrast, because outside directors are independent and could therefore not be influenced by the CEOs/executives, it is expected that a higher percentage of outside directors results in lower executive compensation. In general, outside directors are classified as independent because it is expected these outsiders have no connection with the executives at the firm.

Results of studies in the past show some unequal findings. For example, the study of Core et al. (1999), showed that in contrast to the hypothesized positive effect of inside directors on executive compensation, their results indicate that higher percentage of inside directors results in lower CEO compensation. The above shown negative relationship between independent/outside directors and executive compensation might be clarified by the reason that not all ''independent'' directors are

actually independent. For example, the CEO might be connected to independent directors via social or private life. In this case, the outside directors of the board are classified as independent because they do not work at the firm, but they actually might have some connections with the CEOs. The study of Schmidt (2015), showed that about 24.8% of the CEOs have some social ties with the outside directors in the board. Therefore it might be questionable to what extent outside directors actually are independent.

Although the previous information shows that board independence might be an interesting variable to include in the research model regarding pay-performance research, this variable will not be included in this study. This because previous researchers who did include board independence as a variable, were almost entirely based on samples with a one-tier board structure. As previously mentioned, this study focuses on a Dutch sample in which firms have a two-tier board structure. Moreover, it is questionable to what extent the supervisory board members actually are independent since these members often fulfil board positions in other firms or are past members of the management of the firm (de Jong et al., 2005; DeJong et al., 2001). In addition, members of the supervisory board often elect the supervisory board itself (co-optation), which often are former CEOs (van Beusichem et al., 2016). These former CEOs are not independent because they have received money from the firm in the past, they were involved in former projects, or might be major shareholders, for example. Besides, past pay-performance relationship research on Dutch samples did also not include board independence as a variable in their model (Duffhues & Kabir, 2008; Janssen-Plas, 2009; Postmus, 2015; van der Laan et al., 2010). Besides, also other key papers regarding corporate governance in the Netherlands did not include this in their research (de Jong et al., 2005; DeJong et al., 2001; van Beusichem et al., 2016). Therefore, it seems not to be a fitting Dutch corporate governance variable. Instead of board independence, the determinant described below will be included in this study, which is more suitable to the Dutch context.

Relative size supervisory board

As mentioned in the section above, board independence seems not to be an appropriate variable to use in this study. This due to that board independence is more suited to firms with a one-tier board structure. Besides, it is questionable to what extent the supervisory board members of firms with a two-tier board structure actually are independent. Therefore, the name ‘’board independence’’ seems not the right corporate governance variable to include in this study.

However, a variable which can be included in the model, which approaches the ‘’board independence’’ variable, but is more applicable to the Dutch context, is the relative size of the supervisory board. DeJong et al. (2001) researched the corporate governance structure in the Netherlands and mentioned that the relative size of the supervisory board (RvC) affects the

effectiveness of the members of the supervisory board. Therefore, they mentioned that the relative size of the supervisory board is an appropriate variable to include in the research model when investigating a Dutch sample and corporate governance variables are included.

CEO duality

Especially in US-listed firms, it is common that CEOs also are the chairman of the board. Carter, Li, Marcus, & Tehranian (2016), stated that during the '90s, in about 80% of the US companies this was the case. One of the functions of the chairman of the board is to oversee the whole process of hiring, firing, judging and compensating the CEO (Jensen, 1993). However, due to that in several firms, the CEO is also the chairman of the board, the CEO cannot fulfil the task of the chairman apart from its own interests. Therefore, Jensen (1993), states that it is very difficult for the board to perform its critical tasks, without having an independent chairman. As a result, Jensen (1993) states that it is important for a firm to separate the functions of the CEO and the chairman. Therefore, a positive correlation between CEO/duality and executive compensation can be assumed.

The assumed positive relationship between CEO/duality and executive compensation has been confirmed by the study of Core et al. (1999). To further specify, they mentioned that a CEO who also is the chairman of the board, receives $152.577 as additional compensation, compared to CEOs who are not the chairman of the board. However, the results of the study of Cornett et al. (2008), showed no significant effect of CEO/duality on executive compensation. Because CEO duality is mainly relevant for firms that have a one-tier board structure, this variable will not be included in this study. This study focuses on a Dutch sample in which firms have a two-tier board structure. Moreover, previous research in the past regarding pay-performance relationship and corporate governance on Dutch samples did also not include this variable in their models (de Jong et al., 2005; Duffhues & Kabir, 2008; van der Laan et al., 2010).

Compensation committee

Another corporate governance characteristic which possibly could influence executive compensation is the presence of a compensation committee. As mentioned in the introduction of section 2.3. not all listed firms do have a compensation committee. However, compensation committees are predicted to enhance the effectivity of boards in designing the compensation packages of executives (Conyon & He, 2012). Therefore, it is expected that the presence of a compensation committee negatively affects executive compensation. However, the study of Conyon & He (2012), showed that the presence of a compensation committee does positively influence the amount of executive compensation. However, the results of this study are not statistically significant (Conyon & He, 2012).

2.3.5. Country factors

Next to the above-described characteristics, also country-specific characteristics can be assumed to influence executive compensation. Although country-specific factors, such as culture, legal environment and political influences can be seen as an important determinant of executive compensation, limited research has been conducted (Hüttenbrink, Oehmichen, Rapp, & Wolff, 2014). Below, several country-specific factors will be described. However, regards this study, country-specific factors are less important compared to the previously mentioned determinants of executive compensation, due to that this study only focuses on firms located in the Netherlands.

Culture

A first country-specific factor that seems to influence executive compensation is culture. For example, culture may affect the structure of the compensation packages of executives. Bryan, Nash, & Patel (2015), investigated the cross-country differences in the executive compensation packages, caused by national culture differences. The study used the cross-cultural study of Hofstede (1980) to determine how to measure cultural distances between countries. Hofstede (1980) identified four basic problems which face cultural differences. However, Bryan et al. (2015), used two of them: the measurements of *individualism* and *uncertainty avoidance*. Individualism is an appropriate measurement due to that in case executives pursue their own interests above the interests of the shareholders, agency problems arise. Due to that equity-based compensation is seen as a manner to reduce agency conflicts, Bryan et al. (2015), hypothesized that there should be a positive relationship between the score on individualism and equity-based incentives. The results of their study showed that the hypothesized relationship between the degree of individualism and the usage of equity-based executive compensation can be confirmed (Bryan et al., 2015).

As mentioned above, the second cultural characteristic that has been used by Bryan et al. (2015), to investigate differences in compensation packages across countries is uncertainty avoidance. The index of uncertainty avoidance measures to what extent people feel stressful in risky or unstructured circumstances (Hofstede, 1980). Cultures that prefer predictable outcomes score high on this index. Based on the above, Bryan et al. (2015), hypothesized a negative relationship between the uncertainty index of a country and the use of equity-based incentives. Based on the above-mentioned results, it can be concluded that cultural distances do make a significant influence on the design of executive compensation.

Legal environment

A second country-specific characteristic that might influence executive compensation is the legal environment of the country (Capron & Guillén, 2009). Formal institutions of countries set the rights

and duties of shareholders and stakeholders. Two dimensions of formal institutions which will be described below are shareholder protections and disclosure requirements. According to Capron & Guillén (2009), strong shareholder protection gives the possibility to influence the process of appointing and the resignation of executives. Besides, it offers shareholders the possibility to influence corporate decisions (Capron & Guillén, 2009). Therefore, it results in fewer agency issues.

Little research has been conducted regarding the relationship between legal environment and executive compensation packages. Hüttenbrink et al. (2014), investigated how formal country-level institutions influence the compensation structure of executives. During their study, they focused on shareholder protections and disclosure requirements, which is in line with the studies of Djankov, La Porta, Lopez-de-Silanes, Shleifer et al. (2008) and La Porta, Lopez-de-Silanes, Shleifer, & Vishny (2000). Based on the results of the study of Hüttenbrink et al. (2014), it can be stated that shareholder protection rights are negatively correlated with the usage of stock-based incentives (Hüttenbrink et al., 2014). Furthermore, their results show that in countries with low disclosure requirements, shareholders make less use of equity-based incentives. It can be concluded that stronger disclosure requirements make it easier for shareholders to gain information and therefore, agency costs can be reduced.

Political influences

The third country-specific factor that might affect executive compensation is political influence. In some countries, firms or entire industries are extremely regulated and subject to political influences (Liang, Renneboog, & Sun, 2015). As a result, these extreme regulations and political influences might have a significant influence on the design of compensation packages (Joskow, Nancy, & Wolfram, 1996). One of the countries with these large political influences in China. For example, in China, there are a lot of state-owned firms (SOEs). These political influences might affect the recruitment of managers, and the design of executive compensation packages (Liang et al., 2015). The study of Liang et al. (2015), investigated the effect of political influences on executive compensation on a Chinees sample. The results of their study showed that firms who are owned by the state are negatively correlated with the amount of executive compensation (Liang et al., 2015). Also, the results showed that government ownership is correlated with higher pay-for-performance relationships. Moreover, based on the results it can be stated that managers who have connections to the state, seem to have higher compensations (Liang et al., 2015).

2.4. Effects of firm performance on executive pay

Based on research in the past, it can be stated that firm performance might affect executive compensation. However, as already shortly mentioned in section 2.3.2. a lot of ambiguity exists

among these results. One of the reasons which clarify these differences is the use of different performance measurements and the different ways of measuring executive compensation. Below, the different relationships will be described more extensively, based on empirical evidence. Empirical evidence will be provided to support both the positive and negative effect of firm performance on executive pay. Moreover, evidence will be provided that supports the belief that there is no relationship between the variables and the belief that there is a reversed relationship.

2.4.1. Positive effect

A lot of empirical evidence shows that there is a positive relationship between firm performance and CEO pay. Smirnova & Zavertiaeva (2017), investigated the effect of firm performance on CEO pay, and also the reversed relationship. Their study was based on a sample of large European firms. The results of their study show that both accounting-based (AB) and market-based (MB) measures of firm performance positively affects total CEO compensation (Smirnova & Zavertiaeva, 2017).

Another study that shows a positive relationship between firm performance and executive compensation is the study of van der Laan et al. (2010). The data they used in their study was based on a sample of Dutch listed firms. The joint significance test of the performance measures was rejected, except for bonuses and option grants. Based on this, they concluded that there is only a weak relationship between firm performance and CEO compensation (van der Laan et al., 2010). In contrast to the joint significance test of firm performance on CEO pay, the joint significance test of firm performance on other executive pay shows stronger results (van der Laan et al., 2010).

Conyon & He (2012), studied the effect of firm performance on executive compensation for executives of Chinees listed firms. They also documented a positive relationship. They researched the effect of both AB performance measures and MB performance measures on total CEO pay, excluding stock options and grants. The results of their study show that ROA has a significant and positive effect on CEO pay (Conyon & He, 2012). However current dated stock returns do not have a significant influence on CEO pay (Conyon & He, 2012). They concluded that AB measures of firm performance do significantly and positively affect CEO pay, whereas MB firm performance has a limited positive effect on CEO pay (Conyon & He, 2012).

Another study that researched the effect of firm performance on executive compensation, is the study of Core et al. (1999). The dataset they used consisted out of US-listed firms. They made a distinction regarding compensation between total compensation, cash compensation and salary. The performance measures they used were AB and MB. Regarding total compensation, the results show that ROA has no significant effect, whereas RET shows a significant positive effect. The results of the effect on cash compensation show that the results are similar to the results on total compensation. The results regarding the effects on salary compensation show that ROA negatively affects cash

compensation whereas RET stayed positive (Core et al., 1999). Based on the above-mentioned results, it can be stated that especially MB measurements of performance have a significant and positive effect on executive compensation.

Also, Raithatha & Komera (2016) researched the effect of firm performance on executive compensation. This study was based on a sample of Indian firms. The general conclusion was that firm performance, both when measures as AB and MB, are significant and positively correlated with executive compensation (Raithatha & Komera, 2016). Their results showed that both AB and MB performance measurements positively affect executive compensation. This is the case for both contemporaneous and lagged performance data (Raithatha & Komera, 2016).

Another study that has been cited a lot, is the study of Hall & Liebman (1998). The data they used in their study was based on a sample of large US-listed firms. They only made use of an MB measurement of firm performance and distinct between salary and bonus, stock options and other benefits. The results of their study show that there is a strong relationship between firm performance and CEO compensation (Hall & Liebman, 1998). Besides, they concluded that this strong relationship is mainly caused by the positive changes of value in stock options (Hall & Liebman, 1998).

Prior to the study of Conyon & He (2012), Buck et al. (2008) also investigated the effect of firm performance on executive pay for Chinees listed firms. They measured compensation only in cash salaries and bonuses. Furthermore, they used both AB- and MB performance measurements (Buck et al., 2008). The results of their study show that shareholder value is significantly and positively correlated to executive pay (Buck et al., 2008). Besides, also pre-tax profits are significantly and positively correlated to executive pay. Therefore, based on the results of this study, it can be stated that both AB performance measurements and MB performance measurements have a significant and positive relationship with executive pay.

2.4.2. Negative effect

Besides the above described positive effect of firm performance on executive pay, there is also empirical evidence that there might be a negative effect of firm performance on executive pay. Duffhues & Kabir (2008), investigated for Dutch listed firms whether the pay-performance relationship is always positive. They used cash compensation and total compensation, consisting of the sum of cash compensation and the market value of stock options, as proxy measures for executive compensation (Duffhues & Kabir, 2008). They used both AB and MB measures for firm performance. The results of the regressions analysis show that all performance measures have a significantly negative effect on cash compensation (Duffhues & Kabir, 2008). The results of the regression analysis when the performance measures are regressed on total compensation show that

the AB performance measures have a positive effect on total compensation (Duffhues & Kabir, 2008). However, these effects are insignificant. Besides, the MB measures show a negative relationship, (Duffhues & Kabir, 2008). When using lagged performance measures, all effects become negative, whereas only one effect total compensation stays significant (Duffhues & Kabir, 2008).

Besides, Ozkan (2011) studied the pay-performance relationship for UK firms and his regression results showed that firm performance, when measured as market-based performance, negatively affects cash compensation. Also, Sheikh, Shah, & Akbar (2018), studied the pay-performance relationship for firms in Pakistan, and their results also showed that firm performance, when measured as market-based performance, negatively affects cash compensation.

2.4.3. No significant effect

Besides the above described positive and negative relationships between firm performance and executive compensation, are there also numerous researchers who did not find a significant effect of firm performance on executive compensation. Duffhues & Kabir (2008), investigated this relationship for Dutch listed firms and found partially negative effects, which has been mentioned above but did also find effects that were not significant. Their results show that when one-year lagged performance data have been used, some of the results became insignificant. Besides, when the performance measures were regressed on total compensation, results of the contemporaneous performance show that most of the performance measures do not have a significant effect on total compensation (Duffhues & Kabir, 2008).

The results of the study of Fernandes (2008) also show almost entirely no significant effects of firm performance on executive compensation. His study was based on a sample of Portuguese listed firms. He only measured the effect of an MB measure of firm performance on executive compensation. He examined this effect on total compensation, fixed compensation and variable compensation. The results of his initial regression analysis showed that firm performance has no significant effect on compensation (Fernandes, 2008).

Banghøj et al. (2010), researched what the effects of firm performance on executive compensation are for Danish firms. They distinguished themselves from others in the sense that they did use a sample of privately held firms instead of listed firms. The results of the regressions analysis show that firm performance, both when measured as contemporaneous and lagged data, has a positive but no significant effect on compensation (Banghøj et al., 2010). The effects remain insignificant when other control variables were included.

In addition to Banghøj et al. (2010) who investigated the effects for Danish firms, Cieślak (2018), investigated the relationship for another Scandinavian country; Sweden. However, in contrast to Banghøj et al. (2010), they used listed firms instead of privately held firms. Furthermore, they

made a distinction between family-controlled firms and non-family controlled firms. The results of his study showed that there is no significant effect of firm performance on executive compensation (Cieślak, 2018).

Another study that researched relationship between firm performance and executive compensation, is the study of Sheikh, Shah, & Akbar (2018). The data they used for their research was based on a sample of Pakistanis listed firms. They researched the effects of both AB and MB performance measurements on executive compensation. They regressed these measurements on both cash compensation and total compensation. The results of the regression analysis show that AB performance measurements have a significant positive effect on executive compensation whereas the effect of MB performance measurements is negative but insignificant (Sheikh et al., 2018).

Similar to Banghøj et al. (2010), Eriksson & Lausten (2000) also investigated the pay-performance relationship for Danish firms. They focused on large and medium-sized firms. They investigated whether MB firm performance measure has a significant effect on changes in executive pay. Besides, for AB performance measures of firm performance, they made use of dummy variables. Executive pay has been measured in base salary, bonuses, and total compensation (stock options excluded). Results show that MB performance measure has a significant positive effect on changes in executive pay (Eriksson & Lausten, 2000). However, most of the dummy variables, measuring AB firm performance, show no significant effect on changes in executive pay (Eriksson & Lausten, 2000).

2.4.4. Reversed relationship

Besides researchers who investigated the effect of firm performance on executive pay, are there also several researchers who investigated the reversed relationship; the effect of executive pay on firm performance. One of the studies in which this was the case, is the study of Smirnova & Zavertiaeva (2017). As mentioned above, they researched the effect of firm performance on executive compensation for large European listed firms, however, they also investigated the reversed relationship. The results of their study show that total CEO compensation and bonus have a significant and positive effect on ROA, whereas salary and other benefits show no significant effect on ROA (Smirnova & Zavertiaeva, 2017). When measuring the effects of CEO compensation on the MB performance measure (Sharpe index: SI) (Smirnova & Zavertiaeva, 2017), results show that salary has a significant negative effect on SI, while bonus shows a significant positive effect. In contrast, both total pay and other benefits show no significant effect (Smirnova & Zavertiaeva, 2017).

Another study that studied the reversed relationship is the study of Buck et al. (2008). Their study was based on a sample of Chinees listed firms. They used average cash salaries and bonus as a proxy for executive compensation. The results of the analysis show that executive compensation (salary + bonus) has a significant positive effect on firm performance (Buck et al., 2008).

Another study that researched the reversed relationship is a study of Carpenter & Sanders (2002). They studied this reversed relationship based on a dataset of US-listed firms. They used total compensation as a proxy for compensation. The results of the analysis show that firm performance has a significant and positive effect on the compensation of top management team members (Carpenter & Sanders, 2002).

In contrast to the above-mentioned scientists who found a positive correlation between executive pay and firm performance, several researchers found a negative relationship between (excess) executive compensation and firm performance. Brick et al. (2006) researched this reversed relationship based on a sample of US firms. They regressed whether excess compensation has a significant effect on the future excess return and the results confirmed that excess executive compensation has a negative and significant effect on future firm performance (Brick et al., 2006).

Besides, Carter et al. (2016) investigated the reversed relationship for US-listed firms. They measured firm performance only in AB measurement. Results of the analysis show that excessive total pay has a significant negative effect on firm performance (Carter et al., 2016). In addition, excessive incentive pay shows a significant positive relationship with firm performance (Carter et al., 2016). However, when other performance measures were used during the robustness check, the effect of excessive pay on firm performance became less significant or even not significant.

A third study that provided empirical evidence that excessive executive compensation negatively affects firm performance is the study of Cooper et al. (2016). This study was also based on a US sample. The results of their analysis show that excess executive compensation is negatively and significantly correlated with future firm performance (Cooper et al., 2016). Moreover, they reported that the effect is stronger for more overconfident CEOs. Their explanation for this negative relationship is that CEOs that receive high excess compensation undertake activities that are value-destroying such as overinvestment (Cooper et al., 2016).

2.5. International differences in executive compensation

While the US government oblige large firms in the US to disclose detailed information on executive compensation since the 1930s, other countries in the world expected this quite a few years later from large firms. As an example, the UK required firms to disclose this information since 1995, whereas other members of the European Union required this since 2003 (Fernandes, Ferreira, Matos, & Murphy, 2013). Therefore, a lot of research available regarding the compensation of executives has been focused on US companies.

The origins of the requirements to large US firms to disclose detailed information about the compensation of executives lies at the start of the 1930s. In 1933, all US companies with capital and assets exceeding 1 million dollars were required by the Federal Trade Commission to disclose

information of salaries and bonuses (Conyon, Fernandes, Ferreira, Matos, & Murphy, 2011). A year after the introduction of the disclosure requirements, the Securities and Exchange Commission (SEC) has been created. This commission is responsible for enforcing compensation disclosures for top executives in public listed firms (Conyon et al., 2011). Besides, one of the tasks of this commission is to determine what kind of information firms need to disclose. In contrast to the US, it lasted almost sixty years until a European country required listed firms to disclose executive compensation information. The first European country that obliged firms to disclose information was the United Kingdom. Due to that during the early 1990s, public rumour had arisen about the worthy options executives in privatized water- and electric industry received, the Greenbury committee was established. In 1995, this committee drew a report that called for changes in regulations, disclosure requirements and structure for executive compensation (Conyon et al., 2011). Almost ten years after the introduction of the disclosure requirements in the UK, the commission of the European Communities introduced in May 2003 the so-called ''Modernizing Company Law and Enhancing Corporate Governance in the European Union'' report (Conyon et al., 2011). This so-called ''Action Plan'' was directed at all listed corporations located in members of the European Union, aimed to increase the transparency regarding compensation and share information data. Countries that were a member of the European Union were asked to have implemented the principles by June 2006.

US vs Europe

As a consequence of the introduction and implementation of the disclosure requirements in Europe, data were available for researchers to investigate the differences in the level of compensation of executives and compensation structures in the whole, between US-listed firms and European listed firms. Two of these researchers were Conyon & Murphy (2000), who investigated the differences in cash compensation for executives between US firms and UK firms. Besides, they also investigated the differences in pay-performance sensitivity. Their study was based on data over 1997. Their results showed that CEOs in the UK receive 45% less cash compensation, compared to CEOs of US firms (Conyon & Murphy, 2000). Besides, CEOs of US firms receive 190% more total compensation, compared to CEOs of firms in the UK (Conyon & Murphy, 2000). These large differences were caused by the extensive use of long-term incentives in the US. Moreover, Conyon & Murphy (2000) stated that pay-for-performance relationship in the UK is weaker than the pay-for-performance relationship in the US

In addition to Conyon & Murphy (2000), Conyon et al. (2011) extended the previously mentioned paper by investigating not just the differences in executive compensation between the US and the UK but focused on the differences between the UK and several European countries and the European countries together. This study was possible to conduct due to that as aforementioned,

members of the European Union were obliged to disclose information regarding executive compensation. During their study, they compared six-year compensation data of US and European firms. Their results first showed that average compensation for the CEOs of the 500 largest US-firms has involved during the period 1970-2009. In 1970, average CEO compensation for the CEOs of the 500 largest US firms was approximately €800.000, while in 2009 this was €6 million (Conyon et al., 2011). Moreover, in 1970, US CEOs received 31 times the compensation of average production works, whereas in 2009 this was 263 (Conyon et al., 2011). They mentioned that the extreme increase in CEO compensation has been caused by the growth in equity-based compensation. When calculating the level of compensation and structure of compensation for a broader sample (also including MidCap firms and SmallCap firms), the results showed that the average pay for US CEOs in 2008 was €2 million. Based on this, it can be concluded that CEOs of US firms earn more than twice as much than European CEOs (Conyon et al., 2011). Besides, when focusing on the compensation structure, results show that for firms with revenues exceeding €4 billion, salaries account for 42% of total compensation of European CEOs, while this is respectively 20% for the US (Conyon et al., 2011). Besides, these percentages are respectively 25% and 54% for equity-based compensation.

Similar to the previously mentioned study, also Fernandes et al. (2013) concluded that US CEOs receive higher compensation compared to non-US CEOs and that the compensation structure is different. However, these differences are far less than suggested by (Conyon et al., 2011). They documented that in 2006, US CEOs received about 26% more compensation than non-US CEOs (Fernandes et al., 2013). However, it has to be mentioned that these were results after controlling for firm-, ownership- and board characteristics.

Next to the differences in compensation level and packages of CEOs of US and European firms, also differences in the pay-for-performance sensitivity has been researched by several researchers. The results of the study of Conyon & Murphy (2000), showed that CEOs of US firms receive about 1,5% of every increase in shareholders' wealth. In contrast, for CEOs of firms in the UK, the is respectively 0,25% (Conyon & Murphy, 2000). Therefore, based on these results, it can be stated that the pay-for-performance relationship is stronger in US firms. Similarly, also Conyon et al. (2011), confirmed that CEOs of firms in the US have stronger pay-for-performance sensitivity compared to CEOs of non-US firms. The results of their study showed that an increase of 10% in shareholders wealth, results in an increase of just 1,2% in CEO cash compensation for non-US CEOs (Conyon et al., 2011). In contrast, for US CEOs, this percentage is 4,1% (Conyon et al., 2011). Moreover, every 10% increase in shareholder wealth, results in respectively 3,6% and 0,7% increase in cash compensation for US CEOs and non-US CEOs (Conyon et al., 2011). Another study that confirmed the strong pay-for-performance relationship within US firms is the study of (Ozkan, 2011).

US vs China

Similar to European countries, also Chinees firms have been required to disclose detailed information about executive compensation since the start of the 21st century. More specifically, in 2005 the China Securities Regulatory Commission (CSRC) has been introduced and new rules and laws have been introduced in China that oblige firms to provide this detailed information (Conyon & He, 2012). Therefore, just as with European countries, it has been possible for researchers to investigate executive compensation since the introduction of these new laws and rules. Due to that before 2005 equity-compensation was not permitted in China, executives received just cash salaries, bonuses and stipends before 2005. Since the introduction of the new rules in 2005, executive compensation has been increased significantly. For example, CEO pay (excluding stock options and grants) increased from about $40.000 in 2005 to $90.000 in 2010 (Conyon & He, 2012). Furthermore, the average value of CEO share ownership also increased enormously. The ratio CEO share ownership – CEO pay (excluding stock options and grants) was 10 to 1 in 2005, while this was 400 to 1 in 2010 (Conyon & He, 2012). However, although the worth of stock options increased extremely, the percentage of CEO who owned shares and stocks still was significantly lower compared to the UK and the US Just 3,42% of the CEOs of Chinees firms received equity-based compensation (Conyon & He, 2012).

Based on the above-described changes in the level of compensation and the design of the compensation packages, it can be stated the different introductions of regulations regarding disclosure of information about executive compensation over the world, have improved the disclosure. It can be said that US CEOs earn the most in the world, although the differences between European firms have been declined. Besides, firms located in the US and Europe do make a lot of use of equity-based compensation, compared to the year of the introduction of the disclosure laws. However, not all countries in the world make use of these equity-based incentives in an extensive way. In 2010 Just 3,42% of the CEOs of Chinees firms receive equity-based compensation, for example.

2.6. Hypotheses development

So far, different theories and several determinants of executive pay have been described in the previous sections of this study. Moreover, the effects of firm performance on executive pay have been discussed extensively. In this section, the before mentioned theories and empirical evidence will be developed and summarized into hypotheses that will be tested and answered in this study. It has to be mentioned that from the theories that have been described in section 2.2., the agency theory will be leading in the development of the hypothesis, due to that the other theories mainly focus on the reversed relationship (the effect of executive pay on firm performance). The results of the study of van Essen et al. (2015), for example, showed that the managerial power theory is less

suited to explain the relationship between pay and performance. Furthermore, whereas in the literature review it was about executive pay in general, the hypotheses will be formulated on the effect of firm performance on CEO pay due to that this study focuses on CEO pay instead of executive pay in general.

As previously mentioned, according to the agency theory, managers and shareholders have conflicting interests due to the separation of ownership and control. A tool for shareholders to align the interests of the managers with those of the shareholders is to make use of income-based contracts (Eisenhardt, 1989). Below, the relationships between firm performance and CEO pay will be hypothesized, based on the theories and empirical evidence. From the components of executive pay discussed in section 2.1, only the effect of firm performance on variable pay will be investigated. The effect of firm performance on base salary will not be researched in this study because as mentioned in section 2.1.1., base salary is fixed and it makes therefore no sense to research if this is affected by other variables. Besides, empirical evidence already showed that the base salary is not affected by firm performance (Smirnova & Zavertiaeva, 2017; van der Laan et al., 2010). Moreover, the effect of firm performance on total CEO pay will also not be studied in this study because if the effect of firm performance on variable pay will be positive or negative, and assuming that base salary is fixed, then the effect performance on total pay will probably be the same as the effect of performance on variable pay. Namely, if 1 and 2 both are positive, then the sum of them will probably also be positive. Therefore, the choice has been made to not investigate the effect of performance on total CEO pay as well.

2.6.1. The effect of firm performance on short-term incentive compensation (bonus)

As previously mentioned, according to the agency theory, shareholders should align the interests of executives with the interests of themselves. According to the agency theory, the goal of the optimal contracting approach is to align the interests of managers with those of the shareholders (Jensen & Meckling, 1976). Therefore, designing optimal contracts is an important tool for mitigating agency conflicts. Generally speaking, in designing the optimal contract, short-term incentive pay (also called bonus) is distinguished from long-term incentive pay. The short-term incentive pay consists of the bonus that is most often determined at the end of the year, based on quantitative goals set at the beginning of the year (Abowd & Kaplan, 1999). Furthermore, short-term incentive pay is used to motivate executives and are based on accounting-based (AB) performance measures, generally speaking. Short-term incentives are generally connected to AB performance measures due to that these measures are more directly affected by managers (Gomez-Mejia & Wiseman, 1997; Murphy, 1999). Moreover, whereas market-based (MB) measurements of firm performance also reflect future firm performance, AB measurements of firm performance reflect current and past performance

(Devers, Cannella, Reilly, & Yoder, 2007). As a result, based on the theory, it would be expected that AB measurements of firm performance should be positively correlated to short-term incentive pay.

Empirical evidence supports the suggested positive relationship between AB measurements of firm performance and short-term incentives. Whereas Smirnova & Zavertiaeva (2017), did not find a significant effect of the AB measure of performance on salary and benefits, the results of their study show that it does have a positive and significant effect on bonus (short-term incentive pay). Besides, also the researchers of a study based on a sample of Dutch listed firms concluded that based on their results it can be stated that AB performance measurements have a significant and positive effect on bonuses (van der Laan et al., 2010). However, there is also empirical evidence that does support this positive correlation, although the results are not significantly different from zero. For example, Core et al. (1999), researched the pay-performance relationship for US-listed firms. The results of their study show that ROA has no significant effect on cash compensation (salary and bonus), although the correlation is positive (Core et al., 1999). Moreover, the results of a study based on a sample of Portuguese listed firms show that MB performance measurements do not have a significant effect on CEO compensation (Alves et al., 2014). Therefore, based on the agency theory, and the majority of the empirical evidence, the following hypothesis 1 is formulated:

Hypothesis 1: Accounting-based firm performance measurements have a positive effect on short-term incentive (bonus) CEO compensation.

2.6.2. The effect of firm performance on long-term incentive compensation

As previously mentioned, the agency theory suggests that making use of incentive compensation can reduce or mitigate the agency problems between principal and agent (or shareholder and manager). By connecting the compensation of executives to the corporate performance, interests of both shareholders and managers will be aligned (Eisenhardt, 1989; Jensen & Meckling, 1976). As above, and also in section 2.1. mentioned, two forms of incentive pay are short-term incentive pay and long-term incentive pay. Short-term incentive pay has been described above in section 2.6.1. That section made clear that it is expected that short-term incentives should be connected to accounting-based (AB) firm performance measurements, due to that these measurements are more directly affected by managers (Gomez-Mejia & Wiseman, 1997; Murphy, 1999). Besides, short-term incentives consist of bonuses. In contrast, long-term incentive compensation consists of the present value of any cash or cash-equivalent, based on outcomes over a multiple-year period (Abowd & Kaplan, 1999). According to van der Laan et al. (2010), the majority of the studies in the pay-performance literature focus on long-term incentive pay. As described in section 2.1., examples of forms of long-term incentive compensation are stock options, restricted stocks and stock appreciation rights. According to the study of Jensen & Murphy (1990), stock ownership is responsible for the largest part of the

sensitivity in the pay-performance relationship. Due to that long-term incentives are based on outcomes over a multiple-year period, it is expected that this form of compensation should be correlated to market-based (MB) performance measurements. In contrast to the accounting measures of firm performance, market measures reflect expected future firm performance and are therefore most suitable to connect to long-term incentive pay (van der Laan et al., 2010). In contrast to the agency theory, the managerial power theory expects no significant effect of firm performance on long-term incentive compensation. However, as previously mentioned, due to that this theory is more suited to the reverse pay-performance relationship, the agency theory will be leading in the hypotheses development.

Literature provides empirical evidence that (partially) supports the above suggested positive effect of MB performance measurements on long-term incentive pay. For example, results of the study of van der Laan et al. (2010), show that stock options and value changes in option portfolios of CEOs are significantly and positively affected by the MB performance measurements (van der Laan et al., 2010). Besides, Hall & Liebman (1998), studied the pay-performance relationship on a sample of large US-listed firms and concluded that there is a strong effect of firm performance on CEO compensation. Moreover, the results of their study documented that this relationship is almost entirely caused by changes in the value of CEOs holding stock/stock options (Hall & Liebman, 1998). However, some studies did not find a significant positive effect of MB performance measurements on long-term incentive compensation Postmus (2015). However, to be consistent with the agency theory and several above-mentioned empirical evidence, the following hypothesis 2 is formulated:

Hypothesis 2: Market-based firm performance measurements have a positive effect on long-term incentive CEO compensation.

3. Research method

This chapter contains a discussion of the research method. First of all, a literature review will be presented regarding the most common research methods used in the pay-performance research. Thereafter, the specific model that will be applied in this study will be discussed. Next, it will be described how the variables that will be used in this study will be measured. Lastly, it will be made clear which robustness checks will be applied.

3.1. Methodology

3.1.1. Previous research

As mentioned before, the relationship between firm performance and executive compensation has been researched extensively. Although several research methods have been used to conduct the analysis, one research method has been used most often: the ordinary least squared (OLS) regression analysis. This method has been used by both international and national studies. Examples of international studies who used the OLS are the studies of Brick et al. (2006), Carter et al. (2016), Cieślak (2018), Cooper et al. (2016), and Ozkan (2011). Examples of studies that did use the OLS regarding a Dutch sample are the studies of Duffhues & Kabir (2008), van der Laan et al. (2010), and Weenders (2019).

However, some other techniques have also been used by researchers in the past who researched the pay-performance relationship. For example, Buck et al. (2008), and Conyon & He (2012), used the generalized method of moments (GMM) to investigate the pay-performance relationship for a sample of Chinees listed firms. Moreover, Buck et al. (2008), also used the Granger causality tests. Furthermore, Van Essen et al. (2012), used the structural equation modelling (SEM) method to research the reversed pay-performance relationship for a sample of US-based studies. Similarly, Wu & Mazur (2018), also used the SEM in their study as a research technique. Besides, Smirnova & Zavertiaeva (2017) used the 2SLS and Banghøj et al. (2010) even the 3SLS technique.

Summarizing the above, it can be stated that although the OLS regression analysis seems to be the most used method regarding the pay-performance relationship, several other techniques have also been used in the past. Therefore, all the above-mentioned techniques will be described below. Ultimately, during the conclusion in section 3.1.9, the choice will be made which method will be used in this study to test the formulated hypotheses and research question.

3.1.2. OLS

Regression analysis is one of the statistical research techniques to examine dependence among variables. Within regression analysis, the relationship between one dependent variable and one or more independent variables is investigated. If researchers investigate the effect of one independent

variable on the dependent variable, it is called simple regression. When the researchers include multiple independent variables, it is called multiple regression analysis (Hair, Black, Babin, & Anderson, 2014). Due to that this technique could be used to investigate multiple business research problems, it is by far the most popular and versatile dependence technique, viewed from a worldwide perspective (Hair et al., 2014). The technique is suitable for both the most general and the most specific problems (Hair et al., 2014). Examples are that regression analysis can be seen as the foundation of forecasting models of businesses. Besides, models based on regression analysis can also be used to investigate customer behaviour, to evaluate the effectiveness of a certain program, and to determine what the expected return would be in case of a new stock issue (Hair et al., 2014).

There are different types of regression analysis. A distinction can be made between logistic and linear regression, for example. Researchers can use logistic regression when the dependent variable is binary. This means that the dependent variable can only have two possible outcomes (Hair et al., 2014). Due to that in this study, the dependent variable is metric (compensation), this type of regression method does not fit. The type of method that fits this study is the linear regression method. When the relationship investigates one single independent variable, the technique is called simple linear regression. When the investigation involves several independent variables, the technique is called multiple linear regression (Hair et al., 2014). More specifically, for this study, the ordinary least square (OLS) multiple regression analysis is most suitable. This is the case due to that the linear effect of more than one independent variable on the dependent variable compensation will be investigated in this study. Besides, all variables that will be used in this study are metric. Besides, using OLS would also be in line with previous pay-performance literature. Examples of studies that used the OLS regression analysis to conduct their research are Duffhues & Kabir (2008), Van der Laan et al. (2010), Brick et al. (2006) and Alves et al. (2014).

Before making use of multiple regression analysis, several assumptions have to be met. The first assumption that has to be met is that both the dependent variable and the independent variables need to be metric variables. Due to that in this study all variables are metric, this seems to be no problem. Besides, if variables appear to be non-metric, these can be turned into metric variables by making use of dummy variables. A second assumption that needs to be met is that the sample size should be large enough. This is important to maintain a sufficient level of power. According to Henseler (2019), in case of a simple regression a sample size of 20 observations might be sufficient to maintain power. However, when multiple regression is used, a sample size of 50 to 100 observations is required to maintain a sufficient statistical power (Henseler, 2019a). As will be further addressed in section 4.1.1, 70 listed firms will be used in this study. Because three-year compensation data will be used, the sample size criterium is fulfilled. Therefore, the sample size assumption is not problematic for this study.

Besides, assumptions regarding the linearity, normality, and homoscedasticity need to be met. These assumptions will be checked by making use of univariate analysis, which provide the descriptive statistics of the variables (Henseler, 2019a). Based on these descriptive statistics, the mentioned assumptions can be checked. When the descriptive statistics show that the assumptions are not met, the data will be adjusted, for example by deleting outliers or transforming the data with logarithms. The fourth assumption that needs to be met is the assumption regarding multicollinearity. The effect/impact of multicollinearity is the reduction of any single independent variable's prediction power by the extent to which it is associated with other independent variables in the regression model (Hair et al., 2014). There are two ways of assessing whether or not there are multicollinearity issues. The first is looking for high correlations (above .9). In addition, researchers can look at the so-called VIF values. VIF values should be at least smaller than 10, but preferably smaller than 5. If this is the case, there can be assumed that there is no multicollinearity issue and the assumption is met (Henseler, 2019a).

Overall, when all the above-mentioned assumptions regarding the multiple regression analysis will be met, the OLS multiple regression analysis is an appropriate technique to use in this study. As mentioned above, the variables in this study are metric, sample size seems not to be problematic, and the assumptions regarding linearity, homoscedasticity, normality and multicollinearity will be assessed. In case some of these assumptions will not be met, adjustments to the data will be made.

3.1.3. Fixed and random effects

Together with regression analysis, many researchers also made use of the fixed and random effects application to their regression model. Examples of researchers who did apply the fixed and/or random effects to their regression models are Brick et al. (2006), Cieślak (2018), Fernandes (2008), Jaiswall & Bhattacharyya (2016), and Van der Laan et al. (2010). According to the literature, fixed and random effects can be applied to regression models to control for time and individual differences for studies that examine data of more than one unit in multiple periods, also called ''panel data'' (Mátyás & Sevestre, 2008). When adding random or fixed effects to the regression models, researchers control for the presence of omitted/unobserved time- and firm-specific heterogeneity that could cause bias in the estimates of the OLS regressions analysis. According to the literature, the differences between fixed- and random effects is that the fixed effects models allow for correlation between omitted or unobserved variables and the independent variables that might be arbitrary (Mátyás & Sevestre, 2008). In contrast, random effect models do not allow for these correlations.

According to Bell, Fairbrother, Jones, & Jones (2019), a big disadvantage of the fixed effects model is that it does not allow for the involvement of time-invariant independent variables. This is

the case due to that the effects of such independent variables will be removed from the analysis when fixed effects are used (Bell et al., 2019). Additionally, another disadvantage of fixed effects is that it is not suitable for unbalanced panel data (Mátyás & Sevestre, 2008). According to Sanders & Hambrick (2007), fixed effects are preferred over random effects when the sample consists of a fixed and relatively small set of units of interest (Sanders & Hambrick, 2007). If researchers want to make use of the fixed- or random effects model and they do not yet know which model to choose, the Hausman Test can help them to decide. This test tests whether the fixed- and random effects models provide the same outcomes. When the test shows significant results, the hypothesis can be rejected and the fixed effects should be applied. If the test shows no significant results, the null hypothesis cannot be rejected, and the random effects model should be applied (Hou, Priem, & Goranova, 2014).

3.1.4. Structural equation modelling (SEM)

Structural equation modelling (SEM) is a technique that consists of different statistical techniques (regression analysis, factor analysis, path analysis) that has become very popular in social- and business sciences (Henseler, 2017). SEM can model latent variables, to deal with different forms of measurement error, and to test complete theories. Whereas most other multivariate analysis techniques can just test one relationship at a time, SEM provides the possibility to test several dependence relationships at the same time (Hair et al., 2014; Henseler, 2019b). Furthermore, SEM provides researchers to get an intuitive graphical representation of the theory (Henseler, 2019b). SEM is built of two different models, the measurement model and the structural model (Henseler, 2019b). The relationships between the latent variables and the corresponding indicators are represented by the measurement model. Whereas the relationships between the endogenous and exogenous variables are covered by the structural model (Henseler, 2019b).

SEM can be used for different goals. The general goal of this technique however is to provide a model that gives a true picture of reality. This goal can be achieved by minimizing the differences between the empirical covariance matrix and the theoretical estimated covariance matrix (Hair et al., 2014; Henseler, 2019b). The smaller the differences, the better the model fit. In contrast to several other multivariate techniques, SEM does not have strict requirements regarding measurement levels of the variables. The variables can be metric, quasit-metric or even dichotomous. Furthermore, there are no assumptions to be met (Henseler, 2019b). However, a big disadvantage of not having data requirements is that there are no statistical tests that can be employed within this technique (Henseler, 2019b).

Regarding the literature on the pay-performance relationship, very few researchers used this method to conduct their analysis. A study that made use of SEM within their research to investigate

the reversed pay-performance relationship is the study of van Essen et al. (2015). However, due to that this technique has been used by very few researchers in the past, the technique provides no statistical tests, and to be consistent with previous research regarding the pay-performance relationship, this technique is less suitable for this study and thus will not be used.

3.1.5. Generalized Method of Moments (GMM)

The generalized method of moments technique has also been used by researchers in the past to examine the pay-performance relationship. Examples of studies in which this technique has been used are the studies of Buck et al. (2008), Conyon & He (2012), Raithatha & Komera (2016), and Sheikh et al. (2018). According to the founder of the technique, this technique can be used to estimate parameters of a probability distribution (Hansen, 1982). Parameters of a probability distribution are the mean, and standard deviation for normal distribution, for example. The GMM technique determines the values of the beforementioned parameters that give the best as possible fit, of the sample based on the distribution, in order to estimate the parameters of the probability distribution (Hansen, 1982; Janiec, 2012). An important reason to use this technique is that in contrast to the OLS, this technique control for omitted variable bias (Conyon & He, 2012; Wooldridge, 2010). Another issue that can be solved by making use of the GMM is the endogeneity issue in dynamic panel models, which will be discussed in a section below. GMM corrects for heteroscedasticity and autocorrelation (Capezio, Shields, & O'Donnell, 2011).

3.1.6. Granger causality test

The granger causality test is a dependence technique that has been developed in the 1960s and has been widely used since. However, it has not in the pay-performance literature. The test is a test of causality that is based on prediction (Seth, 2007). The core of the test is to examine whether variable x granger causes variable y. It is about whether the one happens before the other. It is about the question of whether there actually is a causal relationship (Seth, 2007). It can be stated that the Granger causality test, only tests whether one thing happens before the other. A disadvantage of the Granger causality test is that this test is only useful for studies that work with a linear relationship. Moreover, it only measures single direction relationships (Seth, 2007). Besides, according to Eichler (2012) and Seth (2007), the Granger causality test does not measure true causality due to that it does not take into account confounding effects. Due to that based on empirical evidence of the past, it can be stated that the pay-performance relationship goes in both directions, this test seems not to be suited for this study and will therefore not be used in this study. Moreover, this technique has not been used before in the Dutch pay-performance literature.

3.1.7. 2SLS and 3SLS

The standard regression models, such as the OLS, assume that the errors of the dependent variable are uncorrelated with the independent variables. When this assumption does not hold (relationship is bi-directional), endogeneity issues might arise. As mentioned before in this study, there can be bi-directional relations between firm performance and executive compensation. This is also called endogeneity and will be discussed further in the next section. The two- or three least squares (2SLS and 3SLS) techniques can be used to solve this endogeneity problem. The benefit of these techniques is that these are able to regress the pay-performance relationship in both directions simultaneously (Smirnova & Zavertiaeva, 2017). Within the 2SLS technique, variable estimates are predicted in the first stage to control for possible endogeneity. Thereafter, the predicted estimates are used/applied in the second stage to estimate the ultimate regression results. In addition to the 2SLS technique, the 3SLS technique seems to be more efficient and besides incorporates cross-equation covariation in the whole process compared to the 2SLS technique (Ozdemir, Kizildag, & Upneja, 2013). There are a few researchers who did use the 2SLS or 3SLS technique in the past. Examples are the studies of Banghøj et al. (2010), and Smirnova & Zavertiaeva (2017).

3.1.8. Endogeneity issues

As mentioned in section 3.1.2., several assumptions need to be met before making use of the OLS regression analysis. However, as mentioned in the previous sections, another possible issue that can limit the interpretation of the results of the OLS regression analysis is the problem of endogeneity. This endogeneity problem is also referred to as the reversed causality problem. As multiple times mentioned before in this study, researchers in the past investigated both the effect of firm performance on executive compensation and the effect of executive compensation on firm performance. Therefore, the pay-performance relationship is bi-directional. If researchers are not aware of this bi-directional relationship, it could limit the interpretations of the results. Besides, when these bi-directional relationships are present, correlations between regression residuals and variables might cause the estimates to be biased (Smirnova & Zavertiaeva, 2017).

Endogeneity issues can be solved in three ways. A first solution is running simultaneous equations using a two- or three-stage least-squares analysis (2SLS or 3SLS), which have been described in section 3.1.7 and have been used by for example Banghøj et al. (2010), and Smirnova & Zavertiaeva (2017). A second popular solution that can help to deal with the endogeneity problem, is by making use of lagged variables. For example, Raithatha & Komera (2016), mentioned that including lagged performance variables can test this, and with that providing a solution for the endogeneity problem (Raithatha & Komera, 2016). By making use of lagged variables, the effects of firm performance measurements in year $_{t-1}$ will be regressed on executive compensation in year $_{t}$. In

addition to Raithatha & Komera (2016), examples of other studies that made use of lagged performance measurements to deal with the endogeneity problem are the studies of Conyon & He (2012), Duffhues & Kabir (2008), and Ozkan (2011). A last way to solve endogeneity issues is by making use of the GMM, which has been described in section 3.1.5.

3.1.9. Conclusion

Based on the sections above, it can be stated that the SEM and the Granger causality test are inappropriate methods for this study. In contrast, the OLS, GMM and 2SLS methods seem to fit this study. Advantages of the OLS are that it is relatively easy to use and that it produces outcomes that are relatively easy to understand. Furthermore, according to the literature, using OLS with lagged variables is easier compared to the GMM and 2SLS (Shepherd, 2010). Besides, Roodman (2009) described that the GMM is complicated which can result in generating invalid estimates. Besides, previous pay-performance literature regarding Dutch samples has been analysed. All these studies did use the OLS method (Duffhues & Kabir, 2008; Janssen-Plas, 2009; Postmus, 2015; van der Laan et al., 2010; Weenders, 2019). Moreover, several of them mentioned the endogeneity problem and controlled for this problem by using lagged variables (Duffhues & Kabir, 2008; Postmus, 2015; Weenders, 2019). None of them used the GMM or 2SLS method. Therefore, since the OLS seems to be easier to use and to be consistent with previous Dutch pay-performance literature, the OLS will be used in this study. Being consistent in using the same method makes it easier to compare the results. Moreover, to control for endogeneity issues, lagged performance variables will be used in the model during the robustness checks. This will be described in more detail in section 3.2. and 3.4.

A final decision that needs to be made is whether or not to apply the fixed- or random effects model. Section 3.1.3. and the beginning of the conclusion made clear that it might be important to control for the presence of omitted/unobserved time- and firm-specific differences, that could bias the initial OLS results. However, not all literature regarding Dutch samples did apply these models. Duffhues & Kabir (2008), for example, did not apply the fixed effects model, whereas van der Laan et al. (2010) did. Therefore, the choice has been made to run both models. As will be described in section 3.2. and 3.4., the OLS model will be applied during the initial analyses and the OLS with fixed- or random effects model will be applied during the robustness checks. The Hauman Test will decide whether to apply the fixed- or random effects model. Therefore, the data will decide which model to apply.

3.2. Research model

As mentioned above, to test the formulated hypotheses, and to answer the formulated research question, OLS multiple regression analysis will be the research technique that will be applied in this study. As previously discussed, applying this technique is in line with other empirical literature that

researched the effect of firm performance on CEO pay. To test the formulated hypotheses and research question, the model (1) below will be used.

$$CEO\ PAY_{i,t} = \beta_0 + \beta_1 PER_{i,t} + \beta_x CONTR_{i,t-1} + \varepsilon_{i,t-1} \quad (1)$$

Where:

$CEO\ PAY_{i,t}$ = CEO pay of firm i in year t.

$PER_{i,t}$ = Firm performance of firm i in year t.

$CONTR_{i,t-1}$ = Diverse control variables will be included in the model. This will be firm-, CEO-, and corporate governance characteristics of firm i in year t-1. Besides, there will be controlled for industry- and time dummies.

$\varepsilon_{i,t-1}$ = Measurement error.

The dependent variable in the model will be CEO pay, which will be measured in both short-term incentives (bonus) and long-term incentives, as described in section 2.1.2 and 2.1.3. In section 2.6. (hypotheses development) has been argued why the effects of firm performance on base salary and total pay will not be researched. CEO pay will be expressed as a natural logarithm, to adjust for non-normality issues (Duffhues & Kabir, 2008; Nourayi & Mintz, 2008).

With regards to the explanatory variables, the choice must be made to make use of contemporaneous or lagged variables. As can be seen in the model above, the variable firm performance is added to the model as an independent variable. In line with previous research, both accounting-based (AB) and market-based (MB) measurements of performance will be used. As described in sections 2.1.2 and 2.1.3, CEOs could receive variable compensation if the firm performance, measured at the end of the year, meets the predefined objectives. Therefore, it makes sense that the firm performance variables should be included as a contemporaneous variable. This because firm performance in year t should affect variable CEO compensation in year t. However, as mentioned in section 3.1.9., during the robustness analysis, one-year lagged performance variables will be applied to check for possible endogeneity issues. Making use of contemporaneous performance data during the initial regression analysis and using lagged performance variables in the robustness, is in line with several previous papers, such as those of Conyon & He (2012), and Duffhues & Kabir (2008).

Similar to the independent variable firm performance, also for the control variables the choice has to be made to use contemporaneous or lagged variables. Previous literature showed some inconsistency with regards to this. Some of them used contemporaneous variables, including studies based on Dutch samples as well as studies based on international samples (Duffhues & Kabir, 2008; Nourayi & Mintz, 2008; van der Laan et al., 2010). However, there are also international papers

from well-known journals who did use lagged control variables, because of endogeneity issues (Croci, Gonenc, & Ozkan, 2012; Jay Hartzell et al., 2003; Ozkan, 2011). As described in sections 2.1.2 and 2.1.3, the goals which have to be achieved to receive the variable compensation, are predefined at the beginning of the year (van der Laan et al., 2010). Because these goals are set at the beginning of the year, it makes sense that the control variables, which will be described in more detail in section 3.3.3., should be included as lagged variables. This because when the goals/objectives that must be achieved to receive the variable compensation are determined (at the beginning of the year, t-1), the at that moment existing corporate governance setting and CEO- and firm characteristics are relevant. For example, when the goals (and thus the compensation packages) are set, the current board structure is relevant and not the board structure over one year. During the year, these settings and characteristics might change. Therefore, the control variables will be added to the model as one-year lagged variables (t-1). This is in line with the studies of Croci et al. (2012), Jay Hartzell et al. (2003), and Ozkan (2011).

As mentioned in 3.1.9, in addition to the OLS regression analysis, the fixed and random effects model will be applied during the robustness analysis to control for the presence of omitted/unobserved time- and firm-specific heterogeneity that could cause bias in the estimates of the OLS regressions analysis. This will be described in more detail in section 3.4.

3.3. Measurement of variables

In this part, the measurement of the variables that will be used in the research model, as mentioned in the previous section, will be described. First of all, the dependent variable CEO pay will be discussed. Thereafter, the independent variable firm performance will be described. Next, the control variables which will be used in the model to control for CEO-, firm- and corporate governance characteristics will be discussed; CEO tenure, CEO age, firm size, firm leverage, board size, relative supervisory board size, compensation committee, ownership concentration, and the presence of priority- and preference shares. Lastly, the measurement of the industry- and time dummy variables will be discussed.

3.3.1. Dependent variable

As discussed in section 2.1., there are different ways to measure executive compensation and there are different ways to distinguish the components of executive compensation. Different researchers have used different measurements to determine CEO pay, depending on the aim of the study. Some researchers only used cash and total compensation (Duffhues & Kabir, 2008; Nourayi & Mintz, 2008), for example, whereas others distinguished salary, bonuses, other benefits and total pay (Smirnova & Zavertiaeva, 2017). However, although it is not exactly clear out of which components executive compensation is built from, key review papers in the past on executive compensation concluded that

most compensation packages consist of four components. These main components are the base salary of executives, the short-term incentives (bonuses), long-term incentives (such as stock-options) and other benefits (Frydman & Jenter, 2010; Murphy, 1999; Smirnova & Zavertiaeva, 2017).

As mentioned before in this study, during the past decades, governments of countries over the world have made the regulations and disclosure requirements regarding CEO pay of listed firms stricter. This is also the case for listed firms in the Netherlands. As a consequence of these regulations and disclosure requirements, information about CEO pay of listed firms has been available in annual reports more extensively. At this moment, generally speaking, every listed firm in the Netherlands provides information in its annual report about the executives' base salaries, short-term incentive pay, long-term incentive pay, and other benefits (such as expense allowances, pensions etc). As mentioned in the hypotheses development, this study analyses the effect of firm performance on both forms of variable compensation mentioned in section 2.1: short-term incentive compensation (bonus), and long-term incentive compensation. The effects of firm performance on these forms of CEO pay (CEO $PAY_{i,t}$), will be investigated individually. As mentioned in section 2.1.3.4., pensions have become a significant part of executive pay during the last years and might, therefore, be needed to include in the analysis. As shown in 2.1.3.4, pensions might be considered as a form of long-term incentive pay and will, therefore, be included in the regression results during the robustness checks, as will be further addressed in section 3.4. However, the initial regression results will not include pensions as a form of long-term incentive pay.

There are several ways how to use compensation in the regression analysis. One way is to use compensation in units, which have been done by for example Conyon & He (2012), and Smirnova & Zavertiaeva (2017). However, this way of using compensation ignores non-normal distribution issues. To adjust for non-normality issues, it is common to use the natural logarithm of compensation in the analysis, which has been done by for example Duffhues & Kabir (2008), Nourayi & Mintz (2008) and Raithatha & Komera (2016). Therefore, to be consistent with these previous researchers, to control for non-normality issues, CEO compensation will be expressed as the natural logarithm. Another way of using compensation could have been to express it in percentage points, which has been done by for example Cornett et al. (2008), and Mehran (1995). Expressing CEO compensation in percentage points will be used during the robustness checks.

To conclude, the effect of firm performance will be examined on short-term incentive compensation (bonus) and long-term incentive compensation individually. Besides, to prevent the analysis from non-normal distribution issues and to be consistent with previous research, CEO pay will be presented as natural logarithms. During the robustness checks, CEO compensation will be expressed in percentage points of total variable CEO compensation and as the logarithm.

3.3.2. Independent variable

The independent variable which will be used in the research model is firm performance ($PER_{i,t}$). As previously mentioned in this study, especially in section 2.4, based on the pay-performance literature, it can be stated that firm performance can be divided into accounting-based (AB)-, and market-based (MB) measurements. Almost every study in the past mentioned whether it made use of AB- or MB measurements of firm performance. Moreover, several studies made use of both AB and MB measurements of firm performance (Buck et al., 2008; Cieślak, 2018; van Essen et al., 2015; Sheikh et al., 2018). In this study, the effect of both accounting-, and MB measurements of firm performance on CEO pay will be researched. As the measurement of AB firm performance, return on assets (ROA) will be used. This measurement is by far the most used measurement of AB firm performance. Examples of studies who made use of ROA as an AB measurement are Conyon & He (2012), Duffhues & Kabir (2008), and Smirnova & Zavertiaeva (2017). By making use of ROA as the AB measurement of firm performance, this study is in line with previous studies and makes it possible to compare the results. Another possibility would have been to use return on sales (ROS). As can be read in section 3.4., this will be used as a robustness check. As an MB measurement of firm performance, return on stock (RET) will be used in this study. This measurement measures the firm performance by measuring the annual stock return of the shares. Similar to ROA, RET is one of the widely most used measurements of MB firm performance. Several studies used RET as the MB firm performance measurement (Core et al., 1999; Duffhues & Kabir, 2008; Fernandes, 2008; van der Laan et al., 2010). Therefore, similar to ROA, by using RET as a measurement of MB firm performance, this study is consistent and in line with previous studies. Also, Tobin's Q could have been used as MB performance measure. Similar to ROS, this will be done as a robustness check, which can be read in section 3.4.

To summarize, it can be stated firm performance can be measured in both AB-, and MB measurements. Therefore, to improve the quality of this study, both types of measurements will be used in this study. ROA will be used as a measurement of AB firm performance, and RET will be used as a measurement for MB firm performance.

3.3.3. Control variables

Next to the independent variable firm performance, some control variables will also be added to the research model. This due to that besides firm performance, there is also a possibility that CEO compensation could be affected by other variables when they are not included in the research model. Due to that these variables might affect CEO compensation as well, the model should include these variables as well. Therefore, the research model will include several control variables regarding CEO-, firm-, and corporate governance characteristics.

3.3.3.1. CEO characteristics

CEO tenure

The first control variable which will be used in the model is CEO tenure. Based on the literature, CEO tenure can and will be measured as the number of years the CEO has worked in the function of the CEO, which is in line with previous researchers such as Banghøj et al. (2010), Bebchuk, Cremers, & Peyer (2011), Conyon & He (2012), Eriksson & Lausten (2000), Ozkan (2011), and Smirnova & Zavertiaeva (2017). However, some studies measured CEO tenure in a somewhat different way. A study based on a Portuguese sample measured CEO tenure as the total number of years that the CEO is CEO of the firm as of the end of the year (Alves et al., 2014). Whereas Jaiswall & Bhattacharyya (2016) decided to measure CEO tenure as the natural logarithm of the number of years since the CEO is appointed as CEO. Besides, instead of measuring CEO tenure as the number of years since the CEO is appointed as CEO, Nourayi & Mintz (2008) measured CEO tenure in the number of months since the appointment.

Overall, it can be stated that researchers in the past measured CEO tenure in several ways. However, in most cases, it has been measured as the number of years since the CEO has been appointed as CEO. To be consistent with previous studies, this will also be the way of how CEO tenure will be measured in this study.

CEO age

The second control variable which will be used in the research model as a control variable is CEO age. Multiple studies in the past did add CEO age as a control variable to the research model. All of them measured the age of the CEO in years and not in months or days, for example. Examples of studies who did use CEO age as a control variable in their study are Conyon & He (2012), van Essen et al. (2015), Finkelstein & Hambrick (1989), and Ozkan (2011). Therefore, in this study CEO age will also be measured in years.

3.3.3.2. Firm characteristics

Firm size

The third control variable which will be added to the model is the firm characteristic firm size. Firm size has been used a lot as a control variable in the pay-performance literature. According to the studies in the past, there are several ways to measure firm size. Examples of these are total assets, total revenues, the number of employees and total market cap. Van der Laan et al. (2010), used the number of employees as the measure for firm size. Besides, Ozkan (2011), used the market capitalisation (market cap) as a proxy for firm size. Furthermore, Buck et al. (2008), chose to use sales of the firm as a measure for firm size, whereas Conyon & He (2012), and Fernandes (2008) used the

natural logarithm of sales as a proxy for firm size. Moreover, Tosi et al. (2000), used several of the above-mentioned measures as a proxy for firm size; assets, market value, sales, and the number of employees. However, according to Dutch corporate governance literature, the most suited measurement of firm size is the book value of total assets (de Jong et al., 2005; DeJong et al., 2001; van Beusichem et al., 2016). To be consistent with these papers, in this study firm size will also be measured as the book value of total assets. To adjust for non-normality, this will be done by taking the natural logarithm, which is in line with Cieślak (2018), DeJong et al. (2001).

Firm leverage

The fourth control variable and second control variable with regards to firm characteristics, which will be added to the research model is leverage. Based on the pay-performance literature it can be stated that there are several ways to measure the firm's leverage. Carter et al. (2016) measured leverage as the ratio of total debt to debt plus the market value of equity. Another popular way to measure leverage is by dividing the book value of total debt by total assets (Banghøj et al., 2010; Raithatha & Komera, 2016). However, based on papers who investigated a Dutch sample, the most suited way is to define leverage as the ratio of long-term debt divided by the book value of total assets (Cornelisse & Kabir, 2005; de Jong et al., 2005; DeJong et al., 2001; van Beusichem et al., 2016). To be consistent with the Dutch pay-performance literature, leverage will be measured by dividing long-term debt by the book value of total assets.

3.3.3.3. Corporate governance characteristics

Board size

A fifth control variable that will be added to the research model is the size of the board. Board size is the first control variable regarding corporate governance characteristics. The literature on the pay-performance research showed that there are several ways to measure the board size of a firm. Banghøj et al. (2010), Core et al. (1999), and Wu & Mazur (2018) measured board size as the number of total members of the board. Besides, in the studies of Ozkan (2007), and Ozkan (2011), board size has been measured as the sum of both executive- and non-executive directors. Besides, Buck et al. (2008), and Conyon & He (2012) measured the number of the members of the management board, and members of the supervisory board separately. Furthermore, some researchers in the past measured board size as the sum of just the members of the management board, whereas others measured it as the sum of both the members of the supervisory board and the management board. However, due to that this study is focused on listed firms in the Netherlands, and most firms in the Netherlands have a two-tier board structure instead of the most of the previously mentioned studies

in which there were a one-tier board structure, board size in this study will be measured as the sum of the members of both the management board and the supervisory board.

Relative size supervisory board

In section 2.3.4.2. has been described that board independence seems not to be an appropriate variable to include in this study, due to that this study focuses on a Dutch sample. In contrast, in that section can be read that the relative size of the supervisory board does seem to be an appropriate corporate governance variable for this study. This because researchers of a key paper in the past regarding the corporate governance structure of firms in the Netherlands, mentioned that the relative size of the supervisory board affects the effectiveness of members of the supervisory board (DeJong et al., 2001). Therefore, the relative size of the supervisory board will be included as the sixth control variable.

According to this study, the relative size of the supervisory board of firms that have a two-tier board structure can be measured by dividing the number of members of the supervisory board (RvC) by the sum of the number of the members of both the management board (raad van bestuur) and the supervisory board (RvC) (DeJong et al., 2001).

Compensation committee

A seventh variable that will be included in the model as a control variable is the variable that controls for the presence of a compensation committee. It has to be mentioned that not all listed firms are required to have a compensation committee. However, most of them do have one and reports about this in the annual report. Compensation committees consist of solely outside directors who tend to be more objective compared to inside directors (Conyon & Peck, 1998). Several researchers in the past did add the presence of a compensation committee as a control variable in their research model. In contrast to the previously mentioned variables which will be used in this study, this variable can only take two values. Namely, a separate compensation committee is present, or there is no separate compensation committee. Therefore, the control variable compensation committee will be measured as a dummy variable. If there is no separate compensation committee present, the value will take the value of 0. It will take the value 1 if there is a compensation committee present. This way of measuring this variable is in line with several other studies, such as the study of Conyon & He (2012), Liang et al (2015), and Peng et al. (2015).

Ownership concentration

As mentioned in section 2.3.4.1., ownership structure might also affect executive pay. Therefore, ownership concentration will be included in the model as a control variable for the ownership

structure. Concentrated owners can be seen as a tool for monitoring executives (Ozkan, 2007). Some researchers in the past controlled for ownership concentration (Banghøj et al., 2010; Conyon & He, 2012; Ozkan, 2011). In this study, ownership concentration will be measured as the percentage of shares owned by the largest shareholder, which is in line with Banghøj et al. (2010), and DeJong et al. (2001).

Priority- and preference shares

As has been described in section 2.3.4.1., the presence of priority- and preference shares in the capital structure of a firm might also be an important corporate governance characteristic to include in the research model. This because these priority- and preference shares can be seen as tools who protect management from hostile takeovers and limit the control and say of the shareholders (DeJong et al., 2001; van Beusichem et al., 2016).

According to the key papers in the past who focused on a Dutch sample, there is one consistent way to measure the presence of priority- and preference shares. This is by making use of dummy variables. For the priority share variable, the variable will have a value of 1 of priority shares are present within the firm, and a value of 0 is if it is not. The same goes up for the variable regarding preference shares. This dummy variable will have a value of 1 of preference shares are present in the firm and a value of 0 if it is not. Making use of these dummy variables is in line with the studies of de Jong et al. (2005), DeJong et al. (2001), and van Beusichem et al. (2016). To keep consistent with these studies, this study will also use these dummy variables.

3.3.3.4. Industry- and time effects

Industry effects

Besides the control variables with regards to the CEO-, firm-, and corporate governance characteristics, the research model will also control for industry effects. Industries might differ among each other concerning the amount and structure of CEO compensation packages. Similar to the study of Smirnova & Zavertiaeva (2017), the industry dummies will be based on the NACE Rev. 2 classification. The NACE Rev. 2 contains 21 different classifications. However, due to the relatively small sample size, it is likely that not all 21 classifications will be present in the sample. Moreover, it could be the case that there might be only 1 or 2 observations for certain classifications. Therefore, to provide valid results, new groups will be formed based on the NACE Rev. 2 classification by merging several classifications into a new group (reclassification). This is in line with the study of Smirnova & Zavertiaeva (2017), who created the following six groups: Construction & Real Estate, Manufacturing, Energy & Chemicals, Trade & Related Services, Finance & Insurance, and Other

service companies (Smirnova & Zavertiaeva, 2017). For more detailed information, section 4.1.2. can be consulted.

Time effects

The last control variable which will be added to the model is the variable that controls for specific year effects. This control variable will control for common factors that are driven by economy-wide effects (Duffhues & Kabir, 2008). The data that will be used in this study will be collected over multiple years. More specifically, as mentioned before, the performance data will be collected over the years 2015, 2016, 2017, and 2018. The CEO compensation data will be collected over the years 2016, 2017, and 2018. The data of the control variables will be collected over the years 2015, 2016, and 2017. To prevent that specific effects in specific years could affect the results of the regression analysis, year dummies will be added to the research model. Besides, by including these time dummies, is consistent with previous studies on the pay-performance relationship (Ahn, 2015; Cieślak, 2018; Dee, Lulseged, & Nowlin, 2005; Smirnova & Zavertiaeva, 2017).

3.4. Robustness checks

To validate the results of the OLS regression analysis based on the model described in section 3.2., several robustness checks will be conducted. The aim of these additional robustness checks is to test whether the results of the regression analysis remain the same under different circumstances. In other words, it tests the sensitivity of the outcomes (Duffhues & Kabir, 2008).

The first robustness check that will be conducted is replacing the way some variables are measured. First, the firm performance measures will be replaced by other firm performance measures. ROA will be replaced by return on sales (ROS) as an accounting-based (AB) measure of firm performance. This is in line with the studies of Duffhues & Kabir (2008), and Firth, Fung, & Rui (2006). ROS will be measured by dividing the operating income (EBIT) by total sales. Another possibility would have been to use ROE instead of ROA as an AB measure of firm performance (Banghøj et al., 2010; Raithatha & Komera, 2016). Additionally, RET will be replaced by Tobin's Q ratio as a measure for market-based (MB) performance. Tobin's Q is a ratio that can be calculated by dividing the sum of the market value of equity and book value of total debt by the book value of total assets (Bebchuk et al., 2011; Duffhues & Kabir, 2008). Tobin's Q has been used as an MB performance measure by several researchers on the pay-performance relationship (Carpenter & Sanders, 2002; Duffhues & Kabir, 2008; Mehran, 1995; van Essen et al., 2015). Next, both components of variable CEO compensation will be expressed in percentage points of total CEO variable compensation (Cornett et al., 2008; Mehran, 1995). Additionally, instead of using the natural logarithm, the logarithm will be used to express compensation.

As a second robustness check, the pensions of the CEO will be included when measuring the long-term incentives of the CEO. As mentioned in section 2.1.3., and more specifically in section 2.1.3.4., during the last years, pensions have become a significant part of the compensation of CEOs (Yu Liu, Wei, & Xie, 2014). For example, according to Frydman & Jenter (2010), pensions represent about 35% of CEO's total compensation during its tenure. Ignoring pensions can result in underestimating a very important part of CEO's pay. Therefore, the robustness analysis controls for the influence of pensions by including them in long-term incentive pay.

Third, as mentioned in sections 3.1.9. and 3.2., to control for endogeneity issues, one-year lagged performance variables will be used. Therefore, the effect of firm performance in year t-1 will be regressed on CEO pay in year t. This robustness check is in line with multiple previous studies (Croci et al., 2012; Duffhues & Kabir, 2008). Similar to the initial regression results, the control variables also remain lagged variables.

Fourth, sub-samples will be created to test whether the initial results holds when sub-samples have been created. As further addressed in section 4.1.2., this will be done based on industry classifications. It could be the case that different results occur for different industries. To illustrate, this has been shown by the study of Duffhues & Kabir (2008).

As a fifth robustness check, fixed- or random effects will be applied to the OLS regression analysis to check for the presence of omitted/unobserved time- and firm-specific heterogeneity that could cause bias in the estimates of the OLS regressions analysis. This has previously been mentioned in section 3.1.9., and 3.2. As described in section 3.1.3., the Hausman Test will decide whether the fixed or random effects model should be applied. Applying the fixed or random effects to the OLS is in line with many previous researchers (Alves et al., 2014; Fernandes, 2008; van der Laan et al., 2010).

As a last robustness check, sub-samples will be created based on a dummy variable which measures whether or not the predefined goals set at the beginning of the year to receive the variable compensation according to the annual reports, actually are profit and market-based performance-related. As mentioned above, the firm performance variables used in this study are ROA, ROS, RET and Tobin's Q. These variables are indicators for the profitability and market-based performance (RET, Tobin's Q) of the firm. However, it may be the case that the variable compensation of the CEOs of some firms does not depend on goals set regarding the profitability and the market-based performance, but for example on the number of acquisitions or individual goals. Therefore, sub-samples will be created based on a dummy variable to separate the firms who set goals based on profitability (hypothesis 1) and on market-based firm performance (hypothesis 2) from firms who don't. Of course, the expectation is that the regression results show a positive effect of firm performance on variable compensation for the sub-samples in which the set goals are profit- and

market-based related, whereas it is expected to not find a positive effect for firms who set goals based on other indicators.

For an overview of the measurements of all variables, see table 3.1. below.

Table 3.1. Overview measurement of variables

Variable	Measure	Source(s)
CEO compensation (CEO $PAY_{i,t}$)		
Ln_STI (bonus)	Natural logarithm of the sum of short-term incentive (bonus) compensation paid to the CEO	(Janssen-Plas, 2009; Postmus, 2015)
Ln_LTI	Natural logarithm of the sum of long-term incentive (stocks, stock options, SAR, restricted stocks) compensation paid to the CEO	(van Essen et al., 2015; van der Laan et al., 2010)
Ln _LTI-P	Natural logarithm of the sum of long-term incentive compensation (pensions included) paid to the CEO	
STI_%	The sum of short-term incentive (bonus) compensation paid to the CEO / The sum of all variable CEO compensation (SI + LI + Pensions)	(Mehran, 1995)
LTI_%	The sum of long-term incentive (stocks, stock options, SAR, restricted stocks) compensation paid to the CEO / The sum of all variable CEO compensation (SI + LI + Pensions)	(Mehran, 1995)
LTI-P_%	The sum of long-term incentive (pensions included) compensation paid to the CEO / The sum of all variable CEO compensation (SI + LI + Pensions)	
Firm performance ($PER_{i,t1}$)		
ROA	EBIT / Book value of total assets	(Duffhues & Kabir, 2008; Nourayi & Mintz, 2008)
ROS	EBIT / Total sales	(Duffhues & Kabir, 2008; Firth et al., 2006)
RET	(Stock $price_t$ + $dividend_t$ – stock $price_{t-1}$) / Stock $price_{t-1}$	(Duffhues & Kabir, 2008; van der Laan et al., 2010)
Tobin's_Q	(Market value equity + book value total debt) / Book value total assets	(Carpenter & Sanders, 2002; Duffhues & Kabir, 2008)
Control variables ($CONTR_{i,t-1}$)		
CEO_Age	Age of the CEO measured in years	(Conyon & He, 2012; Ozkan, 2011)
CEO_Ten	Number of years that have passed since the executive was pointed as CEO	(Ozkan, 2011; Smirnova & Zavertiaeva, 2017)
Ln_Assets (size)	Natural logarithm of firm's book value of total assets	(Cieślak, 2018; DeJong et al., 2001)

Lev	$\frac{\text{Long-term debt}}{\text{Book value of total assets}}$	(de Jong et al., 2005; van Beusichem et al., 2016)
Board_Size	The sum of the members of both the management board and the supervisory board.	(Banghøj et al., 2010; Wu & Mazur, 2018)
Rel_SB	$\frac{\text{Number of supervisory board members}}{\text{Total members of supervisory- and management board}}$	(DeJong et al., 2001)
CC_dummy	Compensation committee dummy variable. 0 = firm has no compensation committee 1 = firm has an compensation committee	(Conyon & He, 2012; Liang et al., 2015)
Own_Con	Percentage of shares owned by largest shareholder	(Banghøj et al., 2010; DeJong et al., 2001)
Prio_Shares	Priority shares dummy variable. 0 = firm has no priority shares 1 = firm has priority shares	(de Jong et al., 2005; van Beusichem et al., 2016)
Pref_Shares	Preference shares dummy variable. 0 = firm has no preference shares 1 = firm has preference shares	(de Jong et al., 2005; van Beusichem et al., 2016)
Industry_dummies	Dummy variable based on the NACE Rev. 2 classification (after reclassification)	(Smirnova & Zavertiaeva, 2017)
Time_dummies	Dummy variable for controlling year-effect	(Cieślak, 2018; Smirnova & Zavertiaeva, 2017)

4. Sample and data

This chapter describes the sample and data that has been used during the regression analysis. First of all, the sample size and the industry classifications of the sample firms are described. Thereafter, the data that have been used are described.

4.1. Sample

4.1.1. Sample size

In this study, the effect of firm performance on variable CEO pay will be investigated for Dutch listed firms. Therefore, listed firms on the Amsterdam Euronext have been used as the initial sample. As per 27 November 2019, a list of all listed firms on the Amsterdam Euronext have been retrieved from the official website of Euronext. This resulted in a list of 140 firms who were listed on the stock exchange[1].

However, several adjustments had to be made to reach the ultimate sample. First of all, several firms have multiple stocks registered on the exchange. With regards to these firms, the ones who represent the firms has been maintained in the sample whereas the double registrations were removed. This resulted in removing 12 double registered firms. Examples of these firms are Heineken Holding, Lavide Holding, and Philips Buy Back. Next, because this study is based on Dutch listed firms, firms that are not headquartered in the Netherlands had to be removed from the sample as well. For example, Accsys is headquartered in the UK. In addition, NEPI Rockcastle has headquarters in the Isle of Man, UK, and Yatra Capital is headquartered in India. As a result, a list of 34 firms with no headquarters in the Netherlands has been removed from the sample. Furthermore, firms who are financial institutions also had to be removed. In 2015, the Dutch government introduced a remuneration policy for financial institutions. One of the key things of this policy is that employees of financial institutions are allowed to receive a maximum variable compensation of 20% of the base salary (Rijksoverheid, 2015). So variable compensation for these firms is limited. Due to that in this study variable compensation is of main interest, these firms are not suited to this study. Therefore, 14 firms were excluded from the sample. Examples of these firms are ING Bank, ASR Nederland, and ABN AMRO Bank. Next, 8 firms have been excluded because they had missing or insufficient information. To illustrate, Hunter Douglas did not provide information regarding individual CEO compensation. Moreover, FastNed and Marel went public in 2019, and therefore no annual reports are and information is available regarding the sampling period. In addition, Kiadis Pharma and MKB Nedsense had no sales in the sample years and had, therefore, no activities. Lastly, an additional 2 firms have been excluded due to that these firms have been classified as outliers. Euronext is an exchange group and IEX Group is an online platform, and are therefore not a typical firm compared

[1] https://live.euronext.com/markets/amsterdam/equities/list

to the other firms. Summarizing all the above, the total sample which has been used in this study contains 70 Dutch listed firms on the Amsterdam Euronext. For an overview of the sample selection, see table 4.1.

Table 4.1. Sample selection

Sample size	Argument for exclusion	Number of firms excluded
Initial sample	All firms listed on the Amsterdam Euronext	
140	Exclusion of firms with double registration	-/- 12
128	Exclusion of firms that are cross-listed on Amsterdam Euronext, are not headquartered in the Netherlands, or have no operations/origins in the Netherlands	-/- 34
94	Exclusion of financial institutions	-/- 14
80	Exclusion of firms with missing/insufficient information for sampling period	-/- 8
72	Exclusion of firms identified as outlier	-/- 2
70	**Final sample size**	

Of these 70 listed firms on the Amsterdam Euronext, not all firms provide the necessary data for every sample year (2016, 2017, 2018). For example, VolkerWessels had its IPO in 2017, and therefore no sufficient CEO compensation data were available over 2016. Besides, Alumexx went public in 2018 and therefore it had missing information regarding the years 2016, and 2017. For the same reason, also not all the compensation data for Alfen were available. These firms are included in the sample for the years the data were available. As a consequence, not every year has the same number of observations.

To summarize, not all of the 70 listed firms in the sample provide data for all three sample years. As a result, 2016 contains 67 firm-year observations, 2017 contains 68 firm-year observations, and 2018 contains 70 firm-year observations. Together, this results in a total of 205 firm-year observations. Appendix A1 provides an overview of all listed firms included in the sample and in which years the firms have been included in the analysis.

4.1.2. Industry classification

As previously mentioned, the model in this study controls for industry effects. This has been done by making use of industry dummies. Similar to the study of Smirnova & Zavertiaeva (2017), the industry dummies are based on the NACE Rev. 2 classification. These classifications are developed by the European Commission. Due to that, the Netherlands is a member of the European Union, it suits to

use these NACE Rev. 2 classifications in this study. The NACE Rev. 2 contains 21 different classifications. However, due to the relatively small sample size, it is likely that not all 21 classifications will be present in the sample. The results show that in this study, the 70 firms in the sample are classified in only 12 out of the 21 categories of the NACE Rev 2. classifications. Moreover, there are categories which contain only 1 or 2 observations. For example, category A – Agriculture, forestry and fishing, contains only 1 observation.

However, to provide valid results, it is important to have enough observations per group. Therefore, groups will be merged into new groups (reclassification), which is in line with the study of Smirnova & Zavertiaeva (2017), who created the following six groups: Construction & Real Estate, Manufacturing, Energy & Chemicals, Trade & Related Services, Finance & Insurance, and Other service companies (Smirnova & Zavertiaeva, 2017). However, compared to the study of Smirnova & Zavertiaeva (2017), Finance & Insurance will not be a category in this study, due to that as mentioned in section 4.1.1., financial institutions are excluded from the sample in this study. Also the group Energy & Chemicals will not be present in this study, due to that there are no Dutch listed firms classified in this category. As a result, four groups are used in this study; (1) Construction & Real estate, (2) Manufacturing, (3) Transportation, commodities and trade, and (4) Other service companies. See table 4.2. below for an overview of the reclassification process and the ultimate number of firms per group after reclassification. For a more extensive overview, see appendix A2.

Table 4.2. Sample firms' industry classification and reclassification

NACE Rev 2. Classification	**# of firms prior to reclassification**	**Reclassification group**	**# of firms after reclassification**
F - Construction L - Real estate activities	4 5	Construction & Real estate	9
C – Manufacturing	31	Manufacturing	31
A - Agriculture, forestry and fishing B - Mining and quarrying G - Wholesale and retail trade; repair of motor vehicles and motorcycles H - Transportation and storage	1 2 5 2	Transportation, commodities and trade	10
J - Information and communication M - Professional, scientific and technical activities N - Administrative and support service activities R - Arts, entertainment and recreation S - Other service activities	11 4 2 2 1	Other service companies	20
Total	**70**		**70**

4.2. Data collection

After having mapped the ultimate sample, the required data for the variables could be collected. The sampling periods of past studies do vary a lot. There is no one consistent way about the sampling period that should be used. Some used a ten-year period whereas others used a two-, three-, four-, or five-year period, for example. Each researcher has its argumentation. In this study, CEO compensation data have been gathered over the years 2016, 2017, and 2018. The choice has been made to use 2016 as starting year because the Code Tabaksblat has been revised in 2016, as mentioned in section 1.2. and 1.3. Taking this year as a starting point results in that all compensation data used in this study have been composed according to the same version of the corporate governance code. Moreover, taking the year of a modification in the corporate governance setting as a starting point is in line with van der Laan et al. (2010). However, an important criterium that had to be met is that the sample size should be large enough to maintain a sufficient level of power. As mentioned in section 3.1.2., in case of multiple regression analysis, a sample size of 50 to 100 observations is required (Henseler, 2019a). Due to that as described in the previous section, the sample size consists of 70 firms, sample size is no problem when three-year compensation data are used. Using three-year compensation data is in line with a previous study regarding Dutch pay-performance relationship (Weenders, 2019). Data regarding the performance variables have been collected over the years 2015-2018. Data for 2015 are collected because of the lagged-performance data that is needed during the robustness analysis, as described in 3.2. and 3.4. Data regards the control variables have been collected over the years 2015-2017, because of the one-year lag that will be used, as mentioned in 3.1 and 3.2.

The data regarding CEO compensation and a part of the control variables (CEO tenure, CEO age, compensation committee, board size, relative supervisory board size, ownership concentration, presence of preference and priority shares), have been collected from the annual reports of the sample firms. These annual reports are retrieved from the firms' website. The required data regarding the performance measures (ROA, ROS, RET, and Tobin's Q), and some of the control variables (firm size, leverage, industry classification) have been collected from ORBIS. ORBIS is a database designed by Bureau van Dijk that contains financial as well as non-financial data for a large number of firms over the world (Bureau van Dijk, 2013). Annual reports have been used for data that could not be collected from Orbis.

Almost all firms end their fiscal year on the 31st of December. However, some firms have closing dates on the 30th of June. For these firms, the years 2016/2017, 2017/2018 and 2018/2019 have been used for compensation data and performance data, whereas 2015/2016, 2016/2017 and 2017/2018 have been used for the control variables.

5. Results

In this chapter, the results of the analyses are described and discussed. The chapter starts with a discussion of the descriptive statistics of the variables used in the analyses. Thereafter, the Pearson's correlation matrix will be presented and discussed. Next, the results of the OLS regression analyses and robustness tests will be described and discussed in order to test the formulated hypotheses.

5.1. Descriptive statistics

Table 5.1 presents the descriptive statistics of the variables used in the analyses. To mitigate the influence of extreme values and to reduce the variance, the compensation- and performance variables have been winsorized at the 2.5 and 97.5 percentile. Therefore, these variables have been winsorized at the 5% level. Winsorizing the data is an often-used tool in the pay-performance literature (Carter et al., 2016; Liang et al., 2015; Sheikh et al., 2018). Previous literature shows no one consistent way at what level data should be winsorized. Some researchers winsorized at the 2% level, whereas others winsorized at the 5% or 10% level. The choice has been made to winsorize at the 5% level, because when winsorizing at the 10% level, a significant part of the data would have been adjusted, whereas winsorizing at the 2% level results in only adjusting a few observations. Winsorizing at the 5% level is in line with the studies of Liang et al. (2015), and Ozdemir et al. (2013). The descriptive statistics of the industry- and year variables will not be discussed in this section since they have already been discussed in section 4.1.

As can be seen in Table 5.1, the mean STI (bonus) for firms over the sample period is €489k, while the median is €250k. This shows that the STI data is skewed to the right. The minimum STI a CEO received was €0, whereas the maximum was €2.7 million. An example of a firm who did not pay a bonus to its CEO is Kardan NV in 2018. Heineken NV paid its CEO a bonus of €2.7 million in 2018. Compared to the STI (bonus) data of CEOs of Dutch listed firms at the beginning of the decade, the bonus has increased. To illustrate, the study of Cornelisse & Kabir (2005), showed that the average bonus of CEOs of Dutch listed firms in 2003 was €239k. However, the mean STI of Dutch CEOs during 2004-2007 was already €558k (Janssen-Plas, 2009). Moreover, €489k is also in line with other European countries, who have a mean of €447k (Smirnova & Zavertiaeva, 2017). Therefore, it can be stated that the values of the bonus are in line with the study of Janssen-Plas (2009). Moreover, Table 5.1 shows that on average, a CEO received €666k in long-term incentives. The median value of long-term incentives is €145k, which shows that this data is extremely skewed to the right. Moreover, when pensions are included, the average long-term incentives are €770k and the median is €230k. Based on this, it can be stated that the average pensions are €104k, which is a bit less compared to the study based on 2004-2007 data, which shows average pensions of €178k. Several firms did not pay LTI and pensions to its CEO, examples are Roodmictrotec NV (2016) and Snowworld NV (2018).

Table 5.1. Descriptive statistics

Variable	N	Mean	Median	Std. Dev.	Minimum	Maximum
Dependent variable						
STI (bonus) (x €1 mln)	205	0.489	0.250	0.660	0.000	2.736
LTI (x €1 mln)	205	0.666	0.145	1.059	0.000	4.381
LTI-P (pensions incl.) (x €1 mln)	206	0.770	0.230	1.113	0.000	4.481
Total Var. Comp (x €1 mln)	206	1.264	0.490	1.735	0.000	7.111
STI_%	205	0.460	0.422	0.252	0.000	1.000
LTI_%	205	0.380	0.427	0.265	0.000	0.870
LTI-P_ %	206	0.540	0.579	0.254	0.000	1.000
Independent variables						
ROA	208	0.055	0.063	0.072	-0.180	0.210
ROS	208	0.073	0.064	0.218	-0.730	0.640
RET	196	0.042	-0.003	0.291	-0.500	0.800
Tobins Q	208	1.588	1.420	0.707	0.760	3.990
Control variables $^{t-1}$						
CEO_age	204	55.340	56.000	5.920	37.000	73.000
CEO_ten	204	7.559	6.000	5.904	0.080	26.000
Assets (x €1 bln)	206	10.537	1.178	42.900	0.012	390.167
Lev	206	0.177	0.142	0.168	0.000	0.750
Board_size	204	7.830	7.000	2.440	1.000	16.000
Rel_SB_size	204	0.671	0.667	0.110	0.000	0.890
CC_dum	204	0.780	1.000	0.412	0.000	1.000
Own_con	199	0.261	0.172	0.212	0.040	0.980
Prio_sh_dum	200	0.150	0.000	0.358	0.000	1.000
Pref_sh_dum	200	0.520	1.000	0.501	0.000	1.000

Notes: This table reports the descriptive statistics for each variable included in this study. The data of the dependent- and independent variables are based on the years 2016, 2017, and 2018. The data of the control variables are one-year lagged and based on the years 2015, 2016, and 2017. Outliers have been removed by winsorizing the compensation and performance variables at the 97.5 and 2.5. percentile. The compensation- and firm size (Assets) data have been reported before the logarithmic transformation took place. The variable definitions can be found in table 3.1. With regards to the compensation data, in case CEOs did not receive a specific form of variable compensation, the value of 1 has been assigned to this CEO, due to that otherwise this observation would have been ignored in the analysis.

It is hard to compare the long-term incentive compensation data with previous literature, due to that previous Dutch literature focused on fixed compensation, total variable compensation, cash compensation (fixed and bonus), or total compensation, whereas in this study the focus has been on the specific parts of variable compensation. The study of Postmus (2015), did report the long-term variable incentives and reported a mean of €1.27 million, which is a lot more than the mean of €666k of this study. However, the study of Postmus (2015) only focused on the 25 largest Dutch firms, listed at the AEX, whereas this study also includes the smaller Dutch listed firms. This explains the large difference. However, the study of Janssen, Tijhaar, & Volmer (2013), showed some similar results compared to this study. The study showed that during the years 2008-2010, on average CEOs received long-term incentives of €735k, which is quite similar to the €666k Table 5.1 presents. Moreover, the average total variable compensation for this study is €1.2. million, whereas the total variable compensation over 2014-2016 was €1.09 million (Weenders, 2019). Based on this, it can be stated that the variable compensation data are more or less in line with previous literature. However, as already mentioned, it can be seen in Table 5.1 that all the compensation data are highly skewed. To adjust for this skewness and non-normality, the compensation data will be transformed using a natural logarithm. It is important to be mentioned that a value of €1 has been assigned to the observations who did not receive a specific form of variable compensation. Otherwise, these observations would have been ignored when the natural logarithms were used. In addition to the above-mentioned compensation data, Table 5.1 also presents the descriptive statistics of the different parts of variable compensation in percentages of the total variable compensation. It shows that on average, 46% of the variable compensation consists of bonuses, whereas 54% consists of long-term incentives and pensions. However, these variables will only be used during the robustness checks.

Next, Table 5.1 shows that the mean ROA for the sample firms is 5.5% and the median is 6.3%. These values are in line with previous studies. For example, the mean ROA over the period 2015-2017 was 5.2% and the median was 5.7%. In addition, the mean ROS during the sampling period of this study is 7.3%, with a median value of 6.4%, which indicates that the ROS is slightly skewed to the right. This indicates that during the last years, the ROS has been declined. To illustrate, the study of Weenders (2019), showed a mean ROS of 10.1% and a median of 7.7% over 2015-2017. However, as can be seen, the ROS used in the study of Weenders (2019) is extremely skewed to the right. Furthermore, the data in that study have not been winsorized and the data in this study have. As a result, the extremely high values of the ROS has been adjusted, resulting in lower average values. Moreover, the ROS of 7.3% of this study is more or less in line with the study of Duffhues & Kabir (2008), which had a mean ROS of 6.2%. Next, Table 5.1 shows that the average RET is 4.2% and that the median value is 0%. These values are in line with the study based on the sample period

2010-2013, that study shows a mean RET of 3.9% (Postmus, 2015). The last performance variable, Tobin's Q has a mean value of 1.59 and a median of 1.42. These values are in line with previous literature. To illustrate, the study of Weenders (2019) showed a mean of 1.53 and a median of 1.40. Moreover, the study of van Beusichem et al. (2016) showed a mean and median of 1.76 and 1.23 respectively, whereas also older literature showed similar values (DeJong et al., 2001). These values indicate that on average, the market values firms higher than their book value.

As can be seen in Table 5.1, the control variables in this study are CEO age, CEO tenure, the assets of the firm, leverage of the firm, the board size, the relative supervisory board size, compensation committee dummy, ownership concentration, and the presence of priority- and/or preference shares. The first control variables to be discussed are CEO characteristics. Table 5.1 shows that the average age of the CEO during the sampling period is 55.3 years and that on average, the CEO tenure is seven years and six months. Besides, it can be seen that the oldest CEO is 73 years old (AMG Advanced Metallurgical Group NV) and the longest tenure is 26 years (Eurocommercial Properties NV).

Next to the CEO characteristics, there has also been controlled for firm characteristics. As can be seen in Table 5.1, the sample firms have on average a mean book value of assets of €10.5 billion. Furthermore, the median value is €1.2 billion, which indicates that the data are extremely skewed to the right and that there are a few very extreme observations with enormous assets. Moreover, the minimum value is €0.012 billion (TIE Kinetix NV), while the maximum value is €390.17 billion (Royal Dutch Shell). Therefore, during the analysis, this variable will be transformed into natural logarithms. However, during the period 1998-2001, the mean assets were even €14.1 billion (Duffhues & Kabir, 2008). Moreover, the mean leverage of the sample firms is 17.7%, which indicates that 17.7% of firms' total assets are financed with long-term debt. This is in line with previous studies. To illustrate, in 2002 Dutch listed firms were financed for 17% with long-term debt (Cornelisse & Kabir, 2005). Moreover, over the period 1997-2007, this percentage was 13.2% (van Beusichem et al., 2016). Besides, as can be seen in Table 5.1, the maximum value of leverage is 75% and the minimum value is 0%. This means that there are firms that have no long-term debt. An example is Avantium NV in 2017. According to Table 5.1, the average board size regarding the sampling period of this study was 7.8, the median was 7 members, and the largest board consist of 16 members. These values are in line with previous literature. For example, the study of Cardinaels & Van De Wouw (2011), showed a mean of 7.4 board members, which is in line with this study. In Table 5.1 can be seen that on average, 67.1% of the total board size consist of members of the supervisory board. This percentage is in line with previous literature. For example, the study of DeJong et al. (2001), showed an average percentage of 65.9%. The firm with the largest percentage of supervisory board members (89%) is Kardan NV. The next variable, the compensation committee dummy, shows that on average, 78% of

the Dutch listed firms in this sample have a compensation/remuneration committee.

Besides the CEO- and firm characteristics, this study also controlled for ownership characteristics. As presented in Table 5.1, on average, the largest shareholders have 26.1% of the shares. This value is in line with the studies of de Jong et al. (2005) and DeJong et al. (2001), who presented means of 22.1% and 24.5% respectively. The last variables presented in Table 5.1, are the dummy variables which measures the presence of priority- and preference shares. As can be seen, on average 15% of the firms have priority shares, whereas 52% have preference shares. Compared to period 1997-2007, these percentages have been decreased. During the period 1997-2007, 33.9% of the firms had priority shares, whereas 67.3% had preference shares (van Beusichem et al., 2016). This finding is in line with another study who focused on the '90s. De Jong et al. (2005) presented means of 39% and 60% respectively, which confirms the finding that the use of priority- and preference shares have become less popular during the last years.

5.2. Pearson's correlation matrix

Pearson's correlation matrix has been used for the bivariate analysis. Only the most important correlation will be discussed. This because the goal of checking correlations is to draw conclusions on multicollinearity and not to test theories.

The results of the Pearson's correlation matrix can be found in Table 5.2. In this table can be seen that the three compensation variables (LN_STI, LN_LTI, LN_LTI-P) are highly and significantly correlated with each other. This is in line with the expectation since all the three variables measure the compensation of the CEO. As can be seen in the table, long-term incentive compensation has a correlation of .454** with the short-term incentive compensation and a correlation of .735** with long-term incentive compensation with pensions included. The high correlation between long-term incentive compensation and long-term incentive compensation with pensions included (r= .735**) makes sense because it measures the same, except that pensions are included at the LN_LTI-P. These high and significant correlations have also been found by previous Dutch pay-performance literature. For example, the study of Weenders (2019), showed high and significant correlations between the different components of CEO pay. To illustrate, CEO variable pay has a correlation of .658** and .649** with CEO base salary and CEO's other benefits respectively. Regarding compensation variables which will be used during the robustness checks (forms of variable compensation in percentage points of total variable compensation), the correlations with each other also make sense. As can be seen in Table 5.2, long-term incentive compensation with pensions included (LTI-P_%) is highly, negatively and significantly correlated with short-term incentive compensation expressed in percentage points of total variable compensation (STI_%) (r= -1.00%). This makes sense since both

Tabel 5.2 Pearson's correlation matrix

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1	**LN _STI**	1																			
2	**LN _LTI**	,454**	1																		
3	**LN _LTI-P**	,561**	,735**	1																	
4	**STI_%**	,309**	-,488**	-,452**	1																
5	**LTI_%**	,008	,715**	,373**	-,697**	1															
6	**LTI-P_%**	-,309**	,488**	,446**	-1,00**	,697**	1														
7	**ROA**	,389**	,218**	,226**	,107	,051	-,103	1													
8	**ROS**	,265**	,131	,164*	,063	-,002	-,064	,609**	1												
9	**RET**	,093	,139	,118	-,033	,083	,033	,242**	,182*	1											
10	**Tobins_Q**	-,053	,221**	,155*	-,185**	,192**	,173*	,191**	,036	,293**	1										
11	**CEO_age**	,121	-,104	-,045	,125	-,073	-,126	,187**	,263**	-,025	-,104	1									
12	**CEO_ten**	-,093	-,067	-,075	,002	,009	-,012	,029	,122	,045	,144*	,496**	1								
13	**LN_assets**	,422**	,523**	,472**	-,239**	,383**	,220**	,086	,226**	-,025	-,106	,046	-,068	1							
14	**Lev**	,081	,131	-,033	,038	,163*	,033	,016	,215**	-,036	-,131	,019	-,003	,366**	1						
15	**Board_size**	,367**	,475**	,480**	-,246**	,340**	,246**	,066	,083	,048	-,007	,054	-,135	,734**	,204**	1					
16	**Rel_SB**	,152*	,228**	,149*	,086	,217**	,086	,103	,037	,022	-,068	,094	,078	,220**	,073	,297**	1				
17	**CC_dummy**	,390**	,436**	,531**	-,249**	,311**	,249**	,131	,104	-,059	-,040	-,021	-,119	,562**	,233**	,547**	,248**	1			
18	**Own_con**	-,239**	-,290**	-,310**	,120	-,120	-,120	,046	,003	,011	-,032	-,131	-,076	-,135	-,029	-,179*	-,096	-,228**	1		
19	**Prio_shares_dum**	,116	,121	,133	-,028	,072	,028	,109	,110	,008	-,111	-,017	-,027	,180*	-,094	,106	,111	,217**	,029	1	
20	**Pref_shares_dum**	,262**	,258**	,381**	-,189**	,167*	,189**	,039	,004	,067	,110	-,058	-,047	,308**	-,077	,414**	,029	,315**	-,281**	-,017	1

*** Correlation is significant at the 0,01 level (2-tailed). * Correlation is significant at the 0,05 level (2-tailed).*

forms of variable pay by definition should add up to 100%. Besides, both variables representing the long-term incentive pay in percentage points are highly correlated (r= .697**). This is expected because both variables measure the same, except for that LTI-P_% also includes pensions. The same goes up for long-term incentive compensation measured in percentages (LTI_%) and the natural logarithm of long-term incentive (LN_LTI) (r= .715**).

Regarding the performance variables, it can be seen that both accounting-based performance variables ROA and ROS are highly and significantly correlated (r= .609**). This makes sense since both variables intend to measure the same; the accounting-based firm performance. This is in line with the study of Weenders (2019), who showed a correlation of .431** and the study of Smirnova & Zavertiaeva (2017), who showed a correlation of .750** between both accounting-based performance variables. As also can be seen in Table 5.2, the correlation between both market-based performance variables is highly significant (r= .293**), which is in line with a previous Dutch-based study (Weenders, 2019). Moreover, Table 5.2 shows that ROA correlates significantly with all other performance variables (ROS, r= .609**, RET, r= .242**, Tobin's Q, r= .191**). Whereas ROS only correlates significantly with RET (r= .182**), but not with Tobin's Q (r= .036). This indicates that RET and Tobin's Q both measures market-based firm performance, but in a different way.

Regarding the correlations between the CEO compensation variables and the firm performance variables, Table 5.2 shows that both accounting-based performance variables (ROA and ROS) are significantly and positively correlated with the short-term incentive compensation of the CEO (r= .389** and .265**). These positive and significant correlations between the accounting-based firm performance and bonus (short-term incentive) have also been found by a study on European listed firms in which Dutch firms were also included (Smirnova & Zavertiaeva, 2017). Additionally, Table 5.2 shows that Tobin's Q has a significantly positive correlation with the long-term incentives of CEOs, also when pensions are included (r= .221** and r= .155*), which is in line with the expectations that long-term incentive compensation is positively affected by market-based firm performance. However, RET shows no significant correlation with long-term CEO compensation (r= .139 and r= .118), which is in line with the study of Weenders (2019).

Regarding the independent variables, both performance – and control variables, the correlation matrix shows that there are a few correlations which might cause multicollinearity issues. Table 5.2 shows that CEO tenure and CEO age are significantly correlated (r= .496**). This indicates that CEOs who are longer-tenured, also are older, generally speaking. This is in line with a previous Dutch study, who showed a correlation of .396* between the two variables (Janssen et al., 2013). Additionally, Table 5.2 shows that board size is highly and significantly correlated with firm size (r= .734**), which is in line with the study of Janssen et al. (2013). This indicates that generally speaking,

larger firms have larger boards, which makes sense. Furthermore, Table 5.2 shows that the presence of a compensation committee is highly correlated with both firm size (r= .562**) and board size (r= .547**). Lastly, Table 5.2 shows that the presence of preference shares is quite highly correlated with board size (r= .414**). These results indicate that firms that have a compensation committee are larger firms and firms with larger boards. The above mentioned high correlations between two control variables might cause multicollinearity issues. This because both variables are together included in the research model. To control for potential multicollinearity, VIF values have been reported in Appendix B. As can be seen in Appendix B, all VIF values remain clearly below the critical range of 5-10. Therefore, it can be stated that multicollinearity seems to be no problem within the research model used in this study.

5.3. Ordinary least squares regression results

In this section, the results of the Ordinary Least Squares (OLS) regression analyses are described and discussed in order to test the in section 2.6. formulated hypotheses. Below, in section 5.3.1. the results regarding the first hypothesis are described and discussed, thereafter, in section 5.3.2., the results regarding the second hypothesis are described and discussed. Next to the initial regression results, also the results of the conducted robustness checks are discussed in subsections. This to increase the reliability and validity of the initial regression results.

Because in this study variables have been used with several measurement scales, the choice has been made to report the standardized beta coefficients (beta) of the regression results in the tables instead of the unstandardized beta coefficients (b). Examples of measurements scales that have been used are years (CEO_age and CEO_ten), ratio's (ROA, ROS, RET, Tobin's Q), natural logarithm (LN_Assets), percentages (Own_con and Rel_SB_size), and dummies. An advantage of using standardized coefficients compared to unstandardized coefficients is that using standardized coefficients makes it possible to compare the strength of different variables in which different measurements scales have been used (Stephanie, 2019). Reporting standardized beta is in line with several previous researchers (Cardinaels & Van De Wouw, 2011; Cieślak, 2018; Custódio et al., 2013; Hall & Liebman, 1998). However, the most important thing regarding the interpretation of the regression results is to assess whether the variables are significant or not, and for this, it does not matter whether unstandardized- or standardized betas have been used.

5.3.1. Hypothesis 1: Effect of accounting-based (AB) firm performance on short-term incentive (STI) compensation

First, in subsection 5.3.1.1. the results of the initial OLS regression results are described and discussed. Thereafter, in subsection 5.3.1.2. the results of the robustness checks are discussed.

5.3.1.1. OLS regression results

The first hypothesis states that higher accounting-based firm performance results in higher bonuses for CEOs. The main variable of interest regarding this hypothesis is the ROA. The OLS regression results are presented below in Table 5.3.

The results in the full model (13) of Table 5.3 show that ROA has a very significant and positive effect on the short-term incentives (bonus) of the CEO (beta= .319***, t= 4.939). This beta coefficient can be interpreted as follows: every one standard deviation increase in ROA results in an increase of .319 times the standard deviation of the natural logarithm of short-term incentive (LN_STI), keeping all other variables constant. This significantly positive coefficient supports the formulated hypothesis that accounting-based firm performance has a positive effect on short-term incentive compensation. This result is in line with a previous study who studied the effect of firm performance on CEO compensation for a sample based on Dutch listed firms. That specific study gathered data over the period 2004-2007 and showed that ROA has a positive and significant effect on the bonus of the CEOs (b= .434***) (Janssen-Plas, 2009). Moreover, also the regression results of a study based on a European sample showed a significant and positive effect of ROA on the bonus of CEOs of listed firms (b= 11.400***) (Smirnova & Zavertiaeva, 2017). In this European sample Dutch listed firms were also included. However, not all previous researchers in the past did find a significant and positive effect. For example, the study of Duffhues & Kabir (2008), did even show a significantly negative effect (b= -.484***).

Regarding the control variables, it can be seen that some of them are statistically significant. To illustrate, the results in the full model (13) show that the longer a CEO holds its position as CEO, the less bonus the CEO receives (beta= -.126*, t= -1.788). This result is in contrast with the human capital theory which argues that the longer the CEO holds its position, the more experienced the person is, the more compensation the person should receive. Another variable that has a significant effect is the firm size variable (LN_Assets). It has a significantly positive effect on short-term incentive CEO compensation (beta= .306***, t= 3.159). This is in line with the expectations that larger firms are more difficult to manage, therefore, CEOs should be compensated for that. This result is in line with the study of Smirnova & Zavertiaeva (2017) who also showed a significantly positive effect on CEO bonus (b= 140.400*). The large difference between .306*** and 140.400* can be explained as follows: as mentioned and argued above in the introduction of section 5.3, in this study the choice has been made to report the standardized beta coefficients (beta), whereas the study of Smirnova & Zavertiaeva (2017) reported the unstandardized beta (b) coefficients. Furthermore, model 13 in Table 5.3 shows that the compensation committee dummy variable has a significantly positive effect on CEO short-term incentive (beta= .144*, t= 1.864). This result is in contrast with the expectations that the presence of a compensation committee enhance the effectivity of boards in designing the

Table 5.3. OLS regression results for the effect of return on assets (ROA) on short-term incentive compensation

	Natural logarithm of CEO short-term incentive compensation (LN_STI)												
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**
Constant	9.959*** (29.329)	8.037*** (3.129)	5.603** (2.035)	-7.741** (-2.362)	-8.472** (-2.544)	-6.944* (-1.886)	-7.414* (-1.898)	-5.949 (-1.521)	-3.909 (-1.005)	-3.982 (-1.014)	-4.381 (-1.110)	-4.612 (-1.162)	-4.570 (-1.141)
ROA	.389*** (5.927)	.380*** (5.676)	.368*** (5.549)	.341*** (5.611)	.340*** (5.599)	.340*** (5.611)	.339*** (5.550)	.323*** (5.334)	.342*** (5.734)	.343*** (5.717)	.339*** (5.647)	.318*** (4.959)	.319*** (4.939)
CEO_age		.051 (.755)	.138* (1.806)	.104 (1.486)	.103 (1.478)	.096 (1.365)	.096 (1.360)	.105 (1.509)	.082 (1.201)	.082 (1.194)	.092 (1.327)	.099 (1.389)	.097 (1.351)
CEO_tenure			-.172** (-2.293)	-.128* (-1.866)	-.126* (-1.837)	-.115* (-1.657)	-.118* (-1.682)	-.110 (-1.588)	-.120* (-1.759)	-.120* (-1.754)	-.126* (-1.832)	-.126* (-1.805)	-.126* (-1.788)
LN_Assets				.380*** (6.339)	.408*** (6.345)	.343*** (3.704)	.343*** (3.700)	.288*** (3.037)	.298*** (3.208)	.300*** (3.185)	.295*** (3.124)	.306*** (3.175)	.306*** (3.159)
Lev					-.077 (-1.202)	-.070 (-1.098)	-.071 (-1.100)	-.080 (-1.261)	-.075 (-1.211)	-.077 (-1.216)	-.062 (-.954)	-.056 (-.839)	-.056 (-.832)
Board_size						.087 (.975)	.079 (.869)	.033 (.361)	.015 (.162)	.013 (.145)	-.012 (-.124)	-.021 (-.214)	-.021 (-.216)
Rel_SB_size							.023 (.366)	.007 (.104)	.003 (.052)	.004 (.062)	.012 (.196)	.011 (.181)	.012 (.187)
CC_dum								.174** (2.340)	.133* (1.792)	.135* (1.789)	.125* (1.651)	.144* (1.872)	.144* (1.864)
Own_con									-.182*** (-3.019)	-.181*** (-2.990)	-.166*** (-2.677)	-.187*** (-2.902)	-.186*** (-2.881)
Prio_sh_dum										-.010 (-.158)	-.002 (-.037)	-.010 (-.161)	-.010 (-.160)
Pref_sh_dum											.071 (1.035)	.058 (.790)	.059 (.788)
Industry dum												YES	YES
Year dum													YES
Adjusted R^2	14.7%	14.5%	16.3%	30.3%	30.5%	30.5%	30.2%	31.8%	34.6%	34.2%	34.2%	34.2%	33.5%
N	199	199	199	199	199	199	199	199	199	199	199	199	199
F-statistic	35.133***	17.813***	13.885***	22.552***	18.373***	15.465***	13.215***	12.518***	12.615***	11.297***	10.372***	8.340***	7.231***

*Notes: This table reports the standardized coefficients (t-values are presented within parentheses). The compensation variable (LN_STI) and performance variable (ROA) have been winsorized at the 5% level. All the other (control) variables are one-year lagged. The variable definitions can be found in Table 3.1. *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

compensation contracts of executives, see section 2.3.4.2. Lastly, it can be seen that firms that have concentrated owners pay their CEOs fewer bonuses (beta= -.186***). This result is in line with the theory that the concentrated owners are more incentivized to monitor executives (Ozkan, 2007). However, this significant effect has not been proved by all researchers in the past. For example, Janssen et al. (2013) did not find a significant effect of ownership concentration on variable compensation, although the coefficient was negative (b= -.043).

Furthermore, Table 5.3 also presents the percentage of the variance of the dependent variable, that can be explained by the model. As can be seen, this percentage is 33.5% (adjusted R^2) for the full model (model 13). Compared to previously published journal articles, this percentage is relatively low. To illustrate, the models of Duffhues & Kabir (2008) showed adjusted R^2 values of about 62% and the models of Smirnova & Zavertiaeva (2017) regarding bonus showed adjusted R^2 values of about 68%. However, compared to the models included in the theses of former master students, 33.5% is relatively high. For example, the models of Weenders (2019) showed adjusted R^2 below 10%, whereas the models of Postmus (2015) showed R^2 values of 10% and 17%. Moreover, it can be seen that the adjusted R^2 significantly increased from model 3 to model 4 (from 16.3% to 30.3%). This increase has been caused by adding the firm size variable, which indicates that this variable is an important variable. Because in this study standardized coefficients are presented, this can also be seen at the high coefficients the firm size variable shows, compared to the other variables. As described in the introduction part of section 5.3, one of the advantages of making use of standardized coefficients instead of unstandardized coefficients is that standardized coefficients make it possible to compare the strength of the coefficients of multiple variables in which different measurements scales have been used (Stephanie, 2019). To illustrate, in the full model (13), the coefficient of firm size (.306***) is the one with the highest value, except for ROA (.319***), indicating that it makes an important contribution in the adjusted R^2 of the model. Moreover, also the F-statistic (7.231) of the full model shows that overall, the regression model is significant.

5.3.1.2. Robustness checks

Besides the initial results presented in Table 5.3, additional robustness checks have been conducted to increase the validity of the results. The first robustness checks that have been conducted are replacing the way firm performance has been measured and using one-year lagged firm performance data to control for endogeneity issues. The results are presented below in Table 5.4.

As can be seen, the first model (1) in Table 5.4 is the same as model 13 in Table 5.3. As a first robustness check, the accounting-based firm performance variable ROA has been replaced for another accounting-based firm performance variable ROS in model 2. The results show that similar to ROA, also the effect of ROS on short-term incentive compensation is significantly positive at the 1%

Table 5.4. OLS regression results hypothesis 1 with both contemporaneous and lagged performance variables

Variable	Natural logarithm of short-term incentive compensation (LN_STI)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Constant)	-4.570 (-1.141)	-4.285 (-1.005)	-8.405 (-1.994)	-6.624 (-1.479)	-5.596 (-1.336)	-5.246 (-1.235)	-7.904* (-1.806)	-8.057* (-.1868)
ROA	.319*** (4.939)							
ROS		.203*** (3.074)						
RET			.150* (1.962)					
Tobin's Q				-.058 (-.812)				
ROA $_{t-1}$					.194*** (2.883)			
ROS $_{t-1}$						.180***(2.644)		
RET $_{t-1}$							.002 (.033)	
Tobin's Q $_{t-1}$								.012 (.170)
CEO_age	.097 (1.351)	.120 (1.593)	.182** (2.434)	.160** (2.079)	.129* (1.718)	.142* (1.901)	.176** (2.269)	.178** (2.346)
CEO_ten	-.126* (-1.788)	-.164** (-2.264)	-.177** (-2.373)	-.153** (-1.999)	-.138* (-1.876)	-.168** (-2.296)	-.169** (-2.181)	-.172** (-2.246)
LN_Assets	.306*** (3.159)	.267*** (2.620)	.329*** (3.179)	.312*** (3.019)	.290*** (2.859)	.262** (2.530)	.317*** (2.954)	.317*** (3.066)
Lev	-.056 (-.832)	-.071 (-1.012)	-.040 (-.563)	-.040 (-.566)	-.022 (-.310)	-.061 (-.874)	-.036 (-.490)	-.034 (-.476)
Board_size	-.021 (-.216)	-.047 (-.457)	-.104 (-.996)	-.076 (-.732)	-.008 (-.080)	-.034 (-.325)	-.083 (-.771)	-.084 (-.809)
Rel_SB_size	.012 (.187)	.039 (.598)	.035 (.533)	.032 (.478)	.019 (.286)	.038 (.575)	.036 (.527)	.035 (.527)
CC_dum	.144* (1.864)	.189** (2.372)	.203** (2.474)	.190** (2.323)	.133* (1.619)	.185** (2.315)	.186** (2.190)	.184** (2.227)
Own_con	-.186*** (-2.881)	-.167** (-2.488)	-.153** (-2.230)	-.155** (-2.259)	-.178*** (-2.634)	-.156** (-2.315)	-.151** (-2.121)	-.150** (-2.185)
Prio_Shares_dum	-.010 (-.160)	.002 (.026)	.019 (.280)	.020 (.291)	.023 (.353)	.012 (.181)	.026 (.374)	.028 (.411)
Pref_Shares_dum	.059 (.788)	.093 (1.212)	.094 (1.193)	.110 (1.409)	.092 (1.199)	.107 (1.389)	.107 (1.305)	.108 (1.381)
Industry dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES
N	199	199	195	199	199	199	186	199
Adjusted R^2	.335	.283	.260	.248	.279	.274	.241	.246
F-statistic	7.231***	5.883***	5.267***	5.091***	5.780***	5.662***	4.672***	5.034***

*Notes: This table reports the standardized coefficients (t-values are presented in parentheses). The compensation variable (LN_STI) and performance variable (ROA, ROS, RET, Tobin's Q) have been winsorized at the 5% level. All the other (control) variables are one-year lagged. The variable definitions can be found in Table 3.1. *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

level (beta= .203***, t= 3.074). This validates the results in Table 5.3 that accounting-based firm performance has a significantly positive effect on bonuses of the CEOs of Dutch listed firms, which supports hypothesis 1. Moreover, models 3 and 4 in Table 5.4 show that when market-based performance measures are included in the model, the effect becomes weakly significant for RET (beta= .150*, t= 1.962) and even not significant for Tobin's Q (beta= -.058, t= -.812).

As a second robustness check, one-year lagged performance variables have been used in the analysis to control for possible endogeneity issues. The results of these regressions are presented in models 5-8 in Table 5.4. As can be seen, results did not change much when one-year lagged performance variables have been used. Similar to the results in Table 5.3 and the results in models 1 and 2 of Table 5.4, hypothesis 1 still can be supported. Model 5 in Table 5.4 shows that ROA still has a highly significant and positive effect on short-term incentive compensation (beta= .194***, t= 2.883). Moreover, also the other accounting-based performance measure (ROS) in model 6 remained highly significant and positive (beta= .180***, t= 2.644). Moreover, model 7 shows that the significant effect (beta= ,150*, t= 1.962) of RET on STI that model 3 showed, disappeared when one-year lagged data have been used (beta= .002, t= .033). Also, the study of Duffhues & Kabir (2008), showed that the significant effect of RET disappeared when one-year lagged performance data have been used. Besides, the effect of the other market-based performance measure (Tobin's Q) remained insignificant (beta= .012, t= .170). Furthermore, the significance of the control variables in models 2-8 of Table 5.4 remained more or less the same. The effect of CEO tenure and concentrated owners remained significantly negative, and the effect of firm size (LN_Assets) and presence of a compensation committee remained significantly positive. Only the effect of CEO age on bonus became significant (positive) in the models 3-8 which is in contrast to the models 1 and 2.

As a third robustness test, the way short-term incentive compensation is measured has been changed. In Table C1 presented in Appendix C1, short-term incentive compensation has not been measured as a natural logarithm (LN_STI) but as a percentage of total variable compensation (STI_%) and as a logarithm (LOG_STI) instead of the natural logarithm. Models 1 and 2 in Table C1 show that when STI is measured as a percentage of total variable compensation, the effect of ROA remains significantly positive whereas the effect of ROS becomes insignificant. These results hold when one-year lagged performance data have been used in models 3 and 4. Moreover, models 5, 6, 7 and 8 in Table C1 show that when compensation is measured as the logarithm of short-term incentive compensation, the effects of both accounting-based performance measures remain significantly positive both when contemporaneous and lagged performance data have been used.

As a fourth robustness check, sub-samples have been created based on industry classification. As described in section 4.1.2, the following four industry groups have been identified: construction & real estate, manufacturing, transportation commodities & trade, and other service

companies. Similar to the study of Duffhues & Kabir (2008), the results show that the effect is not the same for each industry. To illustrate, the results regarding the industry group construction & real estate presented in models 1 and 2 of Table C2A show no significantly positive effect for both ROA (beta= .218, t= .837) and ROS (beta= 0.10, t= .036). However, the sample size for this industry group was just 27 observations, while according to section 3.1.2. a sample size of 50 to 100 observations is desirable to maintain a sufficient level of power. These results hold when one-year lagged performance data have been used. Moreover, also the group transportation, commodities & trade presented in models 5 and 6 of Table C2A did not show a significant effect of firm performance on short-term incentives (beta= -.292, t= -1.540 and beta= -.155, t= -.713). The effect of ROA became even significantly negative in Table C2B.

In contrast to the previous industry groups, Table C2A shows that firms within the manufacturing group and other service companies group do confirm the initial results presented in the full model of Table 5.3. Regarding the firms within the manufacturing group, both firm performance variables shows significant and positive effects (ROA: beta= .292***, t= 3.114; ROS: beta= .213*, t= 1.899). Regarding firms within the other service companies group, it depends on which firm performance variable has been used to get significant results. The effect of ROA is significantly positive (beta= .294**, t= 2.601), whereas the effect of ROS is not (beta= .079, t= .707). Moreover, it can be seen that the sample sizes of these groups are larger compared to the previous groups. In contrast to Table C2A, Table C2B in Appendix C2 shows that when one-year lagged performance data have been used, the effect of accounting-based firm performance on short-term incentive compensation remained only significantly positive for firms located in the other services sector (model 7 and 8). Regarding the control variables, Appendix C2 shows that it depends on which industry group has been used to see significant results.

As a fifth robustness test, the random effects (RE) model has been applied. The Hausman Test in Table C3A showed that the null hypothesis could not be rejected and that therefore the RE-model should have been applied. Table C3B show that the results are in line with the initial regression results. Results not changing when the RE-model has been applied is in line with the study of Alves et al. (2014), who also applied the RE-model as a robustness check.

As a last robustness test, sub-samples have been created which separates firms in which the short-term incentive compensation of the CEO depends on set goals regarding the profitability of the firm, according to the annual reports, from firms that have set goals which do not relate to the firms' profitability. The results in models 1-4 in Table C4A show that the effect of firm performance is significantly positive for firms in which, according to their annual reports, the short-term incentive compensation of the CEO depends on goals related to firms' profitability. In contrast, the results in models 5-8 show that these effects are not significantly positive for firms in which the short-term

variable compensation of the CEO does not depend on performance-related goals, according to their annual reports. These results indicate that the firms do stick to their word and indeed pay their CEOs higher amounts of short-term variable compensation if the firms do perform well viewed from a financial perspective and this has been agreed on in the compensation contracts set at the beginning of the year. Moreover, Table C4B shows that in 91.2% of the firms the short-term variable compensation of the CEO does depend on profit-related firm performance.

Overall, when analysing the results of the total sample, it can be stated that there is sufficient evidence that accounting-based firm performance positively affects the short-term incentive compensation of the CEOs of Dutch listed firms. However, when going more in-depth, the results in Table C2A show that when contemporaneous performance data have been used, the significantly positive effect is not present for firms located in the construction & real estate sector and firms located in the transportation, commodities & trade sector. Moreover, when lagged performance data have been used, also the significant effect for firms in the manufacturing industry disappeared. Therefore, all things considered, hypothesis 1 can only be confirmed for firms located in the other services sector. Furthermore, also some of the control variables seem to significantly affect the short-term incentive compensation of the CEOs. When the total sample has been used there is robust evidence that firm size and the presence of a compensation committee positively affects the short-term incentive compensation, whereas concentrated ownership has a significantly negative effect. However, when sub-samples based on industry classifications have been used, some of the coefficients became insignificant.

5.3.2. Hypothesis 2: Effect of market-based (MB) firm performance measurements on long-term incentive compensation

In subsection 5.3.2.1. the initial results of the OLS regression results are described and discussed. Thereafter, in subsection 5.3.2.2. the results of the robustness checks are discussed.

5.3.2.1. OLS regression results

The second hypothesis states that long-term incentive compensation is positively affected by the market-based performance of the firms. The main variable of interest is the RET. The results are presented in Table 5.5.

The results in the full model (13) in Table 5.5 below show that the standardized beta of RET is significantly positive (beta= .128*, t= 1.946). The coefficient can be interpreted as follows: every one standard deviation increase in RET, results in an increase of .128 times the standard deviation of LN_LTI, keeping all other variables constant. Because the effect is significantly positive, this result supports the formulated hypothesis. However, due to that, the effect is just significant at the 10% level, several additional tests should be conducted to state that the hypothesis can be supported.

Table 5.5. OLS regression results for the effect of return on stock (RET) on long-term incentive compensation

	Natural logarithm of CEO long-term incentive compensation (LN_LTI)												
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**
Constant	9.328*** (22.530)	14.730*** (3.819)	14.108*** (3.372)	-11.921** (-2.596)	-12.788*** (-2.739)	-8.165 (-1.589)	-10.965** (-2.031)	-8.743 (-1.617)	-5.742 (-1.080)	-5.699 (-1.060)	-5.524 (-1.021)	-6.246 (-1.247)	-6.215 (-1.232)
RET	.139* (1.954)	.137* (1.922)	.139* (1.940)	.148** (2.453)	.146** (2.421)	.132** (2.202)	.132** (2.207)	.144** (2.420)	.145** (2.517)	.145** (2.508)	.146** (2.521)	.094* (1.734)	.128* (1.946)
CEO_age		-.100 (-1.409)	-.084 (-1.026)	-.141** (-2.023)	-.142** (-2.036)	-.158** (-2.274)	-.160** (-2.318)	-.153** (-2.241)	-.174** (-2.616)	-.174** (-2.609)	-.177*** (-2.630)	-.205*** (-3.207)	-.207*** (-3.222)
CEO_tenure			-.032 (-.388)	.032 (.463)	.034 (.492)	.059 (.837)	.048 (.680)	.056 (.806)	.043 (.640)	.043 (.639)	.045 (.663)	.017 (.272)	.017 (.261)
LN_Assets				.536*** (8.856)	.560*** (8.620)	.421*** (4.515)	.422*** (4.544)	.365*** (3.853)	.378*** (4.107)	.377*** (4.034)	.379*** (4.040)	.425*** (4.805)	.428*** (4.815)
Lev					-.067 (-1.030)	-.054 (-.832)	-.055 (-.854)	-.064 (-1.010)	-.059 (-.961)	-.058 (-.928)	-.064 (-.987)	-.019 (-.319)	-.021 (-.343)
Board_size						.187** (2.073)	.154* (1.685)	.106 (1.143)	.083 (.915)	.083 (.914)	.092 (.977)	.021 (.234)	.017 (.185)
Rel_SB_size							.102 (1.624)	.083 (1.339)	.081 (1.341)	.081 (1.329)	.078 (1.267)	.078 (1.380)	.079 (1.380)
CC_dum								.179** (2.418)	.135* (1.845)	.134* (1.801)	.138* (1.831)	.153** (2.176)	.157** (2.229)
Own_con									-.209*** (-3.532)	-.209*** (-3.515)	-.215*** (-3.503)	-.236*** (-4.019)	-.235*** (-4.003)
Prio_sh_dum										.004 (.061)	.001 (.017)	.016 (.282)	.014 (.251)
Pref_sh_dum											-.026 (-.378)	.009 (.141)	.006 (.093)
Industry dum												YES	YES
Year dum													YES
Adjusted R^2	1.4%	1.9%	1.5%	29.9%	29.9%	31.1%	31.7%	33.5%	37.3%	37%	36.7%	45.8%	45.5%
N	195	195	195	195	195	195	195	195	195	195	195	195	195
F-statistic	3.816*	2.910*	1.982	21.695***	17.574***	15.617***	13.880***	13.190***	13.834***	12.384***	11.219***	12.724***	11.123***

*Notes: This table reports the standardized coefficients (t-values are presented within parentheses). The compensation variable (LN_LTI) and performance variable (RET) have been winsorized at the 5% level. All the other (control) variables are one-year lagged. The variable definitions can be found in Table 3.1. *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

Not finding a significantly positive effect at the 5- or 1% level is in line with a previous Dutch-based study who also did not show a highly significant (5- or 1% level) effect of market-based firm performance on long-term variable compensation (b= -.02, p= .685) (Postmus, 2015).

Regarding the control variables, the results presented in the full model in Table 5.5 show that CEO age has a significantly negative effect on long-term incentive compensation (beta= -.207***, t= -3.222). This result indicates that older CEOs receive less long-term variable compensation which is in contrast with the human capital theory which predicts that older people are more experienced and therefore have to be compensated for that. This result also differs from the outcome of the study of Janssen et al. (2013) who did not show that CEO age has a significant effect on variable pay (b= -.093). Regarding the other control variables, the results are in line with the results of the regression analysis of the first hypothesis presented in Table 5.3. Firm size and the presence of a compensation committee have a significantly positive effect, whereas concentrated owners have a significantly negative effect. For a more detailed explanation, section 5.3.1.1. can be consulted.

Moreover, Table 5.5 shows that the adjusted R^2 of the full OLS regression model is .455. This value is lower compared to previous journal articles. For example, the research models of the study of van der Laan et al. (2010) in which different forms of long-term variable compensation are the dependent variables, show adjusted R^2 of about the 70%. However, compared to the theses of previous MSc students, 45.5% is relatively high. To illustrate, the model used in the study of Postmus (2015) shows an R^2 of 17%. Moreover, it can be seen in Table 5.5 that the adjusted R^2 extremely increased from model 3 to model 4 (1.5% vs 29.9%). This increase is caused by adding the firm size variable to the model indicating that firm size is a very important variable in explaining the long-term incentive compensation. Furthermore, the model in Table 5.5 shows an F-statistic of 11.123*** which indicates the overall significance of the model compared to a model in which no independent variables are included.

5.3.2.2. Robustness checks

Several robustness tests have been conducted to increase the validity of the results in Table 5.5. The first robustness checks that have been conducted are replacing the way firm performance has been measured and including one-year lagged performance data instead of contemporaneous data. The results are presented in Table 5.6 below. As can be seen in Table 5.6, the first model (1) is the same as model 13 in Table 5.5. Next, in model 2, 3 and 4, RET has been replaced for Tobin's Q, ROA and ROS. As the results presented in model 2 of Table 5.6 show, the effect of Tobin's Q is highly significant and positive (beta= .170***, t= 2.833) which supports hypothesis 2. Moreover, it is also in line with the initial results. Tobin's Q and RET both showing significant results is in line with the study of Duffhues & Kabir (2008). Besides, models 3 and 4 in Table 5.6 show that also the accounting-based

Table 5.6. OLS regression results hypothesis 2 with both contemporaneous and lagged performance variables

Variable	Natural logarithm of long-term incentive compensation (LN_LTI)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Constant)	-6.215 (-1.232)	-10.802** (-2.055)	-3.808 (-.755)	-3.154 (-.607)	-6.894 (-1.359)	-8.791* (-1.739)	-5.326 (-1.039)	-5.281 (1.020)
RET	.128* (1.946)							
Tobin's Q		.170*** (2.833)						
ROA			.124** (2.123)					
ROS				.099* (1.716)				
RET $_{t-1}$					.190*** (3.334)			
Tobin's Q $_{t-1}$						.171*** (2.817)		
ROA $_{t-1}$							.017 (.288)	
ROS $_{t-1}$								.016 (.267)
CEO_age	-.207*** (-3.222)	-.166** (-2.559)	-.243*** (-3.736)	-.239*** (-3.652)	-.212*** (-3.288)	-.179*** (-2.803)	-.216*** (-3.291)	-.215*** (-3.304)
CEO_ten	.017 (.261)	-.022 (-.366)	.040 (.634)	.026 (.408)	.008 (.121)	-.018 (-.280)	.026 (.409)	.024 (.372)
LN_Assets	.428*** (4.815)	.431*** (4.966)	.413*** (4.720)	.393*** (4.416)	.425*** (4.772)	.417*** (4.814)	.415*** (4.663)	.412*** (4.560)
Lev	-.021 (-.343)	-.006 (-.094)	-.025 (-.417)	-.035 (-.565)	-.018 (-.293)	.009 (.146)	-.016 (-.267)	-.020 (-.323)
Board_size	.017 (.185)	.013 (.148)	.058 (.656)	.052 (.585)	.051 (.570)	.025 (.285)	.041 (.443)	.039 (.425)
Rel_SB_size	.079 (1.380)	.093* (1.657)	.070 (1.238)	.081 (1.426)	.087 (1.511)	.064 (1.137)	.078 (1.361)	.080 (1.396)
CC_dum	.157** (2.229)	.131* (1.912)	.126* (1.810)	.144** (2.070)	.133* (1.887)	.114 (1.643)	.138* (1.916)	.142** (2.031)
Own_con	-.235*** (-4.003)	-.224*** (-3.891)	-.248*** (-4.242)	-.242*** (-4.133)	-.219*** (-3.703)	-.219*** (-3.795)	-.237*** (-3.987)	-.235*** (-3.990)
Prio_Shares_dum	.014 (.251)	.039 (.693)	.007 (.115)	.009 (.152)	.022 (.378)	.048 (.840)	.020 (.353)	.019 (.335)
Pref_Shares_dum	.006 (.093)	.010 (.152)	-.001 (-.015)	.011 (.162)	-.015 (-.213)	.028 (.432)	.017 (.247)	.018 (.267)
Industry dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES
N	45.5%	199	199	199	186	199	199	199
Adjusted R^2	195	.468	.458	.453	.475	.468	.445	.445
F-statistic	11.123***	11.882***	11.451***	11.260***	11.481***	11.870***	10.910***	10.908***

*Notes: This table reports the standardized coefficients (t-values are presented in parentheses). The compensation variable (LN_LTI) and performance variable (RET, Tobin's Q, ROA and ROS) have been winsorized at the 5% level. All the other (control) variables are one-year lagged. The variable definitions can be found in Table 3.1. *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

firm performance variables positively affect long-term incentive pay (beta= .124**, t= 2.123 and beta= .099*, t= 1.716 respectively).

As another robustness check, one-year lagged performance data have been used. As the results in models 5 and 6 in Table 5.6 show, the effect of both RET and Tobin's Q are very significantly positive (RET, beta= .190***, t= 3.334; Tobin's Q, beta= .171***, t= 2.817), confirming the previous results. However, the significance level of the effect of RET increased when lagged-performance data have been used. Besides, the results of models 7 and 8 in Table 5.6 show that when one-year lagged performance data have been used, the significant effect of ROA and ROS disappeared. Regarding the control variables, the results presented in Table 5.6 are in line with the initial results of the full model (13) in Table 5.5.

As described in section 2.1.3.4., pensions have become a significant part of the CEO's compensation during the last years (Yu Liu et al., 2014). Therefore, ignoring pensions could result in underestimating a very large and significant part of CEO's compensation. Therefore, as a robustness check, pensions have been included as a form of long-term incentive compensation (LTI-P) in Appendix C5. Regarding the performance variable, the results did not change much compared to the initial results presented in Table 5.5 and Table 5.6. When using contemporaneous performance data the results show that the effects of Tobin's Q, ROA and ROS remained significantly positive, only the effect of RET became insignificant. Moreover, model 5 and 6 in Table C5 show that similar to Table 5.6, the effects of market-based firm performance become more significant when one-year lagged data have been used. Regarding the control variables, Appendix C5 shows some other results compared to the results in Table 5.5 and Table 5.6. In contrast to the initial results, the effect of leverage becomes significantly positive when pensions are included, whereas the significantly negative effect of CEO age disappeared in some models.

Besides changing the way performance has been measured and including pensions as a form of long-term incentive, also, the way long-term incentive pay is measured has been changed in the robustness checks. In Appendix C6, long-term incentive compensation has been measured as a percentage of total variable compensation (LTI(-P)_%) in Table C6A and as logarithm (LOG_LTI(-P)) in table C6B. Based on the results in Table C6A it can be stated that when long-term incentive compensation is measured in percentage points, there is no robust evidence that market-based firm performance has a significantly positive effect on long-term variable compensation. However, results in Table C6B show that except for model 5 all models show a significantly positive effect of market-based firm performance on long-term variable compensation when it has been measured as the logarithm. Regarding the control variables, the results in Appendix C6 show that in contrast to the initial results, the presence of a compensation committee and concentrated owners loses significance when compensation is measured in percentage points (Table C6A). Moreover, when

compensation is measured as logarithm (Table C6B) and pensions have been included (model 5 and 8), results show significant negative effects of leverage on compensation.

As a next robustness check, sub-samples have been created based on industry classification. As described in section 4.1.2, the following four industry groups have been identified: construction & real estate, manufacturing, transportation commodities & trade, and other service companies. Appendix C7 presents the OLS results in which these four sub-samples have been used. Regarding the performance variables, results presented in Table C7A show that overall, no significant effects have been found when contemporaneous data have been used, except from the RET within the transportation, commodities and trade industry group (beta= -.106**, t=-2.489). However, the results in Table C7B show that when one-year lagged performance data have been used, this significant effect disappeared (model 5), while the effect for firms in the manufacturing (model 3) and other services companies (model 7) became significantly positive. Using sub-samples based on industry classification and not showing the same effect of firm performance on compensation is in line with the study of Duffhues & Kabir (2008). Regarding the control variables, it can be stated that there are some differences between the industries. To illustrate, concentrated owners have a significantly negative effect on LN_LTI for firms within the manufacturing and other service companies industry, whereas this effect is significantly positive for firms within the transportation, commodities and trade sector. For more detailed information, Appendix C7 can be consulted.

As a next robustness test, the random effects (RE) model has been applied. The Hausman Test in Table C8A showed that the null hypothesis cannot be rejected and that therefore the random effects model should have been applied. This has been done in Table C8B and the results in this table show that the results of the RE-model are more or less in line with the pooled OLS results in Table 5.6. The effect of RET (model 1) on long-term incentive compensation (LN_LTI) is statistically insignificant (p= .126) whereas it was significant at the 10% level in the pooled model (Table 5.6). However, similar to the results of model 2 in Table 5.6, the effect of Tobin's Q (model 2) is significantly positive at the 1% level. The significance level of the effect of market-based performance on CEO pay remaining the same when applying the RE-model is in line with the study of Alves et al. (2014). Moreover, similar to the results of Table 5.6, using one-year lagged performance data (model 3 and 4) results in more significant effects. Regarding the control variables, the results are also in line with the initial results (Table 5.6).

As a last robustness test, sub-samples have been created based on a dummy variable which separates firms in which the long-term incentive compensation of the CEO depends on set goals regarding market-based firm performance, according to their annual reports, from firms who set goals which do not relate to market-based firm performance. The results in Table C9B show that based on the information in the annual reports, 80.6% of the firms depend the long-term variable

compensation of the CEO on goals related to market-based firm performance (RET, Tobin's Q, TSR, EPS). This indicates that market-based firm performance can be seen as an appropriate measure to include in the model. Moreover, model 1 and 2 in Table C9A show that the effect of both RET and Tobin's Q is significantly positive for firms in which, according to their annual reports, the long-term incentive compensation of the CEO depends on goals related to market-based firm performance. In contrast, the results of models 5-8 in Table C9A show that these effects are not significantly positive for firms in which the long-term variable compensation of the CEO does not depend on market-based performance-related goals, according to their annual reports. These results indicate that the firms indeed pay their CEOs higher amounts of long-term variable compensation if the firms do perform well (as measured by market-based performance measures) and this has been agreed on in the compensation contracts set at the beginning of the year.

Overall, there is no robust evidence to state that higher market-based firm performance results in higher long-term incentive compensation for CEOs of Dutch listed firms. The results showed that it depends on several factors. Examples of these factors are which market-based performance variable has been used (RET, Tobin's Q), if contemporaneous or one-year lagged performance data have been used, if pensions are included as long-term incentive compensation, how compensation is measured (LN, LOG, %), and whether or not sub-samples based on industry classification have been used. To illustrate, if the total sample has been used, the effect of Tobin's Q (and to a lesser extent RET) is significantly positive for almost all the results. However, when sub-samples have been used based on industry classification (Appendix C7), the significant effect disappeared. All things considered, there is not sufficient robust evidence to confirm hypothesis 2. Regarding the control variables, there seems to be robust evidence that when the total sample has been used, firm size and the presence of a compensation committee have a significantly positive effect on long-term incentive compensation, whereas CEO age and concentrated owners have a significantly negative effect. However, when sub-samples based on industry classifications have been used, some of the significant effects disappeared.

6. Conclusion

This chapter describes the conclusions and limitations of this study. First, the conclusions of the results presented in the previous chapter are described and the formulated research question will be answered. Thereafter, the limitations of this study will be discussed and recommendations will be made for future research.

6.1. Conclusion

During the past decades, the relationship between executive compensation and firm performance has been studied extensively. Researchers investigated both the effect of firm performance on executive compensation and the reversed effect. However, ambiguity among the results still exists. Researchers have found positive, negative and no significant effects. The remuneration of executives is not only a hot topic within the research field, but it also received a lot of (negative) attention in society during the last years. To illustrate, in 2020 KLM intended to increase the variable remuneration of its CEO with 75% up to 100% of its base salary, while the firm received financial support of the Dutch government to survive the difficult time caused by the COVID-19 virus. Due to that, the intended raise in remuneration of its CEO did not match the circumstances, it received a lot of negative attention of both the public and the politics. The information above makes clear that the pay-performance relationship is still a hot topic in both literature and society.

According to the agency theory, shareholders and executives have different interests and different attitudes towards risk and that these ''agency issues'' can be mitigated by depending the compensation of the executives on the firm's performances. Therefore, a positive effect of firm performance on executive compensation is expected. In this study, the focus has been on the compensation of the CEOs of Dutch publicly listed firms. In this section, the in section 1.2. formulated research question will be answered:

To what extent does the compensation of CEOs of Dutch listed firms depend on firm performance?

To answer this question, two hypotheses have been formulated in section 2.6. The first hypothesis stated that accounting-based firm performance measures have a positive effect on short-term incentive compensation (bonus). Moreover, the second hypothesis stated that market-based firm performance measures have a positive effect on the long-term incentive compensation of the CEOs of Dutch listed firms.

Based on the results in which the total sample has been used, it can be stated that there is a significantly positive effect of accounting-based firm performance on short-term incentive compensation, supporting hypothesis 1. However, when sub-samples based on industry classification have been used, some of the significant effects disappeared. Therefore, based on the results of the OLS regression analyses and the conducted robustness tests, it can be stated that hypothesis 1 can

be confirmed for firms located in the manufacturing sector and other services sector when contemporaneous performance data have been used, while it can only be confirmed for firms in the other services sector when one-year lagged performance data have been used. In contrast, hypothesis 1 cannot be confirmed for firms located in the construction & real estate sector and firms located in the transportation, commodities & trade sector.

Furthermore, there is no robust evidence that hypothesis 2 can be confirmed. Regarding the long-term incentive compensation, it depends on which firm performance variables have been used, how long-term incentive pay has been measured, if contemporaneous or one-year lagged performance data have been used, if pensions have been included and whether or not sub-samples based on industry classifications have been used. When analysing the results in which the total sample has been used, the results show that there is robust evidence that Tobin's Q significantly and positively affects long-term incentive compensation, whereas there is less robust evidence for the effect of RET on long-term incentive compensation. However, this significant effect disappeared when sub-samples based on industry classification have been used.

Regarding the control variables, there are also some interesting findings to be mentioned. When the total sample has been used in the regression analyses, almost all models show that the effects of firm size and the presence of a compensation committee on variable compensation are significantly positive and the effects of concentrated owners and CEO age (only when long-term incentive compensation is the dependent variable) are significantly negative. However, some of these significant effects disappeared when sub-samples based on industry classification have been used.

All things considered, to answer the formulated research question, it highly depends on whether this question is meant for short-term- or long-term compensation, how firm performance has been measured, how compensation has been measured, if pensions have been included (in case of long-term incentive compensation), if contemporaneous or lagged performance variables have been used and if sub-samples based on industry classifications have been used. To conclude, there is a statistically significant and robust positive effect of accounting-based firm performance on short-term incentive compensation for firms located in the other services sector. However, there is no unambiguous statistically significant and robust positive effect of market-based firm performance on long-term incentive compensation.

6.2. Limitations and recommendations for future research

As concluded in section 6.1., this study showed some interesting findings and, therefore, contributes to the pay-performance literature. However, a limitation of this study is that this study only focused on the CEOs of publicly listed firms, whereas it did not focus on privately listed firms. Since the

introduction of the Code Tabaksplat, publicly listed firms are obliged to report information regarding the compensation of their CEOs in their annual reports. Therefore, these firms have been used in this study whereas privately listed firms are not, due to information constraints. Next, due to that in this study only Dutch listed firms have been used, it is hard to generalize the results of this study to other countries. To make this happen, a study should be conducted to compare the results of different countries. Another limitation of this study is that in this study, data of Dutch listed firms have been used over a period of only three years. Regarding the results in which the total sample size has been used, it seems that this was not a problem because the sample size was about 200 observations. However, during the robustness check, in which sub-samples have been created based on industry classifications, the results show that for some industry groups, the sample size was below 30 observations which is below the standard of 50 observations needed for multiple regression analysis. Using data of for example 5-7 years, the minimum sample size of 50 observations would have been achieved easily. The last limitation of this study is that during the robustness tests, one-year lagged performance variables have been used. Especially regarding the results of the second hypothesis (market-based performance), the results show that the effect of performance on long-term incentive compensation became more significant compared to the initial results in which contemporaneous data have been used. This might indicate that regarding the long-term incentive compensation, lagged market-based performance variables are important and that it could take more than one year of good performance to be compensated for that. Therefore, instead of using one-year lagged market-based firm performance data, it might have been better to use three-year lagged performance data, for example.

Based on the results and limitations, some recommendations for future research can be made. The first recommendation is concerned with the generalizability of the findings of this study. As mentioned above, by including also the data of privately listed firms, the findings could be more generalized. Besides, if also the data of listed firms of other countries (for example Germany, Belgium and Luxembourg) were included, the results could be generalized over the entire Benelux. Furthermore, it could be possible to compare the results of a country with a two-tier board structure with the results of a country with a one-tier board structure. Another recommendation is that it could be interesting to include the base salary as an independent variable since it could be the case that firms who pay their CEOs a higher base salary, also pay their CEOs higher variable compensation. Moreover, future research could choose to not only focus on the compensation of the CEOs but also on the compensation of other executives such as the CFO or COO. Another recommendation for future research is to extend the sampling period of the data. As mentioned above, extending the sampling period results in more firm-year observations which make it possible to use more sub-samples and keep the sufficient sample size. Moreover, using a larger sampling period also makes it

possible to use three- or five-year lagged performance data instead of one-year performance data. This makes it possible to use a larger time-frame, which especially regarding the long-term incentive compensation could be useful, as described in the limitations above. Another suggestion for future research is to not only include the firm performance variables as an indicator for performance but also focus on the qualitative individual performances of the CEOs. The annual reports of the listed firms provide information regarding the financial goals set at the beginning of the year and to what extent they have been accomplished. However, as can be read in the reports, the variable compensation also seems to be dependent on the individual qualitative goals. As can be seen in Table C10A in Appendix C10, 72.5% of the firms also depend the short-term incentive compensation of the CEO on goals regarding the individual quality of the CEO. Moreover, this is the case for 47.7% of the firm regarding the long-term variable compensation of the CEO (Table C10B). Therefore, it might be interesting to also include this information as a performance variable. However, it is hard to collect these data since these data most often are not numerical and not published in the annual reports, due to privacy and competitive issues. Next, future scholars could choose to use less-standard methods for their analysis. As previously mentioned, most researchers in the pay-performance literature use the OLS pooled or the fixed- or random effects model. However, some researchers in the past did use methods such as the GMM or the 2SLS. Making use of other kinds of methods could increase the validity and reliability of the results.

Besides the above-mentioned recommendations for future research, also a recommendation towards the Dutch government can be made. A significant amount of data used in this study had to be hand-collected. This is specifically the case for compensation data and a part of the corporate governance data. Currently, in the Netherlands, there is no database freely accessible in which all compensation data of the CEOs of the listed firms is presented. Since the remuneration of the CEOs of listed firms is a hot topic in Dutch society, the recommendation towards the Dutch government can be made to establish a database in which these data is presented and as such stimulate scientific research regarding this topic. For example, this could be done by the Dutch Authority for the Financial Markets (AFM).

Appendices

Appendix A – Sample firms

Appendix A1 – Overview sample firms

Table A1. Overview sample firms

	2016	2017	2018		2016	2017	2018
AALBERTS NV				KONINKLIJKE BOSKALIS WESTMINSTER NV			
ACCELL GROUP NV				KONINKLIJKE BRILL NV			
AFC AJAX NV				KONINKLIJKE DSM NV			
AKZO NOBEL NV				KONINKLIJKE KPN NV			
ALFEN NV	X	X		KONINKLIJKE PHILIPS NV			
ALTICE EUROPE NV				KONINKLIJKE VOLKERWESSELS NV	X		
ALUMEXX N.V.	X	X		KONINKLIJKE VOPAK NV			
AMG NV				LUCAS BOLS NV			
AMSTERDAM COMMODITIES NV				N.V KONINKLIJKE PORCELEYNE FLES			
AND INTERNATIONAL PUBLISHERS NV				NEDAP NV			
ARCADIS NV				NEWAYS ELECTRONICS NV			
ASM INTERNATIONAL NV				NSI NV			
ASML HOLDING NV				OCI NV			
AVANTIUM NV				ORANJEWOUD NV			
BASIC-FIT NV				ORDINA NV			
BE SEMICONDUCTOR INDUSTRIES NV				PHARMING GROUP NV			
BETER BED HOLDING NV				POSTNL NV			
BRUNEL INTERNATIONAL NV				RANDSTAD NV			
C/TAC NV				ROODMICROTEC NV			
CORBION NV				ROYAL DUTCH SHELL PLC			
DPA GROUP NV				SBM OFFSHORE NV			
EUROCOMMERCIAL PROPERTIES NV				SIF HOLDING NV			
FORFARMERS NV				SIGNIFY NV			
FUGRO NV				SLIGRO FOOD GROUP NV			
GRANDVISION NV				SNOWWORLD NV			
HEIJMANS NV				STERN GROEP NV			
HEINEKEN NV				TAKEAWAY.COM NV			
HOLLAND COLOURS NV				TIE KINETIX NV			
HYDRATEC INDUSTRIES NV				TKH GROUP NV			
ICT GROUP NV				TOMTOM NV			
IMCD NV				UNILEVER NV			
INTERTRUST NV				VASTNED RETAIL NV			
KARDAN NV				WERELDHAVE NV			
KENDRION NV				WOLTERS KLUWER NV			
KONINKLIJKE AHOLD DELHAIZE NV				**TOTAL**	**67**	**68**	**70**
KONINKLIJKE BAM GROEP NV				***Not present in the sample***	X		

Appendix A2 – Overview NACE. Rev. 2 reclassification per sample firm

Table A2. Reclassification per sample firm

Firm	NACE REV 2 Classification	Reclassification group
AALBERTS N.V.	C - Manufacturing	Manufacturing
ACCELL GROUP NV	C - Manufacturing	Manufacturing
AFC AJAX NV	R - Arts, entertainment and recreation	Other service companies
AKZO NOBEL NV	C - Manufacturing	Manufacturing
ALFEN N.V.	C - Manufacturing	Manufacturing
ALTICE EUROPE N.V.	J - Information and communication	Other service companies
ALUMEXX N.V.	J - Information and communication	Other service companies
AMG ADVANCED METALLURGICAL GROUP N.V.	C - Manufacturing	Manufacturing
AMSTERDAM COMMODITIES N.V.	G - Wholesale and retail trade; repair of motor vehicles and motorcycles	Transportation, commodities and trade
AND INTERNATIONAL PUBLISHERS NV	J - Information and communication	Other service companies
ARCADIS NV	M - Professional, scientific and technical activities	Other service companies
ASM INTERNATIONAL NV	C - Manufacturing	Manufacturing
ASML HOLDING N.V.	C - Manufacturing	Manufacturing
AVANTIUM N.V.	C - Manufacturing	Manufacturing
BASIC-FIT N.V.	R - Arts, entertainment and recreation	Other service companies
BE SEMICONDUCTOR INDUSTRIES NV	C - Manufacturing	Manufacturing
BETER BED HOLDING NV	C - Manufacturing	Manufacturing
BRUNEL INTERNATIONAL NV	M - Professional, scientific and technical activities	Other service companies
C/TAC NV	J - Information and communication	Other service companies
CORBION N.V.	C - Manufacturing	Manufacturing
DPA GROUP N.V.	N - Administrative and support service activities	Other service companies
EUROCOMMERCIAL PROPERTIES N.V.	L - Real estate activities	Construction & Real estate
FORFARMERS N.V.	A - Agriculture, forestry and fishing	Transportation, commodities and trade
FUGRO NV	M - Professional, scientific and technical activities	Other service companies
GRANDVISION N.V	G - Wholesale and retail trade; repair of motor vehicles and motorcycles	Transportation, commodities and trade
HEIJMANS NV	F - Construction	Construction & Real estate
HEINEKEN NV	C - Manufacturing	Manufacturing
HOLLAND COLOURS NV	C - Manufacturing	Manufacturing
HYDRATEC INDUSTRIES N.V.	C - Manufacturing	Manufacturing
ICT GROUP N.V.	J - Information and communication	Other service companies
IMCD N.V.	C - Manufacturing	Manufacturing
INTERTRUST N.V.	M - Professional, scientific and technical activities	Other service companies
KARDAN N.V.	L - Real estate activities	Construction & Real estate
KENDRION N.V.	C - Manufacturing	Manufacturing
KONINKLIJKE AHOLD DELHAIZE N.V.	G - Wholesale and retail trade; repair of motor vehicles and motorcycles	Transportation, commodities and trade
KONINKLIJKE BAM GROEP NV	F - Construction	Construction & Real estate
KONINKLIJKE BOSKALIS WESTMINSTER NV	F - Construction	Construction & Real estate
KONINKLIJKE BRILL NV	J - Information and communication	Other service companies
KONINKLIJKE DSM N.V.	C - Manufacturing	Manufacturing

KONINKLIJKE KPN NV	J - Information and communication	Other service companies
KONINKLIJKE PHILIPS N.V.	C - Manufacturing	Manufacturing
KONINKLIJKE VOLKERWESSELS N.V.	F - Construction	Construction & Real estate
KONINKLIJKE VOPAK N.V.	H - Transportation and storage	Transportation, commodities and trade
LUCAS BOLS N.V	C - Manufacturing	Manufacturing
N.V. KONINKLIJKE PORCELEYNE FLES	C - Manufacturing	Manufacturing
NEDERLANDSCHE APPARATENFABRIEK 'NEDAP' N.V.	C - Manufacturing	Manufacturing
NEWAYS ELECTRONICS INTERNATIONAL NV	C - Manufacturing	Manufacturing
NSI N.V.	L - Real estate activities	Construction & Real estate
OCI N.V	C - Manufacturing	Manufacturing
ORANJEWOUD N.V.	S - Other service activities	Other service companies
ORDINA NV	J - Information and communication	Other service companies
PHARMING GROUP NV	C - Manufacturing	Manufacturing
POSTNL N.V.	H - Transportation and storage	Transportation, commodities and trade
RANDSTAD NV	N - Administrative and support service activities	Other service companies
ROODMICROTEC N.V.	C - Manufacturing	Manufacturing
ROYAL DUTCH SHELL PLC	B - Mining and quarrying	Transportation, commodities and trade
SBM OFFSHORE N.V.	B - Mining and quarrying	Transportation, commodities and trade
SIF HOLDING N.V.	C - Manufacturing	Manufacturing
SIGNIFY N.V.	C - Manufacturing	Manufacturing
SLIGRO FOOD GROUP N.V.	G - Wholesale and retail trade; repair of motor vehicles and motorcycles	Transportation, commodities and trade
SNOWWORLD N.V.	C - Manufacturing	Manufacturing
STERN GROEP NV	G - Wholesale and retail trade; repair of motor vehicles and motorcycles	Transportation, commodities and trade
TAKEAWAY.COM N.V.	J - Information and communication	Other service companies
TIE KINETIX N.V.	J - Information and communication	Other service companies
TKH GROUP N.V.	C - Manufacturing	Manufacturing
TOMTOM NV	C - Manufacturing	Manufacturing
UNILEVER NV	C - Manufacturing	Manufacturing
VASTNED RETAIL N.V.	L - Real estate activities	Construction & Real estate
WERELDHAVE NV	L - Real estate activities	Construction & Real estate
WOLTERS KLUWER NV	J - Information and communication	Other service companies

Appendix B – VIF values

Short-term incentive (LN_STI) models

Table B1. VIF LN_STI ROA

Model	Tolerance	VIF
Constant		
ROA	.800	1.250
CEO_age	.654	1.530
CEO_ten	.673	1.487
LN_Assets	.351	2.849
Lev	.738	1.356
Board_size	.354	2.823
Rel_SB	.894	1.119
CC_dummy	.561	1.781
Own_Con	.808	1.238
Prio_Shares_dum	.829	1.207
Pref_Shares_dum	.608	1.645
Industry_dum1	.646	1.549
Industry_dum2	.512	1.951
Industry_dum3	.607	1.647
Year_dum1	.733	1.365
Year_dum2	.725	1.379

Table B2. VIF LN_STI ROS

Model	Tolerance	VIF
Constant		
ROS	.827	1.209
CEO_age	.648	1.544
CEO_ten	.684	1.461
LN_Assets	.342	2.921
Lev	.722	1.384
Board_size	.357	2.802
Rel_SB	.897	1.115
CC_dummy	.570	1.755
Own_Con	.812	1.231
Prio_Shares_dum	.828	1.208
Pref_Shares_dum	.617	1.620
Industry_dum1	.649	1.542
Industry_dum2	.540	1.851
Industry_dum3	.632	1.583
Year_dum1	.733	1.365
Year_dum2	.723	1.382

Table B3. VIF LN_STI RET

Model	Tolerance	VIF
Constant		
RET	.655	1.527
CEO_age	.662	1.509
CEO_ten	.660	1.514
LN_Assets	.342	2.925
Lev	.744	1.344
Board_size	.352	2.838
Rel_SB	.898	1.113
CC_dummy	.556	1.798
Own_Con	.817	1.223
Prio_Shares_dum	.840	1.191
Pref_Shares_dum	.615	1.625
Industry_dum1	.651	1.535
Industry_dum2	.535	1.870
Industry_dum3	.630	1.586
Year_dum1	.689	1.452
Year_dum2	.611	1.636

Table B4. VIF LN_STI Tobin's Q

Model	Tolerance	VIF
Constant		
Tobin's Q	.706	1.417
CEO_age	.634	1.578
CEO_ten	.634	1.576
LN_Assets	.349	2.868
Lev	.735	1.360
Board_size	.355	2.816
Rel_SB	.897	1.115
CC_dummy	.567	1.762
Own_Con	.815	1.227
Prio_Shares_dum	.825	1.212
Pref_Shares_dum	.619	1.615
Industry_dum1	.599	1.671
Industry_dum2	.538	1.858
Industry_dum3	.627	1.594
Year_dum1	.721	1.388
Year_dum2	.723	1.382

*Note: All VIF values are below 5, therefore remain significantly within the critical range of 5 to 10. Based on this, it can be stated that multicollinearity seems to be no problem within this study.

Long-term incentive models (LN_LTI)

Table B5. VIF LN_LTI ROA

Model	Tolerance	VIF
Constant		
ROA	.800	1.250
CEO_age	.654	1.530
CEO_ten	.673	1.487
LN_Assets	.351	2.849
Lev	.738	1.356
Board_size	.354	2.823
Rel_SB	.894	1.119
CC_dummy	.561	1.781
Own_Con	.808	1.238
Prio_Shares_dum	.829	1.207
Pref_Shares_dum	.608	1.645
Industry_dum1	.646	1.549
Industry_dum2	.512	1.951
Industry_dum3	.607	1.647
Year_dum1	.733	1.365
Year_dum2	.725	1.379

Table B6. VIF LN_LTI ROS

Model	Tolerance	VIF
Constant		
ROS	.827	1.209
CEO_age	.648	1.544
CEO_ten	.684	1.461
LN_Assets	.342	2.921
Lev	.722	1.384
Board_size	.357	2.802
Rel_SB	.897	1.115
CC_dummy	.570	1.755
Own_Con	.812	1.231
Prio_Shares_dum	.828	1.208
Pref_Shares_dum	.617	1.620
Industry_dum1	.649	1.542
Industry_dum2	.540	1.851
Industry_dum3	.632	1.583
Year_dum1	.733	1.365
Year_dum2	.723	1.382

Table B7. VIF LN_LTI RET

Model	Tolerance	VIF
Constant		
RET	.655	1.527
CEO_age	.662	1.509
CEO_ten	.660	1.514
LN_Assets	.342	2.925
Lev	.744	1.344
Board_size	.352	2.838
Rel_SB	.898	1.113
CC_dummy	.556	1.798
Own_Con	.817	1.223
Prio_Shares_dum	.840	1.191
Pref_Shares_dum	.615	1.625
Industry_dum1	.651	1.535
Industry_dum2	.535	1.870
Industry_dum3	.630	1.586
Year_dum1	.689	1.452
Year_dum2	.611	1.636

Table B8. VIF LN_LTI Tobin's Q

Model	Tolerance	VIF
Constant		
Tobin's Q	.706	1.417
CEO_age	.634	1.578
CEO_ten	.634	1.576
LN_Assets	.349	2.868
Lev	.735	1.360
Board_size	.355	2.816
Rel_SB	.897	1.115
CC_dummy	.567	1.762
Own_Con	.815	1.227
Prio_Shares_dum	.825	1.212
Pref_Shares_dum	.619	1.615
Industry_dum1	.599	1.671
Industry_dum2	.538	1.858
Industry_dum3	.627	1.594
Year_dum1	.721	1.388
Year_dum2	.723	1.382

*Note: All VIF values are below 5, therefore remain significantly within the critical range of 5 to 10. Based on this, it can be stated that multicollinearity seems to be no problem within this study.

Appendix C – Robustness checks

Appendix C1 – Replacing LN_STI for STI_% and LOG_STI for hypothesis 1

Table C1. Robustness check hypothesis 1: OLS replacing LN_STI for STI_% and LOG_STI

Variable	STI pay divided by total variable pay (STI_%)				Logarithm of STI (LOG_STI)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Constant)	.539* (1.891)	.514* (1.737)	.529* (1.836)	.521* (1.782)	-1.984 (-1.141)	-1.861 (-1.005)	-2.430 (-1.336)	-2.278 (-1.235)
ROA	.175** (2.324)				.319*** (4.940)			
ROS		.079 (1.055)				.203*** (3.074)		
ROA $_{t-1}$			.139* (1.838)				.194*** (2.883)	
ROS $_{t-1}$				.103 (1.345)				.180*** (2.645)
CEO_age	.172** (2.053)	.193** (2.267)	.181** (2.152)	.196** (2.333)	.097 (1.351)	.120 (1.593)	.129* (1.718)	.142* (1.901)
CEO_ten	-.085 (-1.035)	-.107 (-1.294)	-.086 (-1.043)	-.108 (-1.311)	-.126* (-1.788)	-.164** (-2.264)	-.138* (-1.876)	-.167** (-2.296)
LN_Assets	-.125 (-1.103)	-.138 (-1.195)	-.138 (-1.211)	-.150 (-1.292)	.306*** (3.159)	.267** (2.620)	.290*** (2.859)	.262** (2.530)
Lev	.020 (.260)	.017 (.217)	.041 (.528)	.016 (.207)	-.056 (-.832)	-.071 (-1.012)	-.022 (-.310)	-.061 (-.874)
Board_size	-.033 (-.286)	-.053 (-.453)	-.013 (-.111)	-.038 (-.328)	-.021 (-.216)	-.047 (-.456)	-.008 (-.080)	-.034 (-.325)
Rel_SB_size	-.021 (-.293)	-.007 (-.094)	-.021 (-.280)	-.007 (-.098)	.012 (.187)	.039 (.598)	.019 (.286)	.038 (.575)
CC_dum	-.146 (-1.627)	-.122 (-1.350)	-.162* (-1.750)	-.124 (-1.373)	.144* (1.864)	.189** (2.372)	.133 (1.619)	.185** (2.305)
Own_con	.027 (.354)	.040 (.526)	.027 (.352)	.043 (.574)	-.186*** (-2.881)	-.167** (-2.488)	-.178*** (-2.634)	-.156** (-2.315)
Prio_Shares_dum	-.008 (-1.293)	.002 (.029)	.010 (.130)	.004 (.048)	-.010 (-.160)	.002 (.026)	.023 (.353)	.012 (.181)
Pref_Shares_dum	-.112 (-1.293)	-.091 (-1.044)	-.096 (-1.112)	-.085 (-.987)	.059 (.788)	.093 (1.212)	.092 (1.199)	.107 (1.389)
Industry dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES
N	199	199	199	199	199	199	199	199
Adjusted R^2	.096	.075	.086	.079	.335	.283	.279	.274
F-statistic	2.319***	2.005**	2.171***	2.056**	7.231***	5.883***	5.780***	5.661***

*Notes: This table reports the standardized coefficients (t-values are presented in parentheses). The compensation variable (STI_%, LOG_STI) and performance variables (ROA, ROS) have been winsorized at the 5% level. All control variables are one-year lagged. The variable definitions can be found in Table 3.1. *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

Appendix C2 – OLS using sub-samples by industry classification for hypothesis 1

Table C2A. Robustness check hypothesis 1: OLS using sub-samples by industry classification with contemporaneous performance variables

Variable	Natural logarithm of short-term incentive compensation (LN_STI)							
	Construction & Real estate		Manufacturing		Transportation, commodities and trade		Other service companies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Constant)	-188.981** (-2.686)	-204.152** (-2.765)	-4.688 (-.706)	.388 (.042)	-1.918 (-.259)	-4.312 (-.559)	7.267 (1.059)	3.528 (.492)
ROA	.218 (.837)		.292*** (3.114)		-.292 (-1.540)		.294** (2.601)	
ROS		.010 (.036)		.213* (1.899)		-.155 (-.713)		.079 (.707)
CEO_age	.670 (1.241)	.543 (.981)	-.061 (-.584)	-.074 (-.643)	-.105 (-.230)	-.382 (-.658)	.197* (1.695)	.273** (2.272)
CEO_ten	-1.472* (-1.778)	-1.687* (-2.004)	-.009 (-.081)	.003 (.031)	-.252 (-.381)	.228 (.288)	-.318*** (-2.811)	-.331*** (-2.718)
LN_Assets	1.328** (2.568)	1.521** (3.004)	.486*** (2.999)	.350* (1.928)	.202 (.469)	.550 (.889)	-.068 (-.356)	.000 (.001)
Lev	-.159 (-.290)	-.355 (-.701)	-.045 (-.461)	-.029 (-.281)	-.181 (-.827)	-.166 (-.695)	.093 (.527)	-.018 (-.097)
Board_size	-.035 (-.100)	-.188 (-.562)	.026 (.153)	.045 (.255)	.228 (.664)	.235 (.625)	-.076 (-.491)	-.166 (-1.033)
Rel_SB_size	.240 (.800)	.299 (.999)	-.015 (-.132)	-.026 (-.226)	.536** (2.942)	.483** (2.512)	.035 (.338)	.021 (.192)
CC_dum	.086 (.484)	.076 (.401)	.144 (1.212)	.236* (1.811)	-.253 (-.514)	-.525 (-.830)	.349* (1.946)	.511** (2.791)
Own_con	-.202 (-.893)	-.188 (-.813)	-.060 (-.518)	-.036 (-.297)	.343 (1.282)	.182 (.663)	-.408*** (-3.281)	-.433*** (-3.253)
Prio_Shares_dum	.372 (.556)	.615 (.976)	-.093 (-.887)	-.034 (-.316)	-.135 (-.530)	-.009 (-.032)	-.171 (-1.353)	-.214 (-1.578)
Pref_Shares_dum	-.343 (-.807)	-.470 (-1.136)	-.036 (-.292)	.029 (.232)	.095 (.361)	.230 (.665)	-.083 (-.701)	-.102 (-.806)
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES
N	27	27	89	89	29	29	56	56
Adjusted R^2	.373	.340	.347	.296	.569	.517	.534	.465
F-statistic	2.191*	2.028	4.595***	3.850***	3.843***	3.307**	5.846***	4.679***

*Notes: This table reports the standardized coefficients (t-values are presented in parentheses). The compensation variable (LN_STI) and performance variables (ROA, ROS) have been winsorized at the 5% level. All control variables are one-year lagged. The variable definitions can be found in Table 3.1. *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

Table C2B. Robustness check hypothesis 1: OLS using sub-samples by industry classification with one-year lagged performance variables

Variable	Natural logarithm of short-term incentive compensation (LN_STI)							
	Construction & Real estate		Manufacturing		Transportation, commodities and trade		Other service companies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Constant)	-203.161** (-2.980)	-207.575*** (-3.049)	-5.032 (-.684)	-3.477 (-.386)	-.430 (-.062)	-3.873 (-.504)	5.760 (.843)	2.713 (.395)
ROA $_{t-1}$	.172 (.720)		.112 (1.072)		-.478** (-2.232)		.274** (2.410)	
ROS $_{t-1}$		.282 (.752)		.090 (.736)		-.165 (-.746)		.217** (2.088)
CEO_age	.579 (1.103)	.491 (.929)	-.023 (-.200)	-.024 (-.199)	.068 (.157)	-.375 (-.661)	.205* (1.749)	.265** (2.307)
CEO_ten	-1.745** (-2.206)	-1.829** (-2.269)	-.023 (-.203)	-.024 (-.205)	-.626 (-.952)	.220 (.283)	-.308** (-2.694)	-.320*** (-2.762)
LN_Assets	1.474*** (3.154)	1.506*** (3.266)	.438** (2.499)	.396* (1.915)	.057 (.139)	.497 (.885)	.015 (.081)	.040 (.207)
Lev	-.349 (-.702)	-.424 (-.841)	-.002 (-.018)	-.009 (-.091)	-.199 (-.980)	-.113 (-.498)	.063 (.362)	-.023 (-.129)
Board_size	-.124 (-.394)	-.036 (-.100)	.045 (.237)	.031 (.160)	.034 (.099)	.254 (.691)	-.098 (-.637)	-.146 (-.947)
Rel_SB_size	.356 (1.172)	.425 (1.259)	.006 (.048)	.006 (.048)	.537*** (3.170)	.503** (2.633)	-.010 (-.093)	.002 (.016)
CC_dum	.049 (.271)	-.021 (-.096)	.137 (1.077)	.189 (1.419)	-.004 (-.008)	-.523 (-.842)	.350* (1.904)	.433** (2.472)
Own_con	-.211 (-.923)	-.177 (-.782)	-.049 (-.395)	-.036 (-.292)	.458 (1.756)	.189 (.694)	-.471*** (-3.722)	-.465*** (-3.621)
Prio_Shares_dum	.656 (1.085)	.711 (1.159)	-.038 (-.351)	-.022 (-.206)	-.340 (-1.274)	-.001 (-.005)	-.157 (-1.218)	-.164 (-1.245)
Pref_Shares_dum	- .384 (-.922)	-.384 (-.925)	.027 (.212)	.037 (.291)	.105 (.427)	.211 (.648)	-.089 (-.742)	-.088 (-.727)
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES
N	27	27	89	89	29	29	56	56
Adjusted R^2	.365	.367	.274	.268	.625	.519	.525	.510
F-statistic	2.149*	2.160*	3.549***	3.475***	4.594***	3.321**	5.667***	5.397***

*Notes: This table reports the standardized coefficients (t-values are presented in parentheses). The compensation variable (LN_STI) and performance variables (ROA, ROS) have been winsorized at the 5% level. All control variables are one-year lagged. The variable definitions can be found in Table 3.1. *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

Appendix C3 – Hausman Test and RE-effects model for hypothesis 1

Table C3A. Hausman Test hypothesis 1

Variable	**Coefficients**		
LN_STI	**(b) FE**	**(B) RE**	**Difference (b-B)**
ROA	17.585	17.567	.018
CEO_age	.066	.066	-.000
CEO_ten	-.076	-.077	.001
LN_Assets	.535	.534	.001
Lev	-1.532	-1.518	-.014
Board_size	.004	.003	.001
Rel_SB_size	1.767	1.780	-.013
CC_dum	1.521	1.522	-.001
Own_con	-3.656	-3.653	-.003
Prio_Shares_dum	-.238	-.238	.000
Pref_Shares_dum	.362	.364	-.002
Industry dummy	YES	YES	YES
Chi2(14)	0.06		
Prob>chi2 (p)	1.000		

Notes: The difference in the coefficients between the FE-model and the RE-model is so small (0.06), resulting in that this difference is not significant (1.000). Therefore, the null hypothesis cannot be rejected and the RE-model should be applied.

Table C3B. Robustness check hypothesis 1: Random effects (RE) model

	Natural logarithm of short-term incentive compensation (LN_STI)			
Variable	**(1)**	**(2)**	**(3)**	**(4)**
(Constant)	-4.859 (.219)	-4.289 (.306)	-5.612*** (.004)	-5.112 (.223)
ROA	17.567*** (<.001)			
ROS		3.886*** (<.001)		
ROA $_{t-1}$			10.736*** (<.001)	
ROS $_{t-1}$				3.475*** (.004)
CEO_age	.066 (.177)	.081 (.115)	.086* (.095)	.092* (.070)
CEO_ten	-.077 (.118)	-.104** (.038)	-.086* (.091)	-.107** (.034)
LN_Assets	.534*** (.003)	.454** (.015)	.506*** (.007)	.437** (.022)
Lev	-1.518 (.365)	-1.812 (.300)	-.553 (.752)	-1.539 (.382)
Board_size	.003 (.983)	-.046 (.786)	.009 (.958)	-.030 (.863)
Rel_SB_size	1.780 (.480)	2.833 (.276)	1.795 (.496)	2.863 (.275)
CC_dum	1.522** (.049)	2.031** (.010)	1.418* (.085)	2.012** (.012)
Own_con	-3.653*** (.003)	-3.338*** (.009)	-3.533*** (.007)	-3.112** (.016)
Prio_Shares_dum	-.238 (.746)	-.122 (.872)	.154 (.840)	-.008 (.992)
Pref_Shares_dum	.364 (.548)	.639 (.304)	.661 (.293)	.779 (.214)
Industry dummy	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES
N	199	199	199	199
R^2	.388	.346	.341	.342

*Notes: This table reports the unstandardized coefficients (p-values are presented in parentheses). The compensation variable (LN_STI) and performance variable (ROA, ROS) have been winsorized at the 5% level. All the control variables are one-year lagged. The variable definitions can be found in Table 3.1. *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

Appendix C4: OLS using sub-samples based on PMSI_profit dummy for hypothesis 1

Table C4A. Robustness check hypothesis 1: OLS using sub-samples based on PMSI_profit dummy

Variable	Natural logarithm of short-term incentive compensation (LN_STI)							
	Firms for which short-term performance measure (PMSI_profit dummy) is profit-based				Firms for which short-term performance (PMSI_profit dummy) is not profit-based			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Constant)	-3.216 (-.789)	-2.707 (-.649)	-4.276 (-1.027)	-3.077 (-.743)	-36.767*** (-13.198)	-39.063*** (-10.708)	-40.956** (-7.221)	-40.742** (-7.897)
ROA	.220*** (2.917)				.049 (1.967)			
ROS		.185** (2.369)				.744 (.534)		
ROA $_{t-1}$			.080 (1.029)				-.011 (-.265)	
ROS $_{t-1}$				.187** (2.365)				-.008 (-.260)
CEO_age	-.027 (-.284)	-.005 (-.054)	.013 (.129)	.000 (-.004)	1.481** (7.437)	1.240** (6.032)	1.099* (3.381)	1.137** (4.924)
CEO_ten	-.137 (-1.549)	-.176** (-2.012)	-.169* (-1.973)	-.182** (-2.082)	-1.174* (-3.100)	-.705 (-1.864)	-.423 (-.683)	-.497 (-1.166)
LN_Assets	.448*** (3.848)	.419*** (3.560)	.443*** (3.712)	.417*** (3.533)	-.128 (-.734)	.085 (.446)	.176 (.586)	.159 (.613)
Lev	-.105 (-1.316)	-.151* (-1.813)	-.095 (-1.158)	-.148* (-1.782)	-.033 (-.395)	-.062 (-.445)	-.016 (-.111)	-.033 (-.217)
Board_size	.055 (.464)	.026 (.221)	.040 (.325)	.034 (.286)	-.029 (-.606)	-.043 (-.541)	-.014 (-.182)	-.021 (-.258)
Rel_SB_size	.173** (2.268)	.180** (2.343)	.198** (2.538)	.196** (2.572)	.027 (.267)	.006 (.036)	.044 (.250)	.029 (.166)
CC_dum	-.075 (-.880)	-.059 (-.682)	-.092 (-1.040)	-.075 (-.875)	-.034 (-.402)	-.031 (-.389)	-.044 (-.252)	-.028 (-.385)
Own_con	-.024 (-.302)	-.003 (-.044)	-.002 (-.023)	.000 (.005)	-1.866** (-6.200)	-1.860* (-3.843)	-2.057* (-3.851)	-2.002* (-4.055)
Prio_Shares_dum	-.090 (-1.187)	-.092 (-1.198)	-.073 (-.937)	-.091 (-1.181)	-1.240** (-10.180)	-1.323** (-7.888)	-1.391** (-6.190)	-1.383** (-6.611)
Pref_Shares_dum	.065 (.750)	.106 (1.206)	.088 (.994)	.113 (1.289)	.453 (1.424)	.047 (.149)	-.167 (-.311)	-.110 (-.284)
Industry dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES
N	162	162	162	162	16	16	16	16
Adjusted R^2	.257	.243	.220	.243	.999	.997	.997	.997
F-statistic	4.489***	4.233***	3.831***	4.231***	1044.299***	454.255***	368.241***	367.749***

*Notes: This table reports the standardized coefficients (t-values are presented in parentheses). The compensation variables (LN_STI) and performance variables (ROA, ROS) have been winsorized at the 5% level. All control variables are one-year lagged. The variable definitions can be found in Table 3.1. *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

Frequency table PMSI_profit_dummy for hypothesis 1

Table C4B. Frequency table PMSI_profit_dummy for hypothesis 1

	PMSI_profit_dummy	
	Frequency	**Percentage**
0 (PMSI is not profit-based)	16	8.8
1 (PMSI is profit-based)	166	91.2
Total	182	100

Notes: This table presents the frequencies of the PMSI_profit dummy variable. A value of 0 indicates that the short-term incentive compensation of the CEO is not based on predefined goals regarding the profit of the firm. A value of 1 indicates that the short-term incentive compensation of the CEO is dependent on predefined goals regarding the profit of the firm.

Appendix C5 – Including pension as a form of long-term incentive compensation for hypothesis 2

Table C5. Robustness check hypothesis 2: OLS using long-term incentive compensation pensions included (LN_LTI-P)

Variable	Natural logarithm of long-term incentive compensation (pensions included) (LN_LTI-P)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Constant)	2.847 (.819)	.903 (.247)	4.619 (1.341)	5.804 (1.649)	2.416 (.688)	1.638 (.467)	4.709 (1.359)	5.272 (1.511)
RET	.102 (1.525)							
Tobin's Q		.110* (1.783)						
ROA			.147** (2.496)					
ROS				.157*** (2.714)				
RET $_{t-1}$					.165*** (2.842)			
Tobin's Q $_{t-1}$						.122* (1.961)		
ROA $_{t-1}$							.137** (2.238)	
ROS $_{t-1}$								.151** (2.548)
CEO_age	-.076 (-1.165)	-.050 (-.758)	-.116* (-1.778)	-.124* (-1.884)	-.080 (-1.216)	-.057 (-.867)	-.114* (-1.733)	-.109* (-1.683)
CEO_ten	.001 (.014)	-.023 (-.345)	.026 (.409)	.010 (.156)	-.007 (-.112)	-.023 (-.353)	.028 (.438)	.007 (.116)
LN_Assets	.273*** (3.020)	.273*** (3.069)	.260*** (2.942)	.226** (2.539)	.271*** (2.981)	.264*** (2.979)	.245*** (2.764)	.218** (2.425)
Lev	-.195*** (-3.139)	-.184*** (-3.005)	-.201*** (-3.306)	-.219*** (-3.571)	-.192*** (-3.074)	-.173*** (-2.802)	-.182*** (-2.981)	-.213*** (-3.385)
Board_size	.054 (.597)	.055 (.609)	.097 (1.083)	.097 (1.086)	.083 (.908)	.062 (.691)	.121 (1.322)	.110 (1.220)
Rel_SB_size	-.020 (-.343)	-.011 (-.187)	-.031 (-.537)	-.017 (-.307)	-.013 (-.222)	-.031 (-.531)	-.032 (-.556)	-.018 (-.323)
CC_dum	.345*** (4.804)	.326*** (4.619)	.313*** (4.463)	.335*** (4.815)	.325*** (4.507)	.313*** (4.401)	.295*** (4.111)	.332*** (4.757)
Own_con	-.194*** (-3.251)	-.187*** (-3.164)	-.210*** (-3.559)	-.205*** (-3.508)	-.181*** (-2.984)	-.183*** (-3.091)	-.212*** (-3.586)	-.197*** (-3.368)
Prio_Shares_dum	-.003 (-.050)	.014 (.241)	-.015 (-.254)	-.017 (-.291)	.003 (.052)	.022 (.368)	.000 (-.001)	-.010 (-.171)
Pref_Shares_dum	.100 (1.458)	.104 (1.544)	.087 (1.286)	.098 (1.466)	.081 (1.163)	.117* (1.733)	.098 (1.464)	.109 (1.626)
Industry dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES
N	195	199	199	199	186	199	199	199
Adjusted R^2	.437	.440	.449	.453	.453	.442	.447	.450
F-statistic	10.409***	10.739***	11.103***	11.238***	10.584***	10.818***	11.006***	11.134***

*Notes: This table reports the standardized coefficients (t-values are presented in parentheses). The compensation variable (LN_LTI-P) and performance variable (RET, Tobin's Q, ROA and ROS) have been winsorized at the 5% level. All the control variables are one-year lagged. The variable definitions can be found in Table 3.1. *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

Appendix C6 – Replacing LN_LTI(-P) for LTI(-P)_% and LOG_LTI(-P) for hypothesis 2

Table C6A. Robustness check hypothesis 2: OLS replacing LN_LTI(-P) for LTI(-P)_%

Variable	LTI pay divided by total variable pay (LTI_%)				LTI-P pay divided by total variable pay (LTI-P_%)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Constant)	-.200 (-.708)	-.413 (-1.401)	-.243 (-.851)	-.259 (-.905)	.650** (2.236)	.455 (1.497)	.606** (2.041)	.585** (1.989)
RET	.053 (.655)				-.047 (-.549)			
Tobin's Q		.159** (2.178)				.137* (1.746)		
RET $_{t-1}$			.174** (2.501)				.115 (1.519)	
Tobin's Q $_{t-1}$				.082 (1.094)				.068 (.840)
CEO_age	-.188** (-2.397)	-.147* (2.267)	-.190** (-2.403)	-.174** (2.216)	-.212** (-2.522)	-.173** (-2.028)	-.210** (-2.450)	-.197** (-2.334)
CEO_ten	.090 (1.158)	.051 (.645)	.079 (.998)	.073 (.928)	.098 (1.171)	.059 (.694)	.086 (1.004)	.079 (.932)
LN_Assets	.294*** (2.713)	.303*** (2.861)	.297*** (2.721)	.290*** (2.716)	.070 (.603)	.085 (.694)	.079 (.666)	.074 (.647)
Lev	.059 (.797)	.072 (.986)	.060 (.804)	.073 (.986)	-.023 (-.293)	-.015 (-.190)	-.025 (-.305)	-.014 (-.178)
Board_size	.024 (.218)	.011 (.105)	.047 (.425)	.027 (.248)	.095 (.811)	.072 (.622)	.099 (.830)	.085 (.737)
Rel_SB_size	.116* (1.667)	.129* (1.886)	.123* (1.750)	.109 (1.576)	.008 (.114)	.019 (.258)	.013 (.165)	.002 (.027)
CC_dum	.112 (1.297)	.095 (1.135)	.097 (1.121)	.092 (1.077)	.125 (1.354)	.122 (1.347)	.125 (1.332)	.119 (1.301)
Own_con	-.060 (-.841)	-.051 (-.719)	-.046 (-.637)	-.053 (-.741)	-.043 (-.564)	-.036 (-.474)	-.035 (-.444)	-.038 (-.498)
Prio_Shares_dum	.000 (-.002)	.020 (.289)	.004 (.051)	.016 (.221)	-.004 (-.048)	.009 (.125)	-.005 (-.066)	.005 (.065)
Pref_Shares_dum	.025 (.300)	.022 (.274)	.000 (-.005)	.035 (.426)	.094 (1.066)	.083 (.965)	.070 (.773)	.094 (1.079)
Industry dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES
N	195	199	186	199	195	199	186	199
Adjusted R^2	.189	.209	.212	.194	.068	.059	.074	.071
F-statistic	3.820***	4.266***	4.117***	3.970***	1.878**	2.120***	1.930**	1.949**

*Notes: This table reports the standardized coefficients (t-values are presented in parentheses). The compensation variables (LTI(-P)_% and performance variables (RET, Tobin's Q) have been winsorized at the 5% level. All control variables are one-year lagged. The variable definitions can be found in Table 3.1. *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

Table C6B. Robustness check hypothesis 2: OLS replacing LN_LTI(-P) for LOG_LTI(-P)

Variable	**Logarithm of LTI (LOG_LTI)**				**Logarithm of LTI-P (LOG_LTI-P)**			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
(Constant)	-2.702 (-1.233)	-4.694** (-2.057)	-2.996 (-1.360)	-3.820* (-1.740)	1.232 (.817)	.388 (.244)	1.045 (.686)	.707 (.465)
RET	.128* (1.947)				.102 (1.527)			
Tobin's Q		.170*** (2.833)				.110* (1.784)		
RET $_{t-1}$			.190*** (3.334)				.165*** (2.842)	
Tobin's Q $_{t-1}$				.171*** (2.817)				.122* (1.961)
CEO_age	-.207*** (-3.222)	-.166** (-2.560)	-.212*** (-3.288)	-.179*** (-2.803)	-.076 (-1.164)	-.050 (-.757)	-.080 (-1.216)	-.057 (-.866)
CEO_ten	.017 (.261)	-.022 (-.336)	.008 (.121)	-.018 (-.280)	.001 (.014)	-.023 (-.345)	-.007 (-.112)	-.023 (-.353)
LN_Assets	.428*** (4.817)	.431*** (4.968)	.425*** (4.774)	.418*** (4.815)	.273*** (3.022)	.274*** (3.071)	.271*** (2.983)	.265*** (2.982)
Lev	-.021 (-.343)	-.006 (-.094)	-.018 (-.293)	.009 (.146)	-.195*** (-3.141)	-.184*** (-3.006)	-.192*** (-3.075)	-.173*** (-2.803)
Board_size	.017 (.185)	.013 (.148)	.051 (.570)	.025 (.285)	.054 (.597)	.055 (.610)	.083 (.908)	.062 (.692)
Rel_SB_size	.079 (1.381)	.093* (1.657)	.087 (1.512)	.064 (1.137)	-.020 (-.341)	-.011 (-.185)	-.013 (-.221)	-.030 (-.530)
CC_dum	.157** (2.229)	.131* (1.911)	.133* (1.887)	.114 (1.643)	.345*** (4.803)	.326*** (4.618)	.325*** (4.506)	.312*** (4.400)
Own_con	-.236*** (-4.004)	-.224*** (-3.892)	-.219*** (-3.703)	-.219*** (-3.796)	-.194*** (-3.253)	-.187*** (-3.165)	-.181*** (-2.985)	-.183*** (-3.092)
Prio_Shares_dum	.014 (.251)	.039 (.693)	.022 (.378)	.048 (.840)	-.003 (-.050)	.014 (.242)	.003 (.053)	.022 (.268)
Pref_Shares_dum	.006 (.093)	.010 (.152)	-/015 (-.213)	.028 (.432)	.100 (1.457)	.104 (1.543)	.081 (1.162)	.117 (1.732)
Industry dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES
N	195	199	186	199	195	199	186	199
Adjusted R^2	.455	.468	.476	.468	.437	.440	.453	.442
F-statistic	11.126***	11.885***	11.484***	11.873***	10.413***	10.743***	10.587***	10.822***

*Notes: This table reports the standardized coefficients (t-values are presented in parentheses). The compensation variables LOG_LTI(-P) and performance variables (RET, Tobin's Q) have been winsorized at the 5% level. All control variables are one-year lagged. The variable definitions can be found in Table 3.1. *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

Appendix C7 – OLS using sub-samples by industry classification for hypothesis 2

Table C7A. Robustness check hypothesis 2: OLS using sub-samples by industry classification with contemporaneous performance variables

Variable	Natural logarithm of long-term incentive compensation (LN_LTI)							
	Construction & Real estate		Manufacturing		Transportation, commodities and trade		Other service companies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Constant)	-87.287 (-1.163)	-84.096 (-1.162)	2.789 (.384)	-.141 (-.019)	-.828 (-.262)	-4.280 (-.928)	-3.018 (-.321)	-9.617 (-.800)
RET	-.106 (-.550)		.114 (1.125)		-.106** (-2.489)		.017 (.138)	
Tobin's Q		-.302 (-.907)		.110 (1.398)		.047 (.459)		.124 (.856)
CEO_age	-1.060** (-2.489)	-1.209** (-2.599)	-.234*** (-2.730)	-.218** (-2.640)	.296** (2.509)	.317* (2.034)	-.389*** (-3.093)	-.295* (-1.808)
CEO_ten	-1.222* (-1.965)	-1.104 (-1.750)	.023 (.258)	.009 (.106)	-1.465*** (-8.665)	-1.459*** (-5.496)	.025 (.214)	-.050 (-.343)
LN_Assets	1.013** (2.749)	1.063** (2.994)	.332** (2.444)	.348** (2.613)	-.067 (-.596)	.029 (.171)	.535*** (2.794)	.539*** (2.874)
Lev	-1.462*** (-3.660)	-1.750*** (-3.285)	.092 (1.123)	.080 (.993)	-.021 (-.377)	-.014 (-.223)	-.085 (-.489)	-.079 (-.464)
Board_size	-.643** (-2.585)	-.525** (-2.150)	.075 (.538)	.070 (.511)	.278** (2.850)	.167 (1.636)	-.010 (-.068)	-.010 (-.068)
Rel_SB_size	.202 (.872)	.309 (1.251)	.107 (1.166)	.130 (1.423)	-.038 (-.796)	-.067 (-1.219)	.243** (2.336)	.246** (2.424)
CC_dum	.186 (1.324)	.286 (1.589)	.271*** (2.687)	.227** (2.294)	.698*** (5.484)	.691*** (3.777)	.240 (1.455)	.229 (1.421)
Own_con	-.245 (-1.375)	-.207 (-1.151)	-.258** (-2.655)	-.240** (-2.516)	.553*** (8.409)	.530*** (4.296)	-.482*** (-3.811)	-.463*** (-3.675)
Prio_Shares_dum	1.872*** (3.903)	1.845*** (3.975)	-.062 (-.721)	-.060 (-.713)	-.535*** (-8.070)	-.541*** (-4.560)	-.108 (-.844)	-.084 (-.661)
Pref_Shares_dum	-.642* (-2.055)	-.784** (-2.278)	.023 (.226)	.024 (.241)	-.256*** (-3.725)	-.202* (-2.116)	-.127 (-1.041)	-.145 (-1.205)
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES
N	27	27	86	89	29	29	55	56
Adjusted R^2	.609	.624	.557	.563	.972	.961	.527	.538
F-statistic	4.117***	4.318***	9.216***	9.729***	75.055***	53.532***	5.630***	5.920***

*Notes: This table reports the standardized coefficients (t-values are presented in parentheses). The compensation variable (LN_LTI) and performance variables (RET, Tobin's Q) have been winsorized at the 5% level. All control variables are one-year lagged. The variable definitions can be found in Table 3.1. *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

Table C7B. Robustness check hypothesis 2: OLS using sub-samples by industry classification with one-year lagged performance variables

Variable	Natural logarithm of long-term incentive compensation (LN_LTI)							
	Construction & Real estate		Manufacturing		Transportation, commodities and trade		Other service companies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Constant)	-100.693 (-1.420)	-100.087 (-1.375)	2.209 (.310)	1.092 (.150)	-3.296 (-.871)	-3.061 (-.849)	-7.153 (-.762)	-9.064 (-.911)
RET $_{t-1}$	-.133 (-.803)		.217** (2.593)		.044 (.902)		.192* (1.795)	
Tobin's Q $_{t-1}$		.022 (.106)		.069 (.817)		.045 (.371)		.161 (1.360)
CEO_age	-1.172** (-2.549)	-.985** (-2.272)	-.269*** (-3.152)	-.216** (-2.603)	.315* (2.105)	.299 (1.520)	-.315** (-2.585)	-.304** (-2.355)
CEO_ten	-1.280* (-2.096)	-1.265* (-2.020)	.003 (.034)	.013 (.145)	-1.501*** (-7.123)	-1.445*** (-4.448)	.000 (.00)	-.052 (-.410)
LN_Assets	1.121*** (3.050)	1.047** (2.845)	.393*** (2.888)	.344** (2.547)	.005 (.039)	.016 (.095)	.484** (2.505)	.493** (2.627)
Lev	-1.602*** (-3.555)	-1.397*** (-3.322)	.082 (1.019)	.087 (1.071)	-.031 (-.438)	-.017 (-.266)	-.056 (-.323)	-.012 (-.070)
Board_size	-.667** (-2.697)	-.593** (-2.443)	.080 (.581)	.068 (.490)	.189 (1.714)	.187 (1.588)	.075 (.469)	.027 (.181)
Rel_SB_size	.271 (1.146)	.206 (.809)	.109 (1.207)	.096 (1.055)	-.055 (-.943)	-.064 (-1.161)	.255** (2.466)	.253** (2.526)
CC_dum	.202 (1.434)	.177 (1.224)	.212** (2.135)	.241** (2.419)	.709*** (4.432)	.682*** (3.177)	.216 (1.317)	.171 (1.025)
Own_con	-.267 (-1.502)	-.206 (-1.173)	-.232** (-2.423)	-.231** (-2.301)	.573*** (7.088)	.523*** (3.274)	-.444*** (-3.479)	-.428*** (-3.331)
Prio_Shares_dum	1.951*** (3.969)	1.822*** (3.795)	-.083 (-.980)	-.059 (-.695)	-.595*** (-7.482)	-.532*** (-3.377)	-.070 (-.543)	-.057 (-.442)
Pref_Shares_dum	-.714** (-2.222)	-.642* (-2.032)	-.012 (-.122)	.045 (.453)	-.230** (-2.737)	-.208** (-2.238)	-.162 (-1.333)	-.108 (-.921)
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES
N	27	27	83	89	27	29	52	56
Adjusted R^2	.619	.600	.586	.556	.960	.960	.556	.549
F-statistic	4.249***	4.005***	9.942***	9.469***	48.662***	53.271***	5.904***	6.159***

*Notes: This table reports the standardized coefficients (t-values are presented in parentheses). The compensation variable (LN_LTI) and performance variables (RET, Tobin's Q) have been winsorized at the 5% level. All control variables are one year lagged. The variable definitions can be found in Table 5.3. *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

Appendix C8 – Hausman Test and RE-effects model for hypothesis 2

Table C8A. Hausman Test for hypothesis 2

Variable	Coefficients		
LN_LTI	(b) FE	(B) RE	Difference (b-B)
RET	2.101	1.658	.443
CEO_age	-.178	-.178	-.000
CEO_ten	.016	.016	.000
LN_Assets	1.149	1.143	.006
Lev	-.823	-.771	-.052
Board_size	-.001	.002	-.003
Rel_SB_size	4.205	4.280	-.075
CC_dum	2.159	2.135	.024
Own_con	-7.031	-7.019	-.012
Prio_Shares_dum	.276	.291	-.015
Pref_Shares_dum	.012	.043	-.032
Industry dummy	YES	YES	YES
Chi2(14)	0.73		
Prob>chi2 (p)	1.000		

Notes: The difference in the coefficients between the FE-model and the RE-model is so small (0.73), resulting in that this difference is not significant (1.000). Therefore, the null hypothesis cannot be rejected and the RE-model should be applied.

Table C8B. Robustness check hypothesis 2: Random effects (RE) model

Variable	Natural logarithm of long-term incentive compensation (LN_LTI)			
	(1)	(2)	(3)	(4)
(Constant)	-7.959 (.129)	-12.621** (.014)	-8.893* (.094)	-9.147* (.072)
RET	1.658 (.126)			
Tobin's Q		2.005*** (<.001)		
RET $_{t-1}$			3.188*** (.002)	
Tobin's Q $_{t-1}$				1.591*** (.004)
CEO_age	-.178*** (.006)	-.132** (.032)	-.186*** (.005)	-.170*** (.006)
CEO_ten	.016 (.798)	-.046 (.462)	.0301 (.634)	-.018 (.777)
LN_Assets	1.142*** (<.001)	1.123*** (<.001)	1.142*** (<.001)	1.063*** (<.001)
Lev	-.771 (.718)	.239 (.908)	-.241 (.909)	.438 (.838)
Board_size	.002 (.991)	-.059 (.770)	.093 (.649)	.028 (.894)
Rel_SB_size	4.280 (.182)	4.197 (.175)	5.929* (.063)	3.988 (.209)
CC_dum	2.134** (.032)	1.874** (.048)	1.512 (.129)	1.697* (.083)
Own_con	-7.019*** (<.001)	-6.194*** (<.001)	-8.512*** (<.001)	-6.066*** (<.001)
Prio_Shares_dum	-.291 (.754)	.774 (.394)	.492 (.597)	.707 (.448)
Pref_Shares_dum	.043 (.956)	.167 (.822)	-.427 (.590)	.334 (.660)
Industry dummy	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES
N	195	199	186	199
R^2	.503	.526	.553	.509

*Notes: This table reports the unstandardized coefficients (p-values are presented within parentheses). The compensation variable (LN_LTI) and performance variable (RET, Tobin's Q) have been winsorized at the 5% level. All the control variables are one-year lagged. The variable definitions can be found in Table 3.1. *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

Appendix C9: OLS using sub-samples based on PMLI_MB_perf dummy for hypothesis 2

Table 9A. Robustness check hypothesis 2: OLS using sub-samples based on PMLI_MB_perf dummy

Variable	Natural logarithm of long-term incentive compensation (LN_LTI)							
	Firms for which long-term performance measure (PMLI_MB_perf) is market-based				Firms for which long-term performance (PMLI_MB_perf) is not market-based			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Constant)	-7.591 (-.973)	-12.279 (-1.528)	-7.867 (-.982)	-9.108 (-1.126)	50.557 (.716)	79.275 (1.273)	155.178** (2.362)	151.896 (1.548)
RET	.187* (1.823)				-.159 (-.760)			
Tobin's Q		.248** (2.131)				-.509 (-.945)		
RET_{t-1}			.183* (1.967)				.420 (1.022)	
Tobin's Q_{t-1}				.094 (.832)				.449 (1.047)
CEO_age	.044 (.378)	.075 (.641)	.008 (.064)	.061 (.509)	-.690* (-2.064)	-.828* (-2.105)	.142 (.371)	-.290 (-.769)
CEO_ten	-.037 (-.371)	-.082 (-.784)	-.018 (-.173)	-.035 (-.335)	-.752 (-1.575)	-.660 (-1.450)	-.1.283** (-2.719)	-1.184* (-1.866)
LN_Assets	.218* (1.657)	.279** (2.048)	.233* (1.711)	.212 (1.577)	-.386 (-.242)	-.981 (-.710)	-2.626* (-1.823)	-2.621 (-1.222)
Lev	-.019 (-.204)	.022 (.229)	-.021 (-.213)	.006 (.063)	-.194 (-.316)	-.134 (-.236)	-.473 (-.877)	.176 (.287)
Board_size	-.025 (-.174)	-.019 (-.134)	-.001 (-.007)	.000 (.001)	-.358 (-.610)	.359 (.475)	.000 (.000)	-.322 (-.615)
Rel_SB_size	.092 (1.055)	.045 (.489)	.118 (1.330)	.087 (.925)	.059 (.102)	.029 (.055)	-1.017 (-1.729)	-.563 (-.856)
CC_dum	.304*** (3.220)	.232** (2.335)	.284*** (2.923)	.276*** (2.739)	.950 (.759)	1.250 (1.148)	2.953** (2.489)	2.868 (1.583)
Own_con	-.030 (-.337)	-.072 (-.805)	-.031 (-.334)	-.052 (-.579)	-.244 (-.879)	-.166 (-.615)	-.234 (-.982)	-.281 (-1.054)
Prio_Shares_dum	.042 (.483)	.097 (1.097)	.041 (.456)	.073 (.795)	-.502 (-.684)	-969 (-1.301)	-1.417* (-2.076)	-1.292 (-1.439)
Pref_Shares_dum	-.051 (-.487)	-.013 (-.120)	-.076 (-.688)	-.020 (-.189)	.515 (1.086)	.342 (.823)	.246 (.647)	.339 (.821)
Industry dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES
N	121	122	115	122	29	30	28	30
Adjusted R^2	.288	.297	.288	.271	.542	.571	.671	.577
F-statistic	4.037***	4.192***	3.877***	3.814***	3.071**	3.408**	4.445***	3.469**

*Notes: This table reports the standardized coefficients (t-values are presented in parentheses). The compensation variables (LN_LTI) and performance variables (RET, Tobin's Q) have been winsorized at the 5% level. All control variables are one-year lagged. The variable definitions can be found in Table 3.1. *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

Frequency table PMLI_MB_perf dummy for hypothesis 2

Table 9B. Frequency table PMLI_MB_perf_dummy for hypothesis 2

	PMLI_MB_perf dummy	
	Frequency	**Percentage**
0 (PMLI is not market-based)	30	19.4
1 (PMLI is market-based)	125	80.6
Total	155	100

Notes: This table presents the frequencies of the PMLI_MB_perf dummy variable. A value of 0 indicates that the long-term incentive compensation of the CEO is not based on predefined goals regarding market-based firm performance (RET, Tobin's Q, TSR, EPS). A value of 1 indicates that the long-term incentive compensation of the CEO is dependent on predefined market-based firm performance goals (RET, Tobin's Q, TSR, EPS).

Appendix C10: Frequency tables PMSI_IndQualt dummy and PMLI_IndQualt dummy

Table C10A: Frequency table PMSI_IndQualt dummy

	PMSI_IndQualt dummy	
	Frequency	**Percentage**
0 (CEO short-term incentive compensation is not dependent on predefined individual qualitative goals)	50	27.5
1 (CEO short-term incentive compensation is dependent on predefined individual qualitative goals)	132	72.5
Total	182	100

Notes: This table presents the frequencies of the PMSI_IndQualt dummy variable. A value of 0 indicates that the short-term incentive compensation of the CEO is not based on predefined goals regarding the individual quality of the CEO. A value of 1 indicates that the short-term incentive compensation of the CEO is dependent on predefined goals regarding the individual quality of the CEO.

Table C10B. Frequency table PMLI_IndQualt dummy

	PMLI_IndQualt dummy	
	Frequency	**Percentage**
0 (CEO long-term incentive compensation is not dependent on predefined individual qualitative goals)	81	52.3
1 (CEO long-term incentive compensation is dependent on predefined individual qualitative goals)	74	47.7
Total	155	100

Notes: This table presents the frequencies of the PMLI_IndQualt dummy variable. A value of 0 indicates that the long-term incentive compensation of the CEO is not based on predefined goals regarding the individual quality of the CEO. A value of 1 indicates that the long-term incentive compensation of the CEO is dependent on predefined goals regarding the individual quality of the CEO.

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