Erasmus University Rotterdam

ARE SHAREHOLDERS ABLE TO INFLUENCE THE TIME HORIZON OF TE CEO THROUGH INCENTIVE SCHEMES?

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CHAPTER 1 Introduction

1.1 Introduction

At present a minority of firms is managed by the shareholder(s) (owners). For shareholders in general stocks are an investment and these shareholders do not per definition have the need, the knowledge nor the education to manage a firm. Therefore, a representation of the shareholders, the supervisory board, has to appoint a board of directors (management board) to manage a company in the best interest of its shareholders. "*This separation of ownership and control has long been recognized as a root of corporate governance problems (Berle and Means, 1932; Smith, 1776)*" (Bergstresser & Philippon [2006]).
As the agency theory states, the interests of principles and agents diverge (Hill & Jones [1992]). In this case the interests of the shareholders and the management board differ. Where the shareholders' interest in general is maximizing shareholder value over a longer period of time, due to the personal interests of managers (for example reputation, income) the management board also focuses on short term results. Since the management board has access to all information and the opportunity to filter this information, while shareholders must rely on published reports, information asymmetry is present. Also, the time lag present in availability of information can be used by the management board to alter strategic actions in order to optimize their own goals, instead of maximizing shareholders value. Scientific research shows managers indeed use this opportunity. The results of a survey of Graham et al. [2005] amongst more than 400 executives for example show that *"A surprising 78% of our sample admits to sacrificing long-term value to smooth earnings. Managers also work to maintain predictability in earnings and financial disclosures"* (p. 4).

The optimal moment for the supervisory board to assure the management board acts in the interest of the shareholders is the moment they select and appoint the manager(s). After that, the management control system and the remuneration policy are the two main instruments to stimulate managers to act in the best interest of the shareholders.

The first instrument is the management control system. Otley [1999] states "*Management control systems provide information that is intended to be useful to managers in performing their jobs and to assist organizations in developing and maintaining viable patterns of behaviour*" (p. 364). The management control system must provide managers accurate and

timely information in order to be able to maintain the viable patterns. In other words, the management control system must be designed in such a way the information asymmetry is minimalized.
The second instrument is the remuneration plan design. The distribution between the fixed and variable components of the compensation of managers can be used to align the interests of shareholders and managers. The smaller the discrepancy between both interests, the less reason managers have to make choices which are not in the interest of the shareholders. The variable component of the remuneration has to be designed in such a way the measures used reflect the objectives the firm wants to achieve.

The choice of benchmarks for the variable component is one way to direct the focus of managers. Benchmarks about the financial performance of the firm are used very frequently. In the recent decades, researchers suggested various alternatives. Using nonfinancial measures in evaluating the manager's performance (e.g. the use of the balanced score card of Kaplan & Norton [1996]) or the use of alternative measures of financial performance (e.g. The EVA® Financial Management System of Stewart et al. [1995]) are just two examples where the overall functioning of managers is evaluated on more components than the years' turnover or earnings only.
The period of evaluation is another instrument to influence the time horizon of managers. By evaluating the functioning of a manager over a longer period, the risk of a myopic view of managers is reduced.

When the design of the remuneration plan aligns the time horizon of shareholders and managers, the desired business results at which the goals of shareholders and managers are met are the same for both parties. In this situation there is no incentive for managers to filter or alter the information provided to the shareholders. The provided information will then be timely and accurate, in other words the information asymmetry is lower. This enables shareholders to make choices based on the actual situation instead of a by managers altered representation of reality.

Earlier research shows that the level of information asymmetry is associated to the level of earnings quality in a firm. Bhattacharya et al. [2013] for example *"find that poor earnings quality is significantly and incrementally (i.e., over and above a well-established benchmark model of trading costs) associated with higher information asymmetry."* (p. 283). These

findings enable shareholders and other stakeholders to monitor information asymmetry indirectly by monitoring the earnings quality. The article by Dechow et al. [2010] provides an overview of the determinants of earnings quality and the proxies to monitor earnings quality which is based on a review of more than three hundred studies. By using one or more of the proxies shareholders and stakeholders have the opportunity to benchmark the earnings quality and therefore indirectly influence the level of information asymmetry. This enables them to take measures to improve the level of earnings quality if necessary and in this indirect way reduce the level of information asymmetry.

The concept of earnings quality is difficult to define, because *"earnings quality is defined only in the context of a specific decision model"* (Dechow et al. [2010], p. 344). As a result, researchers use various definitions of earnings quality. In this thesis the definition of Dechow et al. [2010] is used: *"Higher quality earnings provide more information about the features of a firm's financial performance that are relevant to a specific decision made by a specific decision-maker."*(p. 344). The argument for this choice is that, apart from the fact that Dechow et al. [2010] analyzed many papers on earnings quality before they have chosen this definition, the authors stay close to the definition of the Financial Accounting Standards Board of the USA as stated in the Statement of Financial Accounting Concepts.

This thesis evaluates the influence of shareholders on the management of a firm by focusing on a specific aspect of the remuneration plan: the period of evaluation in incentive schemes. Specifically, this thesis evaluates the influence of the shareholders on the time horizon of the remuneration plan and how this remuneration plan may influence the time horizon of the CEO of a firm.

By narrowing the scope of this study to the CEO only, the discussion about the influence of a manager on the firm's performance is avoided. Banghøj et al. [2010] explain this choice: "*The CEO has the overall responsibility of a firm's performance. This also explains the number of papers examining the relation between performance and CEO compensation. Although other executives (non-CEOs) such as the chief financial officer (CFO) and the chief developing officer are responsible for the performance of the company too, they will not have the same opportunities to affect the business as the CEO. Further, the level of responsibility is not the same as for the CEO*" (p. 489).

Considering the previous, the central research question is:

> ***"Are shareholders able to influence the time horizon of the CEO through incentive schemes?"***

To answer this research question, firstly the influence of the shareholders on the incentive schemes is examined. To investigate the influence, the impact of the average time horizon of shareholders on the variable part of the incentive scheme is determined.
Secondly the influence of the incentive scheme on the horizon of the CEO is determined. Due to lack of public personal information about the CEO, in most papers investigating this relation the authors only determine the level of earnings management the CEO uses. When the use of earnings management is low, the quality of earnings is high and then the horizon of the CEO is supposed to be long and vice versa.
Finally, when the percentage of CEO's influenced by the incentive scheme is higher at firms with higher influence of the shareholders on the design, the influence of shareholders on the time horizon of the CEO is plausible.

1.2 Motivation

Since the recent global recession, which started with the bank crisis of 2007, one of the main discussions in press and public debate is about executive compensation (Jansen et al. [2014]). This discussion is not limited to the financial sector only but expands to listed companies and the public sector. This inspired me to focus on the remuneration plan design.

In daily practice I experience the low impact of the annual bonus scheme on the effort of sales managers, while the shareholder expected to stimulate the managers through issuing bonuses. When the effect in a relatively small company with only one active managing shareholder is close to zero, what is the effect of incentive schemes in large, listed companies on the effort and focus of managers? And equally important, do shareholders have the power to influence in the design of the incentive schemes?
In scientific literature, the relationship between the time horizons of the shareholders, the remuneration plan and the effect of this remuneration plan on the time horizon of CEO's is rarely subject of investigation. The paper by Cadman & Sunder [2014] for example discusses

the relation between the horizon of the leading investor in a firm and the design of the bonus plan, but investigates this relation in the specific situation of an initial public offering.
In this thesis I investigate whether there is a relation between the time horizon of investors (the shareholders of a firm) and the incentive schemes. Furthermore, I investigate whether the time horizon of the managers is influenced by the incentive schemes. By answering the research question of this thesis, the aim is to fill this knowledge gap in research.

Investors gain from this insight. This thesis investigates the investor influence on CEO operations through the remuneration plan. This is particularly important for investors who want to invest in a firm but think changing of business operations is necessary to improve the profitability.

In scientific literature the number of studies with regard to the relation between the preferences of the shareholders and the influence they have on the focus of management is limited. In the search for literature on the topic, only a few papers about firms in very specific circumstances were found, such as firms first issuing stocks publicly. By taking this direction in research, other scientists may be inspired to investigate this subject too.

1.3 Contribution

The separation of ownership and management of a firm implies good guidelines and monitoring from the shareholders are required in order to lead management to the desired direction. Due to different objectives and information asymmetry this task is complex and therefore subject to many different studies in different fields of science.
This thesis provides evidence on the influence of shareholders on the incentive plans design and effectiveness on influencing the horizon of CEO's. For shareholders it is important to have an idea about their influence on the focus of a firm. This enables them to make funded investment decisions when considering buying stocks, especially when they feel the need to change the daily operations.

The influence of the remuneration plan on the behavior of a CEO is also investigated in this study. The results of this study can be used as background information when designing the remuneration plan. Although this thesis focuses on the CEO's of listed firms only, the results

also can be considered when designing the remuneration plan of lower management levels or for CEO's and managers of private firms.

For the scientific world this thesis brings contribution because of the different approach. This thesis investigates the relation between the time average horizon of the shareholders of a firm, the design of the variable component of the remuneration plan and the influence of this plan on the time horizon of CEO's. This relation has been subject of few papers up until now. This new approach provides another insight in the broadly examined field of incentive plans and can provide inspiration for other scientists to investigate this subject.

1.4 Structure

The next chapter summarizes a part of the relevant previous literature. A selection of the literature concerning the time horizon of shareholders and managers is discussed. Then the field of remuneration plans and more specific the variable component is elaborated upon. For the research design the distinction between the different methods of calculating the variable component is of great importance. Several methods as described in a selection of scientific papers are identified.
Next the definition of earnings quality is provided and the choice of the proxy earnings management is explained. Earnings management is addressed and a distinction is made between accrual based management and real activities manipulation. In some papers real activities manipulation is named real earnings management (e.g. Gunny [2005]), but this thesis uses the expression used in the seminal paper by Roychowdhury [2006]. The definition of both terms is equal. Finally, the choice to examine both types of earnings management simultaneously is explained.

Chapter 3 provides the hypotheses of this thesis. The theoretical framework, based on the scientific research as described in chapter 2, is set and The Predictive Validity Framework of Libby (Libby [1981]), so called Libby boxes, is used to provide an insight in the translation of the research question (the concepts) to the research design (the operational measures).

In chapter 4 the research design is explained. Next the research design is provided and the dependent and independent variables are defined and explained. Finally, this chapter also provides the description of the used data and the origin of this data.

Chapter 5 presents the descriptive statistics and empirical results. The consequences of the results are explained and finally the conclusions are set.

The final chapter 6 summarizes the paper. Based on the results I present my conclusion and finally some recommendations are provided.

CHAPTER 2 Theory

2.1 Introduction

One way for shareholders to assure the managers act in their best interest, is aligning the time horizon. When the focus of the shareholders and the management team of the organization matches, the desired outcome will be equal for both parties and there will be no need for the management team to alter information before sharing this with shareholders.

First the time horizon of shareholders and managers is discussed. Next the remuneration plan and the different components of this plan is discussed. When the time horizon of the investors in a firm and the time horizon of the CEO is in sync, there are no reasons for the CEO to alter or filter the information.

Then definition of earnings quality is stated. Previous research (e.g. Bhattacharya et al. [2013]) shows information asymmetry is negatively related to earnings quality. Dechow et al. [2010] indicate that "*Higher quality earnings provide more information about the features of a firm's financial performance that are relevant to a specific decision made by a specific decision maker*" (p. 344). Because earnings quality can be measured by publicly available information, this indicator for information asymmetry suits for share- and stakeholders. At the end of this paragraph the choice of the proxy, earnings management, is explained.

This chapter concludes with a deeper insight in earnings management. First earnings management in general is addressed. Second, accrual-based earnings management and real activities manipulation are explained. Finally, I explain why this thesis considers the total level of earnings management.

2.2 Time horizon

Horizon is literally defined as the line which forms the boundary between the earth and the sky. The horizon is also used as synonym for the scope. In this thesis time horizon is the period a person or organization evaluates when making decisions.

2.2.1 Time horizon of shareholders

The timeframe in which a shareholder wants to capitalize his profit, determines the horizon. The horizon for firms with a limited number of shareholders is easy to determine. For example, for one family owned firms the time horizon is transgenerational (Achleitner et al. [2014]). The focus lies on sustainable growth. Venture capitalists at firms planning their initial public offering (IPO) on the other hand generally have a short horizon (Cadman & Sunder [2014]).

For listed companies determining the time horizon of all shareholders together is complex. These firms have a large number of investors[1], with different maturities of liabilities and different investment strategies (Derrien et al. [2013]). Investors with short term objectives will try to influence the management of the firm to maximize short-term shareholder value, regardless of the consequences in the long run. Investors with a longer horizon prefer sustainable growth over short gain.

The paper "***Investor Horizon and CEO Horizon Incentives***" of Cadman & Sunder [2014] is about the incentive policy for the CEO surrounding an Initial Public Offering (IPO). The authors found evidence that venture capitalists (VC), short-horizon investors financing a firm prior to an IPO, provide managers with incentives with focus on the short-term results in order to maximize firms' value at IPO. Furthermore they "*find that although firms, on average, lengthen annual horizon incentives from before to after the IPO, the VC presence mitigates this effect. At the same time, institutional monitoring restricts VCs from shortening annual horizon incentives, as evidenced by a significant lengthening of annual horizon incentives for VC-backed firms that attract high institutional ownership, whereas we find no such lengthening of horizon incentives for VC-backed firms without institutional monitoring*" (p.1324).

The literature about methods to estimate the "average time horizon" of all shareholders of a firm is very limited. In the papers "***Shareholder investment horizons and the market for corporate control***" [Gaspar et al., 2005] and "***Payout Policy Choices and Shareholder Investment Horizons***" [Gaspar et al., 2012] the authors define a twostep method to calculate the "Investor Turnover" for a company. First, they determine the turnover rate per investor. Using data about American institutional investors from the Thomson Reuters Spectrum 13F database, the authors calculate the average period every institutional investor holds his shares. This measurement quantifies their time horizon. In the second step the authors calculate the weighted average of the time-averaged Investor Turnover in order to quantify the time horizon of all institutional investors of a firm in the evaluated period.

[1] Handpicked data from Nasdaq top 100 dated September 4th 2015 shows an average number of 764 investors (median 615). For detailed information see appendix 8.1 at the end of this thesis.

2.2.2 Time horizon of managers

The time horizon of managers is determined by the formal goals set by the supervisory board and their personal goals, like maximizing income and prestige. Because the number of top managers and the number of changes in top management are limited, the time horizon should be more transparent than for the shareholders of a company.

One major influencing factor is the variable part of the remuneration plan. The managers will focus more on the benchmarks on which the variable incentives are based upon. By including the right benchmarks into the bonus plan, the manager's horizon will be influenced positively from the shareholder's point of view. On the other hand, the article "*On the folly of rewarding A, while hoping for B*" of Kerr [1975] describes what happens when the benchmarks do not represent the desired results. Then the construction of the bonus plan causes negative shift of the focus of the managers.

Although the number of influencing factors is limited, there are no scientific methods to quantify the time horizon of managers. Some articles (Dechow & Sloan [1991], Cheng [2004]) take CEO's with just a few years before retirement as the group of managers with a short time horizon. This studies test whether these short horizon managers have more incentives to exaggerate firm's profit. Other studies (e.g. Ali & Zang [2015]) hypothesize CEO's have reputation reasons to show good results in the first years of their tenure and their horizon is short for this reason. All papers about time horizon of managers evaluated for this thesis did not focus on the horizon itself, but analyzed the rate of manipulation of the reported financial figures by the managers in order to determine the time horizon. Most authors evaluated this by analyzing the accrual-based earnings management actions and/ or the real activities manipulation.

2.3 Remuneration plan

The remuneration plan contains all the components of incentives. The most important elements in this plan are:

- Salary;
- incentive schemes;
- stock options;
- various stock plans;

- dividend units;
- performance units and
- performance shares.

(Smith & Watts [1982]).

The total amount of remuneration of the management board has exploded in the last decades. The CEO-to-Worker ratio rose from 20 to 1 in 1965 to 295.9 to 1 in 2013 (Mishel & Davis [2014]). This inflation does not relate to the growth in turn-over or profitability. Murphy and Zábojník [2004] argue this inflation "*can be explained by an increase in the importance of general skills, as opposed to firm-specific knowledge, in managing the modern corporation*" (p. 195).

The rise in total income of the CEO is mainly caused by the inflation of the variable part of the remuneration. This conforms the optimal contracting theory which argue "*that firms will design their incentive contracts to align the interests of the principal and the agent. This is viewed as an effective solution to mitigate agency problems, as incentive contracts can serve as a substitute for monitoring by the board"* (Abernethy et al. [2015], p. 1266). The paper by Goergen and Renneboog [2011] shows that in most countries the variable part is at the least equal to the fixed part of the income for 2005 and in the United States the variable part sums up to more than 75% of the total income of a CEO. This illustrates the supervisory board considers the incentive scheme as an important instrument to influence the functioning of CEO`s.

From the economic perspective, one should expect that the higher the wages, the higher the effort a manager (or employee) delivers. Furthermore, the results of the firm should be considered in the expectations of managers when evaluating a pay raise. Nevertheless, research shows the relative change of incentives from one period to another is substantially influencing the change in effort and motivation. The laboratory experiment of Hannan [2005] shows that effort dropped when wages are reduced in a situation of profit decrease. In case a firm made high profit the level of effort even decreased when workers were offered a small rise in wages. These results illustrate the complexness of management remuneration systems.

Designing the variable part of the remuneration plan is complex. The number of papers regarding bonuses is close to endless, and the outcomes cover a broad range of recommendations. Some of the recommendations to improve the quality of bonus plans are:

- the compensation structure has to fit the business strategy and should be linked to the performance (Chen & Jermais [2014]);
- the plan should contain more than one performance measure (Banghøj et al. [2010]);
- the use of alternative financial measure (Stewart et. al. [1995]);
- the use of nonfinancial measures (Kaplan & Norton [1996]).

When designing the variable part of the remuneration plan, one must realize all elements (including the personality of the manager concerned and the performance of the firm) influence the effectiveness of the designed remuneration plan. Chng et al. [2012] state "*Our empirical findings provide strong support for our theoretical perspective that the effectiveness of incentive compensation to motivate appropriate managerial behaviors is contingent on a fit between executives' CSE*[2] *and firm performance*" (p. 33). This implies the self-esteem of the CEO and the financial results of the firm influence the effectiveness of the remuneration plan.

A major risk when the variable incentives are based on only one year is it stimulates myopic actions from management (Healy [1985], Holthausen et al. [1993]). Managers do have the opportunity to manipulate the result in any year in order to maximize their bonus. For shareholders with a longer horizon, this behavior is undesired. By including long term incentives in the incentive scheme, the managers are stimulated to lengthen their horizon.
For this reason, in most cases a bonus plan consists of partly short-term bonus pay-outs and partly of long term incentives. There are several methods to implement long term incentive plans (LTIP). Granting options to managers as part of the bonus plan is considered to be a LTIP. By issuing options with a longer maturity term, the managers are stimulated to maximize long term shareholders value. Another method to implement LTIP is to calculate the pay-out bonus based on two or more annual net incomes (for example by creating a bonus bank (Stewart et. al. [1995])).

[2] "*The concept of 'core self-evaluation' (CSE),(…), concisely encompasses and consolidates the common, overlapping portions of four previously unconnected personality dimensions: self-esteem, self-efficacy, locus of control, and emotional stability.*" (Hiller and Hambrick, [2005], p. 297)

In the near future the Dodd Frank Act Section 954 will enforce listed companies to recover erroneously awarded compensation. In short, this act requires listed companies to recover incentive-based compensation from the CEO when the SEC demands an accounting restatement. Although this formally does not imply all incentives can be regarded as long term, as long as the act is not formalized, by voluntary implement this "clawback policy" the issued incentives can be interpreted as a long term. In this thesis the voluntary clawback policy is seen as a special case of LTIP.

2.4 Earnings quality

The term earnings quality is difficult to define, because "*earnings quality is defined only in the context of a specific decision model*" (Dechow et al. [2010], p. 344). In their review paper they evaluated over three hundred articles about earnings quality and they define earnings quality as: "*Higher quality earnings provide more information about the features of a firm's financial performance that are relevant to a specific decision made by a specific decision-maker.*"(p. 344). This definition is used in this thesis.

For shareholders earnings quality is important.
First, as the paper by Bhattacharya et al. [2013] states "*An important attribute of the quality of accounting information is the extent to which earnings (accruals) map into cash flows. A poor mapping of accruals into cash flows reduces the information content of reported earnings and results in lower-quality earnings.*" (p. 482). To put it in other words, the higher the earnings quality, the lower the information asymmetry between managers and stakeholders.
Second, earnings quality is negatively related with costs of debt and equity capital (Francis et al. [2005]). Higher earnings quality has a positive contribution to the profitability of a firm.

In their review article Dechow et al. [2010] divide studies regarding earnings quality in whether they provide evidence based on the determinants (proxies in properties of earnings) or based on the consequences (investor responsiveness to earnings and external indicators of earnings misstatements). Because incentive schemes are part of the business policy, analyzing earnings quality based on the determinants is the most appropriate approach. The proxies described in the paper by Dechow et al. [2010] "*includes earnings persistence and accruals; earnings smoothness; asymmetric timeliness and timely loss recognition; and target beating, in which*

the distance of earnings from a target (e.g., small profits) is viewed as an indication of earnings management, and earnings management is assumed to erode earnings quality." (p. 345).
A complicating factor in this approach is the difference in operations of "new" firms (founded after the 1970's) compared to "seasoned" firms (founded before the 1980's). Due to the difference in operations the structure of the balance differs substantially. As a consequence, the proxies earnings persistence, earnings smoothness and asymmetric timeliness and timely loss recognition can't be used. Based on these proxies the earnings quality appears to be much higher at seasoned firms. The higher intangible intensity of new firms causes a "decline" in earnings quality and is not caused by lower quality of earnings (Srivastava [2014]). For this thesis earnings management (abnormal accruals plus real activities manipulation) is chosen to proxy the earnings quality.

2.5 Earnings management

The general accepted accounting principles (GAAP) of the US and the EU require the accounting system that, among other assumptions, principles and constraints, there is compliance with matching principle. This principle requires that revenues and expenses are matched. Due to many different reasons (investments in buildings or machines, payment terms, mismatch between moment of purchase and sale), administering the cash flow does not fulfil this principle. By activating and depreciating tangible assets and using accruals, the cash flow is adjusted for this mismatch of revenues and expenses. Dechow and Dichev [2002] state "*that accruals shift or adjust the recognition of cash flows over time, so that the adjusted numbers (earnings), better measure firm performance (e.g., see Statement of Accounting Concepts No. 1, FASB 1978, para. 44)*" (p. 35, 36). By misusing this principle general management has the opportunity to influence earnings. Their choices in depreciation or accrual policies have substantial influence on the reported net income.

General management is also leading in the choices in daily operations. The expenses of a firm are only partly directly related to the revenues. The costs of general management, research and development and promotion costs are only a few examples of indirect expenses. Because these costs do not relate to the revenues directly, general management has the opportunity to make strategical choices of which the results are reflected in the long term. Cutting these expenses will inflate the annual net income of the current year. The consequences for future net income however can be very negative.

When general management use the policy choices for accruals and/ or real activities to influence earnings of any year there is earnings management. Based on the Earnings Management Hypothesis of Jones [1991] I define earnings management as '***accounting choices that reduce or increase reported earnings***'. Especially in times of difficulties to meet or beat short term goals managers are tempted to make accounting choices which result in meeting these goals. Earnings can be managed by accruals-based earnings management (e.g. over valuate their inventories or current assets or under valuate their current liabilities) or by real activities manipulation (e.g. reduction of research and development or promotional expenditures).

2.5.1 Accrual based earnings management

General management has different ways of managing earnings by accruals. In capital intensive firms the depreciation policy for example can have substantial impact on the net annual income. The depreciation period depends on the estimation of the economic life expectancy. By lengthening or shortening this expectation, the depreciation costs will vary.

At the end of any book year general management has to estimate the amount of non-paying debtors, the value of stock, the costs to be paid and the earnings to be received. Although the major part of this estimations is objective, the subjective estimate remains substantial.
By manipulating the estimates general management can influence earnings without extra effort. This manipulation is referred to as accrual-based earnings management (ABEM).

ABEM provides general management with the opportunity to alter earnings, even after the book year is closed. Because all other figures are final after closing, general management knows the level of manipulation needed to meet the required result. On the other hand, the auditor scrutiny limits the level of earnings management (Gunny [2010]).

Through the years several models where defined to estimate the discretionary part of the accruals. The paper by Dechow, Ge & Schrand [2010] provides a thorough review of the proxies, their determinants and their consequences of earnings quality. In this paper the authors provide a summary of widely used models:

Accrual model	*Theory*	*Notes*
Jones [1991] **model** $Acc_t = \alpha + \beta_1 \Delta Rev_t + \beta_2 \Delta PPE_t + \varepsilon_t$	Accruals are a function of revenue growth and depreciation is a function of PPE. All variables are scaled by total assets	Correlation or error with firm performance can bias tests. R^2 around 12%. Residual is correlated with accruals, earnings and cash flow
Modified Jones model (Dechow et al. [1995]) $Acc_t = \alpha + \beta 1(\Delta Rev_t - \Delta Rec_t) + \beta_2 PPE_t + \varepsilon_t$	Adjusts Jones model to exclude growth in credit sales in years identified as manipulation years	Provides some improvement in power in certain settings (when revenue is manipulated)
Performance matched (Kothari et al. [2005]) $DisAcc_t$ - *Matched firm's* $DisAcc_t$	Matches firm-year observation with another from the same industry and year with the closest ROA. Discretionary accruals are from the Jones model (or Modified Jones model)	Can reduce power of test. Apply only when performance is an issue
Dechow and Dichev [2002] **approach** $\Delta WC = \alpha + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \varepsilon_t$	Accruals are modeled as a function of past, present, and future cash flows given their purpose to alter the timing of cash flow recognition in earnings	$\sigma(\varepsilon_t)$ or absolute ε_t proxies for accrual quality as an unsigned measure of extent of accrual ''errors.'' Focuses on short-term accruals does not address errors in long-term accruals
Discretionary estimation errors (Francis et al. [2005]) $TCA_t = \alpha + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \beta_4 \Delta Rev_t + \beta_2 PPE_t + \varepsilon_t$ $\sigma(\varepsilon_t) = \alpha + \lambda_1 Size_t + \lambda_2 \sigma(CFO)_t + \lambda_3 \sigma(Rev)_t + \lambda_4 log(OperCycle)_t + \lambda 5 NegEarn_t + v_t$	Decomposes the standard deviation of the residual from the accruals model into an innate component that reflects the firm's operating environment and a discretionary component (v_t) that reflects managerial choice	Innate estimation errors are the predicted component from $\sigma(\varepsilon)_t$ regression

Table 1 Dechow, Ge & Schrand [2010], p. 359

2.5.2 Real activities manipulation

A survey amongst more than 400 executives showed managers are willing to use real earnings management to meet the target, even when this would result in lower firm value (Graham et al. [2005]). The literature about real activities manipulation (RAM) is relatively limited. Most of the papers about RAM focuses on research and development costs, although some papers look at advertising expenditures, sales price reduction or other relevant subjects (Zang [2012]).

The seminal paper about RAM is written by Roychowdhury [2006]. In this paper he defines RAM as "*departures from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations*" (p. 337). In this paper RAM is investigated by determining the abnormal level of three variables:

- sales manipulation;
- reduction of discretionary expenditures and
- overproduction.

Where accrual-based earnings management only shifts earnings and costs from one year to another, RAM has impact on cash flow and future operations. For example, by producing products just to reduce the average costs of goods sold in any year, the earnings of the following years is affected due to the fact that the higher inventory in the beginning of the next year will reduce the required production, leading to higher production costs or can even cause substantial extra costs when the overproduction cannot be sold at all. Reduction of research and development can cause even greater consequences when this leads to lack of knowledge compared to competing firms.
Another method of real activities manipulation is presented in the paper by Herrmann et al. [2003]. The authors find proof of the use of asset sales to manage earnings by Japanese managers to manipulate earnings.

Tabassum et al. [2015] used a sample which includes 119 firms listed in Karachi Stock Exchange (KSE) to identify RAM activities and how these activities influence future performance. They found that "*firms engaged in real earnings management (REM) activities through sales manipulation to report higher earnings have worse financial performance in future*" (p. 21). The study of Gunny [2010], using annual data of US firms, on the other hand

shows "*that firms that just meet earnings benchmarks by engaging in R&D or SG&A RM have significantly higher subsequent industry-adjusted ROA than firms that do not engage in RM and just meet earnings benchmarks*" (p. 886). These results illustrate that the impact of manipulating earnings by real activities manipulation on future earnings is inconclusive. One blurring aspect can be that reducing the cost aspects investigated by Gunny can also be a result of a sustainable cost reduction program.

2.5.3 Accrual based earnings management, real activities manipulation or both?

As mentioned before, the accounting choices by which general management can manage annual earnings are subject to auditor scrutiny (Gunny [2010]). Various bookkeeping scandals like the Enron or Ahold cases, resulted in tighter government supervision. The introduction of the Sarbanes-Oxley act in 2002 for example, lead to stricter regulations in order to reduce the risk on financial misreporting. As a result, the use of accrual-based earnings management declined (Cohen et al. [2008]). Simultaneously, the authors found an increase of real activities manipulation.

In her paper Zang [2012] states: "*I provide evidence for the trade-off decision as a function of the relative costs of the two activities and show that there is direct substitution between them after the fiscal year-end due to their sequential nature*" (p. 676).

Finally, the survey of Graham [2005] showed "*80% of survey participants report that they would decrease discretionary spending on R&D, advertising, and maintenance … to meet an earnings target. More than half (55.3%) state that they would delay starting a new project to meet an earnings target, even if such a delay entailed a small sacrifice in value*" (p. 32, 35).

The previously discussed studies illustrate that managers do not use accrual-based earnings management or real activities manipulation exclusively, but select their method of earnings management depending on the situation. For example, when the regulations are stricter, the use of accrual-based earnings management declines (Cohen et al. [2008]), but the real activities manipulation increases (Zang [2012]). And when the results after year end are insufficient, managers will use accrual-based earnings management to meet or beat the desired results (Graham [2005]). Therefore, this thesis considers the total of both to determine the level of earnings management.

CHAPTER 3 Hypothesis development

3.1 Introduction

In this thesis the influence of shareholders on the CEO of the company through the incentive scheme is examined. In order to examine this, the research needs to be split up in three stages:

- first the influence of the shareholders on the incentive schemes is tested;
- second the influence of the incentive scheme on the horizon of the CEO is determined and
- finally, the results are linked to one another in order to see whether the CEO's of firms with powerful shareholders are more influenced by the incentive scheme than others.

Assuming the remuneration plan for year t is finalized before the year starts, the power of the shareholders in year ***y-1*** is related to the influence of the incentive scheme on the CEO in year ***y***.

The next paragraphs address the three stages as mentioned above. Each paragraph contains the corresponding hypotheses. Paragraph two and three conclude with the corresponding Predictive Validity Framework of Libby [1981], also called the Libby boxes. By presenting the Libby Boxes the translation from the concepts to the operational measures is visualized.

3.2 Are shareholders able to influence the incentive schemes of the CEO?

3.2.1 Hypothesis development

The literature about the influence of shareholders on corporate behavior is limited. From the studies available some focus on a special event, for example Cadman & Sunder [2014] about the influence of shareholders on the incentive scheme around an IPO. Other studies, like Derrien et al. [2013], *"assume that long-term shareholders do not trade their shares ... whereas short-term shareholders trade frequently"* (p. 1758) and investigate the influence on corporate behavior based on this two typologies.

The results of these two and several other studies show the shareholders do have influence on the corporate behavior. The Cadman & Sunder [2014] study shows capital investors used their influence to let the incentive scheme of the CEO have a short time horizon. The time horizon of the incentive scheme of the CEO altered to longer time horizon after the IPO by the influence of the institutional investors, although the shift was smaller than the authors expected. The study

of Derrien et al. [2013] found a relationship between the level of investments and the time horizon of the investor.
In case of the study of Cadman & Sunder [2014] the number of shareholders before the IPO was limited. This enabled the authors to analyze the horizon of the original shareholders. For studies only considering listed firms, the number of shareholders makes it very hard to determine the time horizon of the total group of shareholders. Another complexing factor in interpreting the results of these studies is the "what was first, the chicken or the egg" question. Did investors influence the behavior of a firm after acquiring the shares or did they buy the shares of a firm because their corporate behavior fits in the horizon of the investor. For this thesis the answer for this question is not relevant, but it rather justifies the choice to look at the total group of investors as one entity.

Based on the results in previous studies like Cadman & Sunder [2014], I assume the shareholders do have influence on the corporate behavior in general, and more specific on the design of the incentive scheme of the CEO. This assumption is summarized in hypothesis 1:

H1 Shareholders' investment horizons positively affect the CEO's incentive scheme design.

Hypothesis H1 is tested by examining the relationship between the weighted average of the time each individual institutional investor keeps a share in their portfolio (the time-averaged Investor Turnover) and the time horizon of the variable part of the incentive scheme. The procedure of the studies of Gaspar et al. [2005, 2012] is the blueprint on which calculating the time-averaged Investor Turnover will be based.

When this hypothesis is confirmed, it is still possible that shareholder 'X' buys stocks of firm 'A' because the corporate behavior of this firm fitted the best at their horizon. Furthermore, because the distribution of ownership is not equal, it is questionable whether the weighted average of the time-averaged Investor Turnover is representative. The paper by Cadman & Sunder [2014] shows investors need to have enough power to be able to alter the policies of a firm. The power does not only depend on the absolute percentage of ownership, but also on the percentage of ownership of other shareholders. On the other hand, investors with shared

interests do have the opportunity to cluster their say in the concerning firm, in this way increasing their power.

The papers of Gaspar et al. [2005, 2012] provide a method to determine the average time horizon of all (institutional) investors of a firm. The authors however ignore the need for relative power for an investor to be able to alter the corporate behavior of a firm. This could cause a bias because this method also includes institutional investors without the power to influence the strategy of a firm.
To eliminate this bias, one should also investigate the influence of the largest shareholders. I define the largest shareholders as the group of shareholders in total owning 40% or more of the shares held, with a maximum of ten shareholders[3]. Because this exercise is too time-consuming in the light of this thesis, this deepening is recommended for further research.

3.2.2 Libby boxes

Hypothesis H1 is represented by the following Libby Box:

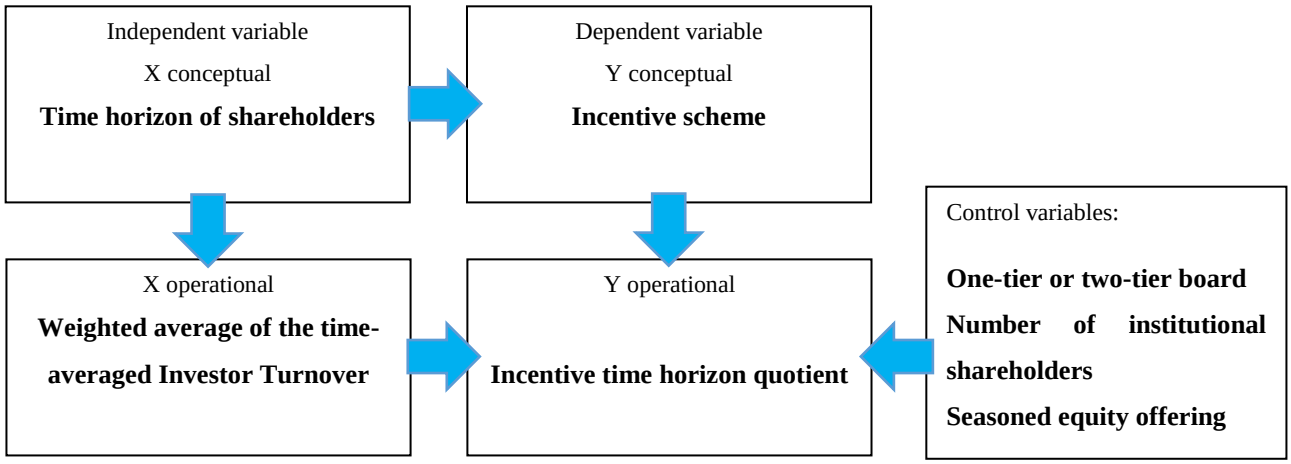

Figure 1 Libby Box hypothesis H1

[3] I assume the percentage of shares owned by number eleven and further is too low to enforce influence on the corporate behavior.

Construct validity

The operationalization of the construct is based on the study by Cadman & Sunder [2014]. By examining whether or not a relation between the average time horizon of the shareholders ("weighted Average of the time-averaged Investor Turnover" (IT)) and the horizon of the incentives "Incentive Time Horizon Quotient" (ITHQ) is present, hypothesis H1 can be confirmed or rejected.

Internal validity

The internal validity is high. The limited number of additional factors influencing the incentive scheme are added as control variables (the type of board, number of shareholders).

One influencing factor not captured is the influence of the CEO on his own incentive scheme. The results of the study of Abernethy et al. [2015] indicate "*that powerful CEOs can negate some of the beneficial effect of PVSOs* (performance-vested stock options (author)) *through their influence on adoption and choice of performance targets*" (p. 1265).

The choice to ignore this factor is based on the lack of relevance for this study. When the CEO indeed has the power to influence his own incentive scheme, two scenarios are possible:

1. The horizon of the CEO is similar to the horizon of the shareholders
2. The horizon of the CEO differs from the horizon of the shareholders

In the first scenario the influence of the shareholders will be strengthened by the "support" of the CEO. In worst case, the influence of the shareholders on the incentive scheme is not present at all when designing the scheme. Because this would only mean the shareholders did a good job at the beginning of the process, namely hiring a CEO with the same time horizon, they surely had indirect influence. Even in this situation, the influence of the shareholders is present, and therefore hypothesis H1 can be confirmed without bias.

In the second case the influence of the shareholders will be influenced negatively by the powerful CEO. When the power of the CEO is larger than the power of the shareholders, hypothesis H1 will be rejected for the right reasons.

External validity

The external validity is limited to the US only. Nevertheless, the results of this study can be used to determine whether or not it will be interesting to extend the study to other parts of the world. Furthermore, due to globalization firms across the world are more and more comparable.

This means the results of this study can at least provide useful background information for shareholders in the rest of the world.

3.3 Does the incentive scheme influence the time horizon of the CEO?

3.3.1 Hypothesis development

According to the optimal contracting theory, the inventive scheme can be used to align the interests of the shareholders of the firm and the CEO (Abernethy et al. [2015]). When the incentive scheme is well designed, tight control of the supervisory board should not be necessary. To achieve this, the design of the incentive scheme can be complex. In their article Sigler & Sigler [2015] state "*It appears that the complex manner in which a CEO is paid is designed to provide an incentive to the top manager to carry out the goals of stockholders and reduce agency problems*" (p.1). A problem faced when designing the incentive scheme is the influence of the incentive scheme on the CEO is difficult to determine. Chng et al. [2012] state "*While compensation researchers from various disciplines agree that incentive compensation influences managerial behaviors and organizational outcomes, they also realize that its effects are quite complex*" (p. 1343).

The large number of articles in scientific journals as well as in the daily press about the misuse of power by CEOs to alter the yearly results suggests many remuneration plan designs do not succeed in the aim to reduce the agency problems. These articles draw a picture of a CEO primarily focusing on his own wealth, regardless the consequences for future performance of the firm. This picture is emphasized by the recent bookkeeping scandals like Enron and Ahold in the beginning of the 21st century.

In response to these affairs governments in many western countries felt the need to enforce strict regulations in order to lower the risk on new scandals. In the United States of America, the Sarbanes-Oxley Act (SOX) was introduced in 2002. Cohen et al. [2008] state "*one of the main objectives was to restore the integrity of financial statements by curbing earnings management and accounting fraud*" (p. 759-760). Additionally, the Dodd Frank Act Section 954 is about to be finalized. This act forces firms to recover bonuses from CEO's when accounting restatements are issued by the SEC.

Although the influence of the incentive scheme on the decisions of the CEO is uncertain, the number of articles is very low. The published articles limit their scope to special situations like an initial public offering or last years of the tenure of the CEO. Nevertheless it is legitimate to question the effectiveness of incentive schemes. Based on the statements of Abernethy et al. [2015], Sigler & Sigler [2015] and Chng et al. [2012] and keeping in mind the skeptic view displayed in scientific and daily press articles I will test whether the following hypothesis can be confirmed:

H2 The CEO's incentive scheme design positively affects the time horizon of the CEO.

Due to the lack of publicly available data, it is impossible to objectively determine the time horizon of a CEO. The results of all decisions concerning the design of the accounting measurement system, composed under supervision of the CEO, on the other hand are observable via all published information. As the CEO has the overall responsibility of the results of a firm (Banghøj et al. [2010]) it is justifiable to use the results of the choices made in accounting as an indicator for the time horizon of the CEO.

Some changes in the accounting measurement system like the depreciation system and valuation methods of stock, receivables and liabilities have to be accounted for in the published (yearly) reports, certainly in case of listed firms.
Less obvious is the change in use of accruals in any year. As stated in paragraph 2.5 "*accruals shift or adjust the recognition of cash flows over time, so that the adjusted numbers (earnings), better measure firm performance*" (Dechow and Dichev [2002], p.35). This principle also provides CEO's an instrument to alter the yearly result by misusing accruals. Therefore, accruals are subject of many scientific articles. Most articles analyze the accruals of any year by comparing them with the accruals of the year before or by benchmarking the accruals with comparable firms or industries. These methods all try to estimate the abnormal part of the total of accruals presented in the annual report.
Choices in expenditures are not directly linked to the sales in any year (research and development, advertising costs) and choices in the level of stock and the valuation of work in progress are other ways to alter yearly profit. These real activities manipulations (RAM) are

also subject of research, although the number of articles is substantially lower than the articles about manipulation of accruals.

Especially after tightening the bookkeeping regulations by governments due to the bookkeeping scandals in the beginning of the 21st century, the level of this method of earnings manipulation increased, while the level of manipulation by accruals decreased (Cohen et al. [2008]). Therefore, in this thesis RAM will also be considered. The time horizon of the CEO will be indicated by total of both methods of earnings manipulation in any year. The higher the manipulation in any year, the lower the earning quality and the shorter the horizon of the CEO.

3.3.2 Libby boxes

Hypothesis H2 is visualized by the following Libby Box:

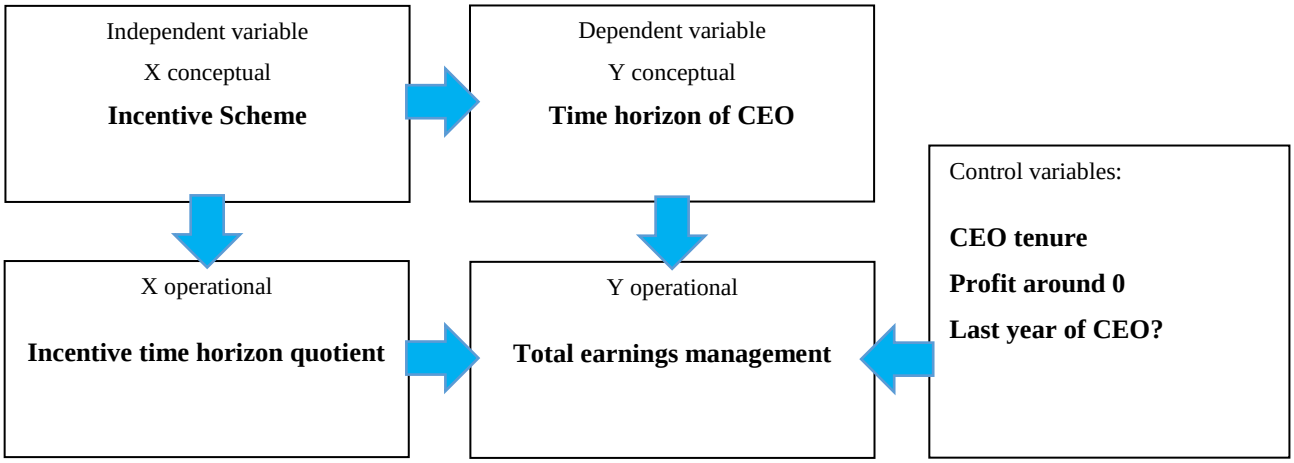

Figure 2 Libby Box hypothesis H2

Construct validity

"[F]or organizations to achieve their objectives, executives must be duly motivated with financial incentives" (Chng et al. [2012], p. 1344). This idea is captured in figure 2. As stated in the previous paragraph, the incentive scheme if fully captured by the operational ITHQ. The choice to use total earnings management as operational for the Time horizon of the CEO is broadly explained in 3.3.2. Because the change in accounting regulation causes a shift from accrual-based earnings management to real activities manipulation (Cohen et al. [2008]) it is necessary to consider the total of earnings management in any year. The overall responsibility of the CEO justifies using the consequences of the choices in a firm as indicator for the time horizon of the CEO. As the time horizon shortens the use of earnings management will increase.

Internal validity

The internal validity is difficult to determine due to the unlimited external factors influencing the CEO's behavior. Following all other studies in this field these personal factors are disregarded in this thesis. Then the internal validity can be rated as high. The number of other factors influencing the CEO's behavior are limited. By including control variables for CEO tenure, just meet or beat zero and whether it is the last full year of the CEO most of the additional influencing factors are captured.

External validity

Similar to hypothesis H1, the external validity is limited to the US only, due to the use of US data. Nevertheless, the results of this study can be used to determine whether or not it will be interesting to extend the study to other parts of the world. Moreover, the globalization transforms firms across the world towards one another and the characteristics of firms across the western world tend to become more comparable. This means the results of this study can at least provide useful background information for shareholders in the rest of the world.

3.4 Does higher investor influence lead to higher influence of the incentive scheme on the time horizon of the CEO?

When hypotheses 1 and 2 are confirmed, the central research question of this thesis "are shareholders able to influence the time horizon of the CEO through incentive scheme" still remains unanswered. There has to be a significant difference between the percentage of CEOs influenced by the incentive scheme of firms with powerful shareholders and firms without them. Only when the relationship between powerful shareholders and influenced CEOs is confirmed, the research question can be confirmed. This is summarized in the last hypothesis:

H3 Shareholders' investment horizons positively affect the time horizon of the CEO.

I assume the incentive scheme for year *y* is agreed upon in the previous year. Therefore, the power of the shareholders in year ***y-1*** must lead to higher influence on the CEO in year *y*.

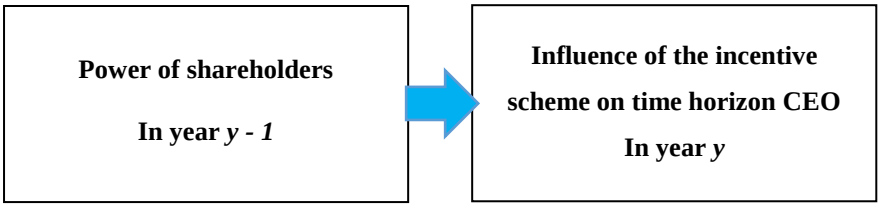

Figure 3 Visualization H3

Due to the lack of previous studies regarding the relationship between the influence of shareholders on the time horizon of the CEO, there is no blueprint for examining this relationship. The study of Cadman & Sunder (2014) examines "whether short-horizon, influential investors provide managers with explicit short-horizon incentives through compensation contracts", but the scope is limited to IPO's and venture capitalists. Therefore the model used in this study is not applicable for the research in this paper.

For this reason the main research question "Are shareholders able to influence the time horizon of the CEO through incentive schemes?" was split into hypothesis 1 and hypothesis 2. The results of the analysis of these hypotheses will be used to analyze hypothesis 3.

To represent the power of shareholders the relative difference between the real Incentive Time Horizon Quotient and the Incentive Time Horizon Quotient calculated by using the coefficients of the regression analysis for hypothesis 1 is chosen.

The influence of the incentive scheme on the time horizon of the CEO is represented by the relative difference between the real influence of the CEO and the influence of the CEO calculated by using the coefficients of the regression analysis for hypothesis 2.

CHAPTER 4 Research design

4.1 Introduction

In this chapter the research design is explained.

The second paragraph elaborates on the method to calculate the Incentive Time Horizon Quotient, the representation of the time horizon of the incentive scheme. This conversion is necessary to be able to compare the time horizon of the incentive scheme and the time horizon of the shareholders, represented by the weighted average of the time-averaged Investor Turnover (H1) and the time horizon of the CEO (H2).

The third paragraph addresses the way hypothesis H1is tested. First the method to calculate the weighted average of the time-averaged Investor Turnover is explained. Finally, the regression analysis regarding the relationship between the weighted average of the time-averaged Investor Turnover and the time horizon of the incentive scheme is explained.

The next paragraph addresses hypothesis H2. The choice of the method to estimate the accrual-based earnings management is explained and the chosen method is elaborated upon.

Then the way the real activities manipulation is estimated is explained.

Next, the way both types of earnings management are added and the method to determine the horizon of the CEO (long or short) will be made clear. Finally, the regression analysis regarding the relationship between the time horizon of the incentive scheme and the time horizon of the CEO is explained.

In the fifth paragraph the regression model regarding hypothesis H3 is addressed.

In the last paragraph I elaborate on the data collection used in this thesis.

4.2 Incentive Time Horizon Quotient

The incentive scheme, or more specific the variable part of the incentive scheme (bonus scheme) of every firm differ. In most cases the bonus scheme contains several aspects, not necessarily based on the same criteria.

The data used is extracted from the ExecuComp Database. This database reports total compensation per director, specified to:

1. Salary (CASH)
2. Bonus (BONUS)
3. Value of Stock Awards – FAS123R (STOCK)
4. Value of Option Awards – FAS 123R (OPTION)
5. Non-Equity Incentive Plan Compensation (NIPC)

6. Change in Pension Value and NonQualified Deferred Compensation Earnings (PENSION)
7. All Other Compensation (OTHER)

By appointing each item with a weight for the time horizon the item represents, the Incentive Time Horizon Quotient (ITHQ) can be calculated.

The weight of each item is based on the results of a survey by Chakhovich et al. [2011]. The results are "*based on survey evidence gathered from 103 Chief Financial Officers (CFOs) in companies listed in the Nordic stock exchange, Nasdaq OMX*" (p. 3).

This study is based on data of the Nordic countries where "*compensation systems have been lower and not as aggressive as in the US or UK*" (p. 3). Two facts explaining the choice to use this data are:

- in for example Sweden the variable part of the remuneration of the CEO still equals the salary part (Goergen & Renneboog [2011], p 1072).
- The mean years for all compensation classes approximately match the theoretical based expectations. These theories are mainly based on US datasets, therefore matching the dataset of this thesis.

Based on this survey the by company management perceived time horizon for the different compensation classes are:

Compensation class	***Users***	***Time Horizon, Mean***	***Time Horizon, Std.dev.***	***Theoretical based expectations***	***Test of the time horizon***	***Test results***	***Matching Execucomp items***
	n	*years*	*years*	*years*	*test value*	*t-value*	
THsalary	87	1.95	1.57	over one year	1 year	5.64**	CASH
THbenefits	53	2.06	1.90	over one year	1 year	4.05**	NIPC
THbonus	68	1.49	1.07	one year	1 year	3.84**	BONUS
THdefbonus	19	2.32	2.00	over one year	1 year	2.88**	OTHER
THretirement	29	4.94	3.00	over 3 years	3 years	3.48**	PENSION
THESO	37	3.19	1.77	over 3 years	3 years	0.65	OPTION
THstocks	26	3.20	1.87	over 3 years	3 years	0.61	STOCK

Table 2 Chakhovich et al. [2011], p. 14

The compensation classes in the article of Chakhovich et al. [2011] do not match the data items in the ExecuComp database fully. Therefore, in the last column the matching items are displayed.

To calculate the ITHQ the amount of each item is divided by the total remuneration of the concerning year and multiplied by the weight assigned to the item.

This leads to the following formula:

$$ITHQ_{i,y} = 1.95 * \frac{CASH_{i,y}}{TOTAL_{i,y}} + 1.49 * \frac{BONUS_{i,y}}{TOTAL_{i,y}} + 3.20 * \frac{STOCK_{i,y}}{TOTAL_{i,y}} + 3.19 * \frac{OPTION_{i,y}}{TOTAL_{i,y}} + 2.06 * \frac{NIPC_{i,y}}{TOTAL_{i,y}} + 4.94 * \frac{PENSION_{i,y}}{TOTAL_{i,y}} + 2.32 * \frac{OTHER_{i,y}}{TOTAL_{i,y}} \quad (1)$$

With TOTAL equals the sum of all remuneration items. In case the total incentives of the CEO in a particular fiscal year is zero or less, the firm is not included for that fiscal year.

The abstraction of this method is high. In future research the ITHQ can be calculated based on the incentive plan as described in the annual reports. For this thesis this way of information gathering is too time consuming.

4.3 Influence of shareholder on the incentive scheme

4.3.1 Weighted average of the time-averaged Investor Turnover

The method to calculate the weighted average of the time-averaged Investor Turnover I draw upon the method used in the paper Gaspar et al. [2012].

In **step 1** the turnover rate of investor *I* at quarter *t* is calculated:

$$TR_{i,t} = \frac{\sum_{k=1}^{Q_t} \left| N_{k,i,t} P_{k,t} - N_{k,i,t-1} P_{k,t-1} - N_{k,i,t-1} \Delta P_{k,t} \right|}{\sum_{k=1}^{Q_t} \frac{N_{k,i,t} P_{k,t} + N_{k,i,t-1} P_{k,t-1}}{2}} \quad (2)$$

with:

$TR_{i,t}$ = turnover Rate of investor *i* at quarter *t*,

Q_t = Set of companies held by investor *i* at quarter *t*,

$P_{k,t}$ = Price of shares of company *k*,

$N_{k,I,t}$ = Number of shares of company *k* held by investor *i* at quarter *t*.

Following Derrien et al. [2013] I "*classify investors with a portfolio turnover of 35% or less as "long-term investors" (cf. Froot, Perold, and Stein (1992)). We classify all other investors (even if we cannot compute their portfolio turnover) as "short-term investors." The 35% cutoff roughly corresponds to the bottom quartile of investor turnover, and its distribution is stable over time"* (p. 1761). The results in the paper by Derrien et al. [2013] show a persistence of investor turnover over the years. This suggests the time horizon of an institutional investor is characteristic.

In step 2 the weighted average of the time-averaged turnover rates for all institutional investors in company *k* in year *y* is calculated:

$$IT_{k,y} = \frac{\sum_{t=1}^{4}\left(\sum_{i \in S_{k,t}} w_{k,i,t}\left(\frac{1}{4}\sum_{r=1}^{4} TR_{i,t-r-1}\right)\right)}{4} \quad (3)$$

with:

$IT_{k,y}$ = Investor Turnover for company *k* at year *y*,

$S_{k,t}$ = set of shareholders in company *k* at quarter *t* of year *y*,

$W_{k,i,t}$ = weight of investor *i* in the total percentage held by institutional investors at quarter *t* of year *y* in company *k*,

$TR_{i,t}$ = Turnover Rate of investor *i* at quarter *t* of year *y*.

4.3.2 Influence of the institutional investors on the incentive time horizon

In order to analyze the influence of the institutional investors on the incentive time horizon, the relation between the ITHQ and the Investor Turnover of the lagged year is evaluated. This is analyzed by the following model:

$$ITHQ_{f,y} = \alpha_1 * IT_{f,y-1} + \alpha_2 * TIER_{f,y} + \alpha_3 * \frac{1}{SHARE}_{f,y} + \epsilon_{f,y} \quad (4)$$

with:

$ITHQ_{f,y}$ = Incentive Time Horizon Quotient for company *f* at year *y*,

$IT_{f,,y-1}$ = Investor Turnover for company *f* at year *y-1*,

$TIER_{f,y}$ = Indicator variable, 1 in case of one-tier-board and 0 in case of two-tier-board,

$SHARE_{f,y}$ = average number of institutional shareholders for company *f* in year *y*

4.4 Influence of the incentive scheme on the behavior of the CEO

First for every firm in the data set the discrete part of earnings management has to be determined for every year. Using the selected models for the accruals-based earnings management and real activities manipulation and based on data from Compustat, for every year and for every industry (based on the two-digit SIC code) the coefficients will be calculated by regression. The financial industry as well as industries with fewer than 15 firms will be eliminated from the sample.

4.4.1 Discrete part of accruals-based earnings management

Following previous literature (e.g. the papers of Cohen & Zarowin [2010] and Chan et al. [2015]), in this thesis a cross-sectional model is used to estimate the normal level of accruals for each 2 digit SIC grouping in any year.

This model estimates the non-discretionary part of the accruals by using the following model:

$$\frac{TA_{f,y}}{AT_{f,y-1}} = k_1 \frac{1}{AT_{f,y-1}} + k_2 \frac{\Delta SALES_{f,y}}{AT_{f,y-1}} + k_3 \frac{PPE_{f,y}}{AT_{f,y-1}} + \varepsilon_{f,y} \quad (5a)$$

with for firm *i* and fiscal year *y*

TA = Total accruals,

AT = total assets,

ΔSales = change in revenues from the previous year,

PPE = gross value of property, plant and equipment.

The quotient estimates $\hat{k}_1$, $\hat{k}_2$ and $\hat{k}_3$ from equation (5a) are used to estimate the measure for normal accruals $NA_{f,y}$ for firm *f* in year *y*.

$$\frac{NA_{f,y}}{AT_{f,y-1}} = \hat{k}_1 \frac{1}{AT_{f,y-1}} + \hat{k}_2 \frac{\Delta SALES_{f,y}}{AT_{f,y-1}} + \hat{k}_3 \frac{PPE_{f,y}}{AT_{f,y-1}} \quad (5b)$$

The discretionary part ($DISC\_ACC_{f,y}$) is defined as:

$$DISC\_ACC_{f,y} = TA_{f,y} - NA_{f,y} \quad (5c)$$

4.4.2 Amount of real activities manipulation

In order to be able to estimate the real activities manipulation component in a year's profit I will follow the study of Gunny [2010]. Based on prior research (e.g. Roychowdhury [2006], Herrmann et al. [2003]) she "*focuses on the following four types of RM demonstrated to exist empirically in the prior literature:*

(1) decreasing discretionary R&D expense (R&D RM),

(2) decreasing discretionary SG&A expense (SG&A RM),

(3) timing the sale of fixed assets to report gains (asset RM), and

(4) overproduction reflecting an intention to cut prices or extend more lenient credit terms to boost sales and/or overproduction to decrease COGS expense (production RM)"

(Gunny [2010], p. 858).

In order to determine the abnormal change in expenditures, the normal level of these types is estimated first. All normal levels of expenses are determined by year and industry, based on the two-digit SIC-code.

To estimate the coefficients of the model for the measure $NRD_{f,y}$ of the normal level of Research and Development expenses she uses the equation:

$$\frac{RD_{f,y}}{AT_{i,y-1}} = \propto_0 + \propto_1 * {}^{1}/_{AT_{f,y-1}} + \beta_1 * MV_{f,y} + \beta_2 * Q_{f,y} + \beta_3 * {}^{INT_{f,y}}/_{AT_{f,y-1}} + \beta_4 * {}^{RD_{f,y-1}}/_{AT_{f,y-1}} + \varepsilon_{f,y}^{R\&D} \quad (6)$$

With:

RD = R&D expense,

AT = total assets,

MV = the natural log of market value,

Q = Tobin's Q[4],

INT = internal funds.

The quotient estimates $\hat{\alpha}_0$, $\hat{\alpha}_1$, $\hat{\beta}_1$, $\hat{\beta}_2$, $\hat{\beta}_3$ and $\hat{\beta}_4$ from equation (5) are used to estimate $NRD_{f,y}$ for the normal level of Research and Development expenses for firm *f* in year *y*. By deducting the product of $NRD_{f,y}$ and the total assets of *y-1* from the actual Research and Development expenses of firm *f* in year *y*, the abnormal part ($RD\_Abn_{f,y}$) is calculated.

The coefficients of the model for the measure $NSGA_{f,y}$ for the normal level of selling, general and administrative expenses are determined by:

$$\frac{SGA_{f,y}}{AT_{f,y-1}} = \propto_0 + \propto_1 * {}^{1}/_{TA_{f,y-1}} + \beta_1 * MV_{f,y} + \beta_2 * Q_{f,y} + \beta_3 * {}^{INT_{f,y}}/_{AT_{f,y-1}} + \beta_4 * {}^{\Delta S_{f,y}}/_{AT_{f,y-1}} + \beta_5 * {}^{\Delta S_{f,y}}/_{AT_{f,y-1}} * DD + \varepsilon_{f,y}^{SG\&A} \quad (7)$$

with:

SGA = Selling, General and Administrative expenses,

AT = total assets,

MV = the natural logarithm of market value,

Q = Tobin's Q,

INT = internal funds,

S = total sales,

DD = indicator variable equal to 1 when total sales decrease between *y - 1* and *y*,

[4] Tobin's Q = ([Price Fiscal Year Close]*[Common Shares Outstanding] + [Preferred Stock Carrying Value] + [Long-Term Debt Total] + [Debt in Current Liabilities])/ [Assets Total/Liabilities and Stockholders' Equity Total]. The used descriptions in this formula are based on the standard descriptions in the Compustat Database.

zero otherwise.

The quotient estimates $\hat{\alpha}_0$, $\hat{\alpha}_1$, $\hat{\beta}_1$, $\hat{\beta}_2$, $\hat{\beta}_3$, $\hat{\beta}_4$ and $\hat{\beta}_5$ from equation (6) are used to estimate $NSGA_{f,y}$ for firm *f* in year *y*. By deducting the product of $NSGA_{f,y}$ and the total assets of *y-1* from the actual Selling, General and Administrative expenses of firm *f* in year *y*, the abnormal part ($SGA\_Abn_{f,y}$) is calculated.

To estimate the measure $NGainA_{f,y}$ for the normal level of gain from asset sales, Gunny [2010] defined the following model:

$$\frac{GainA_{f,y}}{AT_{f,y-1}} = \propto_0 + \propto_1 * \left(1/_{AT_{f,y-1}}\right) + \beta_1 * MV_{f,y} + \beta_2 * Q_{f,y} + \beta_3 * {INT_{f,y}}/{AT_{f,y-1}} + \beta_4 * {ASales_{f,y}}/{AT_{f,y-1}} + \beta_5 * {ISales_{f,y}}/{AT_{f,y-1}} + \varepsilon_{f,y}^{Asset} \quad (8)$$

with:

GainA = income from asset sales,
AT = total assets,
MV = the natural logarithm of market value,
Q = Tobin's Q,
INT = internal funds,
ASales = long-lived assets sales,
ISales = long-lived investment sales.

The quotient estimates $\hat{\alpha}_0$, $\hat{\alpha}_1$, $\hat{\beta}_1$, $\hat{\beta}_2$, $\hat{\beta}_3$, $\hat{\beta}_4$ and $\hat{\beta}_5$ from equation (7) are used to estimate $NGainA_{f,y}$ for firm *f* in year *y*. By deducting the product of $NGainA_{f,y}$ and the total assets of *y-1* from the actual gain from asset sales of firm *f* in year *y*, the abnormal part ($GainA\_Abn_{f,y}$) is calculated.

Finally, to estimate the measure $NPROD_{f,y}$ for the normal level of production costs, the following model is used:

$$\frac{PROD_{f,y}}{AT_{f,y-1}} = \propto_0 + \propto_1 * \left(1/_{AT_{f,y-1}}\right) + \beta_1 * MV_{f,y} + \beta_2 * Q_{f,y} + \beta_3 * {S_{f,y}}/{AT_{f,y-1}} + \beta_4 * {\Delta S_{f,y}}/{AT_{f,y-1}} + \beta_5 * {\Delta S_{f,t-1}}/{AT_{f,y-1}} + \varepsilon_{f,y}^{Production} \quad (9)$$

with:

PROD = costs of goods sold plus change in inventory,
AT = total assets,

MV = the natural log of market value,

Q = Tobin's Q,

S = sales.

The quotient estimates $\hat{\alpha}_0$, $\hat{\alpha}_1$, $\hat{\beta}_1$, $\hat{\beta}_2$, $\hat{\beta}_3$, $\hat{\beta}_4$ and $\hat{\beta}_5$ from equation (8) are used to estimate $NPROD_{f,y}$ for firm *f* in year *y*. By deducting the product of $NPROD_{f,y}$ and the total assets of *y-1* from the actual level of production costs of firm *f* in year *y*, the abnormal part ($PROD\_Abn_{f,y}$) is calculated.

The total of Real Activities Manipulation is calculated as:

$$RAM_{f,y} = -RD\_Abn_{f,y} - SGA\_Abn_{f,y} + GainA\_Abn_{f,y} + PROD\_Abn_{f,y} \quad (10)$$

Where $RAM_{f,y}$ is defined as the amount the real activities manipulation adds to the years' profit.

4.4.3 Total influence of earnings management on years' earnings

To be able to rate the total of earnings management, first the "realistic income" (RI) has to be calculated. In this thesis the operating income before depreciation (OIBD) is chosen as base for RI, because then the investment choices in the past do not influence the judgement of the choices in the concerning year. The "realistic Income" RI is calculated as:

$$RI_{f,y} = OIBD_{f,y} - DISC\_ACC_{r,y} - RAM_{r,y} \quad (11)$$

Next, the earnings management activities of the CEO (CEO_INF) of firm *f* in any year is calculated by expressing the absolute value of both DISC_ACC and RAM in a percentage of RI:

$$CEO\_INF_{f,y} = \left|DISC\_ACC_{f,y}\right| / \left|RI_{f,y}\right| + \left|RAM_{r,y}\right| / \left|RI_{f,y}\right| \quad (12)$$

4.4.4 Relation between the incentive time horizon and the time horizon of the CEO

The relation between the incentive time horizon and the time horizon of the CEO can be evaluated via the following model:

$$CEO\_INF_{f,y} = \alpha_1 * ITHQ_{f,y} + \alpha_2 * CEO\_TEN_{f,y} + \alpha_3 * MB0_{f,y} + \alpha_4 * CEO\_LY_{f,y} + \epsilon_{f,y} \quad (13)$$

with:

CEO_TEN = indicator variable with value 1 when CEO tenure < 5 years, value 0 otherwise

MB0 = Indicator variable with value 1 if presented earnings are around 0, value 0

otherwise

CEO_LY = indicator variable with value 1 when CEO left the firm in that year, value 0 otherwise

4.5 Are CEOs at firms with powerful shareholders more influenced

To represent the power of shareholders (POS) first the normal Incentive Time Horizon Quotient using the coefficients as calculated in formula 4 has to be calculated:

$$N\_ITHQ_{f,y} = \hat{\alpha}_1 * IT_{f,y-1} + \hat{\alpha}_2 * TIER_{f,y} + \hat{\alpha}_3 * \frac{1}{SHARE_{f,y}} \quad (14)$$

The lagged influence of the shareholder on the remuneration plan is included in this equation by using $IT_{f,y-1}$.

Next, POS is calculated as:

$$POS_{f,y} = \left|ITHQ_{f,y} - N\_ITHQ_{f,y}\right| \Big/ \left|N\_ITHQ_{f,y}\right| * 100 \quad (15)$$

To represent the influence of the incentive scheme on the time horizon of the CEO (IIS) first the normal influence of the CEO has to be calculated:

$$N\_CEO\_INF_{f,y} = \hat{\alpha}_1 * ITHQ_{f,y} + \hat{\alpha}_2 * CEO\_TEN_{f,y} + \hat{\alpha}_3 * MB0_{f,y} + \hat{\alpha}_4 * CEO\_LY_{f,y} \quad (16)$$

Next IIS is calculated as:

$$IIS_{f,y} = \left|CEO\_INF_{f,y} - N\_CEO\_INF_{f,y}\right| \Big/ \left|N\_CEO\_INF_{f,y}\right| * 100 \quad (17)$$

Finally, by a simple linear regression the relation between POS and IIS is examined:

$$POS_{f,y} = \alpha * IIS_{f,y} + \beta + \epsilon_{f,y} \quad (18)$$

When the regression of this equation shows statistical relevance, hypothesis 3 can be confirmed.

4.6 Data

The time horizon of the incentive scheme is analyzed for the period 2006 – 2014. The information is extracted from the Corporate Library/ S&P ExecuComp Database.

For analyzing the time horizon of the institutional investors, the period of investigation is 2005 – 2013. The data is extracted from the Thomson Reuters 13F database.

All financial data is drawn from the Compustat database. The period of investigation for this data is also 2006 – 2014.

Following Srivastava [2014] "*I exclude all finance firms because the traditional cost classifications, i.e., cost of goods sold (COGS) versus SG&A, do not apply to these firms. In addition, I exclude the industry categorized as "almost nothing" in the Fama–French classification (Fama and French, 1997), as it is difficult to interpret its results in an industry context. Thus, I exclude the Fama–French industries identified by numbers 44–47(representing finance firms) and 48 (representing "almost nothing"), which leaves 43 industries*" (p. 200).

CHAPTER 5 Empirical results

5.1 Incentive Time Horizon Quotient

The Incentive Time Horizon Quotient (ITHQ) is determined by using the data of the Execucomp database. The results can be summarized as:

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ITHQ 2004	2471	1,49000	2,32000	1,79315	0,12914
ITHQ 2005	2552	1,48387	2,32000	1,80798	0,14763
ITHQ 2006	2776	1,49600	4,45005	2,47329	0,46963
ITHQ 2007	3138	0,36498	4,67505	2,60257	0,40067
ITHQ 2008	3019	-2,75513	4,63885	2,61051	0,43063
ITHQ 2009	2894	1,49000	4,93702	2,61077	0,43266
ITHQ 2010	2797	0,59764	4,92163	2,61392	0,40213
ITHQ 2011	2731	1,52537	4,86871	2,66508	0,41765
ITHQ 2012	2583	0,33354	4,51878	2,67410	0,42103
ITHQ 2013	2460	1,41638	4,51316	2,61913	0,34397
ITHQ 2014	2302	1,49000	4,83613	2,70556	0,40233
ITHQ 2015	2273	0,91350	4,31921	2,66432	0,34496

Table 3 Incentive Time Horizon Quotient descriptive statistics

The negative minimum in 2008 is caused by a negatively rated “value of stock rewards”. Although the total compensation of the considered CEO is positive, the difference in weight of the income classes causes a negative ITHQ.

5.2 Weighted average of the time-averaged Investor Turnover

In order to calculate the time-averaged Investor Turnover the data of the Thomson Reuters 13F database is used for input.

First the turnover rate (TR) of 5433 institutional investors is determined for every quarter of any year within the scope of this thesis. Based on these outcomes the investor turnover per company is calculated. The outcomes of around 9.650 companies per year can be summarized as:

Descriptive Statistics				
	N	Minimum	Maximum	Mean
2005	9,972	0.0000031	1.6737435	0.2830536
2006	10,474	-	1.3796035	0.2971724
2007	11,043	-	1.5432757	0.2876674
2008	10,480	-	1.3368818	0.2886903
2009	9,754	-	1.1874974	0.2999173
2010	9,846	-	1.4643260	0.2929478
2011	9,636	-	1.5600609	0.2716381
2012	9,010	-	1.2793646	0.2512220
2013	8,921	-	1.5750830	0.2721664
2014	8,596	-	1.5839718	0.2883682
2015	8,432	-	1.4971306	0.2370771

Table 4 Weighted average of the time-averaged Investor Turnover descriptive statistics

5.3 Influence of the institutional investors on the incentive time horizon

The analysis can only be executed when information about all variables in formula 4 is available. Combining all input leaves a total of 15.538 observations in the period of 2006 to 2015. The observations are fairly even distributed over the 10 years (a minimum of 1,452 observations in 2006 and a maximum of 1,614 in 2007).

The results are summarized in the following table:

	Unstandardized Coefficients				Standard Error			
Year	Constant	IT	TIER	1/share	Constant	IT	TIER	1/share
2006	2.498283	-.405984	.191680	-.950302	.044390	.149242	.029870	.219439
2007	2.654447	-.482006	.220847	-1.022951	.032983	.108183	.021723	.167394
2008	2.590649	-.194555	.185310	-.829643	.034344	.111645	.020493	.172375
2009	2.729718	-.697792	.157200	-.571188	.040840	.138958	.021295	.136491
2010	2.694786	-.483541	.150788	-1.050528	.039433	.129548	.019260	.160152
2011	2.743268	-.555333	.136933	-.813085	.037507	.138972	.021445	.157689
2012	2.830024	-.885899	.127571	-1.508853	.039716	.155563	.022239	.277079
2013	2.525128	.085945	.116645	-.668431	.028006	.113620	.017759	.165987
2014	2.749630	-.449039	.117915	-.590837	.035342	.132441	.022327	.161458
2015	2.674155	-.317306	.092629	-.816790	.025367	.090548	.017660	.162846
all observations	2.692674	-.526519	.151477	-.833899	.010838	.038189	.006872	.055000

Table 5 Influence of institutional investors on the incentive time horizon

The significance for all variables in all years separate as well as for the analysis of all observations in total is greater than 95%.

The coefficient of determination (the R square value) on the other hand is very low for all the analysis. The average R square over the years shows that about 5.8 % of the variation is explained by the used variables.

The result of the ANOVA F-test for all observations is 324. This indicates the regression analysis is overall significant.

ITHQ represents the time horizon of the remuneration plan. The higher the ITHQ, the longer the time horizon.
IT is negatively significant related. As IT represents the time horizon of the shareholders and the value of IT is lower when the time horizon of the shareholder is higher, the direction is conform expectations upfront.
TIER is positively significant related. As TIER is a dummy variable with value 1 for a one tier board and 0 for a two tier board, this result is also as expected.

Finally, 1/SHARE represents the number of shareholders. As the value of 1/SHARE is lower the more shareholders the firm has, the negatively significant relationship is conform the expectations. Obviously the lower the number of shareholders the higher their influence is. This is confirmed by the negative coefficient α_3.

Based on these results, hypothesis 1, "Shareholders have influence on the incentive scheme design", can be confirmed.

5.4 Relation between the incentive time horizon and the time horizon of the CEO

First the discrete part of accruals-based earnings management is determined by using formulas 5a, 5b and 5c. Using the first two numbers of the SIC code to divide all observations in group, per group the coefficients to estimate the non-discretionary part of the accruals are calculated. By abstracting the non-discretionary part from the real amount of accruals, the discretionary part is calculated. The variation in the results is very high and they are summarized in the following table.

year	max	min	averag	number of observation
2006	98,926	-501,208	-160	12,196
2007	491,460	-158,221	625	12,301
2008	646,987	-2,156,750	408	12,089
2009	367,345	-175,135	-49	12,053
2010	847,446	-623,239	407	12,290
2011	2,213,156	-6,442,834	-2,673	12,889
2012	1,922,361	-1,062,958	728	13,066
2013	401,296	-2,750,950	-724	12,972
2014	1,956,996	-1,580,369	2,360	12,616
2015	1,215,219	-82,141	1,267	12,082

Table 6 Estimate of discretionary part of the accruals

Next, based on the coefficients calculated with formula 6 up to formula 9 the abnormal amount of research and development, selling, general and administrative expenses, gain from asset sales and production costs is determined by deducting the normal amount from the real amount of the considered item.

Per item the maximum, minimum and average for each year is summarized in the next table:

	fyear	RD_Abn	SGA_Abn	GainA_Abn	PROD_Abn	RAM
max	2005	185,417.14	757,410.52	10,522.07	565,686.26	563,204.94
min	2005	-71,495.93	-311,913.61	-22,707.00	-199,583.32	-994,200.89
avarage	2005	-3.35	-88.19	2.63	114.15	208.31
max	2006	44,759.91	506,608.42	39,723.93	144,419.07	260,291.31
min	2006	-20,399.11	-206,641.97	-26,041.93	-59,116.97	-607,821.64
avarage	2006	-11.60	-100.06	2.17	117.28	231.11
max	2007	31,571.29	339,908.92	18,849.42	626,793.98	630,834.73
min	2007	-64,642.02	-180,019.75	-10,038.20	-404,243.60	-467,398.52
avarage	2007	-1.67	-145.51	-4.21	505.77	648.75
max	2008	26,186.74	116,041.85	26,436.35	110,885.23	8,455,594.48
min	2008	-5,477.01	-8,455,594.48	-14,895.70	-64,404.44	-203,305.31
avarage	2008	-14.65	-1,119.52	6.82	118.45	1,259.43
max	2009	28,719.97	215,930.49	68,260.12	146,268.86	320,658.65
min	2009	-13,918.11	-280,577.97	-43,134.92	-130,743.41	-244,366.26
avarage	2009	-8.32	-84.28	-4.60	139.52	227.52
max	2010	15,659.74	90,275.02	52,163.15	129,233.00	128,034.00
min	2010	-7,935.01	-68,017.58	-25,570.91	-269,307.80	-364,288.71
avarage	2010	-4.75	-5.62	4.36	152.49	167.22
max	2011	289,752.96	1,777,093.19	23,717.72	609,903.39	819,029.02
min	2011	-67,888.78	-773,287.05	-13,825.20	-516,190.12	-1,849,136.96
avarage	2011	6.85	-141.83	3.76	-17.03	121.70
max	2012	48,441.07	164,718.64	14,199.76	1,020,131.71	897,819.94
min	2012	-108,606.98	-158,021.15	-16,228.10	-783,759.28	-779,104.69
avarage	2012	-11.41	-49.29	-1.28	-110.59	-51.16
max	2013	237,205.69	804,348.49	15,148.03	287,345.53	1,293,567.13
min	2013	-1,004,871.97	-352,226.85	-21,631.12	-2,126,096.54	-2,206,522.61
avarage	2013	-201.89	-211.89	-4.19	39.70	449.29
max	2014	28,013.65	54,431.07	126,547.58	91,816.20	252,643.51
min	2014	-88,519.17	-172,429.13	-196,045.80	-104,346.53	-347,980.16
avarage	2014	-44.62	-146.08	-22.96	124.67	292.40
max	2015	11,446.28	165,839.16	21,004.36	60,021.24	456,020.66
min	2015	-36,388.53	-449,834.16	-29,851.21	-86,447.23	-220,017.00
avarage	2015	-23.86	-145.89	3.02	133.41	306.18
max		289,752.96	1,777,093.19	126,547.58	1,020,131.71	8,455,594.48
min		-1,004,871.97	-8,455,594.48	-196,045.80	-2,126,096.54	-2,206,522.61
avarage		-29.69	-202.58	-1.39	119.25	350.12

Table 7 Summary of results real activities manipulation

The picture drawn in the previous table shows a wide range in the amounts of abnormal activities. The average amount of real activities manipulation, based on the figures above, is USD 350,000.

Based on the results as summarized in the tables above, the earnings management activities of the CEO are calculated conform formula 12. The first analysis shows some extreme results, as can be seen in the following table:

	Max	Min	Average	number of observations
2005	524,971.25	0.0000000000000	62.17	9,057
2006	12,852.82	0.0000000000000	6.45	8,866
2007	3,802.07	0.0000000000000	4.92	8,554
2008	2,705.47	0.0000000001022	4.16	8,357
2009	2,845.58	0.0000777478651	4.87	8,169
2010	9,468.74	0.0000000000000	6.12	8,112
2011	52,038.25	0.0000000000000	12.03	8,138
2012	7,555.00	0.0000000000000	9.66	8,590
2013	46,155.73	0.0000000000000	12.85	8,776
2014	2,585.00	0.0000000000000	3.83	8,502
2015	9,619.54	0.0000000000000	6.81	7,117

Table 8 Summary of earnings management activities of the CEO

Due to special circumstances like very low realistic income the maxima for the CEO influence are very high in all years. In order to avoid disruption in the outcome all observations with a CEO influence of 10 and higher are deleted. This results in the following:

	Max	Min	Average	number of observations
2005	9.97	0.0000000000000	1.57	8,628
2006	9.94	0.0000000000000	1.64	8,446
2007	9.99	0.0000000000000	1.54	8,161
2008	9.89	0.0000000001022	1.52	8,011
2009	9.97	0.0000777478651	1.65	7,748
2010	9.97	0.0000000000000	1.56	7,678
2011	10.00	0.0000000000000	1.79	7,613
2012	9.95	0.0000000000000	1.64	8,114
2013	9.94	0.0000000000000	1.59	8,303
2014	9.88	0.0000000000000	1.49	8,194
2015	9.96	0.0000000000000	1.52	6,793

Table 9 Summary of corrected earnings management activities of the CEO

Logically, the maximum amount for every year lies around 10. The minimum is equal to the earlier results. Only the average is substantially lower than calculated with the full set of data. For the final analysis the filtered set of date will be used.

Finally, based on all information previously calculated, all data is analyzed. The results of this analysis are summarized in the following table:

	Unstandardized Coefficients						Standard Error					
Year	Constant	ITHQ	CEO_TEN	MB0	CEO_LY	OIBD	Constant	ITHQ	CEO_TEN	MB0	CEO_LY	OIBD
2006	11.716	-3.695	2.325	24.083	15.662	-0.000	14.867	6.054	4.615	11.326	7.581	0.001
2007	0.739	0.739	-0.153	-0.454	0.534	-0.000	1.455	0.571	0.340	0.738	0.555	0.000
2008	4.099	0.044	-0.860	0.726	-0.440	-0.000	4.972	1.924	1.272	2.690	2.075	0.000
2009	8.599	-2.072	0.132	-0.021	4.449	-0.000	4.342	1.673	1.111	2.318	1.899	0.000
2010	16.528	-4.389	-1.676	-3.067	0.939	-0.000	7.201	2.793	1.703	4.163	2.934	0.000
2011	1.604	0.998	0.505	11.477	-1.621	-0.000	4.861	1.854	1.212	3.074	1.972	0.000
2012	31.174	-10.179	10.537	16.236	-5.933	-0.000	28.475	10.790	7.238	19.453	11.761	0.001
2013	4.728	-0.314	-1.816	-0.488	1.245	-0.000	3.642	1.423	0.757	2.150	1.174	0.000
2014	-10.789	4.943	4.568	0.162	-1.929	0.000	12.411	4.652	2.925	8.426	4.657	0.000
2015	-5.895	3.748	9.006	-4.196	-2.998	-0.000	25.097	9.612	5.000	14.627	7.660	0.000
all observations	7.370	-1.428	1.876	4.065	1.154	-0.000	4.056	1.567	1.017	2.475	1.657	0.000

Table 10 Relation between the incentive time horizon and the time horizon of the CEO

The significance for most variables in all years separate as well as for the analysis of all observations in total is significantly lower than 90%:

	Coefficients				
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	7.370	4.056		1.817	0.069
ITHQ	-1.428	1.567	-0.007	-0.912	0.362
CEO_TEN	1.876	1.017	0.014	1.844	0.065
MB0	4.065	2.475	0.013	1.642	0.101
CEO_LY	1.154	1.657	0.005	0.696	0.486
formule11::OIBD	-0.000	0.000	-0.005	-0.604	0.546

Table 11 SPSS output formula 13 for the analysis of all observations

Based on table 11, the only variable within the significance of 10 percent is the tenure of the CEO.

The coefficient of determination (the R square value) is very low. The average R square over the years shows that about 0.1 % of the variation is explained by the used variables.

Finally, the result of the ANOVA F-test is 1,764. This indicates the over significance for the regression model is absent.

The coefficient for ITHQ (time horizon of the remuneration plan) is negative. As CEO_INF represents the activities of the CEO in earnings management this is conform expectations.
All other coefficients are positively related. For CEO_TEN (dummy variable with value 1 for CEOs less than 5 year in service) and CEO_LY (dummy variable with value 1 if the concerning year was the last year for a CEO) this is conform previous literature (for example Ali & Zhang [2015]). The positive coefficient of MB0 (result around 0) can rationally be explained as a CEO is reluctant to present a loss in any year and try to prevent it by larger earnings management activities.

Although the direction of all coefficients are conform expectations, the statistical significance is substantially too low for all to accept hypothesis 2. As a result hypothesis 2, "The time horizon of the CEO is in line with the time horizon reflected in the incentive scheme", has to be rejected.

5.5 Are CEOs at firms with powerful shareholders more influenced

Based on the results as reported in table 5 the power of the shareholders (POS) can be calculated.

	Decriptive statistics			
	N	**minimum**	**maximum**	**mean**
2006	1,499	0.00987	62.70462	12.54140
2007	1,669	0.01431	63.60568	8.88039
2008	1,626	0.01778	75.49069	9.27081
2009	1,615	0.01457	45.12240	10.01283
2010	1,606	0.01330	37.64973	9.04129
2011	1,607	0.00388	61.95154	9.35869
2012	1,599	0.00631	76.57905	9.57673
2013	1,587	0.00841	55.72698	7.59516
2014	1,537	0.00733	43.63585	8.95385
2015	1,642	0.00347	35.69233	7.28238

Table 12 Descriptive statistics power of shareholders

The closer the N_ITHQ is to the real ITHQ, the more powerful the shareholders are. In practice this means the lower the POS, the higher the power of the shareholders. The mean for all years presents a value around 10, which indicates the real ITHQ in average differs around 10 % from the calculated normal ITHQ.

As stated in paragraph 5.4 the results of the designed model for hypothesis 2 show the relations are completely absent. Especially the low significance of the key variable ITHQ (0.362) makes it impossible to calculate the normal CEO_INF needed to calculate the influence of the incentive scheme on the time horizon of the CEO (IIS) which would provide useful information to analyse whether CEOs at firms with powerful shareholders are more influenced than at firms where shareholders have minimal influence.
The descriptive statistics in table 13 confirms an justifies the rejection of hypothesis 2 using the model design as presented in this thesis.

	Decriptive statistics			
	N	**minimum**	**maximum**	**mean**
2006	8,866	2.25181	2,072.07171	99.72078
2007	8,554	0.01134	401,861.74225	422.87241
2008	8,357	0.06346	58,385.95956	123.19016
2009	8,170	0.06633	32,990.23247	113.07749
2010	8,112	0.92879	36,408.26289	104.44090
2011	8,138	0.12752	38,929.67142	102.99295
2012	8,590	2.27497	2,462.98210	100.07406
2013	8,776	0.01133	929,372.33578	292.12408
2014	8,502	0.08977	25,768.97959	144.00515
2015	7,117	0.13029	82,019.63618	120.37194

Table 13 descriptive statistics the influence of the incentive scheme on the time horizon of the CEO

Where the mean deviation of the POS is around 10%, for IIS the mean is 100 % or more. This justifies the conclusion the results of the analysis of formula 13 does not provide useful information that can be used to analyse hypothesis 3.

The absence of relevant information about the influence of the incentive scheme on the time horizon of the CEO (IIS) blocks the possibility to test hypothesis 3 “A positive relation exists between the power of shareholders and the influence of the incentive scheme on the time horizon of the CEO”.

CHAPTER 6 Summary, conclusions and recommendations

6.1 Summary

This thesis aimed to answer the question "are shareholders able to influence the time horizon of the CEO through incentive schemes?". To answer this question a few steps had to be executed.

First, hypothesis 1 ("Shareholders have influence on the incentive scheme design") was tested. The horizon of the shareholder was quantified by calculating the "weighted average of the time-averaged Investor Turnover (IT)", assuming that the longer a shareholder keeps their position in stocks, the longer his time horizon is.
The aimed horizon in the incentive scheme design was quantified by the "Incentive Time Horizon Quotient (ITHQ)". Based on previous research and the available data of the Execucomp database, the ITHQ was calculated.
Using linear regression analysis the relationship between the IT and the ITHQ, considering some important control variables, was tested. Following the results of this analysis is hypothesis 1 can be confirmed. Based on this research design, shareholders do have influence on the incentive scheme design.

Second, hypothesis 2 ("The time horizon of the CEO is in line with the time horizon reflected in the incentive scheme") was tested by testing the relationship between the time horizon of the CEO and the ITHQ.
The time horizon of the CEO is represented by calculating the total amount of earnings management by accrual based earnings management (DISC_ACC) and real activities manipulation (RAM). The earnings management activities were then expressed as a sum-up of both manipulations expressed in a percentage of the real income (the reported income, corrected for DISC_ACC and RAM).
Using linear regression analysis the relationship between the influence of the CEO and the ITHQ was tested, considering some important control variables. Following the results of this analysis hypothesis 2 has to be rejected. The time horizon of the CEO is not in line with the time horizon as reflected in the incentive scheme.

Due to the fact hypothesis 2 has to be rejected, the data available in this thesis is insufficient to judge hypothesis 3.

6.2 Conclusions

Based on the literature study I tried to configure a theoretical framework with which it would be possible to analyze whether shareholders are able to influence the CEO by the design of the remuneration plan.

The model for hypothesis 1 proves influence of the shareholders on the remuneration plan is present.

Although the theoretical framework looked promising and robust, the linear regression analysis for the hypothesis 2 model showed absence of a relation between the chosen representative for the influence of the CEO (CEO_INF) and the included variables, including the key variable Incentive Time Horizon Quotient (ITHQ).

Due to lack of relevant information, hypothesis 3 could not be evaluated.

Does this mean the influence of shareholders on CEOs through the incentive scheme is absent? At least the results of the analysis of data for hypothesis 1 shows the influence of shareholders on the remuneration plan.

Big question concerning hypothesis 2 remains whether the outcome is caused by the absence of influence of the time horizon of the remuneration plan on the time horizon of the CEO or the construct of the model. In my opinion, in retrospective the publicly available data is insufficient to create a useful theoretical framework. The human psyche is very difficult to predict using cold hard figures, especially the figures as reported in the annual reports of firms. This does not mean that an experienced scientist per definition would not be able to design a model which can confirm or reject the hypothesis that an employee in general, or specifically the CEO of the firm, can be motivated by the way they receive their income.

Although the main research question remains unanswered, this thesis provides an useful insight in the relation between the time horizon of the shareholders and the time horizon of the

remuneration plan. It provides an alternative view in this field of expertise and may be useful as a base for future research.

6.3 Recommendations for future research

The exploding remunerations of CEOs, especially of the large conglomerates of the "western world", will remain a point of discussion for the upcoming years. For shareholders, but also for all other stakeholders (for example the end-users of the products fabricated by the firms of the CEOs), it is very important to know what the effect of the remuneration plan has on the motivation of the concerning CEO. The present available studies do not provide this information.

In this thesis I tried to provide a first glance of insight. Although the central research question remain unanswered, the unconventional method used in this thesis could inspire others to think out of the box when designing a model for this kind of research.

As stated in the first chapter of this thesis in my daily experience the effect of changes in remuneration is apparent for a limited time. For example managers get used to a higher salary within very little time. Still the remuneration plan is the main instrument for employers to motivate employees and CEOs to fulfil the objectives of the firm and their share- and stakeholders. In my opinion the chance for a useful framework to scientifically prove my impression about remuneration will be higher when the knowledge of different disciplines of science will be integrated in one study. As stated, the human psyche is complex. Economists are not equipped with the scientific knowledge to exploit this aspect in the right way. Other science disciplines do have the utilities to examine the human aspect in a better, but they lack the knowledge to for example extract the influence of the CEO from the presented annual figures. A multidisciplinary team of scientists could find a theoretical framework which provides us the very needed insight.

CHAPTER 7 References

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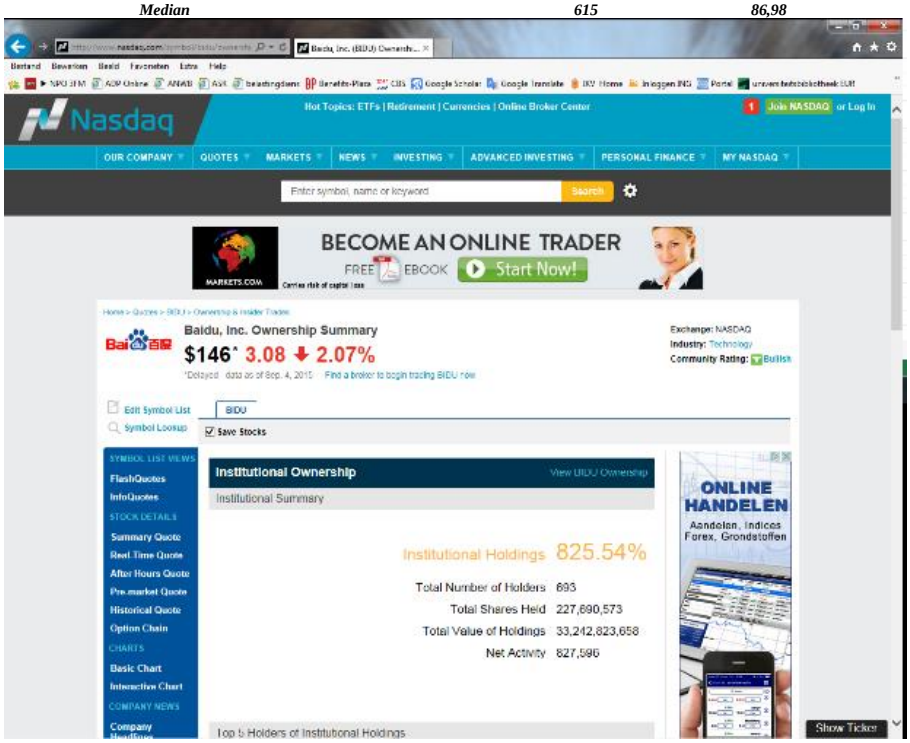
CHAPTER 8 Appendices

8.1 Nasdaq 100 (institutional) ownership

Symbol	Name	# owners	% Institutional owners
AAL	American Airlines Group Inc.	755	72,43
AAPL	Apple Inc.	2.409	59,76
ADBE	Adobe Systems Incorporated	744	91,83
ADI	Analog Devices Inc.	590	87,02
ADP	Automatic Data Processing Inc.	1.157	77,66
ADSK	Autodesk Inc.	513	93,46
AKAM	Akamai Technologies Inc.	576	88,07
ALTR	Altera Corporation	545	89,10
ALXN	Alexion Pharmaceuticals Inc.	657	97,67
AMAT	Applied Materials Inc.	799	86,53
AMGN	Amgen Inc.	1.441	80,62
AMZN	Amazon.com Inc.	1.236	67,12
ATVI	Activision Blizzard Inc	505	67,70
AVGO	Avago Technologies Limited	677	104,61
BBBY	Bed Bath &amp	705	96,64
BIDU	Baidu Inc.	693	825,55
BIIB	Biogen Inc.	1.064	90,40
BMRN	BioMarin Pharmaceutical Inc.	433	99,33
BRCM	Broadcom Corporation	753	86,93
CA	CA Inc.	526	68,14
CELG	Celgene Corporation	1.288	80,81
CERN	Cerner Corporation	699	82,69
CHKP	Check Point Software Technologies Ltd.	536	73,54
CHRW	C.H. Robinson Worldwide Inc.	530	86,98
CHTR	Charter Communications Inc.	388	85,50
CMCSA	Comcast Corporation	1.298	83,66
CMCSK	Comcast Corporation	558	86,67
COST	Costco Wholesale Corporation	1.247	72,54
CSCO	Cisco Systems Inc.	1.774	76,24
CTSH	Cognizant Technology Solutions Corporation	878	90,99
CTXS	Citrix Systems Inc.	536	94,99
DISCA	Discovery Communications Inc.	502	114,13
DISCK	Discovery Communications Inc.	522	82,09
DISH	DISH Network Corporation	435	92,01
DLTR	Dollar Tree Inc.	757	97,64
EA	Electronic Arts Inc.	572	103,43
EBAY	eBay Inc.	1.112	82,42
ESRX	Express Scripts Holding Company	1.322	98,02
EXPD	Expeditors International of Washington Inc.	553	91,00
FAST	Fastenal Company	605	87,27
FB	Facebook Inc.	1.400	68,43
FISV	Fiserv Inc.	712	91,36
FOX	Twenty-First Century Fox Inc.	375	45,92
FOXA	Twenty-First Century Fox Inc.	732	97,97
GILD	Gilead Sciences Inc.	1.632	82,26
GMCR	Keurig Green Mountain Inc.	480	66,27
GOOG	Google Inc.	1.684	68,72
GOOGL	Google Inc.	1.828	78,32
GRMN	Garmin Ltd.	394	40,43
HSIC	Henry Schein Inc.	489	94,74
ILMN	Illumina Inc.	630	96,86
INTC	Intel Corporation	1.821	66,56
INTU	Intuit Inc.	683	87,18
ISRG	Intuitive Surgical Inc.	555	91,89
JD	JD.com Inc.	293	28,19
KHC	The Kraft Heinz Company	1.170	36,46
KLAC	KLA-Tencor Corporation	462	92,30
LBTYA	Liberty Global plc	417	91,09
LBTYK	Liberty Global plc	493	84,91
LILA	Liberty Global plc	414	91,01
LILAK	Liberty Global plc	494	84,62
LLTC	Linear Technology Corporation	542	93,81
LMCA	Liberty Media Corporation	364	80,77
LMCK	Liberty Media Corporation	378	74,99
LRCX	Lam Research Corporation	580	100,29
LVNTA	Liberty Interactive Corporation	344	87,97
MAR	Marriott International	608	56,15
MAT	Mattel Inc.	579	100,44
MDLZ	Mondelez International Inc.	1.203	77,00
MNST	Monster Beverage Corporation	528	65,45
MSFT	Microsoft Corporation	2.166	72,59
MU	Micron Technology Inc.	790	89,33
MYL	Mylan N.V.	784	70,40
NFLX	Netflix Inc.	615	87,85
NTAP	NetApp Inc.	506	93,71
NVDA	NVIDIA Corporation	557	85,75
NXPI	NXP Semiconductors N.V.	685	91,42
ORLY	O'Reilly Automotive Inc.	627	90,69
PAYX	Paychex Inc.	823	67,68
PCAR	PACCAR Inc.	553	63,53
PCLN	The Priceline Group Inc.	898	95,96
QCOM	QUALCOMM Incorporated	1.646	81,67
QVCA	Liberty Interactive Corporation	468	90,65
REGN	Regeneron Pharmaceuticals Inc.	588	73,11
ROST	Ross Stores Inc.	671	88,98
SBAC	SBA Communications Corporation	452	97,39
SBUX	Starbucks Corporation	1.251	72,02
SIRI	Sirius XM Holdings Inc.	486	23,44
SNDK	SanDisk Corporation	643	94,37
SPLS	Staples Inc.	596	94,10

SRCL	Stericycle Inc.	639	90,65
STX	Seagate Technology.	629	95,31
SWKS	Skyworks Solutions Inc.	728	75,72
SYMC	Symantec Corporation	611	91,10
TRIP	TripAdvisor Inc.	463	96,25
TSCO	Tractor Supply Company	557	93,51
TSLA	Tesla Motors Inc.	552	61,63
TXN	Texas Instruments Incorporated	957	86,90
VIAB	Viacom Inc.	728	92,30
VIP	VimpelCom Ltd.	132	5,06
VOD	Vodafone Group Plc	686	9,18
VRSK	Verisk Analytics Inc.	454	93,62
VRTX	Vertex Pharmaceuticals Incorporated	556	94,42
WBA	Walgreens Boots Alliance Inc.	1.276	60,80
WDC	Western Digital Corporation	665	91,09
WFM	Whole Foods Market Inc.	802	79,13
WYNN	Wynn Resorts Limited	477	81,45
XLNX	Xilinx Inc.	548	91,43
YHOO	Yahoo! Inc.	840	69,44
	Maximum	***2.409***	***825,55***
	Minimum	***132***	***5,06***
	Average	***764***	***88,07***
	Median	***615***	***86,98***



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8.2 Used data items from Execucomp

EXECUCOMP Annual Data Items					Formula
DATA#	Variable Name	Description	Type	Length	1
3	CO_PER_ROL	ID number for each executive/company combination	Num	8	
6	CEOANN	Annual CEO Flag	Char	3	
7	SALARY	Salary ($)	Num	8	
8	BONUS	Bonus ($)	Num	8	
9	STOCK_AWARDS	Value of Stock Awards - FAS 123R ($)	Num	8	
10	OPTION_AWARDS	Value of Option Awards - FAS 123R ($)	Num	8	
11	NONEQ_INCENT	Non-Equity Incentive Plan Compensation ($)	Num	8	
12	PENSION_CHG	Change in Pension Value and NonQualified Deferred Compensation Earnings ($)	Num	8	
13	OTHCOMP	All Other Compensation ($)	Num	8	
29	AGE	Executive\'\'s Age	Num	8	
71	GVKEY	Company ID Number	Char	6	
72	EXECID	Executive ID number	Char	5	
73	YEAR	Fiscal Year	Num	8	
80	BECAMECEO	Date Became CEO	Num	8	
83	LEFTOFC	Date Left as CEO	Num	8	
103	TICKER	Ticker Symbol	Char	6	
107	SIC	SIC Code	Num	8	

8.3 Used data items from ThomsonReuters 13F

ThomsonReuters 13F					Formula	
DATA#	Variable Name	Description	Type	Length	2	3
4	mgrno	Manager Number	Num	8		
6	rdate	Report Date	Num	8		
9	shares	Shares Held at End of Qtr	Num	8		
13	change	Net Change in Shares Since Prior Report	Num	8		
15	ticker	Ticker Symbol	Char	4		
20	prc	Share Price, as of FDATE	Num	8		
22	shrout2	Shares Outstanding in 1000s, as of FDATE	Num	8		

8.4 Used data items from Compustat

COMPUSTAT Annual Data Items					Formula					
DATA#	Variable Name	Description	Type	Length	5	6	7	8	9	11
BASIC1	tic	Ticker Symbol	Char	8	■	■	■	■	■	■
BASIC2	sich	Standard Industrial Classification - Historical	Num	8	■	■	■	■	■	■
BASIC3	exchg	Stock Exchange Code	Num	8	■	■	■	■	■	■
YEAR	fyear	Data Year - Fiscal	Num	8	■	■	■	■	■	■
DATA107	sppe	Sale of Property	Num	8	■	■	■	■	■	
DATA109	siv	Sale of Investments	Num	8	■					
DATA12	sale	Sales/Turnover (Net)	Num	8		■	■	■	■	
DATA123	ibc	Income Before Extraordinary Items (Cash Flow)	Num	8	■		■		■	
DATA124	xidoc	Extraordinary Items and Discontinued Operations (Cash Flow)	Num	8						■
DATA13	oibdp	Operating Income Before Depreciation	Num	8		■	■	■		
DATA130	upstk	Preferred Stock at Carrying Value	Num	8		■	■	■		
DATA14	dp	Depreciation and Amortization	Num	8		■	■	■	■	
DATA18	ib	Income Before Extraordinary Items	Num	8		■	■	■	■	
DATA189	xsga	Selling, General and Administrative Expense	Num	8					■	
DATA199	prcc_f	Price Close - Annual - Fiscal	Num	8		■	■	■		
DATA213	sppiv	Sale of Property, Plant and Equipment and Investments - Gain (Loss)	Num	8				■		
DATA25	csho	Common Shares Outstanding	Num	8				■		
DATA303	invch	Inventory - Decrease (Increase)	Num	8	■					
DATA308	oancf	Operating Activities - Net Cash Flow	Num	8	■					
DATA34	dlc	Debt in Current Liabilities - Total	Num	8		■	■	■	■	
DATA41	cogs	Cost of Goods Sold	Num	8			■			
DATA46	xrd	Research and Development Expense	Num	8		■	■	■	■	
DATA6	at	Assets - Total	Num	8				■		
DATA7	ppegt	Property, Plant and Equipment - Total (Gross)	Num	8					■	
DATA9	dltt	Long-Term Debt - Total	Num	8	■					


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