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Association between the Performance-based Compensation of CEOs and Firm Performance in the Nordic Corporate Sector

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Abstract

The executive directors of companies serve as the agents of the shareholders and should serve their best interests in managing the company. However, according to the common agency problem Chief Executive Officers (CEO) and managers in general, are likely to put their own personal interests before those of the company and its owners. Therefore, it is crucial for companies to implement such compensation strategies that align the CEO interests with those of the shareholders by giving the managers proper incentives to maximize the company value. The composition of the company board of directors has been viewed as a key factor in creating such appropriate compensation packages. However, there is no clear consensus among researchers on whether a clear link exists between company performance and CEO compensation, or if the board of directors are truly able to control the CEOs' power over their own pay.

Secondary quantitative data from 25 Nordic publicly traded manufacturing companies were gathered from NASDAQ OMC Nordic 40 database, the company financial statements, and annual reports for the period from 2011 to 2015 and analysed through descriptive statistics, correlation, and multivariate OLS regression analyses using IBM Statistics Software SPSSS. An overview of the data was obtained through the descriptive statistics, correlation analysis demonstrated the relationships between the variables, following with regression analysis showing the extent of the influence of independent variables on the dependent variables. The chosen methods and carefully selected research methodology enabled testing the hypotheses and answer the research questions of the study.

The empirical findings showed that performance-based pay had a positive impact on company financial performance for accounting-, market- as well as hybrid performance measures. The results also demonstrated that board structure 'best practices' board size and the ratio of independent directors on the board had an influenced the level of CEO performance pay in the sample companies.

Keywords/tags (subjects)
Firm performance, CEO compensation, performance-based pay, corporate governance, board of directors, agency problem, managerial power theory, ROA, ROCE, Tobin's Q, Market capitalization

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Tiivistelmä

Yritysten toimitusjohtajat toimivat osakkeenomistajien edustajina ja heidän tulisi näin ollen palvella näiden parhaita etuja yhtiön johtamisessa. Yleisen ”edustusongelman” (engl. ”agency problem”) mukaan toimitusjohtajat sekä johtajat yleisesti asettavat kuitenkin omat henkilökohtaiset etunsa yrityksen ja sen omistajien etujen edelle. Siksi yrityksille on ratkaisevan tärkeää toteuttaa sellaisia palkitsemisstrategioita, jotka linjaisivat toimitusjohtajan etuja osakkeenomistajien etujen kanssa tarjoamalla johtajille asianmukaisia kannustimia yrityksen ja sen myötä osakkeenomistajien arvon maksimoimiseksi. Yrityksen hallituksen rakenteen on katsottu olevan myös ratkaisevassa roolissa toimitusjohtajien palkkioiden asianmukaisessa rakentamisessa. Tutkijoiden keskuudessa ei kuitenkaan ole selvää yksimielisyyttä siitä, onko yrityksen tuottavuuden ja toimitusjohtajan palkkioiden välillä selkeää yhteyttä, tai pystyykö hallitus todella kontrolloimaan toimitusjohtajien vaikutusvaltaa omaan palkitsemiseensa.

Sekundäärinen kvantitatiivinen data 25 pohjoismaisesta julkisen kaupan yrityksestä koottiin NASDAQ OMC Nordic 40 -tietokannasta, yhtiöiden tilinpäätöksistä sekä vuosikertomuksista ajalta 2011 - 2015 ja analysoitiin kuvailevien tilastojen, korrelaatio- ja monimuuttuja-OLS-regressioanalyysien avulla käyttämällä IBM Statistics Software SPSSS -ohjelmistoa. Yleiskatsaus tietoihin saatiin kuvaavien tilastojen avulla, korrelaatioanalyysi osoitti muuttujien väliset suhteet, jonka jälkeen regressioanalyysi osoitti riippumattomien muuttujien vaikutuksen tutkimuksen riippuviin muuttujiin. Huolellisesti valitut tutkimusmenetelmät mahdollistivat hypoteesien testaamisen ja tutkimuskysymyksiin vastaamisen.
Empiiriset havainnot osoittivat, että tulosperusteisella palkalla oli positiivinen vaikutus yrityksen taloudelliseen tulokseen kirjanpito-, markkina- ja hybridi-suorituskykymittareilla. Tulokset osoittivat myös, että yritysten hallituksen rakenteen "parhaiden käytäntöjen" (engl. ”best practices”) hallituksen koon ja riippumattomien johtajien suhde koko hallitukseen vaikuttivat toimitusjohtajan palkkatasoon otosyrityksissä.

Avainsanat (asiasanat)
Yrityksen suorituskyky, toimitusjohtajan palkitseminen, tulospalkkaus, omistajavalvonta, yrityksen hallitus, edustusongelma, ROA, ROCE, Tobin’s Q, markkina-arvo

Muut tiedot

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1 Introduction

A company's ability to carry out production –deriving from technical-, managerial- and innovative capabilities– essentially represents a company's distinctive competitiveness (Bottazzi, Secchi & Tamagni 2008, 1). Campbell & Underdown (1991) describe that the interaction of two dominant sets of factors, external and internal, determines the success of any business organization. The external factors such as environmental conditions, consumer behaviour, changes in government policies etc., are outside the control of the company's management. The internal factors on the other hand come from within the company and involve the management's ability to develop and carry out business strategies fitting the environment. (2-3.)

The goal of the firm, however, is often not compatible with the interests of the managers who, given the opportunity, will act in favour of their own personal interests, even at the shareholders' expense (Shleifer & Vishny 1997, 740-742; Jerzemowska 2006, 9). The matter of productivity and the efficient allocation of company resources should ultimately be done in order to increase the value of the firm and therefore, the wealth of the company shareholders. The issue of company long-term profitability and safeguarding shareholder wealth has become an increasingly more prominent topic in recent years as the excessive pay levels of CEOs of large corporations have been on the surface of public attention. (Conyon 2013, 60.) Among the most notable scandals is Enron, which was the seventh-largest company in the USA, where the performance of the firm was not aligned with the bountiful benefits the management received from operating their company ineffectually (Core, Holthausen & Larcker 1997, 1). The topic of executive compensation has caught the attention of the media as well as legislators and has produced a considerable body of interdisciplinary academic research. (Murphy 1998, 1-2; Conyon 2013, 60). Additionally, the new Say-on-Pay passage under the Dodd-Frank Act in July 2010 aiming to increase the transparency of executive total compensation in public companies in the U.S has drawn more attention to the topic (Ludwig 2019).

As the CEO is often held almost solely accountable for the success of the firm, being responsible for maintaining and executing corporate objectives and making decisions

that can potentially have definitive consequences on company's success, it is only reasonable that the CEO is rewarded amply for their efforts (Core et al. 1997, 3). Whether the high pay levels of the CEOs are justified in terms of their contributions towards improving firm performance and serving shareholder interests, however, is debatable. This issue is the basis of the classical agency theory that is concerned with the relationship between the principal (owners/shareholders) and agent (manager) from which the agency problem derives. The agency problem questions whether the agents of the company are in fact committed to serving the shareholder interests and increasing the value of the company, or if their interest lies only in their own personal gain. (Bebchuk & Fried 2003, 1-2; Pepper 2018, 2-3.)

One of the most important determinants of a successful organization is its compensation policy because it serves as a key factor in shaping how top executives behave. Creating such compensation arrangements that reward excellent performance and chastise poor performance is seen as a potential remedy to the agency problem (Jensen & Murphy 1990a, 3.) Canarella and Nourayi (2008, 295), and Mayers and Smith (2010, 298), also point out that controlling the incentive problems between managers and owners can be done by introducing incentive compensation provisions in the compensation packages that reward the CEOs for exceptional company performance. In determining the compensation packages the board of directors is ultimately in charge of how they are designed. It is, therefore, assumed that board composition would have an impact on the structure and level of CEO pay (Randøy & Nielsen 2002, 58).

The current study examines the impact of CEO performance-based pay on firm-level financial performance. As many previous studies conducted on the topic focus on the total compensation, this research looks specifically at the effects of the performance-based element of the compensation. This research draws its theoretical foundation from the agency- and managerial power theory. Agency theory states that compensation policies are designed to give management (and CEOs) proper incentives to make choices that increase the wealth of the shareholders (Jensen & Murphy 1990b, 1-2). Managerial power theory argues that CEO pay is often excessive and that it does not correlate with performance and that CEOs often exercise power over the boards, being able to affect their own payment arrangements (Bebchuk & Fried 2004, 2). This study agrees with the agency theory and contends with the managerial power theory

by hypothesizing that performance-based compensation has a positive correlation with firm performance and that board composition affects CEO performance-pay.

Based on the abovementioned research background the research problem is formulated as the *Effectiveness of performance-based pay and corporate governance practices in enhancing firm performance and aligning CEO with shareholder interests.*

The study explores the following research questions:

1. Is there any association between the firm-performance and the performance-based compensation of CEOs?

2. Do board characteristics impact the relative share of performance-based pay in the total compensation of CEOs?

To answer these questions data of 25 Nordic publicly listed companies from the manufacturing industry has been collected for the period of 2011-2015. The impact of performance pay on firm financial performance is examined through several dependent variables divided into accounting-based-, market-based- and hybrid performance measures. In addition, the significance of corporate governance mechanisms on CEO pay arrangements is investigated with board structure, specifically size and share of independent board members. The required financial data for measuring company performance was collected from secondary sources including the company official annual reports and the stock market database NASDAQ OMX Nordic 40. The data for governance and compensation variables were also gathered from the firm annual reports. The data was analysed by calculating descriptive statistics, Pearson's Correlation Coefficient as well as the Ordinary Least Square Regression model, through application of the statistical analysis software SPSS.

1.1 Relevance of the Topic

The topic of CEO compensation is widely researched by academics in various fields (economics, finance, accounting and management) with the majority being from either the U.S or U.K. (Mäkinen 2007, 11). This study aims to further contribute to the body of knowledge by focusing specifically on the Nordic region. Additionally, the performance-based element of CEO compensation is used instead of total

compensation in order to determine how well CEO pay is tied to company performance in the largest publicly listed manufacturing companies listed in the OMX Nordic 40 stock exchange.

In this research the manufacturing industry in the Nordic countries (Finland, Sweden, Norway and Denmark) is studied. The purpose is to draw light on whether or not the composition of remuneration packages of the CEO and other top executives correlates with the firm's financial performance. In addition, the impact of corporate governance practices on the level of performance-based incentives is investigated in order to determine whether governance practices in the Nordics is effective in properly incentivizing CEO behaviour. This research will also give a new aspect with its focus on the manufacturing industry, enabling comparisons to be made with other regions and countries.

1.2 Structure of the Thesis

The remainder of the thesis is divided into four sections: theoretical literature review and hypothesis development; research design and methods; results of the analysis; as well as conclusions, discussion and limitations along with recommendations for future research. Section 2 covers the literature review of the paper, familiarizing the reader with the theoretical background of the study, examining the topics of executive remuneration, corporate governance and related main theories, following with definitions of company financial performance and measurement along with justifications for the methods used. Based on the theoretical framework, the hypotheses were developed at the end of section 5. Following the review of literature, the methodology of the research is described in section 3, including used research methods, introduction of main variables and implemented data analysis techniques. Section 4 presents the results of the study along with analysis of their implications on the hypotheses. Finally, section 5 concludes the findings presented in the previous section and discusses how well they were able to answer the research questions and support the hypotheses. The limitations of the research along with recommendations for the future are considered at the end of the chapter.

2 Theoretical literature review

The literature reviewed for this study explores the topic of executive remuneration in relation to firm financial performance and examines the role of corporate governance mechanisms with board structure on compensation arrangements. The two common and contending theories associated with discussions regarding executive pay are the Agency theory and Managerial Power Theory and will also be used here as the basis for examining the topic as well as the implications of research findings. The theories provide differing perspectives on the executive compensation, its level and arrangement, as well as its alignment with the shareholders' interests. The theories also discuss whether a clear link exists between CEO pay and the financial performance of the firm. As determinants of the financial health of the companies in this study, several accounting – and market performance measures as well as a hybrid of both have been utilized.

Many early studies have mainly focused on the aspect of firm size and profits relative to executive compensation. Later research has confirmed the positive association between them, showing evidence that the executive remuneration increases as the firm size grows, due to the need for higher level corporate and managerial skills increasing as the organization becomes more diverse and complex. In more recent studies, the focus has turned to the links between executive compensation and firm performance. Previous studies have grazed at the same issues in other industries such as the service sector, and of manufacturing in different areas and countries. (Carroll & Nourayi 2008, 295.) It has also been found in previous studies that the corporate governance mechanism such as ownership structure and board characteristics can help to reduce the potential agent-principal problem, as they can be a relevant factor in how firms set up their compensation packages (Ozkan 2011, 261).

Therefore, this paper will also look at corporate governance practices and study the effect of board structure, specifically board size and independence on the executive compensation.

2.1 Corporate Governance

In this section of the paper the implications and effects of corporate governance practices on CEO compensation and further, firm performance are examined through existing literature.

All corporate entities, both private and public companies, governmental corporate entities, as well as non-profit organizations must be governed. In its essence corporate governance deals with different ways power is exercised over these corporate entities. In companies this governing body is in the form of the board of directors and is involved with the activities of the board, its relationships with the members and the management, as well as with external regulators, auditors, and other stakeholders. It is good to distinguish that corporate governance is not the same as management. The responsibility of running the company falls on the executive management, but the board of directors is in charge of policymaking and formulating strategy while also supervising the company management. (Tricker 2015, 4.)

When corporate governance is done well it can help prevent scandals, fraud as well as civil and criminal liabilities potential for the organization. Not to mention simply being good business by enhancing the company reputation making it more appealing to investors, customers, and suppliers. (Lipman, & Lipman 2006, 3.) It is also suggested that greater agency problems and consequently lower performance is demonstrated by companies that have weaker governance structures in place (Core, Holthausen, & Larcker 1999, 372).

Board of Directors

The association between executive compensation and board structure has been studied in the past with mixed findings (Core et al. 1999, 372-373). The findings of past research will be examined in this section and based on the literature a hypothesis will be formulated at the end of the chapter. It has been found that the monitoring effectiveness of the board would reduce the CEO's influence over their payment arrangements (Ataay 2018, 1156).

The use of best practice-codes relating to board structure and characteristics are generally seen as crucial factors in controlling the power of CEOs and have therefore,

been the topic of various studies (see sections 2.2 and 2.3). The best practices addressed in the current study are related specifically to the structure of the board. The first board structure best practice is the board independence. Bebchuk, Grinstein, and Peyer (2009), state that in order to improve control particularly over executive compensation, director independence has been seen as a key instrument (26). According to Capezio, Shields, and O'Donnel (2011), studies have shown that non-executive dominated boards would be more efficient at constraining CEO misbehaviour. The general understanding, supported by a considerable body of evidence, is that when CEOs and other top executives have more control over the boards the compensation is higher and performance sensitivity is weaker (Ataay 2018, 1153). Presented by cases where the CEO was paid less than the market average, a negative response was less likely to happen when the board was controlled by 'owners' instead of 'managers', therefore, indicating that greater board independence may lead to a necessary environment for incentive alignment (Capezio et al. 2011, 490-491).

On the other hand, a significant amount of research also argues against the best-practice methods of board independence and outcome-based contracting. The findings suggest that executive insiders may in fact be more efficient in rewarding CEO performance due to their better understanding of the firm's financial and operational management (ibid., 490-495). Therefore, it is not conclusive whether non-executive directors are truly more effective in controlling top management and wading off managerial entrenchment. The second board characteristic considered a best practice is the board size. According to Lipman and Lipman (2006), the general rule is that a board should not have more than 10 or less than 4 members. The reasoning being that a smaller board would be more effective in decision making since reaching consensus and avoiding disagreements is easier with fewer members. (14.) Bebchuk and Fried (2004), suggest similarly that more time and effort is needed from larger boards to provide adequate monitoring and supervision as they are more likely to be exposed to communication and coordination difficulties, consequently being less effective in constraining managerial behaviour (22). Alternatively, it can also be argued that larger boards are able to bring richer board resources to the table that can help improve planning and executing operations (Hundal 2017, 157).

In the light of the previous studies and their findings on the effects of board composition on executive compensation, the author sees appropriate to further examine their significance in the current study. The author hypothesizes that the use of best practice codes, in this case smaller more independent boards, would lead to higher outcome-based incentives received by the CEOs as compensation.

2.2 Agency Theory

A conflict of interest commonly arises when the goals or concerns between the two parties are not compatible. When shareholders want the CEOs to take certain actions in which the gained returns would exceed the costs, the CEO might not be so inclined if it does not serve his or her personal gain (Jensen &Murphy 1990b, 2). Such a situation commonly referred to as the agency problem or principal-agent problem, describes the conflicting interests between the principal (owner) and the agent (manager) in a relationship in which the agent is meant to act in the best interests of the owner. In the executive-shareholder relationship the agent (manager) is hired by the principal (owner) to run the company in their place. (Jerzemowska 2006, 8-9.)

Agency theory is one of the most common theories linked to the executive compensation issue. Related to the agency theory view, the 'optimal contracting' approach acknowledges that managers suffer from an agency problem and are not inherently thinking of maximizing shareholder wealth. Under this approach creating proper incentives for managers is seen as an important factor in aligning manager and shareholder interests. In optimal contracting the company boards are viewed to be working in favour of the shareholders' interests and are expected to devise compensation packages that efficiently incentivize managers to increase company and shareholder wealth. (Bebchuk & Fried 2003, 1.) In addition, according to the traditional agency theorists the use of best practices and independent boards are also a key factor in aligning the CEO's interests with those of the shareholders with the use of outcome-based incentive plans (Capezio et al. 2011, 488). Conversely, some views question if the use of the combination of board independence and performance-based incentives are always the best method. Although a strong association between executive pay and firm performance is predicted by the agency theory in cases where the board utilizes outcome-based incentive plans, there is evidence suggesting that the association is almost non-existent between performance-based pay and firm

performance. Particularly in situations where a company is exposed to a lot of external 'market noise' and volatility, the connection between CEO compensation and firm performance is evidently weaker due to CEO risk-bearing. (Capezio et al. 2011, 488.) 'Market noise' refers to activity or information that causes confusion or misrepresentation of true underlying trends, which can include for example market fluctuations misconstruing those overall trends. (Black 1986, 529-530; Kenton 2020.)

Although agency theory is commonly used in justifying the link between CEO pay and firm performance, typically called "incentive alignment", it does not predict a very strong relationship between the two. The common consensus is that agents are in fact risk averse. Therefore, a potential problem exists that CEOs will go after strategies that are both low-risk and low-return if they are made entirely accountable for the company performance with their compensation. (Aguinis, Gomez-Mejia, Martin, & Joo 2017, 120.) In conclusion, there are two sides to the coin. On one side if the link between CEO pay and firm performance is too weak the agent may receive high compensation without sufficient results. On the other, the CEO may avoid high-risk/high-return strategies if the link is too strong, also resulting in decreased value for shareholders.

2.3 Managerial Power Theory

The second theory commonly associated with CEO compensation is the Managerial Power theory. Bebchuk and Fried (2004), state that the managerial power approach argues against the agency theory view for executive compensation being a solution for the agency problem, and instead sees the pay-setting process as a core part of the problem. The executive compensation is also seen as being excessive and not correlating to company performance. (1.) Whereas the agency theory suggests that the right corporate governance mechanisms could work in safeguarding the shareholders' interests in setting executive remuneration, the managerial power theory contends that top managers, especially CEO's, obtain unreasonable power over the process of setting their own pay. (Bebchuk & Fried 2004, 8-9; Gümbel 2006, 221-223.) The view of managerial power theorists is that CEOs may in fact be controlling the board instead of being controlled by it, devising compensation packages for themselves that secure generous rewards regardless of their actual performance or that of the company. (Kolb 2012, 32). Similarly, Ataay (2018), says that although boards are

responsible for setting the compensation arrangements, CEOs and other top executives might still utilize considerable bargaining power over the board, which would still lead to compensation packages that do not serve the shareholders best interests. In order to safeguard against the CEO's managerial dominance and potential board capture, similar to agency theory, managerial power theory also emphasizes the importance of director independence. (1153.)

Empirical evidence has shown that companies that had a higher proportion of independent directors, as well as an outside chairperson also paid greater levels of performance-based pay relative to total compensation (Beatty & Zajac 1994, 318-319). Research of Core, Holthausen, and Larcker (1999, 403-404) has also further supported these findings. Still, although the managerial power theory advocates that more independent boards would be more proficient in aligning CEO incentives, the evidence remains equivocal with various studies (Conyon 2006, 39; Dalton & Daily 1994, 59; Murphy 2002, 868-869), showing that there is no difference between CEO pay and performance whether the board consists of non-executive or executive directors and that it does not explain the differences in CEO pay levels and structures very well (Capezio et al. 2011, 488).

2.4 Executive remuneration

Excessive CEO and top executive compensation levels, especially in the U.S, is one of the largest contributors to rising inequality. This escalation of top executive remuneration has widened the pay gap between the bottom 90% earners and the top high earners, with a ratio of 278-to-1 when comparing the CEO to a typical worker. In 2018 the average pay of a CEO from the top 350 firms in the U.S was approximately $17.2. (Mishel and Wolfe 2019.) According to another study the median CEO pay in the U.S in 2018 of 853 mid-sized companies was approx. $5.3 million, while European CEOs of 54 companies measured at $4.5 million (Ludwig 2019).

Executive compensation has been the topic of numerous studies in various fields, with researchers attempting to unveil whether the pay levels of CEOs and top executive management is justified and if it adequately correlates with the financial performance of companies. Financial economists have viewed the compensation arrangements of managers as a partial remedy in alleviating the common agency problem and is the

leading approach in studying executive compensation. (Bebchuk & Fried 2003, 1-3.) Ozkan (2011), also states that the role of compensation packages in motivating top managers and, consequently, alleviating the conflict of interest between agent and principal, has widely been observed to be potentially a decisive one (261).

In optimal contracting arrangements, according to Jensen and Murphy (1990b), high compensation levels might be involved when they are meant to provide strong incentives for managers to increase shareholder wealth. However, such generous compensation arrangements are problematic since they are solely connected with poor managerial performance. One mechanism for incentive alignment is the use of outcome- or performance-based compensation arrangements. By incorporating performance-based elements, the CEO is expected to be more inclined to make decisions that enhance company performance and increase shareholder wealth but also benefit the CEOs personally. (1-3.) Furthermore, an independent board is also considered as another mechanism in reinforcing incentive-alignment. A more independent board is believed to be better equipped to control the CEO compensation, since independent or outside directors are not directly tied or accountable to the company. Therefore, they are expected to be more likely to link the CEO pay more closely with the company performance and ultimately effectively safeguard the shareholders' interests. (Capezio et al. 2011, 488.) Conversely, some argue that even though remuneration committees and boards of directors are predominantly independent nowadays, CEOs still have substantial influence (managerial power) over the boards and their own compensation arrangements (Murphy 2002, 848-850; Conyon 2013, 61).

There are three prevalent reasons associated with the structure of the labour market for why the CEO pay has increased in the past couple decades including

1. the reasons for the rise in CEO pay are the same as for growth in other occupations, and the labour market for CEOs happens to fit the model of perfect competition;

2. CEOs have *managerial power* and can affect their own compensations, meaning their labour market does not fit the model of perfect competition; or

3. CEO labour market is similar to that of entertainment superstars, and the supply for qualified chief executives is rather inflexible, the demand, therefore, increasing CEO pay. (Mayer 2018, 9.)

According to Lee (2002), the clearest area where the agency problem arises, is in executive remuneration, since the shareholders' money is paid directly to their agents (70). The compensation packages of CEOs have been seen as an essential factor in alleviating the conflict of interest between shareholders and managers (Ozkan 2011, 261). How much and in what form the top management should be compensated for contributions to the company's profitability and performance is a challenging issue, not least due to difficulties in measuring the actual efforts of those in higher executive positions. It is recognized that executive positions require a great level of expertise and are considered highly demanding, which naturally should affect the level of compensation (Core et al. 1997, 3-4). The executive compensation packages often consist of two parts; fixed pay which is often in cash, and performance-based pay, which may consist of cash as well as non-cash components such as stock options. The company may also provide the CEO with different types of retirement funds and other long-term incentive plans. (Lee 2002, 70.) According to Murphy (1998) most compensation packages of executives include four main components: base salary, annual bonus (tied to accounting performance), stock options, and long-term incentive plans (3). Lee (2002), on the other hand suggests that executive pay has three aspects: salary, bonus, and long-term incentives which can include stock options or other equity-linked compensation. He further defines their functions as

- *salary* for compensating executives for the yearly time and efforts,
- *bonuses* providing incentive for reaching goals for bonus, and
- *equity-linked compensations* for providing incentives for long-term performance. (70.)

In this thesis, the main focus will be on the incentive-based element of CEO compensation. Performance-based pay will be examined on its own as well as in the form of two ratios to examine the proportion of performance pay relative to other elements of the compensation packages. The ratios are used to allow for a more

comprehensive analysis of the importance of the composition of the remuneration packages in relation to firm performance as well as board structure.

Performance-based pay

Although extensive empirical research on CEO pay-performance sensitivity exists, the angle of performance-pay has not been considered as comprehensively (El-Sayed & Elbardan 2016, 32), which is why this study examines this element of compensation more closely.

When performance pay was first introduced many organisations had high hopes that it would help companies to deliver higher levels of individual and organisational performance as well as cultural change. Since then performance pay has become an integral part of organisations' compensation strategies to inspire higher commitment and motivation. Performance-pay is built on the idea that reward can encourage the right kind of behaviour and that money is potentially an effective incentive to motivate employees to work in favour of their organisation. (Suff, Reilly, & Cox 2007, 1.) Suff et al. (2007), define performance-related pay as "rewarding employees with a financial payment, either consolidated or non-consolidated, following an assessment of their performance and, typically, the achievement of objectives" (1-2). Similarly, Baker, Jensen & Murphy (1988), describe pay-performance compensation as a practice where remuneration is tied systematically to a measurable output (7). Agency theory suggests that in situations where managerial decisions are not perfectly apparent to the owners, designing appropriate compensation policies would incentivize managers to take actions that increase shareholder wealth (Jensen & Murphy 1990b, 1-2). A common practice to align manager interests with those of the shareholders is devising highly contingent long-term incentive contracts in order to motivate top executives towards the kind of performance that benefits the company and shareholders' interests in the long-term (Shleifer & Vishny 1997, 744). In this way the interests of CEOs would be more closely linked with company performance, and hopefully discouraging actions that promote only short-term development.

As the core purpose of a business is always to aim for gaining and increasing profits, the bar for performance is being raised continuously. Regardless of whether the company is experiencing good growth or steady sailing, they should always reach for

more and beyond the horizon. This can have problematic effects when the top management's pay is linked strongly to the company's performance and targets are increasingly raised. This can counterintuitively provoke the executives to start 'working the numbers in their favour'. One reason for salary bonuses more and more taking the form of stock options, is the belief that when the compensation is tied more closely to the market performance, there will be less room for the CEO to manoeuvre the outcomes to their own benefit over that of the company's.

2.5 Financial performance

The main purpose of an enterprise is to generate profit to ensure survival in the present and growth in the future (Nishanthini & Nimalathasan 2013, 1-2). A great deal of the theory in corporate finance, defended by acclaimed economist, finance scholars, and practitioners, is built on the supposition that a company should aim to maximize its shareholders' wealth (Chandra 2007, 5-6).

'Profitability' and 'productivity' are terms often encountered when discussing the efficiency of a firm's operations. Profitability is evidence of the earnings potential of a company and on how effectively it is being managed (Chandra 2007, 2; Tulsian 2014, 19.) When talking about profit and profitability, it should be noted that these are two separate terms. While profit represents the absolute measure of earning capacity, profitability is seen as a relative measure of earning capacity (Nishantini & Nimalthasan 2013, 1; Tulsian 2014, 19.) Company productivity on the other hand can be defined as "the efficient use of resources–labour, capital, land, materials, energy, information– in the production of various goods and services" (Prokopenko 1987, 3). Productivity and measurement of its growth serve as the basis for the analysis of economic growth. It is noted that particularly when international comparisons are made, careful attention is needed when choosing from the various existing approaches in measuring and interpreting productivity. (Measuring Productivity– Measurement of Aggregate and Industry-Level Productivity Growth 2001, 3.)

According to Scarlett (2005), *goal congruence* is a state that performance measures should aim to achieve. This is where the best interests of management correspond to those of the company and making decisions in order to reach the company's objectives are voluntary on the managers' part. In order to effectively improve firm

performance, the used measure needs to be a fitting and applicable indicator, however, choosing the correct ones is not an easy task as performance measures are everything but fool proof. Adopting an unsuitable performance measure can result in undesirable consequences for example that managers might be inclined to take unsatisfactory actions either by focusing only on maximizing the *measure* while disregarding the company interests, or merely adjusting their own *behaviour* in such a way that desired results only appear to be reached. (127.)

At the core of analysing financial performance, is investigating companies' financial statements, which record all the firm's business activities for a certain period. In financial statements companies' performance reports can be found in a compact form. (Bosworth 2005, 41; Schönbohm 2013, 5.)

Financial Ratio Analysis

In order to extract information from a company's financial statements, the data can be used in calculations to make interpretations about the health of a company, how well it has performed in the past, what its current financial position is, and predicting its potential future development. These calculations are commonly referred to as accounting ratios and are considered the basis of ratio analysis. The data for calculating the ratios can be found in the firm's income statement, balance sheets, and cash flow statement. The purpose of accounting ratios is that they relate one financial figure to another while facilitating the process of making interpretations about a business activity's performance. (Bosworth 2005, 41-42.)

Using accounting ratios allows controlling for size and time as well as fostering inter- and intra-firm comparability (Broadbent & Cullen 1993, 47). Bosworth (2005) notes that in order for ratios to be useful in an analysis, the rationale for selection should be directed by the viewpoint (of management's, owner's, lenders'), the objective of the evaluation, and the standards of the comparison (42). Schöhnbohm (2013), defines the three most commonly used financial ratios by the company's ability to: pay back short- and long- term liabilities, move inventory and collect receivables, and enhance profitability and investment opportunities. In this paper the focus will be on the third types of ratios that address the topic of profitability.

Chandra (2007) classifies financial ratios into five categories:

- Liquidity ratios,
- leverage ratios,
- turnover ratios,
- profitability ratios, and
- valuation ratios (70).

Leverage ratios examine the amount of debt used to finance operations and help to estimate the level of risk resulting from using debt as capital. One types of ratios analysing financial leverage are *structural ratios* which look at the proportion of debt and equity in the firm's financial structure. (ibid., 72.) Two leverage ratios of Debt-to-Equity (hereafter D/E) are used as control variables in the study. D/E measures the capital structure or financing aspect of companies. According to Chandra (2007), a lower debt-equity ratio generally indicates that the creditors of the company enjoy more protection. In other words, the higher the proportion of debt, the riskier the firm and its stock is to the shareholders (73.) Moyer, McGuigan, and Rao (2014) note similarly that when the company's proportion of equity decreases, investors may be more hesitant to acquire its debt obligations (82).

The relationship between firm performance and executive compensation has shown to be highly sensitive to the type of measure used. Previous studies have used accounting-based measures such as return on assets and return on equity along with market-based measures such as total shareholder return and stock price, to determine company performance. As shortcomings for accounting measures, from the shareholders perspective, stock price changes affect their returns, and cannot be defined through accounting terms. On the other hand, market fluctuations and economic situations constantly affect stock prices and therefore, do not reflect executive performance wholly. Several studies have found that executive compensation responds more to market-based than to accounting-based measures. Conversely, other studies present strong connections between accounting-based measures and executive pay, which suggests that there is no clear consensus on whether compensation corresponds more to accounting or to market-based measures. (Canarella & Nourayi 2008, 295-296.) One study of Amarou and Bensaid (2017)

found that increase in firm performance also leads to higher executive total compensation, but that specifically the bonus element was dependent on the company's accounting performance (68-69).

Due to the reasoning above the financial performance of the sample companies in this study is measured by looking at both accounting and market performance, as well as a hybrid measure of the two using Tobin's Q, in order to analyse the relationship between CEO pay and firm financial performance more comprehensively

Limitations of Ratio Analysis

The limitations often associated with analysing financial statements derive from the differing accounting policies between firms, which can make it difficult to produce consistent comparisons (Bosworth 2005, 41). Chandra (2007), adds that examining financial statements is usually not enough to draw sufficient conclusions about a firm's performance, but they do give important hints about what should be investigated in more detail (69). Moyer et al. (2014), note that even though ratio analysis can produce valuable information, caution should still be exercised when evaluating the ratios can also be misleading. In order to critically analyse the ratios, one should recognize that

- the ratios are only as trustworthy as the data that they are based on,
- the validity of *comparative analysis* depends on proper definition of the industries and the availability of the data collected, and
- financial ratios only give a *historic record* of the financial status and performance of a company. (96.)

In conclusion, ratios should be seen as useful tools for supporting efficient management decisions but should not be used as substitutes for critical business judgment. (ibid.)

Accounting performance

To examine the effects of executive performance pay on company financial performance, several accounting measures are used including Net and Operating

profit, Return on Assets (hereafter ROA), Return on Capital Employed (hereafter ROCE), Earnings Per Share (hereafter EPS) and Marginal Productivity.

Operating profit is a measure that provides an understanding of the overall efficiency of an enterprise. Operating profit is calculated by subtracting all operating expenses – such as salaries, rent, research, and development costs– from the gross profit. Because operating expenses include all selling, distribution and administration expenses but excludes taxes, it presents the company's earnings clearly. (Nishantini & Nimalathasan 2011, 3.) Net profit, also known as net income or net earnings, is obtained when all operating expenses, and other charges including interest, taxes, and depreciation are subtracted from the total revenue. Net profit shows the bottom line of what a company has earned or lost during the accounting period. (Murphy, 2020.)
In order to evaluate the performance of a company one of the very basic and direct measures is its earnings. When buying and selling the stock shares of a company it is elementary to have an understanding of the value of those stocks. Calculating earnings per share is a direct way to find out the amount each single stock depicts of the company earnings, meaning how valuable one share is. Earnings show very explicitly that the larger the earnings are, the better the performance of the company is. (Cuadra 2002, 39.)

Profitability ratios include *profit margin ratios* and *rate of return ratios.* Profit margin ratios such as operating profit rate present the relationship between profit and sales and measure the management's efficiency to generate profits on sales, total assets, and shareholders' investment (Moyer et al. 2014, 84).

Operating profit rate or operating profit margin represents the percentage of profit a company produces from its operations, before the subtraction of interest and tax. Also considered a profitability ratio, operating profit rate shows the ratio between operating profit and net sales. The main function is determining the operational efficiency of the company and its management by its ability to generate profits from its core business activities. Therefore, the higher the ratio the better the operational efficiency can be considered. (Tulsian, 2014, 20.)

ROA and ROCE are both, according to Chandra (2007), *rate of return ratios* which is a type of profitability ratio showing the relationship between profit and investment

(77). Assets are resources controlled by the company, for example equipment or other property of value, from which the company is expected to produce benefits in the future. Capital on the other hand is the money that has been invested in the firm by its owners for the running of the business. In order to acquire assets such as buildings or machinery, the company needs capital to procure them. (Mackay 2018.) Capital employed equals the total capital the company has utilized which includes shareholders' equity as well as debt and liabilities (Kenton 2020).

ROA provides an indication on how much a business is able to generate income for each dollar (euro) of assets (Gallagher & Andrew, 2007, 92), which provides investors with an impression on how effectively the company converts the money it invests into earnings (Hargrave, 2020). ROCE shows how much return is generated for each unit (euro) that is invested in the business (Nishantini & Nimalthasan 2013, 5). When seeking to determine the overall performance of a company, ROCE serves as a useful profitability measure as it shows how well the owners' and creditors' investments have been employed into the business by the management. The benefits of using ROCE include that trends can be found to determine whether the company is improving as the measure can be compared for a span of several years. (Manna, Nath, & Gupta 2019, 57.)

Marginal productivity – Productivity is in basic terms explained through inputs and outputs, how much output is produced with a certain amount of inputs (Rogers 1998, 5-6; Diewert & Nakamura, 2005, 1). Marginal productivity or marginal product is the term used for that *extra output* gained for adding *one* additional unit of input to a process, while all other inputs remain unchanged (Machlup 1936). For example, when adding one extra worker (labour unit) to the assembly line of a product, marginal productivity is the extra products (*output)* assembled by adding that employee at the station, assuming that other inputs such as technology remain the same. According to the theory of Marginal Productivity a company will hire additional workers for an occupation "until the revenue from hiring another worker equals the market wage for the occupation" (Mayer 2018, 1). Therefore, if the pay level of a certain occupation decreases, the firm may hire new employees to increase productivity, and similarly if the pay rises, the firm may decrease the number of employees of that position to cut costs. However, Mayer (2018), argues that marginal productivity theory may not apply to the CEO pay because the fluctuations in CEO compensation levels do not

affect the number of CEO's hired or reduced, as a company usually only has one CEO (1).

Market performance

In order to determine the relationship between the market performance of the company and CEO performance-based compensation several market performance measures have been employed, which will be explained in this chapter.

When referring to 'the market' or 'stock market' investors usually talk about stocks as a group, meaning an organized market for stocks which are primarily in the form of shares, bonds, and derivatives (Imperiale 2005, 1; Dembinski 2003, 128).

Market Capitalization–Cuadra (2002), defines market capitalisation, or market cap, of a stock as the total value given to a stock by the market participants (35). It shows a public company's whole tradable value and serves as an indicator of the firm's future value or net worth in the public opinion. Also known as market value, market cap can be used as a measure of share market performance, as an economic indicator for comparing size and growth of business activities, and also as a key measure in stock valuation. (Selvam, Gayathri, Vasanth, & Marxiaoli 2016, 94; iMinds 2009, 1.) Typically, companies are split into three caps (capitalizations); large-cap, mid-cap, and small-cap each with their own distinct characteristics. Companies falling in the large-cap category are usually big companies in leading industries and enjoy stability as they are not easily shaken by outside forces so that their stock prices would be significantly affected. Large-cap companies' stocks are therefore, considered to be less risky but also yielding smaller returns. The stock of small-cap companies on the other hand are more mobile and likely to give significant returns on investment, with the downside of course, that being more volatile they also possess a larger amount of risk. Mid-cap companies fall somewhere in between and have decent growth potential while being less risky, which is why mid-cap companies have been popular among investors and traders. (Cuadra 2002, 36; Brooks, Holzhauer, & Lu 2014, 33.) The market capitalization values are usually divided as: $10 billion of more=large-cap, $2 to 10 billion= mid-cap, and $300 million to $2 billion= small-cap (Chen 2020).

The benefits of using market cap as an economic measure include that its calculation is simple and the data for it is easily and widely accessible. (Cuadra 2009, 1.) It is

calculated by multiplying the market price per share with the number of shares outstanding (Imperiale 2005, 2). Limitations of market cap include that it is not the most accurate of equity measures, for one because it does not include all components that determine the value of an enterprise, such as debt, cash, or other interests held by the company. There is also the matter of whether the firm's stock is properly valued– or if it is under- or overvalued– in which case relying too heavily on market cap in determining firm value could result in inaccurate deductions about the company's actual performance. (iMinds, 2009, 1.)

Beta– Risk assessment is seen as a fundamental part of estimating the value of capital investments. Beta coefficient works as a measure of the systematic risk or volatility of an investment or asset in relation to the unsystematic risk of the stock market (Karačić & Bukvić 2014, 521). Maniatis (2011), continues that evaluating risk is a very important component when dealing with stocks because the stock's profitability goes hand in hand with the negative movement of the value of the stock. Therefore, if investors are to expect high returns on their investments, they also need to consider the existence of a higher degree of risk. (25.) Beta is also relevant to investors since diversification can be used to eliminate unsystematic risk but not systematic, therefore, their rewards lie only in braving the domain of systematic risk (Hundal, Eskola, & Tuan 2019). Beta is used to calculate the expected return of an asset which indicates that high-risk (high beta) assets should yield a higher return than low-risk (low beta) assets (Perković 2011, 102).

The relevance of determining the level of risk in the topic of executive remuneration, due to the need to compensate for example CEO's risk-bearing in their decision-making. It is only reasonable that especially in industries demonstrating high market volatility, that it is taken into consideration when devising executive compensation packages, to prevent possibly risk-averse behaviour.

Hybrid performance –Tobin's Q

As many previous studies have provided evidence supporting that both accounting and market performance have an impact on the compensation (Canarella & Nourayi 2008, 294-296), it was found essential to measure both for the analysis of the current study. Tobin's Q according to Fu, Singhal & Parkash (2016) is assumed to represent a firm's

investment and growth opportunities (1). Defined as the ratio of the sum of the market value of debt and equity to the replacement cost of the firm's assets (Daines 2001, 9-10; Hundal 2017). Replacement cost in this case would roughly mean, how much it would cost to re-establish the company today. Manna et al. (2019), add that Tobin's Q has been widely used in financial literature to examine future investment opportunities and is a popular ratio in a variety of different situations examining financial phenomena and decision-making (57). Previous studies present varying uses for Tobin's Q that range from explaining relationships between managerial ownership and firm value, market structure, and profitability to diversification and firm performance (Fu et al. 2016, 1). Wernerfelt and Montgomery (1988), for example used it to measure firm performance in estimation of the relative importance of focus, industry, and share effects (246-248).

2.6 Hypothesis development

Once the literature review on the research topic is done, the following step is to develop hypotheses based on the theories studied. A hypothesis is the assumption on which the research premises are based on and which will be tested by the findings of the study. Hypothesis development is important as it works to authenticate the findings of the research through quantification and testing. (Bhattacharyya 2006, 11.) Sachdeva (2009), defines a hypothesis as "a specific statement of prediction" which explains specifically what is expected to happen in the study (11).

Based on the literature review on the topic the following hypotheses were formulated:

H_1: Board characteristics influence performance-based pay

> *H_{1a}: Board size affects the performance-based pay*
>
> *H_{1b}: A more independent board of directors gives more performance-based pay*

H_2: Performance-based pay influences the company financial performance

> *H_{2a}: Higher performance-based pay leads to a higher accounting performance*

H_{2b}: Higher performance-based pay leads to a higher market performance

The author hypothesizes that good firm performance and the proportion of performance-based compensation paid to executive management would have a strong positive relationship, meaning the higher the performance pay the higher the overall firm performance. Furthermore, board characteristics are hypothesized to impact the composition of executive remuneration packages in a way that more independent boards would pay higher levels of performance-based pay. Additionally, it is supposed that the size of the board would also impact the level of CEO performance pay.

3 Methodology

The objective of the current research is to provide further understanding of whether Nordic manufacturing companies' executive compensation practices as well as board characteristics have an impact on their financial performance. The secondary data is collected from the annual reports of these 25 companies over a 5–year period in order to highlight the possible changes and provide a more comprehensive perspective of the topic. As mentioned in the literature review section of the paper, the topic of executive remuneration and firm performance is a widely researched area, however, it is more focused on the U.S with fewer studies from Europe or the Nordic region. Therefore, this study aims to gain further understanding of the issue and its implications in the Nordic countries.

The term 'method' encompasses the techniques for collecting information or evidence as well as various means of progressing in that information gathering. 'Methodology' on the other hand means the underlying theory and analysis of how research advances or should advance and is often guided by discipline. To methodology also relates the theory of knowledge "epistemology" determining what can be observed. (Sachdeva 2009, 7.)

The research design is the plan of how the conceptual research problem is related to relevant and applicable empirical research (Ghauri & Gronhaug 2002). The research design should provide a strategic approach that will allow the best possible way to answer the research questions within the given frame. in other words, the research

design can be seen as the strategy on how to obtain the information that is needed to conduct the research. It defines the research actions, such as what type of data is to be collected and also how to collect it. (47.) Ghauri and Gronhaug (2002, 48), list three main classes of research designs: exploratory, descriptive, and causal. Saunders, Lewis, and Thornhill (2009) refer to these as research purposes and use the term 'explanatory' for causal design which is perhaps the more common term (138-139). The choice of design is dependent on how structured the research problem is. The designs are matched as follows:

Research design	Problem structure
Exploratory	Unstructured
Descriptive	Structured
Causal	Structured

Exploratory research is characterized by problem solving and flexibility. This design is suitable when the research problem more or less inadequately understood. The potential causes of a phenomenon are investigated in an experimental way. Descriptive and causal designs are used when the research problem is structured and properly understood. Whereas descriptive research aims to only systematically observe and describe a phenomenon, causal/ exploratory research also investigates the cause-and-effect factors of the research problem. (Ghauri & Gronhaug 2002, 49.) In the case of this study, as it has been established in previous sections that the topic has been widely studied and a bulk of research exists, the research design was chosen to be causal– or explanatory– studying the cause-and-effect factors between the variables.

Research philosophy is related to the development and nature of knowledge and holds crucial assumptions about the way in which the researcher views the surrounding world. The research strategy and methods chosen as a part of that strategy are based upon these assumptions. (Saunders et al. 2009, 108.) Based on the nature of the current research being highly structured and focused on the causality between variables as well as being relatively independent of social factors the choice research philosophy was positivist. The positivist philosophy is concerned with observable facts and the objective stance of the researcher. According to the positivist philosophy,

the data collected, and hypotheses formulated have been done based on existing theories and the observable facts (company data) are used to test those hypotheses to produce credible and generalisable results. (ibid., 113-114.)

In building a research design it is also important to determine what research approach would be most suitable for a given study. There are two approaches: deductive and inductive. In the deductive approach a theory and hypothesis are developed after which the research strategy is designed in order to test that hypothesis. The inductive approach differs in order so that a theory is developed as a result of the data collection and analysis. Induction is concerned with building a theory –as opposed to testing an existing one– by collecting data and attempting to uncover the reasons behind a phenomenon. The deductive approach is more often connected to what one might call *scientific research*, seeking to explain causal relationships between variables, therefore, also associating it more closely with the positivist research philosophy. (ibid., 124-126.) Due to these reasons, the choice of approach in the current study was deductive.

There are two primary types of research methods with their own distinct characteristics. Depending on the nature of the phenomenon researched, one can choose to use either a *qualitative* or a *quantitative* approach to conducting the study, but also a combination of both. Quantitative methods are described as more 'result-oriented' and analytical in nature, as well as having an emphasis on testing and verification. Qualitative, on the other hand, is more process-oriented, subjective, and has an emphasis on understanding. (Ghauri and Gronhaug 2002, 86.) Saunders et al. (2009) distinguish quantitative and qualitative analysis techniques as statistical and non-statistical (3). Research is usually classified as qualitative when a problem or phenomena needs to be understood or explored further and requires unstructured exploratory techniques to do so. Large samples of data are usually handled in quantitative research that are studied through some form of statistical analysis. (Bhattacharyya 2006, 390.)

The method chosen for the current study was quantitative as the study examines a large sample of data to test existing theories. Furthermore, as an extensive body of prior research exists and due to time and resource limitations in conducting this study, the author chose not to use qualitative research in combination.

3.1 Data Collection

Data From the 25 largest manufacturing companies in the Nordic region was collected for the purposes of this study. The source for data on share prices was collected from the Nasdaq OMX Nordic 40 index. In addition, accounting figures and corporate governance information were obtained from the annual reports of the sample firms, specifically from the financial statements and corporate governance reports. Both of these data sources are considered as secondary which is defined as data that has already been collected by someone else for some other purpose (Saunders, Lewis & Thornhill 2009, 256). The total sample for the research consisted of 25 publicly listed manufacturing companies. The data was collected from 1st January 2011 to 31st December 2015, with the exception of the data for calculating marginal productivity, for which data was collected starting from 1st January 2010. In total the collected data accounts for five years of observations.

Data collection is a core element in research therefore, it is essential to understand the type of data relevant to a given research problem and the most credible sources and effective way of collecting. Data in research is usually divided into two types: primary and secondary data. (Ghauri & Gronhaug 2002, 76.) Primary data is collected by the researcher themselves using for example questionnaires, surveys, or interviews to fit that particular study and research problem). The advantage of using primary data is therefore, that it is more consistent with the research questions and objectives of the study at hand. Disadvantages include that the collection can be costly as well as take a long time to do. Also, the researcher needs to be more careful in selecting tools and analysis methods when using primary data to avoid jeopardizing the reliability of the research. (ibid., 81-82.)

Secondary data is data that has already been collected and presented by someone else for some other purpose, but which can be used to answer our research questions. Secondary data can be divided into *internal* and *external.* Internal sources include information about suppliers, customers, employees, marketing plans, etc. This information is usually available when working for a company and cannot be taken at face value. The annual reports of companies are a part of published external sources. It is noted that such as the internal sources, the company annual statements also have a tendency to present information in a more beneficial light, so they should also be

reviewed with a critical eye. The benefits of secondary data are that there is an abundance available and it is often easily accessible through the internet. Using secondary data also relieves the researcher from having to create questionnaires or interviews to collect their own data, which might result in faulty results if not done properly. The disadvantages of secondary data include the fact that the data might have been collected for a completely different purpose and therefore, may not fit our research objectives as well as it should. One way to counter this issue is by using the research problem of the study as the starting point for the data that is needed, so if the data does not fit the problem, it should be discarded. (Ghauri & Gronhaug 2002, 78-80.)

The data has been collected from the annual statements of the 25 sample companies, specifically from the income statement, balance sheet, and corporate governance statement, and is characterized as secondary. To assess the companies' performance, both accounting and market-based measures are used since both have been utilized in previous research. Accounting measures are used to analyse the firms' internal performance and market measures to examine how the companies perform relative to the market. The data collected to examine CEO remuneration include total compensation, fixed pay, and performance pay.

The time horizon of a five-year period was chosen in order to answer the research questions of the study and fit the purpose of a quantitative analysis of the Nordic manufacturing companies' financial data. In research methodology, the study would be referred to as longitudinal as the data is examined over an extended period from a 'diary' perspective (Saunders et al. 2009, 155). The advantages of longitudinal studies include that they are able to answer questions about cause and consequence effectively, and the reliability of the results increases as the changes in the data are examined over a longer period (Adams, Khan, & Raeside 2014, 7-8).

Sampling is needed in research because rarely is it possible or even optimal in terms of resources to attempt to gather data from an entire population. Sampling takes only a portion of the population and generalizes the results in an attempt to answer questions on behalf of that whole population. (Ghauri & Gronhaug 2002, 112.) The population, in this case, are manufacturing companies listed in the Nordic stock exchange. Sampling procedures can be divided into *non-probability* and *probability* sampling.

Ghauri & Gronhaug (2002) argue that non-probability sampling would not be representative and that valid inferences could not be made with it of the population. This is because non-probability sampling does not allow for assessment of the amount of sampling error, unlike probability sampling does. (113.)

Regardless, non-probability sampling has been used in this study, more specifically the *judgment sampling.*

The companies selected for the sample represent a number of the largest in the industry listed in the OMX Nordic 40 based on total share turnover. The reasoning for using companies from only one industry (manufacturing) in the sample was keeping the measurement and analysis of the data as simple and comparable as possible. The author justifies the use of this sampling method because it was the most advantageous for the purposes of this study. In this method the sample units have been carefully selected in a way that the author believes will represent the population the best. Additionally, The reasoning for selecting the largest companies was that the data would be best available and most consistent in quality. The structure of the variables is presented in Figure 1.

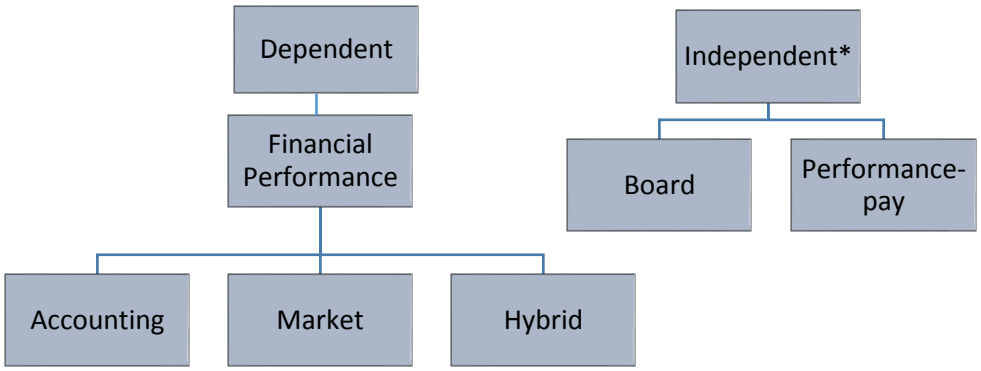

Figure 1 Variable classification (Adapted by the author)

* Control variables included

The main dependent variables consist of the ratios measuring accounting, market, and hybrid performance of the company. Also, the performance pay variables were used as dependent when examining the effect of board characteristics on compensation.

In order to reduce heteroscedasticity in the measurements, the natural logarithmic (LN) values have been used for several of the variables, including Net Profit, Operating Profit, BV (book value) of Assets, BV Equity, BV Debt, Performance Pay and Board Size.

To assess the accounting performance of the companies ROA, ROCE, Net Profit, Operating Profit, Marginal Productivity, and EPS were used. Here ROA is calculated by dividing *net income* (EBIT) with *total assets* (or book value of assets). ROCE is calculated by dividing *net profit after interest and tax* by *capital invested.* Capital employed is determined by the sum of *net current assets* and *net tangible fixed assets.* (Nishantini & Nimalthasan 2013, 5-6.) ROCE is calculated as follows:

$$Return\ on\ Capital\ Employed = \frac{Net\ Profit}{(Book\ value\ of\ Equity + Book\ value\ of\ Debt)}$$

The market performance measures used in this research consist of Market Capitalization, Stock return, as well as Beta to measure market risk.

Market Capitalization represents the market value as well as the size of the company and is calculated by dividing the yearly average of the market price per share by the total number of shares. The formula for stock return was calculated through the following formula:

$$Stock\ Return = \frac{Closing\ Price_{current\ day} - Closing\ Price_{previous\ day}}{Closing\ Price_{previous\ day}}$$

Beta was also used as a measure of market performance in the form of market risk. As explained in section 2.4, the beta of a security is a measure of systematic risk benchmarked against the market and it determines the stock returns sensitivity to changes in systematic factors. A beta of less than 1 indicates that the stock is less volatile than the market. When the beta value exceeds 1, the firm's stocks are exposed to a higher level of risk than the market. To calculate beta, the following formula has been used:

$$Beta = \frac{Covariance(R_e, R_m}{Variance\ (R_m)}$$

Where:

R_e – stock return

R_m – market return

$Covariance$ – a measure of a stock's return relative to the market's return

$Variance$ – a measure of the market moves relative to its mean

Tobin's Q has been used as a hybrid measure of both accounting- and market performance with the following formula:

$$Tobin'sQ = \frac{(Total\ Debt + Market\ Capitalization)}{Total\ Assets}$$

The Tobin's Q is low when the value is between 0 and 1 and it indicates that the stock is undervalued. Conversely, if the value is greater than 1 the Q is high and shows that the stock costs more than the replacement cost of the firm's assets, implying that the stock is overvalued. (Hutabarat & Senjaya 2016, 466.)

The main independent variables include Performance Pay (LN), Ratio of performance Pay 1 (performance pay-to-total compensation), and the Ratio of Performance Pay 2 (performance pay-to-fixed pay) to measure CEO performance-based compensation. In the measure of performance pay (LN), the component of only cash bonus has been used from the CEO performance incentives, excluding for example stock options. The justification is that the cash bonus is seen as a more traditional and widely accepted form of compensation.

$$Ratio\ of\ Performance\ pay = \frac{Performance\ pay}{Total\ Compensation\ or\ Fixed\ pay}$$

In addition, corporate governance variables are used as independent variables to examine the effect of board characteristics on the performance pay element of compensation. The measures include Board Size (LN), and Ratio of Board Independence. Board size is measured by the total number of directors and the ratio of

board independence is calculated by dividing the number of independent/outside directors by the total size of the board.

Control variables used in the study include BV of Assets, BV of Equity, Debt-Equity Ratios 1 (hereafter D/E1), and 2 (hereafter D/E2). The Debt-to-Equity ratios were calculated as follows:

$$D/E = \frac{Total\ Liabilities}{Equity_{Book\ or\ Market\ value}}$$

D/E1 examines the proportion of debt to book value of equity and D/E2 to market value of equity. D/E2 is calculated in addition because the book value of equity can be inadequate in showing its true value in the case of rising prices (Chandra 2007, 436).

Table 1 Variable descriptions (adapted by the author)

Variable	Label	Definition	Found in
Independent variables			
Performance-pay			
Performance Pay	LNPerfPay	Natural logarithm of CEO performance-based compensation	Annual Reports
Performance Pay-to-Total Compensation Ratio	RatioPerfPay1	CEO performance pay divided by CEO total compensation	Annual Reports
Performance Pay-to-Fixed Pay Ratio	RatioPerfPay2	CEO performance pay divided by CEO fixed compensation	Annual Reports
Corporate Governance			
Board Size	BoardSize	Natural logarithm of total number of directors	Annual Reports
Ratio of Board Independence	RatioBoardInd	The number of independent directors divided by the total number of directors	Annual Reports
Dependent variables			
Accounting Performance			
Net Profit	LNNetProfit	Net income for the period	Annual Reports
Operating Profit	LNOperProf	Earnings before income and tax	Annual Reports
Operating Profit rate	OperProfRate	Operating profit divided by total revenue for the period	Annual Reports

Table 1 Variable descriptions (continued)

Marginal productivity	MargProd	The subtraction of net revenue of the previous year from the current year's net revenue divided by the subtraction of previous year's total cost from the current year's total cost	Annual Reports
Return on Assets	ROA	Profitability measure calculated by dividing net profit by book value of total assets	Annual Reports
Return on Capital Employed	ROCE	Net profit divided by the sum of book value of debt and book value of equity	Annual Reports
Earnings Per Share	EPS	Net profit divided by the number of shares outstanding	Annual Reports
Market performance			
Market Capitalization	LNMarketCap	Natural logarithm of market capitalization	Annual Reports & NASDAQ OMX Nordic 40
Stock Return	StockRet	The subtraction of closing price of previous day from the closing price of current day divided by the closing price of the previous day	NASDAQ OMX Nordic 40
Beta	Beta	A measure of systematic risk. Calculated by dividing the product of covariance of the stock return and market return by the variance of the market return	NASDAQ OMX Nordic 40
Hybrid Performance			
Tobin's Q Proxy	TQ	The sum of market capitalization and book value of debt divided by book value of assets	Annual Reports & NASDAQ OMX Nordic 40
Control variables			
Book value of Equity	LNBVEquity	Natural logarithm of equity	Annual Reports
Book value of Assets	LNBVAssets	Natural logarithm of total assets	Annual Reports
Book value of Debt	LNBVDebt	Natural logarithm of total finance debt	Annual Reports
Debt-to-Book value of Equity Ratio	DE1	The firm's capital structure calculated by dividing book value of debt by the book value of equity	Annual Reports
Debt-to-Market Value of Equity Ratio	DE2	The firm's capital structure calculated by dividing book value of debt with market value of equity (market capitalization)	Annual Reports & NASDAQ OMX Nordic 40

3.2 Data analysis

The link between executive remuneration and firm performance is difficult to measure accurately, due to variabilities for example in firm size, industry, country, and market fluctuations. For this reason, measurement and analysis were done in a way that takes into account these disparities.

In this study three types of analyses were used: Descriptive statistics to interpret and summarize the data; Pearson's Correlation Coefficient to find relationships between variables; and OLS Regression analysis to examine dependencies between those variables. Analysis in this case refers to computing specific indices or measures and looking for existing patterns of relationship among data groups (Kothari 2004, 130).

The descriptive statistics serve in managing all the numerical data and provide its main facts. The primary findings in Table 2 contain the minimum and maximum values, showing the extremes in the included variables; mean, also known as central tendency, presenting the average of each variable; and standard deviation, measuring the dispersion of the data, meaning how widespread individual variable values are. (Adams, Khan, & Raeside 2014, 171-174.)

Pearson's Correlation Coefficient (r) indicates whether a significant linear relationship between two continuous variables exists as well as the strength and direction (increasing or decreasing) of that linear relationship (SPSS Tutorials: Pearson Correlation 2020). Correlation analysis is about finding and determining the degree of relationships between two or more variables. The coefficient takes a value between -1 and 1, where an r value close to 1 signifies a strong positive linear relationship, and a value close to -1 indicates a strong negative one. The SPSS software also shows the level of significance between the variables. (Adams et al. 2014, 200.) A positive relationship indicates that the variables move in the same direction, meaning that as one variable increases or decreases, so does the other. Negative correlation between variables on the other hand illustrates that as one variable increases the other decreases or vice versa indicating that the variables move in opposite directions. A high and significant correlation between variables, therefore, shows the degree of their relationship, however, it does not necessarily mean that a cause-effect relationship

exists between the variables. (Sharma 2005, 1-5.) The Pearson's Correlations Coefficient is determined using the formula:

$$r_{xy} = \frac{cov(x,y)}{S_x S_y} = \frac{\sum(X_t - X)(Y_T -)/(n-1)}{S_x S_y}$$

Once the dependent and independent variables were identified the regression analysis was carried out. The regression model chosen to test the hypotheses presented in section 2.5 is the ordinary least square (OLS) multivariate regression, which measures how two or more independent variables affect changes in the dependent variable. Regression analysis is therefore, concerned with causal and functional relationships existing between the variables. (Kothari 2004, 130.) This analysis technique involves estimating the coefficients of the explanatory (independent) variables that will predict the dependent variable (Adams et al. 2014, 202).

The R square, also known as the coefficient of determination, is also included in the research output, serving as another measure for verifying the results of the analysis. The value of the coefficient is marked as a percentage, meaning that if for example the R square values at 90 percent, it would indicate that 90 percent of the variation in the dependent variable is explained by the model. (ibid., 204.) The formula for R Square is the following:

$$R^2 = \frac{Sum\ of\ Squares\ Explained\ by\ Regression}{Total\ Sum\ of\ Squares\ (before\ Regression)} = \frac{\sum(\hat{y}_t - \bar{y})^2}{\sum(y_t - \bar{y})^2}$$

The OLS Regression equation used for the analysis is the following:

$$y_{it} = \alpha_{it} + \sum_{k=1}^{p} \beta_k x_{it} + \varepsilon_{it}$$

Where:

$y_i -$ dependent variable of firm i in period t

$\alpha_{it} -$intercept of the model

$x_i -$ corresponds to the i^{th} explanatory variable of the model

$\varepsilon -$ the random error with expectation 0 and variance σ^2

i – each sample firm

t– each time period of analysis

Using a multivariate OLS regression analysis the functional relationships of models have been measured as follows:

$$LNPerfPay_{it} = \alpha_{it} + \beta_1(OperProfRate)_{it} + \beta_2(MargProd)_{it} + \beta_3(LNBVAssets)_{it} + \beta_4(LNBVEquity)_{it} + \beta_5(DE1)_{it} + \beta_6(DE2)_{it} + \beta_7(ROA)_{it} + \beta_8(ROCE)_{it} + \beta_9(EPS)_{it} + \beta_{10}(LNMarketCap)_{it} + \beta_{11}(TQ)_{it} + \beta_{12}(StockRet)_{it} + \beta_{13}(Beta)_{it} + \beta_{14}(LNBoardSize)_{it} + \beta_{15}(RatioBoardInd)_{it} + \varepsilon_i$$

$$RatioPerfPay1_{it} = \alpha_{it} + \beta_1(OperProfRate)_{it} + \beta_2(MargProd)_{it} + \beta_3(LNBVAssets)_{it} + \beta_4(LNBVEquity)_{it} + \beta_5(DE1)_{it} + \beta_6(DE2)_{it} + \beta_7(ROA)_{it} + \beta_8(ROCE)_{it} + \beta_9(EPS)_{it} + \beta_{10}(LNMarketCap)_{it} + \beta_{11}(TQ)_{it} + \beta_{12}(StockRet)_{it} + \beta_{13}(Beta)_{it} + \beta_{14}(LNBoardSize)_{it} + \beta_{15}(RatioBoardInd)_{it} + \varepsilon_i$$

$$RatioPerfPay2_{it} = \alpha_{it} + \beta_1(OperProfRate)_{it} + \beta_2(MargProd)_{it} + \beta_3(LNBVAssets)_{it} + \beta_4(LNBVEquity)_{it} + \beta_5(DE1)_{it} + \beta_6(DE2)_{it} + \beta_7(ROA)_{it} + \beta_8(ROCE)_{it} + \beta_9(EPS)_{it} + \beta_{10}(LNMarketCap)_{it} + \beta_{11}(TQ)_{it} + \beta_{12}(StockRet)_{it} + \beta_{13}(Beta)_{it} + \beta_{14}(LNBoardSize)_{it} + \beta_{15}(RatioBoardInd)_{it} + \varepsilon_i$$

$$LNNetProfit_{it} = \alpha_{it} + \beta_1(LNPerfPay)_{it} + \beta_2(RatioPerfPay1)_{it} + \beta_3(RatioPerfPay2)_{it} + \beta_4(LNBVAssets)_{it} + \beta_5(LNBVEquity)_{it} + \beta_6(LNMarketCap)_{it} + \beta_7(TQ)_{it} + \beta_8(StocRet)_{it} + \beta_9(Beta)_{it} + \beta_{10}(LNBoardSize)_{it} + \beta_{11}(RatioBoardInd)_{it} + \beta_{12}(LNBVDebt)_{it} + \beta_{13}(DE1)_{it} + \beta_{14}(DE2)_{it} + \varepsilon_i$$

$$LNOperProf_{it} = \alpha_{it} + +\beta_1(LNPerfPay)_{it} + \beta_2(RatioPerfPay1)_{it} + \beta_3(RatioPerfPay2)_{it} + \beta_4(LNBVAssets)_{it} + \beta_5(LNBVEquity)_{it} + \beta_6(LNMarketCap)_{it} + \beta_7(TQ)_{it} + \beta_8(StocRet)_{it} + \beta_9(Beta)_{it} + \beta_{10}(LNBoardSize)_{it} + \beta_{11}(RatioBoardInd)_{it} + \beta_{12}(LNBVDebt)_{it} + \beta_{13}(DE1)_{it} + \beta_{14}(DE2)_{it} + \varepsilon_i$$

$$OperProfRate_{it} = \alpha_{it} + +\beta_1(LNPerfPay)_{it} + \beta_2(RatioPerfPay1)_{it} + \beta_3(RatioPerfPay2)_{it} + \beta_4(LNBVAssets)_{it} + \beta_5(LNBVEquity)_{it} + \beta_6(LNMarketCap)_{it} + \beta_7(TQ)_{it} + \beta_8(StocRet)_{it} + \beta_9(Beta)_{it} + \beta_{10}(LNBoardSize)_{it} + \beta_{11}(RatioBoardInd)_{it} + \beta_{12}(LNBVDebt)_{it} + \beta_{13}(DE1)_{it} + \beta_{14}(DE2)_{it} + \varepsilon_i$$

$$MargProd_{it} = \alpha_{it} + +\beta_1(LNPerfPay)_{it} + \beta_2(RatioPerfPay1)_{it} + \beta_3(RatioPerfPay2)_{it} + \beta_4(LNBVAssets)_{it} + \beta_5(LNBVEquity)_{it} + \beta_6(LNMarketCap)_{it} + \beta_7(TQ)_{it} + \beta_8(StocRet)_{it} + \beta_9(Beta)_{it} + \beta_{10}(LNBoardSize)_{it} + \beta_{11}(RatioBoardInd)_{it} + \beta_{12}(LNBVDebt)_{it} + \beta_{13}(DE1)_{it} + \beta_{14}(DE2)_{it} + \varepsilon_i$$

$$ROA_{it} = \alpha_{it} + +\beta_1(LNPerfPay)_{it} + \beta_2(RatioPerfPay1)_{it} + \beta_3(RatioPerfPay2)_{it} + \beta_4(LNBVAssets)_{it} + \beta_5(LNBVEquity)_{it} + \beta_6(LNMarketCap)_{it} + \beta_7(TQ)_{it} + \beta_8(StocRet)_{it} + \beta_9(Beta)_{it} + \beta_{10}(LNBoardSize)_{it} + \beta_{11}(RatioBoardInd)_{it} + \beta_{12}(LNBVDebt)_{it} + \beta_{13}(DE1)_{it} + \beta_{14}(DE2)_{it} + \varepsilon_i$$

$$ROCE_{it} = \alpha_{it} + +\beta_1(LNPerfPay)_{it} + \beta_2(RatioPerfPay1)_{it} + \beta_3(RatioPerfPay2)_{it} + \beta_4(LNBVAssets)_{it} + \beta_5(LNBVEquity)_{it} + \beta_6(LNMarketCap)_{it} + \beta_7(TQ)_{it} + \beta_8(StocRet)_{it} + \beta_9(Beta)_{it} + \beta_{10}(LNBoardSize)_{it} + \beta_{11}(RatioBoardInd)_{it} + \beta_{12}(LNBVDebt)_{it} + \beta_{13}(DE1)_{it} + \beta_{14}(DE2)_{it} + \varepsilon_i$$

$$EPS_{it} = \alpha_{it} + +\beta_1(LNPerfPay)_{it} + \beta_2(RatioPerfPay1)_{it} + \beta_3(RatioPerfPay2)_{it} + \beta_4(LNBVAssets)_{it} + \beta_5(LNBVEquity)_{it} + \beta_6(LNMarketCap)_{it} + \beta_7(TQ)_{it} + \beta_8(StocRet)_{it} + \beta_9(Beta)_{it} + \beta_{10}(LNBoardSize)_{it} + \beta_{11}(RatioBoardInd)_{it} + \beta_{12}(LNBVDebt)_{it} + \beta_{13}(DE1)_{it} + \beta_{14}(DE2)_{it} + \varepsilon_i$$

$$LNMarketCap_{it} = \alpha_{it} + +\beta_1(LNPerfPay)_{it} + \beta_2(RatioPerfPay1)_{it} + \beta_3(RatioPerfPay2)_{it} + \beta_4(LNNetProfit)_{it} + \beta_5(LNOperProf)_{it} + \beta_6(OperProfRate)_{it}\beta_7(MargProd)_{it} + \beta_8(LNBVAssets)_{it} + \beta_9(ROA)_{it} + \beta_{10}(ROCE)_{it} + \beta_{11}(EPS)_{it} + \beta_{12}(LNBoardSize)_{it} + \beta_{13}(RatioBoardInd)_{it} + \beta_{14}(LNBVDebt)_{it} + \beta_{15}(LNBVEquity)_{it}\beta_{16}(DE1)_{it} + \beta_{17}(DE2)_{it} + \varepsilon_i$$

$$TQ_{it} = \alpha_{it} + +\beta_1(LNPerfPay)_{it} + \beta_2(RatioPerfPay1)_{it} + \beta_3(RatioPerfPay2)_{it} + \beta_4(LNNetProfit)_{it} + \beta_5(LNOperProf)_{it} + \beta_6(OperProfRate)_{it} + \beta_7(MargProd)_{it} + \beta_8(ROCE)_{it} + \beta_9(EPS)_{it} + \beta_{10}(LNBoardSize)_{it} + \beta_{11}(RatioBoardInd)_{it} + \beta_{12}(LNBVDebt)_{it} + \beta_{13}(LNBVEquity)_{it} + \beta_{14}(DE1)_{it} + \beta_{15}(DE2)_{it} + \varepsilon_i$$

$$StockRet_{it} = \alpha_{it} + +\beta_1(LNPerfPay)_{it} + \beta_2(RatioPerfPay1)_{it} + \beta_3(RatioPerfPay2)_{it} + \beta_4(LNNetProfit)_{it} + \beta_5(LNOperProf)_{it} + \beta_6(OperProfRate)_{it}\beta_7(MargProd)_{it} + \beta_8(LNBVAssets)_{it} + \beta_9(ROA)_{it} + \beta_{10}(ROCE)_{it} + \beta_{11}(EPS)_{it} + \beta_{12}(LNBoardSize)_{it} + \beta_{13}(RatioBoardInd)_{it} + \beta_{14}(LNBVDebt)_{it} + \beta_{15}(LNBVEquity)_{it}\beta_{16}(DE1)_{it} + \beta_{17}(DE2)_{it} + \varepsilon_i$$

$$Beta_{it} = \alpha_{it} + +\beta_1(LNPerfPay)_{it} + \beta_2(RatioPerfPay1)_{it} + \beta_3(RatioPerfPay2)_{it} + \beta_4(LNNetProfit)_{it} + \beta_5(LNOperProf)_{it} + \beta_6(OperProfRate)_{it}\beta_7(MargProd)_{it} + \beta_8(LNBVAssets)_{it} + \beta_9(ROA)_{it} + \beta_{10}(ROCE)_{it} + \beta_{11}(EPS)_{it} + \beta_{12}(LNBoardSize)_{it} + \beta_{13}(RatioBoardInd)_{it} + \beta_{14}(LNBVDebt)_{it} + \beta_{15}(LNBVEquity)_{it}\beta_{16}(DE1)_{it} + \beta_{17}(DE2)_{it} + \varepsilon_i$$

The output of the OLS regression model presents several statistical results allowing the most significant variables to be uncovered which would serve best in proving the hypotheses. The statistical coefficients drawn from the OLS regression output that were considered purposeful for the research included the unstandardized coefficient beta, the p-value indicating significance level, and t-value. The maximum level of significance considered for the regression coefficients was chosen to be 10% in this study.

The entire analysis implemented in this study, including the correlation- and regression analyses were done using the SPSS Statistics software.

3.3 Validity and Reliability

The purpose of research is to produce information that is as truthful and reliable as possible. All researches want to deliver trustworthy results and prove that the measurements and tools they have used are credible. In order to reduce the chances of producing flawed results in research it is important to pay attention to the *reliability* and *validity* of the research design (Saunders et al. 2009, 156).

Reliability is concerned with the consistency and certainty of the measurement, referring to the repeatability of the methods. If the same results can be achieved under the same circumstances using the same methods, the measurement can be considered reliable. (Krishaswami & Satyaprasad 2010, 93.) According to Saunders et al. (2009), threats to reliability include subject error, relating to the issue of external factors (e.g. time of the week or day) that may affect the observation; subject bias, e.g. in interviews employees might answer what they think their manager wants them to; observer error, relating to the way of collecting data (e.g. differing questions in

interviews depending on interviewer); and observer bias which is about how the data and results and interpreted by the researcher (156-157).

When examining the level of validity, the researcher needs to ask questions like; are the results of the study true, and can the results be generalized to other settings, populations, or periods? The first question relates to internal and the latter to external validity. There are various threats that researchers need to watch out for when conducting studies. (Ghauri & Gronhaug 2002, 55.) Four common threats include *History*, representing particular events occurring simultaneously with the study that can affect the response; *maturation*, referring to the question of whether the result is due to the tested factors or simply the passing of time; *test affect*, meaning the effect of the test itself on observed results; and *selection bias* referring to circumstances where the subjects are not assigned randomly. (ibid., 55-56).

The author believes that a possible threat to the study is selection bias since the subjects or units were not assigned randomly but handpicked from the largest firms, therefore, weakening how well the sample represents the whole population (the manufacturing industry). Due to availability issues of newer statements (from 2016 to 2018) at the time of the data collection, the author chose to use older statements to avoid having gaps in the data sample. Therefore, the author notes that a risk exists of the findings being outdated at the time of publication. Additionally, other issues on validity in this particular study includes the time frame used for the data collection. For external reasons the length of the research process was prolonged which has resulted in a data set that has matured by approx. 4 years.

Regarding reliability issues, the author notes that due to the lag between data collection on results analysis previously unseen errors in data were found that needed corrections. Furthermore, this sheds doubt that there might be other errors that have gone unnoticed, leaving the reliability of the data somewhat uncertain. Reliability issues also exist regarding the figures used to measure CEO performance-based compensation. The reason for this is that companies often use different terms for their performance-based incentives in their annual reporting (in this case variable pay, variable bonus/remuneration, cash bonus, and short-term incentives), which can lead to measurement errors in the study resulting from inaccurate or false figures used in calculations.

4 Results

The results of the analyses are presented and interpreted in the following chapter. The findings will be shown in three subchapters. The first section presents the results of the descriptive statistics, familiarizing the reader with the data and variables used. The second subchapter goes into the correlation analysis results, illustrating the relationships between variables. The second chapter focuses on the primary results, the regression analysis findings assessing the truthfulness of the hypotheses.

4.1 Descriptive statistics

The descriptive statistics of all the variables used in the analysis are presented in table 2. The table illustrates the minimum and maximum as well as the range between the variable values for the period. The mean and standard deviation of the values are also shown in the table. The absolute values of the company variables are presented in millions (EUR). It is noted that unlike the natural logarithmic values used in correlation and regression analyses the absolute values for performance pay utilized in the descriptive statistics are not sufficiently comparable. This is because in some cases where the information on CEO pay was not fully available, the values of the whole executive board for performance pay have been used instead.

Looking at accounting variables, the table shows that in the sample companies the mean for net profit was 716 million, and 1,078 billion for operating profit. The maximum was 7,879 billion for net profit and 10,065 billion for operating profit. The minimum values of -3789 for net profit and -1318 for operating profit explain the low average for values. The standard deviation was very high for both values meaning that both values are greatly dispersed from their means and show that the performance based on profit was highly varied across the sample companies. The mean of operating profit rate is 0.0827 indicating that for every euro of sales the companies generated 0.0827 euros of profit (before interest and tax) on average. Meanwhile the maximum operating profit rate of 0.46 belonging to Novo Nordisk A/S showed that they generated 0.46 euros of profit before interest and tax for every euro of sales. The minimum was -0.6304 indicating that for every sales euro Aker ASA their operating loss was 0.604 euros. The standard deviation for operating profit rate was a fairly low 0.118 indicating that the low average performance can be applied to most of the

sample companies. The maximum value for both ROA and ROCE is a rather low 0.38 indicating that the best return demonstrated by the companies was 0.38 euros for every 1 euro of assets owned or capital employed. The mean for ROA is 0.0563 and 0.0746 for ROCE both of which are very low and judging by the low standard deviation of 0.08 and 0.103 apply for almost all of the sample companies. EPS on the other hand demonstrated a mean of 1.163, maximum of 5.97, and a minimum of -4.76 with a standard deviation of 1.687 indicating that the companies show high variance on the earnings per share they generated during the period. On average exhibiting a low 1.163 earnings but with the high standard deviation indicates it is not conclusive to the whole sample. Overall, the accounting performance of the companies was comparatively low on average, with very high variability between top and bottom performers.

The market and hybrid performance showed a more positive tendency than the accounting measures. The means were 14088 for Market cap, 1.829 for Tobin's Q, 0.3009 for stock return, and 0.3162 for Beta. Nevertheless, the high standard deviations show that the values are relatively dispersed also in the market variables not allowing for assumptions to be made of the whole sample. The mean for market cap of 14,08 billion indicates that on average the sample companies would be categorized as large-cap. The maximum market value of 129,314 billion belonged to Novo Nordisk A/S while AstraZeneca AB had the smallest capitalization of 956,31 million. Although the wide range of 128,358 billion indicates that the sample companies are dispersed among all market capitalizations. The average Tobin's Q of 1.829 demonstrates that the sample companies tend to be overvalued, with the maximum value a considerable 16.23 indicating that the stock value of Aker ASA is 16 times more than the cost to replace the company's assets. The systematic risk measured by beta showed that the average risk the companies experience is a quite low 0.316 meaning the companies are much less volatile than the market. With a standard deviation of 0.420 the results can be applied to the majority of the sample.

Looking at the governance variables it can be seen that the average size of the board of directors in the Nordic manufacturing sector tends to be approximately 10 members. The maximum for board size was 15, with the largest boards belonging to Volvo AB, Atlas Copco AB, and Carlsberg A/S varying in size from 13 to 15 over the 5–year period. The smallest boards had 7 directors, with Outokumpu Oyj, Neste Oyj,

and Yara International having the smallest boards of the sample companies varying from 7 to 8 members total. The mean for board independence was found to be 0,847 indicating that the boards of directors of the sample companies were predominantly independent. Stora Enso Oyj, Neste Oyj, and Norsk Hydro ASA had the highest ratios (1) with a wholly independent board. The lowest ratio was 0,33 indicating that less than half of the board consisted of independent directors. From the sample companies, Novo Nordisk A/S, Vestas Wind Systems A/S, and Yara International had the lowest board independence. The standard deviations were comparatively low meaning that it is safe to conclude that on average nearly all companies had fairly independent and moderately sized boards of directors.

For the performance pay measures ratio 1 measuring the amount of performance-pay relative to total compensation displayed a mean of 0.3005 indicating that on average the CEOs of the sample companies received a cash bonus that was approximately 30% of the total pay. The maximum measured at 0.66, which shows that the highest ratio of performance pay was 66% of CEO total compensation. Illustrated by ratio 2, the mean for performance pay relative to fixed pay was 0.5247 presenting that on average the performance pay was over 50% of the fixed element of CEO compensation. The standard deviation for ratio 2 is fairly high, making the values dispersed. In conclusion the Nordic companies in the manufacturing sector demonstrate reasonable levels of performance-based compensation.

Table 2 Descriptive statistics

Descriptive Statistics					
	Range	Minimum	Maximum	Mean	Std. Deviation
NetProfit*	11668	-3789	7879	716	1261
OperProf*	11383	-1318	10065	1078	1482
OperProfRate	1.09	-0.6304	0.46	0.0827	0.118
MargProd	14.00	-2.6281	11.37	1.1258	1.537
BVAssets*	52857	4555	57412	14224	11238
BVDebt*	16219	30	16249	3204	3371
BVEquity*	17312	1524	18836	5848	4352
DE1	2.20	0.0051	2.20	0.5936	0.430
DE2	11.88	0.0004	11.88	0.7823	1.724
ROA	0.52	-0.1381	0.38	0.0563	0.080
ROCE	0.67	-0.2855	0.38	0.0746	0.103
EPS*	10.73	-4.7600	5.97	1.1630	1.687
MarkerCap*	128358	956	129314	14088	19579
TQ	16.23	0.1805	16.41	1.8290	2.536
StockRet	13.029	-0.7374	12.292	0.3009	1.190
Beta	1.83	-0.3741	1.46	0.3162	0.403
PerfPay*	2840118	0	2840118	584635	576219
RatioPerfPay1	0.66	0	0.66	0.3005	0.168
RatioPerfPay2	1.92	0	1.92	0.5247	0.420
BoardSize	8	7	15	10	1,934
RatioBoardInd	0.67	0.33	1	0.847	0.16362

* the absolute values of the variables of Swedish, Danish and Norwegian companies in the sample are deflated by the year-ending exchange rate of Euro against Swedish, Danish and Norwegian crowns, and U.S dollar respectively. Number of observations: 125

4.2 Correlation results

Table 3 presents the correlation results of all the variables used in the study. The table lists the dependent variables, consisting of accounting-, market performance, and hybrid measures; independent variables, including performance pay- and board characteristic variables; and control variables, containing measures of Debt-to-Equity, Book value of Assets and Book value of Equity. Correlations with the significance levels of 0.01%. 0.05% and 0.1% were considered.

All three of the performance pay variables (Performance Pay (LN), Ratio of Performance Pay 1 and Ratio of Performance Pay 2), were found to have a significant ($p<0.01$) weakly positive correlation with NetProfit, OperProf, and ROCE indicating

that as company profitability increases, so does the amount of performance-based pay or reversely, that when performance pay increases, it would have a positive impact on the company profits. In the case that CEO pay is tied to performance the latter relationship would be a natural result as the more profit the company produces, the more performance pay the CEO would be given. The correlation with ROCE was significantly moderately positive with Ratios 1 and 2, which was stronger than with PerfPay (LN). This shows that the more the portion of performance- pay is relative to fixed pay or the total compensation of the CEO, the more profit the company generates from its total capital. Conversely it can also imply that companies that are more efficient with using their capital also tie the CEO pay more tightly to the company performance by having a larger portion of the compensation in the form of performance-pay. All the performance-pay variables also had a significant ($p<0.01$) weakly positive correlation with ROA, implying that either the better the company makes use of its assets, the more the CEO would be paid performance pay, or that CEOs who receive more of their pay in the form of performance-based incentive make use of the company assets more efficiently. Ratios 1 and 2 also showed a significant ($p<0.01$) weakly positive relationship with operating profit rate indicating the more the revenue the company has available to cover non-operating costs, the more performance-pay the CEO receives, or oppositely that companies that focus more on linking the CEO with the firm's performance are more effective at generating revenue.

PerfPay (LN) was positively correlated at the 0.10 level of significance with MarketCap (LN), indicating that either larger companies pay more performance pay to their chief executives, or CEOs that are paid more performance-based incentives are more efficient in growing the market value of the company.

Both performance pay ratios had a significant ($p<0.01$) weakly negative correlation with D/E 1 (book value of equity), but a significant positive correlation with D/E 2 (market value of equity). The negative correlation between both ratios and D/E 1 indicates that the higher the performance pay, the lower the amount of debt compared to equity(book value) the company uses to finance its operations, or that companies that borrow less are also more likely to pay their CEOs more performance pay. Contrarily, having a positive correlation with D/E 2 would imply that CEOs receiving more performance pay relative to fixed and total pay compensation, borrow more to finance operations. On the other hand, it can mean that companies with more debt-

heavy financing relative to their market value rely more on performance-based elements of compensation for incentivizing CEO behaviour.

RatioBoardInd had significant ($p<0.01$) negative correlations with OperProf (LN), ROA, MarketCap (LN), MargProd, TQ, BVAssets (LN) and BVEquity (LN), and a positive correlation with D/E 1, but no significant relationship with any of the performance pay variables.

Board size had a significant ($p<0.01$) weakly positive relationship with BVEquity, BVDebt, and MarketCap as well as a moderately positive one with BVAssets. Either way this would imply that smaller boards are more effective in managing the company to generate more returns on its stock. However, as board size did not have significant correlations with any of the other profitability measures, this particular finding is not very strong. A positive relationship with MarketCap could indicate that larger companies tend to have larger boards, or that larger boards are more effective in growing the market value of the company.

No significant correlation was found between the Board variables (LNBoardSize and RatioBoardInd) and Performance Pay variables, which goes against the agency theory view that a smaller more independent board would promote compensation practices that tie the CEO pay more closely to the company performance, therefore, acting as a moderator of the CEOs power over their own pay.

Most of accounting performance measures showed significant positive correlations with performance pay variables, indicating that CEO compensation for performance pay would be sensitive to the company's accounting performance. From market performance measures only market cap exhibited a significant ($p<0.1$) positive relationship, which would be in line with the findings of some previous studies that showed CEO compensation to be highly sensitive to company size. The hybrid measure Tobin's Q showed no correlation the performance pay measures, but had a negative association with board independence implying that a company that has a more independent board tends to be undervalued or conversely, that overvalued companies would have a lower share of independent directors on the board.

Table 3 Pairwise correlation results

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
X1	1	.831***	.620***	.652***	.587***	.535***	0.085	.457***	0.01	.229**	0.006	.439***	.463***	.205**	-.219**	-0.002	0.16*	-0.121	.295***	.296***	.270***
X2	.831***	1	.685***	.582***	.507***	.403***	0.071	.491***	-0.048	0.068	-0.022	.497***	.510***	.239***	-.201**	-0.019	.214**	-0.137	.341***	.307***	.257***
X3	.620***	.685***	1	.782***	.510***	.433***	-0.021	.201**	-0.023	0.145*	-0.01	0.145*	.191**	-0.174	-.375***	0.101	.181**	-.383***	0.12	.291***	.288***
X4	.652***	.582***	.782***	1	.658***	.502***	-0.013	.375***	0.009	.226**	.376***	0.068	0.144	-.320***	-.494***	-0.076	0.127	-.387***	.237***	.373***	.333***
X5	.587***	.507***	.510***	.658***	1	.563***	-0.003	0.099	0.01	0.086	0.114	-0.113	-0.07	-.285***	-.432***	-0.026	0.039	0.058	.222**	.477***	.459***
X6	.535***	.403***	.433***	.502***	.563***	1	-0.038	0.114	0.034	0.123	.218**	-0.039	0.04	-0.153*	-.385***	0.061	0.087	-0.152*	.186**	.261***	.212**
X7	0.085	0.071	-0.021	-0.013	-0.003	-0.038	1	0.004	-0.05	-0.004	-0.057	0.135	0.146*	0.082	-0.08	0.014	0.075	0.039	0.043	-0.059	-0.062
X8	.457***	.491***	.201**	.375***	0.099	0.114	0.004	1	0.026	0.149*	.370***	.663***	.666***	.425***	0.032	-.460***	.346***	-.254***	0.158*	-0.07	-0.139
X9	0.01	-0.048	-0.023	0.009	0.01	0.034	-0.05	0.026	1	-0.002	-0.081	0.001	0.005	0.064	0.063	-0.115	0.1	-0.079	0.035	-0.102	-0.129
X10	.229**	0.068	0.145	.226**	0.086	0.123	-0.004	0.149*	-0.002	1	0.092	0.096	0.106	0.007	-0.065	-0.026	0.049	-.177**	0.044	0.132	0.114
X11	0.006	-0.022	-0.01	.376***	0.114	.218**	-0.057	.370***	-0.081	0.092	1	-.207**	-0.175*	-.361***	-.211**	-.228**	0.145*	-.268***	0.082	0.131	0.069
Y1	.439***	.497***	0.145*	0.068	-0.113	-0.039	0.135	.663***	0.001	0.096	-.207**	1	.974***	.839***	.182**	0.083	.404***	-.216**	0.16*	-0.06	-0.049
Y2	.463***	.510***	.191**	0.144	-0.07	0.04	0.146*	.666***	0.005	0.106	-0.175*	.974***	1	.776***	0.011	0.059	.351***	-.242***	0.171*	-0.046	-0.044
Y3	.205**	.239***	-0.174*	-.320***	-.285***	-0.153*	0.082	.425***	0.064	0.007	-.361***	.839***	.776***	1	.532***	0.15*	.259***	0.065	0.034	-.197**	-0.17*
Y4	-.219**	-.201**	-.375***	-.494***	-.432***	-.385***	-0.08	0.032	0.063	-0.065	-.211**	.182**	0.011	.532***	1	0.089	0.036	.289***	-0.084	-.281**	-.251***
Y5	-0.002	-0.019	0.101	-0.076	-0.026	0.061	0.014	-.460***	-0.115	-0.026	-.228**	0.083	0.059	0.15*	0.089	1	0.136	-0.014	0.025	.292***	.436***
Y6	0.16*	.214**	.181**	0.127	0.039	0.087	0.075	.346***	0.1	0.049	0.145*	.404***	.351***	.259***	0.036	0.136	1	-.359***	-0.121	-0.007	0.028
Y7	-0.121	-0.137	-.383***	-.387***	0.058	-0.152*	0.039	-.254***	-0.079	-.177**	-.268***	-.216**	-.242***	0.065	.289***	-0.014	-.359***	1	0.111	0.024	0.028
Y8	.295***	.341***	0.12	.237***	.222**	.186**	0.043	0.158*	0.035	0.044	0.082	0.16*	0.171*	0.034	-0.084	0.025	-0.121	0.111	1	.585***	.435***
Y9	.296***	.307***	.291***	.373***	.477***	.261***	-0.059	-0.07	-0.102	0.132	0.131	-0.06	-0.046	-.197**	-.281***	.292***	-0.007	0.024	.585***	1	.948***
Y10	.270***	.257***	.288***	.333***	.459***	.212**	-0.062	-0.139	-0.129	0.114	0.069	-0.049	-0.044	-0.17*	-.251***	.436***	0.028	0.028	.435***	.948***	1

Note: *** p<0,01; ** p<0,05; *p<0,1
X1: LNNetProfit; X2: LNOperProf; X3: OperProfRate; X4: ROA; X5: ROCE; X6: EPS; X7: StockRet; X8: LNMarketCap; X9: Beta; X10: MargProd; X11: TQ;
Y1: LNBVAssets, Y2: LNBVEquity, Y3: LNBVDebt, Y4: DE1, Y5: DE2, Y6: LNBoardSize, Y7: RatioBoardInd, Y8: LNPerfPay, Y9: RatioPerfPay1, Y10: RatioPerfPay2
Number of observations: 125

4.3 Multivariate OLS Regression analysis results

Tables 4, 5, and 6 illustrate the dependence of firstly, the performance pay variables on the governance variables, and secondly, the accounting-, market- and hybrid performance variables on the performance pay variables. The dependency on control variables including BV Assets (LN), BV Equity (LN), BV Debt (LN), DE1, and DE2 are also presented in each table respectively. Additionally, when examining accounting performance variables, market performance variables were also used as independent variables in the analysis and vice versa. The level of significance is expressed with * $p<0.1$, ** $p<0.05$ and *** $p<0.01$. The results in the tables are presented with two figures: the estimated coefficient B on top, and the t value under in parenthesis to indicate the level of significance.

As shown in Table 4, from the performance pay variables only performance pay (LN) showed a significant dependence board size (p-value=0.019) and board independence (p-value=0.064). The relationship with board size was negative, indicating that as board the board size grows, the total amount of performance pay decreases. This clearly suggests that smaller boards pay the more performance-based pay, therefore, more effectively tie CEOs compensation to company performance. With the ratio of board independence, the association was positive, implying that companies with more independent boards pay more performance-based incentives to their CEOs. Hence, it can be suggested that higher board independence leads to better incentive alignment.

Based on these findings it can be concluded that, board size and independence have an impact on CEO performance pay therefore, proving hypothesis H_{1a} and H_{1b}.

Although the current study does not focus on examining the dependencies from this angle, it is still noted that the performance pay variables presented significant dependencies also on accounting-, market, and control variables. Performance pay (LN) was positively dependent on Operating profit (LN) at the 0.0.5 level of significance, suggesting that higher profitability would lead to higher performance pay. This can be due to companies being able to pay more when they are producing more profits, or simply because performance pay is an effect of good performance, the CEO is rewarded for his or her efficiency. Both ratio 1 and ratio 2 of performance pay were significantly positively dependent on ROCE at the 0.01 level, indicating that

companies deploying their capital more effectively also pay their CEOs more performance-based pay relative to total compensation. Ratio 2 also showed a significant negative dependency on market cap, while ratio 1 demonstrated a positive association, both at the 0.05 level. The positive association of ratio 1 with market cap suggests that the proportion of performance pay to total compensation increases as the firm size grows, while the negative relationship of ratio 2 would imply that smaller companies pay a more performance pay relative to fixed pay.

Performance pay (LN) and ratio 2 displayed positive dependency on Beta at the 0.10 level of significance, suggesting when a company is exposed to higher risk, the level of CEO performance pay also increases. This suggests that in companies that are exposed to more volatility in the market, the CEOs are compensated more in the form of performance incentives perhaps to account for risk-bearing.

The R square for PerfPay (LN) was 0.307 indicating that changes in performance pay can be explained by the independent variables in the model, but not completely. Ratio 1 had an R square of 0.434, and for ratio 2 it was 0.509, which indicates that the chosen independent variables explain the changes in the ratios fairly well, but not perfectly.

Table 4 Performance-Pay Variables

Dependent variables	LNPerfPay	RatioPerfPay1	RatioPerfPay2
(Constant)	5.367 -0.8	0.165 -0.65	0.078 -0.132
LNBoardSize	-5.702** (-2.472)	-0.106 (-1.211)	-0.223 (-1.099)
RatioBoardInd	5.727* (1.875	0.142 (1.23)	0.333 (1.237)
LNNetProf	-0.242 (-0.191)	-0.008 (-0.89)	-0.007 (-0.338)
LNOperProf	0.653** (2.552)	0.018* (1.81)	0.02 (0.895)
OperProfRate	-11.831 (-1.692)	-0.222 (-0.84)	-0.3 (-0.488)
MargProd	0.103 (0.45)	0.014 (1.598)	0.028 (1.379)
LNBVAssets	3,.77 (1.553)	0.15* (1.72)	0.377* (1.859)
LNBVEquity	-0.572 (-0.243	-0.134 (-1.503)	-0.368* (-1.776)
LNBVDebt	-1.617* (-1.913)	-0.002 (-0.07)	-0.001 (-0.009)
DE1	1.366 (0.602)	-0.16 (-1.465)	-0.359* (-1.799)
DE2	0.105 (0.285)	0.033*** (4.46)	0.109*** (6.417)
ROA	10.611 (0.783)	0.427 (0.833)	0.694 (0.582)
ROCE	0.508 (0.077)	0.758*** (6.269)	1.907*** (6.735)
EPS	0.406 (1.361)	-0.007 (-0.582)	-0.037 (-1.408)
LNMarketCap	-0.714 (-0.983)	0.120** (2.319)	-0.186** (-2,348)
TQ	0.304 (1.068)	0.01** (2.022)	0.126* (1.762)
StockRet	-9.94E-06 (-0.061)	-6.59E-06 (-1.075)	-1.67E-05 (-1.17)
Beta	1.494* (1.713)	0.005 (0.144)	-0.134* (-1.679)

Note: *** p<0.01; ** p<0.05; * p<0.1.
Number of observations: 125

Nearly all of the accounting performance variables presented in Table 5 showed significant positive dependency on the performance pay variables, except for Marginal productivity. Statistically significant dependency at the 0.01 level was found for Net profit, Operating profit, ROA, and ROCE. Operating profit rate was significantly positively dependent on ratio 2 at the 0.01 level (p-value= 0.004), and at the 0.05 level of significance on ratio 1 (p-value= 0.046), as well as on performance pay (LN) (p-value= 0.05). The positive association with operating profit rate implies that higher performance pay is linked to increased returns on sales, making the company better equipped to cover non-operating expenses such as interest, which also makes it more attractive to investors and lenders. Both ROA and ROCE were significantly positively associated with all performance pay measures at the 0.01 level, presenting that CEOs that receive more performance pay are more effective with turning the company assets as well as shareholders' equity and debt into earnings. Both ROA and ROCE are common profitability measures used by investors to determine useful investment opportunities, making it reasonable for executives to work to improve those metrics in company performance. EPS also showed positive dependency on PerfPay (LN) at the 0.05 level, illustrating that share value increases with CEO performance pay. Properly incentivized CEOs can be more motivated and operate more efficiently, which can in turn raise the trust of investors in the company profitability. These results would indicate that rewarding the CEO with higher levels of performance pay on its own as well as relative to fixed- and total compensation leads to increased firm profitability on several accounting performance measures.

The R squares for the accounting performance variables were 0.451 for NetProfit, 0.512 for OperProf, 0.528 for OperProfRate, 0.653 for ROA, 0.466 for ROCE, and 0.314 for EPS. With the majority of the dependent variables, with R squares ranging from 0.451 to 0.653, the models explain approximately half of the variability in the dependent variable, making the model a reasonably good fit. For EPS the R square of 0.314 indicates that only 31,4% of the variability is caused by the independent variables, which is statistically high enough, but shows that other factors play a role in explaining earnings per share that were not included in this analysis.
Additionally, significant positive dependency on board independence was found at the <0.05 level for ROA and ROCE, as well as a significant negative association with operating profit rate at the 0.01 level, indicating that companies with a higher ratio of

independence produce better returns on their assets and capital but less return on sales revenue. However, none of the accounting variables were significantly dependent on board size implying that the size of the board does not directly correlate with firm accounting performance.

In conclusion, these results show that a significant positive relationship exists between accounting-based performance measures and CEO performance pay proving hypothesis H_{2a} that higher performance-based pay leads to higher accounting performance.

Table 5 Accounting measures

Dependent variables	LNNetProfit	LNOperProf	OperProfRate	MargProd	ROA	ROCE	EPS
(Constant)	-5.905 (-1.404)	-8.857 (-2.305)	0.089 (0.613)	2.042 (0.757)	0.011 (0.134)	-0.025 (-0.304)	2.434 (0.991)
LNPerfPay	0.233*** (2.811)	0.159*** (2.765)	0.165** (1.983)	0.009 (0.234)	0.002* (1.65)	0.004** (2.015)	0.082** (2.226)
RatioPerfPay1	6.19*** (4.498)	4.2*** (2.858)	0.111** (2.014)	1.267 (1.302)	0.101*** (3.228)	0.113*** (2.081)	0.018 (0.004)
RatioPerfPay2	2.415*** (4.367)	2.331*** (4.523)	0.299*** (3.76)	0.497 (1.187)	0.041*** (2.961)	0.079*** (3.627)	-1.055 (-0,482)
LNBoardSize	-1.695 (-1.084)	-0.477 (-0.334)	0.021 (0.397)	-0.152 (-0.301)	-0.024 (-0.757)	0.012 (2.47)	0.787 (0.862)
RatioBoardInd	0.922 (0.517)	0.744 (0.457)	-0.185*** (-2.997)	-0.137 (-0.61)	-0.069** (-2.006)	0.114** (2.235)	-1.047 (-1.005)
LNMarketCap	1.961*** (4.62)	1.696*** (4.375)	0.079*** (5.36)	0.32 (0.993)	0.051*** (9.646)	0.077*** (6.294)	0.821*** (3.314)
StockRet	9.58E-05 (0.872)	4.13E-05 (0.411)	7.86E-07 (0.207)	-0.049 (-0.43)	1.07E-06 (0.484)	1.37E-06 (0.385)	-8.23E-07 (-0.013)
Beta	0.403 (0.682)	-0.95 (-0.361)	-0.005 (-0.222)	-1.87E-05 (-0.226)	0.012 (0.961)	0.016 (0.835)	0.113 (0.328)
TQ	-0.455*** (-2.927)	-0.469*** (-3.305)	-0.032*** (-6.005)	0.05 (0.133)	-0.008** (-2.402)	-0.018*** (-3.528)	-0.105 (-1.155)
LNBVAssets	1.887 (1.363)	2.505*** (1.981)	0.599** (2.608)	-0.274 (-0.314)	0.692*** (3.969)	0.06 (1.342)	-1.703** (-2.108)
LNBVEquity	1.229*** (3.463)	-2.718** (2.255)	0.609** (2.507)	0.333 (0.416)	0.802*** (4.265)	-0.144*** (-3.372)	0.235 (0.305)
LNBVDebt	-0.386*** (-3.138)	-0.976*** (-3.984)	-0.054*** (-0.506)	-0.21 (-0.784)	-0.04*** (-7.364)	0.015 (1.019)	0.574** (2.199)
DE1	-3.683*** (-3.006)	-3.429*** (-3.064)	-0.287*** (-3.423)	0.248 (0.328)	-0.033** (-2.477)	-0.215*** (-5.429)	-1.93*** (-2.698)
DE2	0.8*** (3.672)	0.6*** (3.014)	0.038*** (6.596)	0.129 (0.819)	0.023*** (6.507)	0.031*** (4.387)	0.428*** (3.362)

Note: *** p<0.01; ** p<0.05; * p<0.1.
Number of observations: 125

Table 6 shows that from the market performance measures, market cap was significantly positively dependent on ratio 1 (p-value= 0.022) and ratio 2 (p-value= 0.013) at the 0.05 level. This finding shows that higher performance-based pay leads to better market value for the company. Proper incentives can motivate CEOs to make decisions that increase shareholder wealth which can result in a positive reaction from

the market. Additionally, the results showed that market cap was significantly positively dependent (p-value 0.00) on board size and negatively correlated with board independence (p-value= 0.059), indicating that larger companies tend to also have larger, less independent boards. The reason for such an association could be explained by the view that larger boards have more resources to manage the company effectively. Additionally, the negative relationship with board independence can suggest that inside directors have a better understanding of the company, and therefore, they would be more efficient in generating profits out of its activities. Stock return on the other hand had no significant relationship with any of the independent variables, while Beta demonstrated a positive association with PerfPay (LN) and BoardSize (LN), as well as a negative one with D/E 2 at the 0.10 level of significance. These findings suggest that companies that have larger boards and pay their CEOs more performance pay are more sensitive to market fluctuations. Tying executive pay more tightly to the company performance can provoke the CEO to take riskier actions in hopes of improving profitability. The negative association with D/E 2 indicates that in companies where debt exceeds the market value of the company's equity, the risk is also increased.

The hybrid measure Tobin's Q was significantly positively associated with performance pay (LN) at the 0.05 level and ratio 2 at the 0.1 level, indicating that a higher level of performance-based pay leads to a higher market-than-book value of the firm. This would indicate that companies, where the CEO pay is more tightly linked to company performance, tend to be overvalued. When properly incentivized the CEO is more motivated to take actions that can potentially increase shareholder value such as specific investments, increasing the positive response from investors in the market. Tobin's Q also demonstrated significant relationships with both governance variables showing a positive dependency on board size (p-value= 0.033) and a significantly negative (p-value= 0.009) one on board independence. These findings imply that larger boards also induce company overvaluation on the market, while higher board independence leads to the company being undervalued. Beta had a positive association with performance pay (LN) and board size at the 0.1 level. The findings signify that companies with larger boards experience more volatility, as well as companies where the CEO receives more performance-based pay are also exposed to more risk. The

positive dependency on performance pay can result from the CEOs making riskier decisions when motivated to increase company performance more.

The R square for MarketCap (LN) was 0.846 which is extremely high and proves that the changes are almost completely explained by the independent variables in the model. The R square for Beta was 0.1 and 0.074 for StockRet which are rather low and imply that there are other factors affecting these variables that were not examined in the current study. Tobin's Q, however, had an R square of 0.420 proving that almost 50% of the changes can be explained by the independent variables.

Although not all market performance measures showed statistically significant dependencies with performance pay measures, there was a significant positive relationship between Market cap and Tobin's Q, and two of the performance pay variables. These findings prove hypothesis H_{2b} that higher performance pay leads to higher market performance.

Table 6 Market- & Hybrid* performance measures and risk

Dependent variables	MarketCapLN	StockRet	Beta	TQ
(Constant)	-0.938 (-0.761)	-5067.95 (-1.277)	0.475 -0.652	2.014 (0,579)
LNPerfPay	-0.011 (-0.027)	4.993 (0.086)	0.018* (1.656)	0.137* (1.711)
RatioPerfPay1	0.120** (2.319)	-1447.481 (-1.124)	-0.078 (-0.272)	2.297 (1.641)
RatioPerfPay2	0.138** (2.519)	-624.481 (-1.133)	-0.066 (-0.538)	0.967* (0.109)
LNBoardSize	1.139*** (2.73)	791.912 (0.607)	0.433* (1.758)	2.485** (2.157)
RatioBoardInd	-0.097* (-1.904)	-172.983 (-0.656)	-0.478 (-1.428)	-4.076*** (-2.661)
LNNetProfit	0.172*** (3.154)	0.502 (0.004)	0.475 (0.861)	-0.011 (-0.083)
LNOperProf	0.172*** (3.058)	6.403 (0.049)	-0.037 (-1.291)	0.228** (2.139)
OperProfRate	-3.916*** (-3.604)	-944.719 (-0.33)	0.367 (0.572)	-12.297*** (-4.145)
MargProd	0.012 (0.268)	-20.432 (-0.175)	-0.013 (-0.051)	0.067 (0.517)
ROA	10.204*** (4.655)	42.61 (0.008)	0.135 (0.105)	
ROCE	0.137*** (2.808)	1263.68 (0.434)	0.357 (0.511)	0.505 (0.171)
EPS	0.130*** (2.641)	-0.706 (-0.029)	-0.017 (-0.522)	0.43*** (2.787)
LNBVAssets	0.525** (2.404)	496.822 (0.36)	-0.087 (-0.405)	
BVEquityLN	0.735*** (14.781)	-159.575 (-0.113)	0.202 (0.783)	1.014** (2.289)
LNBVDebt	-0.167 (-1.043)	-207.747 (-0.482)	0.132 (1.397)	-1.688*** (-4.37)
DE1	0.991** (2.398)	18.763 (0.017)	0.079 (0.323)	2.346*** (2.687)
DE2	-0.44*** (-11.14)	71.535 (0.667)	-0.045* (-0.56)	-0.213* (-1.839)

Note: *** p<0.01; ** p<0.05; * p<0.1
Number of observations: 125
*Hybrid performance

5 Conclusion

The purpose of this following section is to summarize and explain the findings that were presented and analysed in the Results- part of the thesis. This is done in order to answer the research questions and emphasize the interrelationship between the results and the theoretical findings. Limitations of this study, as well as recommendations for future research, will also be discussed at the end of the section.

5.1 Discussion

The findings produced by the analyses were able to answer all the research questions posed at the beginning of the thesis. Each hypothesis was also supported by the results. The effects of CEO performance-based compensation on company financial performance, as well as the influence of board structure on performance-pay were tested in this study. Using the OLS regression statistics the results adequately answered the research questions, which will be summarized next.

1. Is there any association between the firm-performance and the performance-based compensation of CEOs?

H_{2a}: Higher performance-based pay leads to a higher accounting performance

The findings show a clear link between CEO performance-based compensation and company accounting performance contrary to many previous studies that have found no significant relationship between accounting-based measures and CEO compensation. Surprisingly, CEO pay-performance sensitivity was much more prominent with the accounting performance measures than it was with market measures as a bulk of previous research has shown evidence of the opposite. This can, however, be a result of the specific type of performance-pay element used in the study, which was purely in the form of cash bonus which is often determined by accounting measures. Also, not including other components, such as stock options can make the measure slightly less sensitive to market performance.

H_{2b}: Higher performance-based pay leads to a higher market performance

The results showed a significant positive association between performance pay measures and market performance of the company, mainly market capitalization. Therefore, the hypothesis that performance pay has a positive impact on company market performance is proven. Also, beta and Tobin's Q displayed a positive association with the level of performance pay, while stock return demonstrated no significant relationships. These findings suggest that in companies where the CEO is paid more performance-based incentives, the market value of the company is also higher implying that the CEOs would be more efficient in managing the company and increasing shareholder value. From another perspective, it can also be that investors have more confidence in companies that are more committed to aligning the CEO with company profitability, therefore, being willing to invest and pay more for the company shares. The link between pay and firm size is also in line with various previous studies where CEO compensation was found to be higher in larger companies, even though the relationship examined was from the perspective of excessive total compensation of executives. Additionally, the positive relationship with beta could mean that CEOs take on more risk when appropriately encouraged through compensation which would serve as relieving implication on the agency theory view of the risk-aversion of managers. However, the significance was not statistically high enough to make proper conclusions.

2. Do board characteristics impact the relative share of performance-based pay in the total compensation of CEOs?

H_{1a}: Board size affects the performance-based pay

In line with the agency theory view and findings of several previous studies a significant relationship was found between board size and the performance pay variables. The results of the effect of board structure on performance pay showed that board size was negatively associated with the level of performance pay, indicating that as board size decreases, CEO performance pay increases. According to the agency theory view, corporate governance 'best practices' such as a smaller board of directors, should show to be more effective in controlling the CEO pay, by for example setting such pay arrangements that link the CEO compensation with the

performance of the firm. The findings, therefore, support the agency theory view and contend with the managerial power theory that argues boards would be ineffective in controlling the CEO compensation.

H_{1b}: A more independent board of directors gives more performance-based pay

The board independence was found to have a positive impact on performance This is in line with the theoretical review that director independence would be a key instrument in controlling executive pay. In accordance with the agency theory view, the findings indicate that in companies where the boards consist of a larger share of independent directors, the CEO performance-based compensation is higher, and is, therefore, more directly tied to the performance of the firm. In summary, the results imply that independent directors are efficiently working in favour of the shareholders' interests.

5.2 Limitations and suggestions for future research

There are various limitations to the conducted research for this thesis, which provide suggestions for future studies. The focus of this study was on the manufacturing industry as well as publicly listed companies on the OMX Nordic 40 stock index. In order to obtain more comprehensive results, future research could be done using a wider range of industries as well as examining companies that are privately owned or listed on other indices. The performance pay variables used to measure CEO pay-for-performance sensitivity in the research were also limited to the more traditional element of cash bonus, which can be somewhat outdated in the current market environment. Taking more of the performance incentive elements (such as stock options) into consideration can provide a more comprehensive understanding of the effects of the CEO compensation structures in companies to assure the creation of shareholder wealth. It is also noted that a large bulk of previous literature has focused on the CEO total compensation, finding evidence that in companies with more independent boards were negatively correlated with the levels of CEO total pay, and not on the performance pay element, which can pose a challenge on comparability on previous findings.

There is also the matter of the reliability of the company annual reports' data. It should be noted that companies may attempt to present only favourable information or

even avoid disclosing some data for some particular reason. Such information moulding or concealment can cause the data analysis to be faulty and misleading.

As this study was conducted using solely quantitative methods, for future research the author suggests that using qualitative elements such as interviews or questionnaires in addition to secondary data collection could provide further insights and support for the findings.

References

Adams, J., Khan, T. A., & Raeside, R. 2014. *Research Methods for Business and Social Science Students.* 2nd ed. New Delhi: Sage Publications Pvt. Ltd.

Aker ASA. *Annual Reports 2010-2015.* Accessed on 30 March 2018. Retrieved from https://eng.akerasa.com/Investor/Financial-and-other-reports/Annual-Reports

Amarou, Y., & Bensaid, M. 2017. The Impact of Firm Performance on Executive Compensation in France. *Mediterranean Journal of Social Sciences, 8*(2), 63-69.

Assa Abloy AB. *Annual Reports 2010-2015.* Accessed on 28 March 2018. Retrieved from https://www.assaabloy.com/en/com/investors/reports/

AstraZeneca AB. *Annual Reports 2010-2015.* Accessed on 28 March 2018. Retrieved from https://www.astrazeneca.com/investor-relations/annual-reports.html

Ataay, A. 2018. Performance sensitivity of executive pay: the role of ownership structure, board leadership structure and board characteristics. *Economic Research-Ekonomska Istraživanja, 31:1,* 1152-1168.

Atlas Copco. *Annual Reports 2010-2015.* Accessed on 26 March 2018. Retrieved from https://www.atlascopcogroup.com/en/investor-relations/financial-reports-presentations/financial-publications

Autoliv AB. *Annual Reports 2010-2015.* Accessed on 26 March 2018. Retrieved from https://www.autoliv.com/investors/reports-presentations-transcripts

Baker, G. P., Jensen, M. C., & Murphy, K. J. 1988. Compensation and Incentives: Practice vs. Theory. *Journal of Finance, 43*, 593-616.

Bebchuk, L., & Fried, J. M. 2003. Executive Compensation as an Agency Problem. *Journal of Economic Perspectives, 17*(4), 71-92.

Bebchuk, L., & Fried, J. 2004. Pay Without Performance: The Unfulfilled Promise of Executive Compensation. Cambridge, MA: Harvard University Press.

Bebchuk, L., Grinstein, Y., & Peyer, U. 2009. Lucky CEOs and Lucky Directors. *Journal of Finance, 65*(6), 2363-2401.

Beatty, R. P., & Zajac, E. J. 1994. Managerial Incentives, Monitoring and Risk Bearing: A Study of Executive Compensation, Ownership, and Board structure in Initial Public Offerings. *Administrative Science Quarterly, 39,* 313–35.

Bhattacharyya, D. K. 2006. *Research Methodology.* New Delhi: Excel Books India

Black, F. 1986. Noise. *The Journal of Finance, 41*(3), 529-543.

Boliden AB. *Annual Reports 2010-2015.* Accessed on 30 March 2018. Retrieved from https://www.boliden.com/investor-relations/reports-and-presentations/annual-reports

Bosworth, D. L. 2005. *Determinants of Enterprise Performance.* Manchester: Manchester University Press.

Bottazzi, G., Secchi, A. &, Tamagni, F. 2008. Productivity, profitability and financial performance. *Industrial and Corporate Change Advance,* 1-41.

Broadbent, M., & Cullen, J. 1993. *Managing Financial Resources.* 3rd ed. Oxford: Butterworth-Heinemann.

Brooks, R., Holzhauer, H., & Lu, X. 2014. Growth/Value, Market-Cap, and Momentum. *The Journal of Investing, 23*(1), 33-42.

Campbell, K., & Underdown, C. B. 1991. *Corporate Insolvency In Practice.* London: The Chapman Publishing Ltd.

Canarella, G., & Nourayi, M. M. 2008. Executive Compensation and Firm Performance: Adjustment Dynamics, Non-linearity and Asymmetry. *Managerial and Decision Economics, 29,* 293-315.

Capezio, A., Shields, J., & O'Donnell, M. 2011. Too Good to be True: Board Structural Independence as Moderator of CEO Pay-for-Firm-Performance. *Journal of Management Studies, 48:3,* 487-513.

Carlsberg A/S. *Annual Reports 2010-2015.* Accessed on 27 March 2018. Retrieved from https://www.carlsberggroup.com/reports-downloads/?p=14

Chandra, P. 2007. *Financial Management.* 7th ed. New Delhi: Tata McGraw-Hill Education.

Chen, J. 2020. *Market Capitalization.* Article on Investopedia website. Accessed on 19. April 2020. Retrieved from https://www.investopedia.com/terms/m/marketcapitalization.asp

Conyon, M. 2006. Executive Compensation and Incentives. *Academy of Management Perspectives, 20,* 25–44.

Conyon, M. J. 2013. Executive Compensation and Board Governance in US Firms. *The Economic Journal, 124,* 60-89.

Core, J., Holthausen, R. W., & Larcker, D. F. 1997. Corporate Governance, CEO Compensation, and Firm Performance. Article on ResearchGate website. Accessed on 3 December 2019. Retrieved from https://www.researchgate.net/publication/228198199_Corporate_Governance_CEO_Compensation_and_Firm_Performance

Core, J. E., Holthausen, R. W., & Larcker, D. F. 1999. Corporate Governance, Chief Executive Officer Compensation, and Firm Performance. *Journal of Financial Economics,* rev. ed., *51,* 371–406.

Cuadra, V. 2002. *Stock Market Essentials: The Pocket Essential Guide.* Chichester: Summersdale Publishers.

Daines, R. 2001. Does Delaware law improve firm value? *Journal of Financial Economics*, 62, 525–558.

Dalton, D. R., & Daily, C. M. 1994. Outside Directors Revisited: Prescriptions for CEOs and Directors. *Journal of Small Business Strategy*, *5*, 57–68.

Dembinski, P. H. 2003. *Economic and Financial Globalization: What the Numbers Say.* Vol. 2. New York: United Nations Publications.

Diewert, W. E., & Nakamura, A. O. 2005. *Concepts and Measures of Productivity: An Introduction*. Calgary: University of Calgary Press.

Electrolux. *Annual Reports 2010-2015.* Accessed on 27 March 2018. Retrieved from https://www.electroluxgroup.com/en/annual-reports-and-reviews-27641/

El-Sayed, N., & Elbardan, H. 2016. Executive Compensation, Corporate Governance and Corporate Performance: Evidence from the UK. *Journal of Organizational Studies and Innovation, 3,* 31-49.

Ericsson. *Annual Reports 2010-2015.* Accessed on 25 March 2018. Retrieved from https://www.ericsson.com/en/investors/financial-reports/annual-reports

Fu, L., Singhal, R., & Parkash, M. 2016. Tobin's q Ratio and Firm Performance. *International Research Journal of Applied Finance, VII,* 1-10.

Gallagher, T. J., & Andrew, J. D. 2007. *Financial Management: Principles and Practice.* 4th ed. St. Paul, Minnesota: Freeload Press.

Ghauri, P., & Gronhaug, K. 2002. *Research Methods in Business Studies – A Practical Guide.* Harlow: Pearson Education Limited.

Gümbel, A. 2006. Managerial power and executive pay. *Oxford Journal of Legal Studies, 26,* 219–33.

Hargrave, M. 2020. *Return on Assets– ROA.* Article on Investopedia website. Accessed on 15 April 2020. Retrieved from https://www.investopedia.com/terms/r/returnonassets.asp

Hundal, S. 2017. Multiple directorships of corporate boards and firm performance in India. *Corporate Ownership & Control, 14*(4), 150-164.

Hundal, S., Eskola, A., & Tuan, D. 2019. Risk Return Relationship in the Finnish Stock Market in the light of Capital Asset Pricing Model (CAPM). *Journal of Transnational Management, 24*(4).

Hutabarat, F. M. & Senjaya, V. F. 2016. *Tobin's Q Analysis as an Indicator Used in Measuring and Analyzing Banking Industry of Companies Listed in KOMPAS100 Period 2010-2014.* Proceedings of the INDOMPAC National Seminar.

iMinds, 2009. *Market Capitalisation: Money.* iMinds Pty Ltd. eBook publication.

Jensen, M. C., & Murphy, J. K. 1990a. CEO Incentives - It's Not How Much You Pay, But How. *Journal of Applied Corporate Finance, 68,* 138-149.

Jensen, M. C., & Murphy, J. K. 1990b. Performance Pay and Top- Management Incentives. *Journal of Political Economy, 98*(2), 225-264.

Jerzemowska, M. 2006. The Main Agency Problems and Their Consequences. *Journal of Economic Pragensia, 2006*(3), 9-17.

Karačić, D., & Bukvić, I. B. 2014. Research Of Investment Risk Using Beta Coefficient. *Interdisciplinary Management Research, 10,* 521-530.

Kenton, W. 2020. *Return on Capital Employed– ROCE Definition.* Article on Investopedia website. Accessed on 23. March 2020. Retrieved from https://www.investopedia.com/terms/r/roce.asp

Kenton, W. 2020. *What is Noise?* Article on Investopedia website. Accessed on 23. March 2020. Retrieved from https://www.investopedia.com/terms/n/noise.asp

Kone Oyj. *Annual Reports 2010-2015.* Accessed on 27 March 2018. Retrieved from https://www.kone.com/en/investors/reports-and-presentations/financial-reports/

Kolb, R. W. 2012. *Too Much Is Not Enough: Incentives in Executive Compensation.* New York: Oxford University Press.

Kothari, C. R. 2004. *Research Methodology: Methods & Techniques.* New Delhi: New Age International Ltd.

Krishaswami, O. R., & Satyaprasad, B. G. 2010. *Business Research Methods.* Mumbai: Himalaya Publishing House.

Lee, P. 2002. Not Badly Paid But Paid Badly. *Corporate Governance*, *10*(2), 69-74.

Ludwig, A. 2019. CEO Pay Trends Around the Globe. *Harvard Law School Forum on Corporate Governance, 3 February 2019.* Accessed on 2 March 2019. Retrieved from https://corpgov.law.harvard.edu/2019/02/03/ceo-pay-trends-around-the-globe/

Machlup, F. 1936. On the Meaning of Marginal Product. *Explorations in Economics: Notes and Essays Contributed in Honor of F.W. Taussig.* New York: McGraw-Hill.

Mackay, R. 2018. *What is the difference between resource, asset and capital?* Article on medium.com website. Accessed on 19. April 2020. Retrieved from https://medium.com/@rodmackay/what-is-the-difference-between-resource-asset-and-capital-a5c587c93fc9

Maniatis, P. 2006. Beta Risk Estimation In Stocks. *International Business & Economics Research Journal, 5*(11), 25-34.

Manna, A., Nath, T., & Gupta, A. 2019. *Governance-Led Corporate Performance: Theory and Practice.* Bingley, West Yorkshire: Emerald Group Publishing.

Mayer, G. 2018. Does the Theory of Marginal Productivity Apply to CEOs? Article on Researchgate.net website. Accessed on 23. October 2019. Retrieved from https://www.researchgate.net/publication/323809296_Does_the_Theory_of_Marginal_Productivity_Apply_to_CEOs

Mayers, D., & Smith, C. W. 2010. Compensation and Board Structure: Evidence From the Insurance Industry. *The Journal of Risk and Insurance, 77*(2), 297-327.

Mishel, L., Wolfe, J. 2019. CEO compensation has grown 940% since 1978– Typical worker compensation has risen only 12% during that time. *Economic Policy Institute 14 August 2019 report*. Accessed on 19 February 2019. Retrieved from https://www.epi.org/publication/ceo-compensation-2018/

Moyer, R.C., McGuigan, J.R., & Rao, R.P. 2014. *Contemporary Financial Management.* 13th ed. Boston, MA: Cengage Learning.

Murphy, J. K., 1998. Executive Compensation. *Handbook of Labor Economics, 3*, 2485-2563.

Murphy, K. J. 2002. Explaining Executive Compensation: Managerial Power Versus the Perceived Cost of Stock options. *The University of Chicago Law Review*, *69*, 847–869.

Murphy, C. B. 2020. *How do gross profit and net profit differ?* Article on Investopedia website. Accessed on 10 April. Retrieved from https://www.investopedia.com/ask/answers/101314/what-are-differences-between-gross-profit-and-net-income.asp

Mäkinen, M. 2007. CEO Compensation, Firm Size and Firm Performance: Evidence from Finnish Panel Data. *The Research Institute of the Finnish Economy.*

Neste. *Annual Reports 2010-2015.* Accessed on 27 March 2018. Retrieved from https://www.neste.com/corporate-info/news-inspiration/material-uploads/annual-reports

Nishantini, A., & Nimalathasan, B. 2013. Determinants of profitability: A case study of listed manufacturing companies in Sri Lanka. *Merit Research Journals of Art, Social Science and Humanities, 1*, 001-006.

Nokia. *Annual Reports 2010-2015.* Accessed on 25 March 2018. Retrieved from https://www.nokia.com/about-us/investors/results-reports/

Norsk Hydro ASA. *Annual reports 2010-2015.* Accessed on 25 March 2018. Retrieved from https://www.hydro.com/en-CA/investors/reports-and-presentations/

Novo Nordisk. *Annual Reports 2010-2015.* Accessed on 27 March 2018. Retrieved from https://www.novonordisk.com/investors/financial-results-and-investor-events.html

Organisation for Economic Co-Operation and Development. 2001. *Measuring Productivity– Measurement of Aggregate and Industry-Level Productivity Growth.* OECD Manual. France. Accessed on 19 February 2019. Retrieved from http://www.oecd.org/sdd/productivity-stats/2352458.pdf

Outokumpu Oyj. *Annual Reports 2010-2015.* Accessed on 30 March 2018. Retrieved from https://www.outokumpu.com/en/investors/materials

Ozkan, N. 2011. CEO Compensation and Firm performance: An Empirical Investigation of UK Panel Data. *European Financial management*, *17*, 2, 260-285.

Pepper, A. 2018. *Agency Theory and Executive Pay: The Remuneration Committee's Dilemma.* Switzerland, Cham: Palgrave Macmillan.

Perković, A. 2011. Research Of Beta As Adequate Risk Measure – Is Beta Still Alive? *Croatian Operational Research Review*, *2*, 102-111.

Prokopenko, J. 1987. *Productivity Management: A Practical Handbook.* Geneva: International Labour Organization.

Randøy, T., & Nielsen, J. 2002. Company Performance, Corporate Governance, and CEO Compensation in Norway and Sweden. *Journal of Management and Governance*, *6*, 57-81.

Rogers, M. 1998. The Definition and Measurement of Productivity. Melbourne Institute of Applied Economic and Social Research. *Working paper*, 9/98.

Sachdeva, J. K. 2009. *Business Research Methodology.* Mumbai: Himalaya Publishing House Ltd.

Sandvik AB. *Annual Reports 2010-2015.* Accessed on 28 March 2018. Retrieved from https://www.home.sandvik/en/investors/reports-presentations/annual-reports/

Saunders, M., Lewis, P., & Thornhill, A. 2009. *Research Methods for business students.* Harlow: Prentice Hall.

SCA. *Annual Reports 2010-2015.* Accessed on 27 March 2018. Retrieved from https://www.sca.com/en/about-us/Investors/financial-archive/annual--and-sustainability-reports/

Schönbohm, A. 2013. Performance Measurement and Management with Financial Ratios – the BASF SE Case. *Working Papers 72*, IMB Institute of Management Berlin.

Selvam, M., Gayathri, J., Vasanth, V., & Marxiaoli, S. 2016. Determinants of Firm Performance: A Subjective Model. *International Journal of Social Science Studies*, *4*(7), 90-100.

Sharma, A. K. 2005. *Text Book of Correlations and Regression.* New Delhi: Discovery Publishing House.

SKF AB. *Annual Reports 2010-2015.* Accessed on 28 March 2018. Retrieved from https://investors.skf.com/en/reports-and-presentations

Shleifer, A, & Vishny, R. W. 1997. A Survey of Corporate Governance. *The Journal of Finance, 52*(2), 737-783.

SPSS Tutorials: Pearson Correlation. Article on Kent State University website. Accessed on 15. February 2020. Retrieved from https://libguides.library.kent.edu/SPSS/PearsonCorr

SSAB AB. *Annual Reports 2010-2015.* Accessed on 28 March 2018. Retrieved from https://www.ssab.com/company/investors/reports-and-presentations

Stora Enso Oyj. *Annual reports 2010-2015.* Accessed on 25 March 2018. Retrieved from https://www.storaenso.com/en/investors/reports-and-presentations

Suff, P., Reilly, P. &, Cox, A. 2007. Paying for Performance – New trends in performance-related pay. Institute of Employment studies.

Tulsian, M. 2014. Profitability Analysis (A comparative study of SAIL & TATA Steel). *Journal of Economics and Finance*, *3*(2), 19-22.

UPM-Kymmene Oyj. *Annual reports 2010-2015.* Accessed on 25 March 2018. Retrieved from https://www.upm.com/fi/sijoittajat/raportit-ja-esitykset/2011/

Vestas Wind Systems. *Annual Reports 2010-2015.* Accessed on 26 March 2018. Retrieved from https://www.vestas.com/en/investor/financial_reports#!

Volvo. *Annual reports 2010-2015.* Accessed on 25 March 2018. Retrieved from https://www.volvogroup.com/en-en/investors/reports-and-presentations/annual-reports.html

Wernerfelt, B. &, Montgomery, C.A. 1988. Tobin's q and the Importance of Focus in Firm Performance. *The American Economic Review*, *78*(1), 246-250.

Wärtsilä Oyj Abp. *Annual Reports 2010-2015.* Accessed on 30 March 2018. Retrieved from https://www.wartsila.com/investors/reports-presentations

Yara International. *Annual Reports 2010-2015.* Accessed on 27 March 2018. Retrieved from https://www.yara.com/investor-relations/reports-presentations-2019/