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Preliminary: Board Diversity and CEO Compensation: Evidence From Norway

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1 Detailed Introduction
The purpose of this research is to understand the effect of gender diversity on CEO compensation in Norwegian companies from 2000 to 2016. Over the years, executive compensation and board diversity have been a subject of debate. The discussion is mostly around the high CEO compensation and the low proportion of women on corporate boards. Norway is of special interest because of the large number of women in corporate boards as well as the low CEO compensation compared to other countries.

Since 2014, the nominal annual wage growth has been low and the annual wage growth in 2016 was the lowest growth Statistics Norway has measured in the 2000s\(^1\). Nevertheless, the executive compensation has increased substantially over the last years. Even though these gaps are debated as large in Norway, the gap between executive and average employee compensation is among the lowest in Europe. This is due to the compressed compensation structure, extensive welfare system and regulated tax system (Gitmark, 2015). Research show that the compensation gap between an executive and average worker is 1:4 in Norway, while the gaps are considerably larger in other countries such as United Kingdom and Singapore where the compensation gaps are 1:24 and 1:37 (Grenness, 2011).

This paper will examine the association between gender diversity on the board of directors and the level of CEO compensation, using a large data sample of Norwegian companies. The research within the field of board diversity and CEO compensation is extensive, however there is limited research addressing our issue. We aim to replicate the Equilar analysis of CEO pay in 100 large U.S. companies, that was presented in the New York Times in 2016. According to this analysis, having more women on boards gives a higher compensation for the CEO (Morgenson, 2016). Conducting the same analysis on a sample of listed companies in Norway will be of great interest for several reasons. First, this type of analysis has not been conducted in Norway before. Furthermore, Norway is the country in the world with the most women on boards. In addition, the wage gap between executives and employees in Norway is among the smallest in the world.

\(^1\) (Statistics Norway, 2017)
This paper will address theory on how the compensation of CEOs are determined, and review previously conducted literature in the field. A multiple regression analysis will be used to investigate the research question and is presented in section 5. Using a panel data methodology, our analysis will be able to control for unobservable heterogeneity in the data set. The methodology and fixed effects are described in section 6. To further address the endogeneity issue, we will use a difference-in-difference method to find out if there is a true association between gender diversity and CEO compensation, presented in section 7.

This paper will help to anticipate the effects of the 40% gender quota for all ASA firms in Norway, on CEO compensation. If the goal is to lower the CEO compensation, the conclusion will present an outcome in favour of the gender quota if the correlation is negative, whereas a positive correlation will give opposing results. If our results show that a larger portion of women on boards results in a lower CEO compensation, this is a valid economic argument for including more women on boards.

2 Problem Formulation
This paper examines the association between gender diversity on boards and the CEO compensation in Norwegian firms. We will analyse firms listed on the Oslo Stock Exchange and compare the results with non-listed firms, to control for other effects. Diversity on boards is defined as the percentage of women on boards, and CEO compensation is defined as the total compensation received by the top executive.

3 Background Information
The theoretical framework is based on aspects around corporate governance, the principal-agent theory, the managerial power theory, and the human capital theory. These executive compensation theories suggest several factors that can be expected to affect executive compensation, and are therefore essential for explaining the association between diversity of board members and the CEO compensation. We will also look at CEO compensation in Norway and characteristics of gender diversity on boards.
3.1 CEO Compensation in Norway
In Norway, the board of directors decide the compensation of the company’s CEO. The Norwegian law of public limited firms §6-16a state that the board of directors are responsible of preparing a statement on the determination of compensation and other remuneration to the CEO and other senior executives. Some directors choose to delegate this task to compensation committees, although the directors still have the overall responsibility for determining the senior management compensation.

3.2 Corporate Governance
Central to corporate governance is how companies are directed and controlled (Cadbury, 1992). Shleifer and Vishny (1997) define corporate governance as the method in which suppliers of finance to corporations guarantee themselves a return on their investments. The board of directors play an important role in controlling and monitoring management (Fama & Jensen, 1983).

3.3 The Principal-Agent Theory
The principal-agent theory assumes that both parties act in their own self-interest (Jensen & Meckling, 1976). This theory asserts the relationship between a principal and an agent, where the principal engages the agent in particular tasks. An agency problem arises when an agent (e.g. CEO) has goals which is unaligned with those of a principal (e.g. shareholders). Such conflicts are likely to arise when important decision agents have no financial interest in the results of their decisions (Fama & Jensen, 1983). The CEO is in charge of the daily operations of the firm and has a fiduciary responsibility on behalf of the shareholders. Even though it is in the best interest of the CEO to maximize his own utility, he is expected to make decisions that maximize shareholder value.

The board of directors are seen as important to overcome agency problems between CEOs and shareholders (Adams & Ferreira, 2009, p. 304). The directors are most often elected by the shareholders to ensure that the daily operation is in

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2 (Lovdata, 2018b)
line with the shareholders best interests. The board function as an intermediary between the CEO and the shareholders, as the board is the governing body of the corporation on behalf of the owners. The main duty of the board of directors is to approve important strategic and financial decisions, and function as a counsel and monitor of the CEO. They also have the ability to replace executives that do not act in line with the shareholders best interest. Thus, the board of directors can reduce agency problems through extensive monitoring, increased incentive alignment, and active participation in decision making (Adams & Ferreira, 2009).

Within the boardroom, there can be a conflict of interest between the CEO and the directors creating agency problems (Hermalin & Weisbach, 2017). The CEO is incentivised to maintain a good relationship with the board, to ensure his job position and high-level income. Since the CEO plays an important role in re-nominating directors, this also applies to the board of directors as they wish to stay on the board. Therefore, both the CEO and the board of directors have incentives to give generous salaries and perks, higher than would be preferred by shareholders (Hermalin & Weisbach, 2001).

Agency theory argues that executives are likely to neglect their responsibilities and act in their self-interest unless there is a good disciplinary-incentive-reward scheme based on maximizing the shareholder utility. The board of directors can reduce the agency problem by creating an effective compensation system to recruit, retain, and motivate the executives (Firth, Chr, Ropstad, & Sjo, 1996).

### 3.4 The Managerial Power Theory

Managerial power theory focuses on a different link between the agency problem and executive compensation. Under this approach, executive compensation is not only seen as an instrument for addressing the agency problem, but also as a part of the agency problem itself (Bebchuk & Fried, 2003). This may lead to excessive executive compensation arrangements when compared to what is economically efficient (Bebchuk, Fried, & Walker, 2002).

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3 Under some circumstances employees can also have the right to choose representatives on the board (Lovdata, 2018a).
This theory emphasises the balance of power between the top management and the board (Bebchuk et al., 2002). Examining the large body of empirical research on executive compensation, authors argue that managerial power can explain significant characteristics of the executive compensation landscape. Even though there are limits to what the board will accept and what markets will allow, research show that these constraints do not prevent executives from obtaining arrangements that are significantly more favourable than those they could obtain by a completely independent board. Therefore, researchers argue that this should be taken into consideration when devising executive compensation arrangements (Randøy & Skalpe, 2010).

3.5 The Human Capital Theory

Human capital is the totality of human experience (Merriam-Webster, 2017). When applying it to determining the CEO compensation, it is the sum of skills and knowledge gained from education and experience that create economic value (Schultz, 1961). Mincer (1958) and Becker (1994) showed the importance of investing in education and job training for increased earnings. The human capital theory works under the assumption of economic rationality, a market where owners and directors have the ability to reward the most valuable CEO (Randøy & Skalpe, 2007). Randøy and Skalpe’s (2007) research on executive pay found a positive relationship between age and the CEO compensation. This gives ground to the human capital theory where excellence and expertise should be rewarded in form of higher compensation.

3.6 Gender Diversity on the Board

Boardroom diversity can be defined as the heterogeneity in the composition of the board, and can be interpreted by taking gender, age, ethnicity, educational background and professional qualifications of the directors into account. In this paper, we will focus on gender diversity. For many years, Norway has been among the top countries when it comes to gender equality and was the first country to mandate gender balance in the board of directors. In 2008, the Parliament of Norway passed a gender balance law that required boards to consist of at least 40-percent of each gender. This law has increased the share of women
on the boards of public limited companies in Norway from almost zero to just above 40-percent (Gitmark, 2015). Even though the gender diversity of the board is a highly discussed topic, research on the association between gender diversity and CEO compensation is limited. Nevertheless, it is well documented that women behave differently than men in multiple settings (Randøy & Nielsen, 2002). This indicate that a greater gender diversity on board may have an effect on the CEO compensation. In this paper, we will examine if there is a negative correlation between the CEO compensation and gender diversity on boards.

4 Literature Review

In recent years, several studies have analysed the relationship between CEO compensation and firm performance, as well as other determinants of CEO compensation such as firm size and firm tenure. These studies provide valuable insight on aspects of CEO compensation and board characteristics. To our knowledge, there has not been any direct empirical evidence on the relationship between gender diversity on boards and CEO pay in Norway. However, a few studies on gender diversity on boards and CEO pay has been conducted in the United States.

One important corporate governance control mechanism is through the monitoring role of the board of directors. Mínguez-Vera and Campbell (2007) found a relationship between gender diversity and the quality of the monitoring role and hence the financial performance of the company. Through a panel data analysis, they found that gender diversity, measured by the percentage of women on the board and by the Blau’s and Shannon indices, has a positive impact on firm value of Spanish companies. In addition, their findings show that the reverse causal relationship is not significant and that a larger gender diversity could generate economic benefits. Despite the ambiguous results on the relationship between CEO compensation and financial performance, these findings could also affect the CEO compensation through the effect on financial performance.

Several studies show that board characteristics have a significant effect on the CEO compensation. CEO compensation typically increase with the firm size as well as board size (Core, Holthausen, & Larcker, 1999; Holthausen & Larcker,
1993). In addition, a larger diversity in the board, for example by representation of both women and men, can increase the boards legitimacy (Burke & Mattis, 2013). In addition, Adams and Ferreira (2009) found that male directors have less attendance problems the more gender-diverse the board is, and suggest that gender-diverse boards allocate more effort to monitoring. Barua et al. (2010) argue that female directors are more likely to comply with the ethical values and regulations of the firm. Furthermore, Konrad et al. (2008) found that women raise tougher questions when deciding the compensation of the CEO and thus prompt a greater discussion of the compensation contract. On the other hand, a more diverse board could cause coordination problems and experience more conflicts (Smith, Smith, & Verner, 2006). These conflicting results imply that researchers are uncertain about the association between diversity on the board and CEO compensation.

Finkelstein and Hambrick (1989, p. 248) argues that boards have long been considered to play an important role in the establishment of executive pay. On the other hand, Adam and Ferreira’s (2009) research found no significant association between gender diversity on boards and the level of CEO compensation in US-listed firms. This is consistent with their expectations as only 25% of the firms in their dataset have more than one female directors, and are thus less involved in setting the CEO compensation. A more recent study by Bugeja et. al. (2016) also examined gender-diversity of boards and found no statistically significant relationship with CEO compensation. Nevertheless, they found that gender-diverse variables have a negative and significant relationship with bonus. However, this study is of limited value as only approximately half of the firms they studied did not award bonus to the CEO.

Bugeja et al. (2016) also examined the association between gender-diverse compensation committees and CEO compensation in US-listed firms. They focused on the compensation committee rather than the board, as it is the compensation committee of firms in their dataset that negotiates and determines the executive compensation level. Their research found that there is a negative relationship between gender-diversity of the board and CEO compensation levels. They suggest that gender-diverse compensation committees may be a way of
reducing excess compensations levels. However, in total across the sample there is on average only 11% of females on the compensation committees, and most firms have no women in the compensation committees (Bugeja et al., 2016).

In our analysis we will pay special attention to endogeneity concerns that may affect the interpretation of the results. This is important since there is a great chance of omitted unobservable firm characteristics when analysing gender diversity and CEO compensation. Bugeja et al. (2016) focus on robustness of the models and use the Durbin-Wu-Hausman test for the presence of endogeneity, which indicates that endogeneity is not an issue. Adams and Ferreira (2009) found presence of endogeneity and addressed this problem by including control variables. In our analysis, we will use a difference-in-difference approach as well as including control variables, and thus improve the validity of the results. By comparing Norwegian ASA firms that are affected by the gender balance law with Norwegian AS firms that are not affected by the law, we can further argue whether gender diversity affect the CEO compensation, or not.

While both gender diversity and CEO compensation have received a great deal of attention in recent years, limited empirical research is done on the association between gender diversity and CEO compensation. In addition, these studies focus on US firms, with a smaller number of women on boards. This paper complements previous research by providing a comprehensive analysis on firms that have a greater amount of gender diversity among the board of directors. Furthermore, US firms are typically larger than Norwegian firms and thus often have larger boards, resulting in a higher CEO compensation. In addition, most articles focus on the relationship between gender diversity on boards and financial performance. This paper contributes to the research by investigating the link between the gender diversity of the board and the CEO compensation in Norway. The country’s introduction of the gender balance law in 2008 make Norway an interesting country to look at. The results of our analysis will hopefully contribute to the understanding of whether the gender balance law has had an effect on the determination of CEO compensation.
5 Model Estimation

The data sample is ordered from the Centre for Corporate Governance (CCGR) in January 2018. To determine the association between gender diversity and CEO compensation, the following multiple regression model is estimated. CEO compensation is the dependent variable and gender diversity is the independent variable of particular interest.

\[
(1) \text{CEO executive salary}_{it} = \beta \text{Diversity}_{it} + \sum_{k} y_k \text{x}_{kit} + \alpha_{i-n} + \lambda_t + \epsilon_{it}
\]

The variables are defined as following:

- \( \text{CEO executive salary}_{it} \): CEO executive compensation in firm \( i \), in year \( t \)
- \( \text{Diversity}_{it} \): Percentage of women, Blau’s Index and D_Div
- \( \text{x}_{kit} \): Vector of firm-specific control variables; Firm Size, Firm Age, Board Size, Financial Performance, CEO tenure, Foreign Board membership, CEO ownership, Debt Level, CEO board member, CEO gender
- \( \alpha_{i-n} \): Industry Fixed Effects, assumed to not vary over time
- \( \lambda_t \): Time Fixed Effects, assumed to be constant cross-sectionally
- \( \epsilon_{it} \): Robust standard errors

5.1 Measure of CEO Compensation

The total CEO compensation includes base compensation, bonus, long term incentives, benefits, pension, stock options and stock grants (Randøy & Skalpe, 2010). Base compensation is the fixed amount of money the CEO is paid for
performing the job. Bonus is usually a one-time payment that is paid when the firm reaches agreed upon goals. Long term incentives are typically a predetermined sum of money the CEO is given to buy stocks in the company. Usually there is restrictions for how long the stocks must be held before they can be sold. Benefits is compensation that is not money, such as insurance, company car and cell phone. Every year there is also a fixed amount of money for pension. Furthermore, the CEO can be given stock options or stock grants. Stock options gives the CEO the right, but not the obligation to buy stocks in the company for a predetermined price. Stock grants is compensation in form of corporate stocks (Gitmark, 2015).

5.2 Proxies for Gender Diversity
In this analysis gender diversity will be measured in two ways. First, the percentage of women on the board of directors is used to measure the level of gender diversity. The percentage is calculated by taking the number of female directors over the total number of board directors. Because of the gender balance law, this measure will be at least 40% for the Norwegian ASA firms. Nevertheless, this may not always be the appropriate measure of gender diversity. Hence, we also include another commonly used measure of diversity called Blau’s index. This measure is calculated as follows:

\[
(2) \quad 1 - \sum_{i=1}^{k} p_i^2
\]

Where \(p_i^2\) is the proportion of board members in each of the i categories and \(k\) is the total number of board directors. Values of the index range from 0 to a maximum of 0.5, which occurs when the board consists of an equal number of women and men (Campbell & Mínguez-Vera, 2007).

5.3 Firm-Specific Control Variables
Based on previous research we have found a number of firm-specific factors that are likely to affect CEO compensation. We include control variables to account for these effects.
5.3.1 CEO Compensation and Financial Performance

Similar to studies done by Eaton and Harvey (1983), an average return on equity (ROE) is used to count for the unusual changes in the period being studied and the lag that often occurs between increased performance and compensation. ROE is calculated by dividing annual earnings before tax on the shareholder equity at the end of the year. Studies of compensation and financial performance have shown mixed results. Tosi, Werner, Katz, and Gomez-Mejia (2000) find a small positive relationship between CEO pay and financial performance. On the other hand, Firth et al (1996) examined the determinants of CEO compensation in Norwegian listed firms, and found no significant relationship between remuneration and financial performance, measured by profitability and stock returns. In addition, studies done by Randøy and Nielsen (2002) on Norwegian and Swedish companies, show no significant relationship between company performance and CEO compensation, except for Norwegian companies when a change in market-to-book performance measure is used. Due to the ambiguous results on the relationship between financial performance and CEO compensation, no specific relationship is expected a priori.

5.3.2 CEO Tenure

The tenure is the number of years the CEO has been in the role (Finkelstein & Hambrick, 1989). Elhagrasay et. al (1998) emphasise the CEO’s power to influence his own compensation. Hill and Phan (1991) argued for CEO tenure as a factor of CEO power. The longer the tenure, the more influence the CEO will have on the board of directors. Empirical tests support their argument. However, research regarding compensation and CEO tenure presents ambiguous results in the US. O’Reilly et. al (1988) found no relationship between CEO tenure and CEO compensation. Finkelstein and Hambrick (1989) found a concave relationship, while Hogan and McPeters (1980) found a positive and linear relationship. Contrarily, Randøy and Nilsen (2002) found a significant negative relationship, suggesting that the CEO has more bargaining power in the beginning of the employment, and weaker the longer they sit.
5.3.3 Board Size
Board size is the total number of directors on the board at year-end. In our analysis we will exclude boards that consists of less than two directors from the sample as they do not represent diversity. Holthausen and Larcker (1993) and Core et al. (1999) find a positive association between board size and CEO compensation.

5.3.4 Foreign Board Membership
Foreign board membership is measured by a binary variable which take the value 1 if one or more of the board members is not Norwegian citizens, and 0 otherwise (Randøy & Nielsen, 2002). Recent studies argue that foreign board membership may have an effect on the CEO compensation. Since the Norwegian CEOs are among the lowest paid in developed countries (Economist, 2000), foreign board members might increase the boards acceptance for higher CEO compensation. Therefore, we expect to find a positive correlation between foreign board members and the CEO compensation.

5.3.5 CEO Compensation and Firm Size
The firm size is measured through the book value of total assets. In order to smooth the high variability of the variables, we use the natural logarithm of total assets. Most studies found a positive relationship between firm size and CEO compensation. Tosi, Werner, Katz, and Gomez-Mejia (2000) found that there is a positive relationship between firm size and CEO pay. In addition, Firth et al. (1996) found a positive relationship between CEO pay and firm size in Norwegian listed firms.

5.3.6 Average Wage Level of the Company
Firth et al. (1996) found a positive and significant relationship between a CEO's compensation and the average wage level of the company. This association may be due to the unique characteristics of Norway's social and economic structure.

5.3.7 Other Control Variables
Other variables that are proven to influence CEO compensation is gender of the CEO, age of the CEO, if the CEO is a Board Member, CEO ownership and debt
ratio (Elhagrasey et al., 1998; Jensen, 1989). In addition, the age of the firm exhibits the phase of the life cycle the firm is in and must therefore be taken into account (Morck, Shleifer, & Vishny, 1988).

6 Methodology

Panel data is used to control for unobservable time-invariant heterogeneity in cross-sectional model that affect CEO compensation. Not controlling for such factors can lead to biased coefficients if the characteristics and the explanatory variables are correlated. Industry and time fixed effects are estimated to get consistent estimates of the coefficient parameters (Campbell & Mínguez-Vera, 2008).

6.1 Industry Fixed Effects

Industry fixed effects can be estimated if the sources of unobserved heterogeneity vary cross-sectionally, but not over time. Estimates of the coefficients are affected by the variation within each industry over time. Each industry is assigned with a fixed effect intercept dummy, except for one base industry that is excluded to avoid perfect multicollinearity (Brooks, 2008). This effect imply that a CEOs compensation is compared with CEOs from other companies within the same industry. We will control for industry effects by using the nine grouping industry classification system used by the Oslo Stock Exchange (Randøy & Nielsen, 2002). Hausman test can help us to choose between a fixed effect model or a random effect model, and check of there is a correlation between the unique errors and the regressors in the model.

6.2 Time Fixed Effects

Time fixed effects controls for omitted variables that vary over time but are constant across units. Since our data sample is over a long period of time, there is likely to be economic fluctuations that affect all the firms in the sample. Time fixed effects will deal with macro shocks like tax rate changes, interest rate increase or decrease, and change in government spending. For instance, it is likely to assume that the companies in our sample were affected by the financial crisis in
2007 and 2008. We will test whether it is necessary to include time fixed effects with the Hausman test (Brooks, 2008).

7 Endogeneity

Our model may have failed to exclude other exogenous compensation determinants that are unrelated to the number of women on boards. To account for this possible effect, we compare the CEO compensation for the ASA firms and AS firms in Norway using a difference-in-difference approach. With this approach, the event group is the ASA Norwegian firms and the control group is the AS Norwegian firms. As the gender balance law was passed in 2008, the pre-event period is 2000-2008 and the post-event period is 2009-2016.

The difference-in-difference statistic $D = \Delta_{ASA} - \Delta_{AS}$ where $\Delta_{ASA}$ is the difference between the CEO compensation of ASA firms in the post-event period and the pre-event period respectively. Similarly, $\Delta_{AS}$ is the difference between the CEO compensation in the two periods, in the AS firms. $D$ is estimated by the model

$$y_{it} = \beta_0 + \beta_1 E_{Gi} + \beta_2 P_{E_t} + \beta_3 E_{Gi} \cdot P_{E_t} + \epsilon_{it}$$

where $y_{it}$ is the number of firms in group $i$ at time $t$. $E_{Gi}$ is a dummy variable which is 1 if the firm is the event group and 0 if the firm is in the non-event control group. Consequently, the dummy variable $P_{E_t}$ is 1 if $t$ is in the post-event period, and 0 if $t$ is in the pre-event period.

The estimator of $D$ is the Ordinary least squares estimate of $\beta_3$ in model (3). This coefficient reflects the effect on the CEO compensation if the observation is an ASA firm in the event period.
8 References


Randøy, T., & Skalpe, O. (2010). Effekten av lederlønnsreguleringer i Norge. (FoU rapport nr. 2/2010).


