



BI Norwegian Business School - campus Oslo

# GRA 19502

Master Thesis

Component of continuous assessment: Thesis Master of Science

Final master thesis – Counts 80% of total grade

The effect of CEO-specific heterogeneity on firm's policies:  
Empirical evidence from Norwegian companies

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Start: 02.03.2018 09.00

Finish: 03.09.2018 12.00

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**Study Programme:** Master in Finance

**Date of submission:** 2<sup>nd</sup> September 2018

This thesis is a part of the MSc programme at BI Norwegian Business School. The school takes no responsibility for the methods used, results found and conclusions drawn.

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**ABSTRACT**

This study aims to investigate whether CEO heterogeneous characteristics influence a company's performance and shape its corporate behavior. The focus is on non-listed Norwegian firms and such observable characteristics as CEO's gender, age, tenure, and ownership. The study closely follows the approach undertaken by Bertrand and Schoar (2003). We find that the external validity of their results holds as manager fixed effects are statistically and economically significant after controlling for firm and year fixed effects as well as time-varying firm characteristics. We also find that, on average, longer-tenured CEOs seem to be more conservative in their decisions and older CEOs who have a higher stake in the company appear to be positively linked to a company's performance. We identify that heterogeneity in decisions related to interest coverage and dividend payout ratio is attributed to some other observable or unobservable traits than the ones analyzed in this study. Our hypothesis that, in the case of Norwegian companies, CEO effects should matter less for performance and influence company policies to a lesser degree compared to US firms is refuted. We believe it might be due to the specificity of our sample i.e., non-listed companies with high ownership concentration.

## 1. INTRODUCTION

While most former studies research US firms (Bertrand & Schoar, 2003), (Custodio & Metzger, 2013), (Adams, Almeida & Ferreira, 2005)) the current paper intends to test the external validity of prior results, i.e. see if they hold across countries/cultures. In particular, the study will concentrate on Norwegian companies and is intended to determine and quantify the impact of CEO's gender, age, tenure, as well as stock ownership on firm's performance and financial policy.

The neoclassical view of the firm presupposes that managers are homogeneous production inputs, i.e. are perfect substitutes. Consequently, firms with similar technologies, factor, and product market conditions will act in like manner irrespective of the composition of the senior management. Under this quite narrow view, variation in corporate behavior is attributed to the strength of governance mechanisms. If a company exhibits poor or limited management control this translates into managers' ability to advance their own objectives and force their own idiosyncratic style. Alternatively, if some managerial styles contribute more to shareholder value maximization, better governed firms are expected to select managers with these styles. More precisely, managers no longer impose their idiosyncratic style as a consequence of weak governance, but are purposefully chosen to act in the best interest of the shareholders because of their superior management styles. Under this interpretation management turnover would also be driven by company specific needs. In other words, CEOs are viewed as hedonic goods with multidimensional skill bundles that are being hired and let go as firm optimal strategy changes over time (Eisfeldt & Kuhnen., 2013) and hence match with the firm in an assortative way.

Since, under either interpretation, individual managers are central in bringing about the changes in corporate policies our primary goal is to first show that managers do influence a company's financial policy and performance. Next and final step would be to provide some evidence of the extent to which managerial demographic traits account for differences in cross-firm practices beyond industry, firm, and market characteristics.

Our empirical work contributes to the existing literature by testing external validity of prior results as, to our knowledge, no comparable research using Norwegian data has been conducted. Further on, the reason why this study focuses on Norwegian companies arises from the fact that Norway is known to have a highly

egalitarian culture with flat organizational structures<sup>1</sup> where, as a result, CEOs might be less powerful due to the tradition of collaborative and consensual decision making. In 2018 Global CEO Outlook<sup>2</sup>, Kimmo Antonen<sup>3</sup> characterized Nordic CEOs as having more modest view of their own leadership capabilities which he himself sees as a winning formula for Nordic region.

Moreover, unlike the US, where dispersed ownership structure prevails, the Nordic markets are generally characterized by a high degree of ownership concentration and an environment with strong shareholder rights' protection. According to a study conducted by SIS Ägarservice<sup>4</sup>, approximately two thirds of all companies in Norway have at least one shareholder in control of more than 20% of the votes. Nonetheless, the ownership structure of Norwegian companies is not as concentrated when compared to other European countries (except UK)<sup>5</sup>, making Norway an outlier and thus further deepening the interest of our research.

That being said, Nordic corporate governance model allows the shareholder majority to effectively control and take long-term responsibility for the company that they own. Moreover, the agency conflict might lay within controlling shareholders' perspective on the company's optimal strategy rather than classic agent principal problem. Consequently, given that major owners take active participation in outlining company behavior, the power of the CEO in the decision-making process is restrained, he or she being forced to act in the best interest of the controlling shareholders. On that account, the extent to which CEOs heterogeneous talents and abilities map into firm performance and corporate policies would be limited. We thus hypothesize that, in our sample, CEO's fixed effects and, consequently, characteristics, should matter less for a wide range of corporate decisions when compared to previous studies based on US data.

The study is built on the approach undertaken by Marianne Bertrand and Antoinette Schoar (2003) in their research paper "Managing with style: the effect of managers on firm policies". Firstly, we construct a CEO-company matched panel data set that enables us to track down CEO's employment history across firms and

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<sup>1</sup> Bøhren, Ø. (2000). The ownership structure of Norwegian firms: Characteristics of an outlier.

<sup>2</sup> KPMG (2018). Global CEO Outlook Retrieved 24<sup>th</sup> June 2018 from [https://assets.kpmg.com/content/dam/kpmg/se/pdf/komm/2018/CEO\\_Outlook\\_Nordics\\_WEB\\_fina\\_l.pdf](https://assets.kpmg.com/content/dam/kpmg/se/pdf/komm/2018/CEO_Outlook_Nordics_WEB_fina_l.pdf)

<sup>3</sup> Kimmo Antonen - CEO and senior partner at KPMG Finland

<sup>4</sup> A Stockholm-based consultancy specialized in the analysis of ownership and board data for listed companies. SIS Ägarservice AB. Retrieved 13<sup>th</sup> November 2017 from [www.aktieservice.se](http://www.aktieservice.se).

<sup>5</sup> The largest shareholder in Continental Western European firms (except UK) holds, on average over 50% of votes: Austria - 82%; France – 56%; Italy – 52%; UK – 14%. (Goergen, 2012)

then run a series of regressions using a three-way fixed effects model. This makes it possible to estimate how much of the unexplained variation in firm practices can be attributed to manager fixed effects, after controlling for firm and year fixed effects, as well as time-varying firm characteristics. We cannot rule out that our findings might be partially driven by endogenous CEO-firm matching. In other words, CEOs might choose those companies whose strategy is complementary to their personal traits and skills or the firm might hire the CEO that will be best suited to optimally implement a chosen strategy, and observable CEO characteristics will be the driving selection criterion. We address this endogeneity concern by including firm fixed effects and appropriate controls in our model. Further we study which out of the observed managerial traits hold a stronger explanatory power when it comes to corporate practices and firm performance.

The specific corporate variables Bertrand and Schoar (2003) study relate to investment policy, financial policy, organizational strategy, and performance. The managerial characteristics they look at are birth cohort and MBA graduation. Due to the specificity of our database, company type and size we had to restrict our research to financial policy and firm performance. The corporate variables we study are: financial leverage, interest coverage, cash holdings, and dividend payout ratio (when analyzing financial policy) and ROE and ROA (when looking at performance). Because we do not have available information regarding CEO's education, we don't include it in our analysis. However, we extend the list of CEO characteristics by also looking at the effect of CEO's gender, tenure and stock ownership. We would like to point out that, since our sample consists primarily of non-listed companies, our results are not directly comparable to Bertrand and Schoar (2003) and rather provide evidence on CEO's role in non-listed companies with high ownership concentration.

We find statistically and economically significant manager fixed effects when it comes to explaining variations in firm's practices after controlling for firm and year fixed effects as well as time-varying firm characteristics. We then look deeper into the aforementioned observable managerial traits and find evidence that, on average, longer-tenured CEOs seem to be more conservative in their decisions and that older CEOs who have a higher stake in the company appear to be positively linked to a company's performance. We identify that heterogeneity in decisions related to interest coverage and dividend payout ratio can be attributed to some other observable or unobservable traits than the ones analyzed in this study, the impact of

the latter being statistically insignificant. Our hypothesis that, in the case of Norwegian companies, CEO effects should matter less for performance and would influence company policies to a lesser degree compared to US firms is refuted. We believe it to be due to the specificity of our sample which is comprised of non-listed firms with relatively high ownership concentration as well as to the Norwegian business culture which is based on Scandinavian work values such as equality, high level of trust<sup>6</sup> and cooperation. Hence, stronger CEO effects might imply more discretion provided to managers in Norwegian companies, especially privately-owned ones. Our original hypothesis might have been confirmed if Norwegian public companies were studied but, unfortunately, the database we have constructed for public companies does not provide us with enough observations to allow us to pursue a comparable to Bertrand and Schoar (2003) study further.

We also looked into how manager fixed effects are linked to CEO compensation and whether or not managers with higher performance effects are paid a premium. We find that managers who exhibit higher return on equity fixed effects, seem to receive higher residual salary. Hence, managers who are associated with higher performance measured by ROE appear to be rewarded with a premium. This is in line with Tervio 's (2008) finding that the difference in the pay of two CEOs at firms with different size reflect both the difference in their managerial abilities and the difference in the size of the firms they manage. Whether CEOs are indeed paid a premium as a result of their skills or they choose the company that pursues a strategy that matches the manager's skills set and thus promises to pay them over any over outside option is still debatable.

The rest of this study is organized as follows. Section 2 provides literature review and a brief discussion of the theoretical background as to why individual managers may matter for corporate decisions. Section 3 presents the research question and the hypothesis we intend to test. Section 4 and 5 present the data source, describe the construction of the samples, and define the main variables of interest. Section 6 quantifies the importance of manager fixed effects for various corporate practices under consideration, and provides a by industry analysis of

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<sup>6</sup> According to World Value Survey: Round Five (2014), 73.7% of interviewed Norwegians believe that most people can be trusted when dealing with them, followed by Sweden and Finland with respectively 65.2% and 58% (Inglehart, R., C. Haerper, A. Moreno, C. Welzel, K. Kizilova, J. Diez-Medrano, M. Lagos, P. Norris, E. Ponarin & B. Puranen et al. (eds.). 2014. World Values Survey: Round Five - Country-Pooled Datafile Version: www.worldvaluessurvey.org/WVSDocumentationWV5.jsp. Madrid: JD Systems Institute.)



manager fixed effects. Section 7 discusses in more detail how manager fixed effects relate to CEO compensation levels. In Section 8 we study observable manager characteristics as the specific determinants of idiosyncratic managerial style. Section 9 summarizes the study and offers some concluding remarks.

## 2. LITERATURE REVIEW AND THEORETICAL BACKGROUND

### 2.1.WHY CEOs MATTER?

A plethora of studies focused on the analysis of corporate practices and their subsequent effect on firm performance implicitly assume the neoclassical view of the firm, under which managers are perfect substitutes. However, in the modern business world the firm is a complex organization, characterized by the separation of ownership and management. This gives managers discretion to pursue goals other than shareholder value maximization. Factors that often guide managerial preferences are high salaries, prestige, market share, job security, luxury life etc. Moreover, given the level of uncertainty in the real world, the degree of information (in)accuracy, the limited time and limited ability of managers to process information, as well as other constraints, CEOs simply cannot be entirely homogeneous agents.

An explanation in support of the above is being put forward by the advocates of behavioral economics. According to economist Richard Thaler, people behave in ways that defy economic theory<sup>7</sup>. In other words, there are various factors which affect the financial decision making of an individual such as age, gender, occupation, personal financial risk tolerance, etc. (Chavali & Mohan Raj, 2016). Thus, could be argued that managers' heterogeneous traits, preferences, skills, risk aversion levels or opinions are not redundant when it comes to making decision at the firm level. Turning to standard agency models, managers are thought of being those individuals who have discretion inside their firm, which they can use to alter corporate decisions and advance their own objectives (Bertrand & Schoar, 2003). These models put forward the idea that heterogeneity in firm's ability to control managers gives the latter the opportunity to behave in a more opportunistic way and pursue their own preferences and, consequently, impose their idiosyncratic style on the firm they lead.

In an attempt to explain recent growth in executive compensation Eisfeldt and Kuhnen (2013) develop a competitive assignment model in which CEOs and firms form matches based on multiple characteristics. Under this model managers

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<sup>7</sup> Appelbaum, Binyamin (2017-10-09). "[Nobel in Economics is Awarded to Richard Thaler](https://www.nytimes.com/2017/10/09/business/nobel-economics-richard-thaler.html)". *The New York Times*. Retrieved 2017-11-04 from <https://www.nytimes.com/2017/10/09/business/nobel-economics-richard-thaler.html>

are meant to impose their idiosyncratic style on the company as boards optimally select the right manager for the right job. More precisely, company productivity is dependent on the match between the CEO skills needed for company evolution (the ability to grow sales, cut costs or lead company through a crises) and the supply of skills of the CEOs under consideration. As CEO market is limited at times the board might also consider CEOs that match only on the most important parameters or even retain current CEO until a better match is found.

Following Kesner and Sebor (1994) selecting the CEO is a key organizational decision, which has important implications for firm effectiveness. It is crucial for the future of the company to succeed in finding a good 'fit' between the characteristics of the company and the individual who will fulfil the CEO position. In their study, Pfeffer and Salancik (1978) came to the conclusion that most firms under all conditions strive to recruit and hire CEOs with backgrounds and skills fitting the company's needs. Moreover, given that managers are only successful in their new jobs if the required strategy matches their talent type (Eisfeldt & Kuhnen, 2013), firms should tailor their executive searches to the desired strategy going forward. In this matching environment, in contrast to a principal-agent framework, both firm and CEO characteristics are important for managerial turnover.

Further on, Bertrand and Schoar (2003) hypothesized that differences in CEOs' managing style are driven by some specific personal characteristics and that these fixed effects matter for corporate decisions such as investment, financial policy, organizational structure and corporate performance. The characteristics they chose to look at were birth cohort and MBA graduation. The data they analyzed has shown that managers from earlier birth cohorts appear, on average, to be more conservative and that managers who hold an MBA degree seem to follow more aggressive strategies.

The results presented by Bertrand and Schoar (2003) allow for two alternative interpretations: (1) CEOs impose their idiosyncratic styles on companies, and (2) boards choose CEOs because of their attributes, in case firms' optimal strategies change over time. Both of the two interpretations support the hypotheses that CEOs have specific traits that further translate into company policies and, thus, account for the variation in company performance.

The next question to be answered is what are those managerial characteristics and abilities that matter? Different studies sought to answer this

question by looking at different CEO attributes: age and education (Bertrand & Schoar, 2003), overconfidence (Malmendier & Tate, 2005), ownership, tenure and optimism (Ben Mohamed, Souissi, Baccar, & Bouri, 2014; Barker III & Mueller, 2002), gender (Barber & Odean, 2001; Faccio, Marchica, & Mura, 2016), etc.

## 2.2. CEO's AGE

There are various researchers who investigated the impact of *CEO's age* on the financial implications of the firm. As postulated above, according to Bertrand and Schoar (2003), CEOs from earlier birth cohorts (i.e. older generation executives) appear to be less aggressive, on average, and their strategies are founded on lower capital expenditures levels, higher interest rate coverages, higher levels of cash holdings and lower financial leverage. This can be explained by the desire of CEOs to maintain a legacy of success and hence the avoidance of those strategic choices that might dampen down firm performance in the short run and taint their reputation in the last years of employment (Matta & Beamish, 2008).

Furthermore, Hambrick and Mason (1984) argued that older CEOs are less likely to bring up new ideas because they are more conservative. They feel comfortable in the way they are currently leading the company and are unlikely to change their style even under pressuring circumstances. Their higher degree of risk aversion and reluctance to new ideas can be attributed, to a greater extent, to their few years left until retirement. Chown (1960) also supports the idea that the lack of change is due to the fact that they are less able to come up with new ideas.

Next, Child (1974) stated that executive youth is associated with economic growth. However, older executives have more experience in seeking and evaluating new market information. They take more time to make decisions as they incorporate prior knowledge into their decision-making process. MacCrimmon and Wehrung (1986) argued that risk aversion increases with executives' age. Young optimism will fade away and CEOs will prefer secured profits over risky more profitable projects. To corroborate that view comes the study of Barker III and Mueller (2002) where they advocate that older CEOs invest less in R&D projects because of the respective projects' higher risk and longer-term payoff that the older CEO might not get to personally benefit from.

### 2.3. CEO's TENURE

The impact of *tenure* is more unclear and uncertain than the impact of age. Some studies suggest a positive relationship while other results point to a negative one. According to Ben Mohamed et al. (2014), short tenure provides an incentive to managers to opt for short-term outcome strategies to build up their reputation, while long-tenured CEOs can lose touch with the organizational environment. The latter view is also shared by Miller (1991) who argues that strategies and structures of firms may deviate from the requirements of the environment the more years the CEO holds the respective position within the company. A logical supporting explanation is the consequent entrenchment of CEOs. Holding the managerial position for too long CEOs adapt to the environment they are placed in and become more resilient to external pressures regarding changes in corporate strategy and structure. Longer stay converges to greater power, more established personal connections, instill overconfidence, all of which incite dissentient behavior, such as investing in negative NPV projects, excessive exploitation of firm's internal funds, etc. Furthermore, it allows managers to harmonize and homogenize the board by recruiting and promoting those who share views similar to their own thus weakening even further the control that might be exerted over them. At the same time, CEOs' policies are less volatile as their tenure increases since they are more strongly committed to implementing their own paradigm to how the organization should be run (Barker III & Mueller, 2002).

Adams et al. (2005) also argued that CEOs with higher tenure normally gain higher power within the firm. More power on the one hand leads to better stock performance, but on the other hand also to higher volatility. This means that CEOs with a higher tenure prefer higher returns to more secured projects. Furthermore, Adams et al. (2005) tested the impact of CEO power on the variance of firm performance. Results confirm that the variance of firm performance is higher when CEO has higher power.

On the other hand, Alutto and Hrebiniak (1975) derived a positive relationship between longer-tenured CEOs and commitment towards their results. Higher commitment leads to higher incentives to perform well. Contradicting is the paper of Miller (1991). This paper, as pointed above, argued that CEO's strategies become more conservative and take a moderate route as his/her tenure with the company becomes longer. This can either be the result of the fact that the CEO is

convinced about their own strategy or the fact that interests in firm environment is lost and they stopped reinventing. Similarly, this finding also suggests that firms headed by less experienced, perhaps younger CEOs may assume relatively greater risks in pursuit of more profitable opportunities.

#### **2.4. CEO's GENDER**

The papers of Smith , Smith, and Verner (2006) and Carter , Simkins, and Simpson (2003) both found a positive relationship between gender diversity and firm performance. Consequently, *CEO gender* is another important variable that induces divergences in corporate strategic decision-making. These differences are built on the premise that men are more overconfident when it comes to financial and investment decisions. Following Thakor and Goel (2006), individuals who exhibit overconfidence traits overvalue the precision of their information. This leads to two inefficiencies: it increases project selection errors and diminishes the quality of the information available to judge the CEO. The gender driven heterogeneity aligned with the theory of overconfident investors also implies that men are more confident that their investment will result in profit, regardless of the level of knowledge they have on their investment opportunity. This might make them more likely to engage in suboptimal investment behavior such as over- or underinvesting when they have abundant internal funds and curtail investment when they require external financing (Malmendier & Tate, 2005). However, Thakor and Goel's (2006) finding suggests that moderately overconfident risk-averse CEO increases firm value by mitigating the underinvestment problem. The best outcome for the shareholders is thus to have a CEO who is overconfident but not too overconfident.

At the same time, women are proven to exhibit a lower propensity to risk-taking behavior which, as Faccio et al. (2016) document, will lead to the avoidance of riskier investment and financing opportunities. In other words, women are more risk averse than men (Weber , Blais & Betz, 2002). Hence, firms run by female CEOs will likely underinvest in projects relative to the shareholders' optimum, take less risky corporate choices, experience less volatile outcomes (earnings), will have lower leverage, and a higher chance of survival which might come at the expense of capital allocation efficiencies and firm value creation (Faccio et al.,2016).

## 2.5. CEO's OWNERSHIP

Another factor that correlates to how managers get involved in the strategic decision-making process is the stake that they own in the company, i.e. *ownership* that drives the risk-taking incentives of the manager. Barker III and Mueller (2002) test and provide support to the hypothesis that a firm's R&D spending is positively associated to the extent of its CEO's stock ownership. This is due to R&D being rather risky expenses and which payoff in the long run. Therefore, a bigger stake in the company will increase their propensity to riskier investments because they are rewarded by capital markets. Consequently, in accordance to agency theory, the greater the ownership percentage, the higher the at-risk wealth of the manager and thus the willingness to have more long-term oriented view which encourages both R&D spending and investment. Furthermore, CEO ownership is negatively associated with investment–cash flow sensitivity (Ben Mohamed et al., 2014) since a higher stake in the company is expected to boost cooperation and align the management's focus with that of the shareholders.

Prior research on CEO characteristics has proven that various CEO traits are related, to a significant extent, to the heterogeneity in performance as well as financial and investment practices. However, while most former studies are based on the US data (Bertrand & Schoar, 2003; Custodio & Metzger, 2013; Adams et al., 2005) the current study intends to test the external validity of the prior results. We are convinced that it will be beneficial to do further research on these topics across countries and cultures, due to the plentitude and availability of data that is yet to be investigated. However, not all CEO attributes can be easily studied. Therefore, the most accessible CEO characteristics are analyzed in this paper. In particular, the study concentrates on Norwegian companies and intends to determine and quantify the impact of CEO's gender, age, tenure, education as well as stock ownership on firm's performance and financial policy.

## 2.6. ENDOGENEITY

One caveat of our results might be the issue of endogeneity, more precisely, the fact that different types of CEOs may endogenously match with different corporate strategies (Kaplan, Klebanov & Sorensen, 2012)). In other words, CEO picking might not be random, meaning that managers might be chosen by the firms because of their observable managing style so that they best match the optimal strategy of the organization. Eisfeldt and Kuhnen (2013) argue that productivity declines whenever a firm's skill demands are no longer compatible with their CEO's skill set. That is because managers will succeed at their job if their skill set matches the demand of the strategy the firm seeks to implement. Hence, CEO-firm matching appears to be driven by an assortative matching between the parties involved.

The papers of Gabaix and Landier (2008) and Tervio (2008) study models of assortative matching based on observable firm characteristics (size) and unobservable manager traits (talent) and show that CEOs have different talents and are matched to firms in a competitive assignment model. The first paper argues that the best CEOs manage the largest firms, as this maximizes their impact and economic efficiency and that the marginal impact of CEO's talent is assumed to increase with the value of the firm under his/her control. Moreover, both CEO and the firm are seen to optimize the value of preserving their match rather than seeking any other outside option with a lower mutual compatibility. In his turn, Tervio (2008) studies the role of managerial ability within the assignment model by evaluating the predicted effects of counterfactual distributions of ability and firm size on CEO pay and shareholder value. His paper postulates that heterogeneity of firm's size is complementary with heterogeneity of managerial ability and that their interaction generates the joint distribution of profits and pay.

This assortative CEO-firm matching might conjecture that if optimal strategies of firms change over time CEOs might not impose their style but rather be chosen by firms because of their attributes (Custódio & Metzger, 2013). In this case it is hard to disentangle whether CEO style or traits affect corporate policies or if the decisions already embedded in the firm's strategy determine the selection of that particular manager.

To alleviate this issue different methods could be applied such as performing a natural experiment by finding an appropriate exogenous shock or by using the instrumental variable approach. Since it is rather hard to find either to satisfy all the



conditions that come with them (ex. in case of instrumental variables: relevance condition and exclusion condition<sup>8</sup>), another semi-solution to tackle endogeneity is to control for firm effects and tangible characteristics (ex. firm size, degree of financial constraint, firm performance) (Malmendier & Tate, 2005). We chose to implement a three-way fixed effects model.

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<sup>8</sup> Roberts, M. R., & Whited, T. M. (2013). Endogeneity in empirical corporate finance1 *Handbook of the Economics of Finance* (Vol. 2, pp. 493-572): Elsevier.

### 3. RESEARCH QUESTION AND HYPOTHESES

It is important to point out that the study does not seek to prove that some CEO-specific characteristics are better than others but rather to show that managers, being different in terms of their preferences, opinions, traits and abilities, correlate to and potentially impact the corporate practices of the firm they manage. Accordingly, the *research question* the study aims to answer is: *Do CEO-specific characteristics affect firm's policies and to what extent by looking at the Norwegian market.*

Should be highlighted that the magnitude of the CEOs' traits and abilities that maps into corporate decisions is conditioned on the level of discretion they possess which is thought of being a function of firm's ownership concentration, organizational and environment regulation, etc. In his paper, Bøhren (2000) looks at the ownership structure of Norwegian companies and finds that the latter have a rather flat power structure. The largest investor holds, on average and quite stable over time, 28% of outstanding equity per firm. Given that major owners take active participation in outlining company behavior, the power of the CEO in the decision-making process is restrained, he or she being forced to act in the best interest of the controlling shareholders. On that account, the extent to which CEO's heterogeneous talents and abilities map into firm performance and corporate policies would be limited.

Henceforth, we hypothesis that the *correlation and effect of CEO traits would be less pronounced in our sample when comparing to other studies that focus on US traded companies.* The reason is that the latter exhibit a highly decentralized ownership structure, where only about 2% of firms have a majority shareholder and the holding of the largest shareholder is less than 10%, while the one of the five largest owners - below 30%<sup>9</sup>. Supporting this latter hypothesis is the fact that the institutional framework for corporate governance in Norway provides a relatively high protection of shareholder rights. In other words, the Norwegian regulatory environment ensures that both stockholders as a group and small stockholders as a subgroup can effectively exert their ownership rights which reduces managerial discretion within firms.

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<sup>9</sup> Goergen (2012)

#### 4. SAMPLE CONSTRUCTION

Although public firms are subjected to higher disclosure and have more frequent and easily accessible data, to ease the tracking of CEOs across firms and over time we find it preferable to analyze private firms given that CEOs in Norwegian listed companies have long tenure and little prior CEO activity in other companies. More precisely, when researching available data on public Norwegian companies we found that the majority of CEOs were either internal promotions or, if hired externally, worked prior at a non-listed company. Being left with too few observations (less than 100 switching CEOs) we chose to perform the analysis on primarily non-listed companies covered in the Center for Corporate Governance Research (CCGR) database.

We follow Bertrand and Schoar (2003) and construct a manager-firm matched panel dataset. This is needed to effectively quantify how much of the unexplained variation in firm practices can be attributed to manager fixed effects, while disentangling firm fixed effects from manager fixed effects which are perfectly collinear under the absence of managerial turnover. The dataset spans the 2000-2015 time period and allows us to track the same CEO over time and across different firms that are covered in CCGR. The database includes the population of 478 249 Norwegian listed (232<sup>10</sup>) and non-listed (478 017) firms with limited liability and comprises high quality<sup>11</sup> accounting information. Following Janis Berzins and Øyvind Bøhren (2013) family firms<sup>12</sup> represent roughly 65% of all companies and is thus a predominant company type in CCGR.

To exclude non-operative companies and to obtain a sample suitable to the purpose of our study we add the following sampling filters:

1. To avoid non-operative firms, a sample firm must have positive sales, total assets, total equity and employees. We also ignore 5% smallest companies measured by total assets to disregard micro companies.

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<sup>10</sup> The number of listed and non-listed firms is defined based on the status of the company in the last year for which data is available.

<sup>11</sup> Irrespective of the listing status, size and industry the law mandates every company to submit a standardized set of full accounting statements certified by a public auditor. Failure to provide this information within 17 months after fiscal year-end triggers automatic liquidation by the court.

<sup>12</sup> Janis Berzins and Øyvind Bøhren (2013) define companies where family ownership surpasses 50% as family firms.

2. Further, the firm must have consistent accounting statements. For instance, total assets need to equal total liabilities plus stockholders' equity. We also exclude observations where ROA and ROE exceeded 500% in absolute value as such extreme values represent data errors rather than outliers. Consistency filters were applied to all analyzed variables.
3. Subsidiaries in business groups are disregarded due to consolidation of financial statements. For instance, dividends may be paid to manage cash and risk for the group as a whole (Michaely & Roberts, 2012). Moreover, expropriation is common phenomenon within business groups.
4. Financial firms as well as utilities are excluded to avoid the impact of their regulatory capital requirements and special accounting rules. These filters are common in the studies of investment regressions (Bertrand & Schoar, 2003). To preserve consistency we apply the same filters to non-investment variables.
5. To study idiosyncratic differences across managers we restrict our sample to professional CEOs and keep only those CEOs who, together with family members, control less than 20% of the company. We consider 20% to be an appropriate cut off point for professional CEO definition given the relatively concentrated ownership structure in Norwegian non-listed firms and the fact that two thirds of all companies in Norway have at least one shareholder in control of more than 20 % of the votes<sup>13</sup>. Hence, by limiting CEO ownership in the company to be below 20% we ensure that no manager has a controlling stake in the firm they manage.
6. Even though family companies do hire external CEOs, families can be reluctant to give up control and CEOs can find their professional judgements over-ridden by family decisions. Simple majority (over 50% of shares) is sufficiently large for the family alone to determine the composition of the board and, thus, influence company policies. To account for possible family intrusion and influence on company policies we also look at a sample where we restrict our professional

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<sup>13</sup> A Stockholm-based consultancy specialized in the analysis of ownership and board data for listed companies. SIS Ågarservice AB. Retrieved 13<sup>th</sup> November 2017 from [www.aktieservice.se](http://www.aktieservice.se).

CEOs sample to non-family companies, i.e. companies where family ownership is under 50%.

7. Lastly, we restrict our attention to companies whose CEO can be observed in at least one other firm over time since we want to assess whether there is any evidence that firm policies systematically change with the identity of the CEO. We believe that to be a reasonable filter and plausible approach to follow given the limited pool of “good” candidates on the market, thus their interchangeable movement from one company to another. In doing so, we impose a minimum period of two consequent years that the manager has to be in one company to give enough time to his/her style to find its way into the company's operations. Following Bertrand and Schoar (2003), once the switching CEOs sample is identified, we keep all observations for the sample companies, i.e. including all years irrespectively if the manager was or was not observed in other companies.

## 5. SAMPLE DESCRIPTION

Applying sampling filters no. 1-4 to the entire CCGR database we end up with 983548 firm-year observations and a total of 179316 firms which represent our CCGR sub-sample. Further, we restrict the sample to only moving professional CEOs (by applying sampling filters no. 5 and 7) and end up with the Manager-firm matched sub-sample. As reported in Table I and Table II, it comprises 48344 firm-year observations, 10156 firms and 6342 switching CEOs. On average, switching CEO in the Manager-firm matched sub-sample has a tenure of 4.7 years in each of the companies he/she managed and is 56 years old. That shows how uncommon young switching CEOs are in Norway. We also notice that CEO turnover in Norwegian primarily non-listed firms is a rather rare phenomenon as only 6342 CEOs out of 167426 have held CEO positions in at least two different firms. While family firms represent roughly 50% of all the firms included in the CCGR sub-sample, there are few family companies left, namely around 7%, once we filter for professional switching CEOs. That might be an indication that Norwegian family

companies rarely give preference to hiring a professional CEO and, instead, rely on relation by blood or marriage.

**TABLE I**  
**SAMPLE STATISTICS**

<b>Panel A: Firms' Distribution</b>						
	Manager-firm matched sample		Manager characteristics sample		CCGR Database	
	No.	%	No.	%	No.	%
Family firms	659	6.49	924	6.76	89540	49.93
Non-listed firms	10101	99.46	13616	99.57	179182	99.93

  

<b>Panel B: Descriptive statistics</b>			
	Manager-firm matched sample	Manager characteristics sample	CCGR Database
CEOs	6342	30534	167426
Tenure	4.74	4.77	7.00
Age	56	56	58

*“Manager-firm matched sample”* is the sub-sample of firm-year observations for the subset of 10156 firms for which the CEO is observed in at least one other firm and has at least a two-year stay in each of them. *“Manager characteristics sample”* is the sub-sample of firm-year observations for the subset of 13675 firms that have at least two CEOs during the observed period and for which information on CEO characteristics such as gender, year of birth, tenure is available. *“CCGR database”* is the sample of firm-year observations of 179316 firms covered in the CCGR database after the applied sampling filters no. 1-4. All three samples exclude firms in the financial and insurance industry as well as utilities. The number of non-listed and family firms is defined based on the status of the company in the last year for which data is available. In Panel B, for the Manager-firm matched sample the values reported are for switching CEOs (i.e. the CEOs that can be observed in at least two companies). Tenure and Age are the average tenure and age of the CEOs in the sample and are expressed in number of years.

Later on, for the purpose of identifying which CEO characteristics impact a company's performance and financial policy we no longer need every CEO to be observed in at least one other firm. In other words, while managerial turnover still drives our sampling criteria, the only requirement is for each firm to have, during the period under investigation, at least two CEOs with different traits and abilities. By applying this filter to the 179316 firms covered in the CCGR sub-sample we end up with the Manager characteristics sub-sample that includes 96205 firm-year observations, 13675 firms and 30534 CEOs.

**TABLE II**  
**DESCRIPTIVE STATISTICS**

	Manager-firm matched sample		Manager characteristics sample		CCGR Database	
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.
Total Assets (*1000 NOK)	160.55	1956.36	141.65	1904.10	34.87	679.66
Total Debt (*1000 NOK)	94.78	1154.06	85.58	1159.02	21.28	417.59
Total Equity (*1000 NOK)	65.78	897.99	56.09	853.00	13.70	306.31
Net Income (*1000 NOK)	6.67	173.88	7.59	174.59	1.98	66.82
Sales (*1000 NOK)	187.10	2199.57	156.58	1773.61	40.01	674.06
ROA	0.06	0.20	0.06	0.17	0.09	0.20
ROE	0.25	0.91	0.24	0.86	0.33	0.91
Interest coverage	13.98	86.73	15.04	85.53	16.91	88.14
Cash holdings	16.71	64.32	17.70	66.16	11.62	46.71
Leverage	0.66	0.21	0.64	0.22	0.66	0.23
Dividend ratio	0.13	0.42	0.14	0.43	0.17	0.47
Shares owned by CEO and family (%)	10.23	4.66	10.49	4.75	77.36	29.58
Compensation (*1000 NOK)	1.16	0.81	1.03	0.73	0.84	0.53
Sample Size	48344		96205		983548	

“*Manager-firm matched sample*” is the sub-sample of firm-year observations for the subset of 10156 firms for which the CEO is observed in at least one other firm and has at least a two-year stay in each of them. For each of the included firms all observations are kept, including the years where the firm was managed by a CEO that did not switch companies. “*Manager characteristics sample*” is the sub-sample of firm-year observations for the subset of 13675 firms that have at least two CEOs during the observed period and for which information on CEO characteristics such as gender, year of birth, tenure is available. “*CCGR database*” is the sample of firm-year observations of 179316 firms covered in the CCGR database after the applied sampling filters no. 1-4. All three samples exclude firms in the financial and insurance industry as well as utilities. Total Assets, Total Debt, Total Equity, Net Income, Sales and Compensation are expressed in mln of NOK; Shares owned by CEO and family is expressed in %. Sample Size indicates the maximum number of firm-year observations (not all variables are available for each year and firm).

Unfortunately, because of limitations in the nature and availability of data, we are unable to address several important issues in our study. One of them is the fact that since we do not have information on the owners' identity, some CEOs might have switched as a result of an internal move, i.e. might have just been moved from one company to another due to the presence of cross-ownership or interlocked boards. This issue poses a concern as CEOs could be assortatively matched with the companies and, thus, if uncovered, consistency in managing style would be a consequence of CEO-firm matching.

Table II reports the means and standard deviations of the key corporate variables analyzed in this paper. The first 2 columns present the statistics for the 10156 firms included in the Manager-firm matched sample, the next 2 columns – Manager characteristics sample and the last 2 columns report statistics for all the firms included in the CCGR sub-sample. As expected, given that ownership concentration is generally much higher in family owned firms that stand for 50% of our CCGR sub-sample, the percentage of shares owned by the CEO together with his family is, on average, 77% in CCGR sub-sample compared to 10% for the Manager-firm matched sample. We notice that, on average, the firms in our two samples, when compared to CCGR sub-sample, are bigger in size as they have about four times higher total assets, total debt, total equity and sales in absolute values but exhibit comparable ratios of cash holdings, leverage, interest coverage and dividend payout. Hence, firms with professional CEOs that exhibit turnover are bigger in size and might not be representative of the entire population of Norwegian non-listed firms. They also tend to compensate their CEOs with slightly higher salaries, which supports CEO-firm assortative matching model. Given that operating performance is higher when personal ownership is high (Berzins, Bøhren & Rydland, 2008), ROA and ROE for the average firm in the Manager-firm matched sample are slightly lower when compared to the average firm in the CCGR sub-sample.



## 6. EMPIRICAL METHODOLOGY

Following Bertrand and Schoar (2003) we analyzed how CEO fixed effects relate to a firm's financial policy and performance. The following dependent variables were chosen:

- a) *Financial policy*: financial leverage, interest coverage, cash holdings, dividend payout ratio;
- b) *Corporate performance*: ROA, ROE.

Further, we employ the three-way fixed effects model to estimate how much of the variation in the corporate practices of interest can be attributed to time invariant manager fixed effects as well as observable time variant firm characteristics (e.g., firm size, performance), unobservable differences across firms such as time invariant firm fixed effects, and year fixed effects.

More specifically, for each dependent variable of interest, we estimate the following regression:

$$(1) y_{it} = \beta X_{it} + \gamma_i + \lambda_{CEO} + \alpha_t + \varepsilon_{it},$$

where:  $y_{it}$  stands for one of the corporate variables,

$X_{it}$  represents a vector of time-varying firm level controls,

$\gamma_i$  are firm fixed effects,

$\lambda_{CEO}$  are manager fixed effects,

$\alpha_t$  are year fixed effects, and

$\varepsilon_{it}$  is the error term. To account for serial correlation errors are clustered at the firm level.

To disentangle and quantify the existence and possibly infer a subsequent impact of CEO fixed effects on corporate practices it is important to control for all relevant observable firm-level characteristics. For example, Papadakis and Barwise (2002) find that the size of the firm is negatively related to the CEO's ability to influence the decision-making process because of the more decentralized and formal nature of this process in larger firms compared to smaller ones. This entails that CEO's power is reduced in large organizations and the extent to which their characteristics relate to corporate practices is limited. On the other hand, the larger the organization the more complicated it is to manage it, the more important the CEO becomes, the higher the likelihood of CEO's entrenchment and thus the greater

the impact of his/her personal style on corporate decision-making. In their article on the impact of board of directors on corporate financial performance, Zahra and Pearce (1989) remark that CEOs have considerable power within the organization and that even the board input is thought to be valued only if it is compatible with CEO objectives, preferences, and style, thus stressing the importance of CEOs on firm corporate behavior overall. Furthermore, in well performing firms, manager effects might be biased upwards if a company's optimal strategy changes after the new CEO arrives. Hence, following Hutton et al (2009), the standard control variables for firm size and performance used in every regression are logarithm of total assets and ROA. For some regressions we also use additional corporate controls that we find to be relevant. For example, when looking how manager fixed effects influence dividend payout ratio and interest coverage we also control for liquidity (Berzins et al. (2013)) by using cash holdings as a regressor. When leverage is taken as a dependent variable, we control for assets' tangibility following Custodio et al. (2013) who argue there is a positive link between the two.

We wish to highlight that the aim of the study is to document the correlation between manager effects and corporate practices. Inferring a causation between the two might be a more of a difficult task because of the inherent endogeneity issue related to CEO-firm matching that has been present in many other relevant studies as well (Malmendier & Tate, 2005; Custódio & Metzger, 2013; Kaplan et al., 2012). (see Section 2.6). To try and mitigate this endogeneity concern and to be able to derive an accurate statistical inference from our data (i.e. make sure our estimated coefficients are unbiased), we include in our regressions control variables as well as firm fixed effects. Moreover, we also use clustered robust standard errors. Default standard errors can greatly overstate estimator precision. In other words, failure to control for within-cluster error correlation leads to misleadingly small standard errors which, in turn, determine narrow confidence intervals, high t-statistics and low p-values. That increases the probability of "false positives" (type I error), i.e. rejecting the null hypothesis when it is, in fact, true. As such, since we use firm fixed effects to control for the unobserved variation of firm-specific traits, we use errors clustered at the firm level.

As presented in Table III, adding CEO fixed effects increases the adjusted  $R^2$  of the original model (1). That, combined with statistically significant at 1% level CEO fixed effects indicates that CEOs' idiosyncratic characteristics do, in fact, impact a company's practices. On average, as expected, for most of the corporate

variables the increases in adjusted  $R^2$  are slightly higher for the subset of non-family firms when compared to the adjusted  $R^2$  increases for the subset of family firms. A possible explanation is the reluctance of family companies to give up control. Thus, the CEO of a family-owned firm would have less discretion in the decision-making process. Moreover, the CEOs kept in the sample own under 20% of the firm's equity. In the meantime, a firm is defined as being family-owned if the largest family has at least 50% of voting rights. Subsequently, the CEO alone does not have enough power to impose him/herself and overturn the decisions taken by the family. Nonetheless, we do acknowledge that the current findings are sample specific given that the subsample of family firms used is rather small, only 659 companies and might not be representative of the entire population of Norwegian family firms.

**TABLE III**  
**CEO EFFECTS ON CORPORATE POLICIES**

	Non-Family Firms			Family Firms			Family and Non-Family firms		
	(1)	(2)	$\Delta$	(1)	(2)	$\Delta$	(1)	(2)	$\Delta$
	<i>Adj. R<sup>2</sup></i>	<i>Adj. R<sup>2</sup></i>	<i>Adj. R<sup>2</sup></i>	<i>Adj. R<sup>2</sup></i>	<i>Adj. R<sup>2</sup></i>	<i>Adj. R<sup>2</sup></i>	<i>Adj. R<sup>2</sup></i>	<i>Adj. R<sup>2</sup></i>	<i>Adj. R<sup>2</sup></i>
Leverage	0.68	0.77	0.087	0.69	0.79	0.093	0.68	0.77	0.088
Cash Holdings	0.15	0.29	0.141	0.14	0.25	0.116	0.15	0.29	0.143
Dividend Ratio	0.21	0.30	0.089	0.21	0.28	0.062	0.20	0.28	0.072
Interest coverage	0.22	0.27	0.049	0.20	0.20	0.000	0.23	0.28	0.046
ROE	0.45	0.51	0.060	0.47	0.54	0.064	0.45	0.51	0.062
ROA	0.60	0.65	0.041	0.72	0.76	0.047	0.60	0.63	0.039

Reported in the table is the Adjusted  $R^2$  from fixed panel regressions where standard errors are clustered at firm level. For each depended corporate variable (column 1) the first model (1) includes firm and year fixed effects while the second model (2) also includes respective manager fixed effects of switching CEOs. Each regression also contains, as regressors, some time-varying firm characteristics specific to the dependent variable as well as ROA and logarithm of total assets to control for company performance and respectively size. Column 4, 7 and 10 report the increase in adjusted  $R^2$  after the switching manager fixed effects are included as an independent variable in regression (1). In each regression the fixed effects of switching CEOs are statistically significant at 1% level. The regressions are run on the Manager-firm matched sample that includes 10156 firms out of which: 9497 are Non-family firms and 659 are Family firms. Family firms are defined following the approach of Janis Berzins and Øyvind Bøhren (2013) as being the companies where family ownership surpasses 50%.

Next, even though, as hypothesized, the adjusted  $R^2$  increases after accounting for manager fixed effects in the corporate variables regressions, the magnitude of the change in adjusted  $R^2$  is slightly higher, but rather similar to that documented by Bertrand and Schoar (2003). This implies that manager fixed effects of Norwegian CEOs are equally pronounced when compared to US data, invalidating our hypothesis of lesser effect in case of Norwegian firms because of a more centralized corporate structure in Norway when compared to US. That could be because of the specificity of our sample which is comprised of non-listed firms with relatively high ownership concentration as well as to the Norwegian business culture which is based on Scandinavian work values such as equality, high level of trust and cooperation. For example, De Vries and Miller (1986) suggest that the more centralized the organization the more powerful the CEO and the greater the impact of his/her traits. Hence, stronger than expected CEO effects might imply more discretion provided to managers in Norwegian companies, especially privately-owned ones.

### 6.1. BY INDUSTRY ANALYSIS

We further proceed to investigate in more detail the extent of manager fixed effects by industry. We classify the firms in the Manager-firm matched sample into four industry sectors<sup>14</sup> according to their SIC (2009)<sup>15</sup> and following the approach used by Berzins et al. (2008). As before, for every corporate variable we perform two regressions. In the first regression we regress the dependent corporate variable on firm and year fixed effects, ROA and logarithm of total assets (to control for performance and size respectively) as well as on the corresponding time-varying firm characteristics. In the second regression we add the appropriate manager fixed effects. We compare the adjusted  $R^2$  in both regressions and report its changes in Table IV.

As expected, the changes in adjusted  $R^2$  are positive, economically and statically significant, ranging, on average, from 10 p.p. to 24 p.p. CEO effects

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<sup>14</sup> To make sure our results are representative and have a statistical inference we will only analyze those industries for which we have at least 200 CEOs and thus guarantees a sufficient number of firm-year observations. That excludes the following industry sectors: Agriculture, forestry, fishing, mining; Energy; Construction; Financials and utilities.

<sup>15</sup> Standard Industrial Classification. (2009) Retrieved 17<sup>th</sup> May 2018 from [https://www.ssb.no/a/publikasjoner/pdf/nos\\_d383/nos\\_d383.pdf](https://www.ssb.no/a/publikasjoner/pdf/nos_d383/nos_d383.pdf)

appear to have a more pronounced explanatory power of the variation in corporate practices in the Manufacturing and chemical products sector, the changes in adjusted  $R^2$  being the highest for most corporate variables. On the other end, the lowest CEO effects are reported for the Service industry. Overall, the positive change in adjusted  $R^2$  is higher when we look at each industry separately compared to the prior samples and, most probably, is sample, industry sector specific. For example, manager effects seem to be more pronounced in explaining variation in firm performance in the Manufacturing and chemical products industry followed by Trade, Transport and, lastly, Services. The adjusted  $R^2$  increase in the regression with ROE as dependent variable being respectively 22 p.p., 21 p.p., 16 p.p., and 13 p.p.

This finding implies that either CEO fixed effects in Manufacturing and chemical products sector matter more and that CEOs should be chosen wisely or that CEOs already undergo a more thorough filtering within this sector.

**TABLE IV**  
**BY INDUSTRY CEO EFFECTS ON CORPORATE POLICIES**

	(1) Manufacturing and chemical products	(2) Services	(3) Trade	(4) Transport
Leverage	0.172	0.096	0.162	0.141
Cash Holdings	0.195	0.125	0.235	0.242
Dividend Ratio	0.104	0.136	0.152	0.157
Interest Coverage	0.247	0.151	0.145	0.125
ROE	0.217	0.127	0.207	0.163
ROA	0.191	0.075	0.162	0.138
N	2757	5998	6725	7889
No. of firms	375	1340	961	1237
No. of switching CEOs	200	699	519	670

Reported in the table is the increase in adjusted  $R^2$  after the switching manager fixed effects are included as an independent variable to the baseline regression that contained, as regressors, some time-varying firm characteristics specific to the dependent variable as well as ROA and logarithm of total assets to control for company performance and respectively size. Regression are run on Manager-firm matched sample that is a sub-sample of firm-year observations for the subset of 10156 firms for which the CEO is observed in at least one other firm and has at least a two-year stay in each of them. The firms are classified by industry according to the Standard Industrial Classification (2009) (Standard for Næringsgruppering (SN2009)) into one of the industry sectors, following the approach of Berzins et. al (2008). For the purpose of analysis only the industries that had at least 200 switching CEOs where considered. In each regression the fixed effects of switching CEOs are statistically significant at 1% level. N represents the sample size that indicates the maximum number of firm-year observations (not all variables are available for each year and firm). Standard errors are clustered at firm level.

## **6.2. ROBUSTNESS OF RESULTS**

### **6.2.1. Robustness Check 1**

To validate the reported results, we conduct a series of specification checks. We start with reestimating the manager fixed effects after collapsing the data at the manager-firm level. More precisely, we estimate firm-year specific residuals by regressing one by one the dependent corporate variables on firm fixed effects, year fixed effects and firm controls specific to each dependent variable under investigation. Therefore, in each of the regressions with interest coverage and dividend ratio as dependent variables we also control for liquidity by including cash holdings as an explanatory variable. When looking into leverage we additionally control for assets' tangibility and when cash holdings are taken as dependent variable, dividend ratio is included as a regressor in the equation. Next, we collapse these firm-year specific residuals by manager-firm spell and get an averaged out residual value for each company that the manager has worked for. More precisely, the collapse command creates a single record for all the years that each CEO worked for the same company over time and it reports the average residual of the firm specific residual for the manager in question. We then proceed to filter out for those managers who held CEO positions in at least two companies during the analyzed period and, thus, create a different Manager-firm matched data sample that satisfies all of our filtering criteria. At this stage we no longer separate our sample into family and non-family firms as we are only interested in showing that manager fixed effects are significant when using a different estimation technique. Finally, we reestimate manager fixed effects for all corporate variables of interest. This alternative method of filtering out firms with switching professional CEOs yields the same results.

### **6.2.2. Robustness Check 2**

Another concern that needs to be addressed is the validity of the persistence in style. The fact that manager fixed effects are significant and robust to an alternative estimation technique does not necessarily imply persistence of managerial style across companies. To show that manager characteristics matter we need first to confirm that managerial style is consistent from company to company and, thus, is manager and not company specific. Bertrand and Schoar (2003) address

this issue by applying a more parametric specification to analyze the persistence in managerial style. More specifically, they regress a manager's average residual in the second firm on the average residual value in the first firm that the manager is observed in. The average residuals per each company that the CEO managed are obtained as described above. We follow their approach and report the outputs of these regressions in Table V.

**TABLE V**  
**PERSISTENCE OF MANAGER EFFECTS**

	(1)	(2)	(3)	(4)	(5)	(6)
	Leverage	Cash Holdings	Dividend Ratio	Interest coverage	ROE	ROA
Avg resid firm1	0.0020 (0.0108)	0.0143 (0.0108)	-0.0045 (0.0127)	-0.0064 (0.0093)	-0.0299*** (0.0105)	-0.0058 (0.0104)

In the table are reported the estimated coefficients from individual policy variable regressions in which we regress a manager's average residual in his second firm on his average residual in his first firm. Regressions are run on the "Manager-firm matched sample" that is the sub-sample of firm-year observations for the subset of 10156 firms for which the CEO is observed in at least one other firm and has at least a two-year stay in each of them. Robust standard errors clustered at the firm level are reported in parentheses. Significance levels are marked as follows: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

When comparing our results to those of Bertrand and Schoar (2003) it is puzzling why all obtained coefficients are close to zero i.e., are economically insignificant and only the coefficient for ROE, while still economically insignificant, is statistically significant at 1% level. Moreover, unlike Bertrand and Schoar (2003) we also observe negative coefficients for dividend ratio, interest coverage, ROE and ROA, which would indicate that managerial style is inconsistent and changes as manager moves from one company to another. For example, our findings appear to suggest that a CEO that is associated with higher dividend ratio in the first company would have a slightly lower dividend ratio in the next one. Nonetheless, even though these coefficients have a negative sign, the actual change in dependent variable is almost null and, as pointed out earlier, only the coefficient for ROE is significant at 1% level.

The lack of statistical significance of the coefficients related to dividend ratio might be caused by a more relaxed dividend payout policy in privately-held firms compared to publicly traded ones. In private firms, dividends might be paid out in absence of attractive investment opportunities or in periods when firms are

cash-rich without being bound to a target dividend payout ratio. This might be the reason why manager effects were found to be statistically significant in public companies (US data) but insignificant for private companies. Statistical insignificance of cash holdings might be related to statistical insignificance of dividend policy.



## 7. COMPENSATION

In this subsection we want to investigate further how manager effects relate to compensation and whether managers with higher fixed effects experience higher compensation levels. We employ the three-way fixed effects model to estimate how much of the variation in compensation levels can be attributed to time invariant manager fixed effects, unobservable differences across firms such as time invariant firm fixed effects, year fixed effects, as well as observable time variant firm characteristics. Specifically, we regress the logarithm of total compensation on logarithm of total assets, logarithm of sales, ROA, firm, year and manager fixed effects. We also control for whether or not the CEO of the company is a board member, as well as for some manager-level traits such as managerial tenure and whether or not the manager is female. Table VI summarizes the regression results with logarithm of salary as dependent variable.

The first column of Table VI reports the results from a pooled OLS regression with neither firm nor manager fixed effects. Year fixed effects are included in all the specifications to capture the effects of economic booms and recessions as well as other potential year differences on pay level. The adjusted  $R^2$  for this regression is 47%. Next, we add to the same regression firm fixed effects and register an adjusted  $R^2$  of 81.9% (column 2, Table VI). An increase of 34.9 percentage points (p.p.) indicates that unobservable firm heterogeneity (such as firm quality, firm culture about compensation practice, etc.) seems to play a considerable role in explaining compensation level variability. To compare between the importance of firm fixed effects and manager fixed effects we run one more regression in which firm fixed effects are replaced with manager fixed effects (column 3, Table VI). This yields an adjusted  $R^2$  of 82.4%, which is a 35.4 p.p. increase relative to the base line pooled OLS regression, and just under 1 percentage point increase over the firm fixed effects specification. This suggests that managerial traits appear to have a significant explanatory power when it comes to heterogeneity in CEO compensation levels but it is almost equal to the explanatory power of firm level unobservable factors.

**TABLE VI**  
**DETERMINANTS OF THE LEVEL OF EXECUTIVE COMPENSATION**

	(1) Pooled OLS (No firm or manager fixed effects)	(2) Firm Fixed Effects (No manager fixed effects)	(3) Manager Fixed Effects (No firm fixed effects)	(4) Firm and Manager Fixed Effects
Log Total Assets	0.1671*** (0.0063)	0.0949*** (0.0011)	0.1113*** (0.0020)	0.0983*** (0.0013)
Log Sales	0.0211*** (0.0058)	0.0400*** (0.0012)	0.0238*** (0.0018)	0.0327*** (0.0013)
ROA	0.0551* (0.0291)	0.0043 (0.0107)	-0.0025 (0.0114)	-0.0015 (0.0104)
CEO Tenure	0.0026** (0.0013)	0.0075*** (0.0004)	0.0114*** (0.0004)	0.0101*** (0.0004)
CEO board member	0.0668*** (0.0101)	-0.0026 (0.0032)	0.0031 (0.0035)	-0.0055* (0.0028)
CEO Gender	0.0282* (0.0155)	0.0302*** (0.0050)	0.0000 (0.0044)	0.0151*** (0.0036)
Firm fixed effects		1.0000*** (0.0013)		0.5102*** (0.0195)
Manager fixed effects			1.0000*** (0.0062)	0.5647*** (0.0208)
Adjusted R- squared	0.4698	0.8193	0.8241	0.8512

The table reports the regression results on the determinants of the level of executive compensation. Regressions are run on the “Manager-firm matched sample” which is the sub-sample of firm-year observations for the subset of 10156 firms for which the CEO is observed in at least one other firm and has at least a two-year stay in each of them. We also cleaned for 0 salary as well as for extremes values in salary, i.e. less than 0.5 and more than 15 mln NOK. The sample thus comprises a subset of 3705 firms and 2009 switching CEOs. The dependent variable is logarithm of CEO salary. Column (1) reports the estimated coefficients of a pooled OLS regression without any firm or manager fixed effects; column (2) is the regression with only firm fixed effects; column (3) is the manager firm fixed effects regression; column (4) is the regression with both firm and manager fixed effects. All four regressions also include year fixed effects. Robust standard errors clustered at the firm level are reported in parentheses. Significance levels are marked as follows: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

To further explore the interdependence between manager and firm characteristics and CEO compensation, we regress residuals from the pooled OLS

regression on manager (firm) fixed effects and find relatively high adjusted  $R^2$  of 59.6% (57.8%). When we regress residuals from the firm fixed effects regression on manager fixed effects, the adjusted  $R^2$  we obtain is almost equal to the adjusted  $R^2$  of when residuals from the manager fixed effects specification are regressed on firm fixed effects, the adjusted  $R^2$  being 0.0352% (0.0315%). Yet again the numbers suggest that, for our sample, unobservable company and observable and unobservable executive management characteristics seem to be equally important. Consequently, our results indicate that managerial fixed effects are important for explaining variation in executive compensation. We cannot disregard that these findings might be driven by the endogenous CEO-firm matching (see Section 2.6). Thus, because firms and CEOs are assumed to be matched via a competitive assignment, both the CEO and firm optimize over the relative value of preserving the match versus pursuing their outside option (Eisfeldt & Kuhnen, 2013). Hence, firms will choose those CEOs that will best implement the pre-established strategy and CEOs, in their turn, will choose the firm that promises to compensate their firm-specific skills over any other outside option. At the same time, our results do not support Graham, Li and Qiu (2008) finding that manager fixed effects have significant incremental explanatory power beyond what can be explained by firm level factors. This may be due to our sample of Norwegian firms as opposed to US companies analyzed by Graham et al. (2008) in their paper, and hence by the unique features of Norway's social and economic structure that is characterized by moderate executive compensation levels.

To investigate even further which specific manager fixed effects relate to and, possibly explain managers' compensation levels, we regress manager-specific compensation residuals obtained from regression (2) in Table VI on manager fixed effects obtained from regressions used in Table III. Note that manager fixed effects that we regress on are estimated coefficients and thus, are noisy by definition. To account for the measurement error in obtained manager fixed effects we apply GLS estimation technique. More precisely, we weight each observation by the inverse of the standard error on the independent variable which we obtain from regressions used in Table III.

We are primarily interested in how manager fixed effects in firm performance (ROA, ROE) relate to compensation, since, if some managerial styles lead to better performance, these managers are expected to experience higher compensation levels. The results reported in Table VII suggest that managers who

exhibit higher return on equity fixed effects seem, in fact, to receive higher residual salary, the results of the regression being statistically significant at 5% level. This is in line with Tervio (2008) finding that the difference in the pay of two CEOs at firms with different size reflect both the difference in their managerial abilities and the difference in the size of the firms they manage. Since we control for firm size when computing residual compensation we might assume that CEO traits map into CEO compensation levels and the difference in pay is a result of difference in CEO ability. Manager fixed effects on the remaining corporate variables seem to have a statistically insignificant impact on residual compensation.

**TABLE VII**  
**MANAGER FIXED EFFECTS AND COMPENSATION**

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Residual compensation</i>					
Leverage	0.0036 (0.0169)					
Cash holdings		-0.0000 (0.0000)				
Dividend ratio			-0.0073 (0.0067)			
Interest coverage				0.0000 (0.0000)		
ROE					0.0079** (0.0036)	
ROA						0.0202 (0.0217)

In each entry is reported the estimated coefficients from different regressions where the *independent variable* is the manager fixed effects corresponding to each of the row corporate variables (obtained from the regressions reported in Table III). The *dependent variable* is the residual compensation obtained from regression (2) reported in Table VI. Each regression is estimated using GLS estimation technique to account for estimation error and each observation is weighted by the inverse of the standard error.

Overall, analyzing the link between manager fixed effects and executive compensation levels our findings suggest that the variability of the latter is explained by the former. Even after controlling for year and firm effects as well as firm-specific traits, adding manager effects to the compensation regression yields higher adjusted  $R^2$ . That could be due to managers being rewarded for their abilities

or to the fact that better governed firms seek out those CEOs that exhibit performance enhancing skills. The fact that CEO effects do not hold more explanatory power when compared to unobserved firm effects could be because Nordic countries have moderate and comparable compensation levels among CEOs that are rather related to market compensation than manager specific achievements and characteristics. Also, since we study non-listed companies in which performance cannot be easily tracked through stock prices or be tight to company performance through options, compensation most likely is linked to the market salary level irrespective of managerial skills and attributes.

## 8. OBSERVABLE MANAGERIAL CHARACTERISTICS

In the previous sections we brought forward statistically significant results that CEO heterogeneity translates into a firm's corporate policies. Nonetheless, the question about what are those specific managerial traits that affect the corporate decision-making process is still open. To answer it we looked at the importance of a set of demographic variables such as tenure, gender, CEO's birth year and ownership in the company. The following regression model was estimated:

$$(2) \quad y_{ijt} = \beta X_{it} + \mu \text{Cohort}_j + \delta \text{Tenure}_j + \gamma \text{Gender}_j + \eta \text{Ownership}_j + \alpha_i + \lambda_t + \varepsilon_{ijt}.$$

Where:  $y_{ijt}$  is the dependent variable represented by the corporate variables specified above;

$i, j,$  and  $t$  index respectively firms, CEOs and time;

$X_{it}$  is the vector of controls (observable firm characteristics)

$\text{Cohort}_j$  is the birth cohort of CEO  $j$ ;

$\text{Tenure}_j$  is the number of years CEO  $j$  has been in office;

$\text{Gender}_j$  is a dummy variable =1 if CEO  $j$  is a man and 0 if a woman;

$\alpha_i$  are firm fixed effects;

$\lambda_t$  are year fixed effects;

$\text{Ownership}_j$  is the shares owned by each CEO  $j$  in company  $i$

$\varepsilon_{ijt}$  is the error term clustered at the individual manager level.

Here we use the Manager characteristics sample that comprises 96205 firm-year observations, 13675 firms and as much as 30534 professional CEOs (see Table II). The 13675 firms are those left after applying the sampling filters (see Section 4) to the CCGR database. At the same time, we ensured that all the filtered-out companies exhibit managerial turnover, i.e. have at least two professional CEOs with different characteristics during the period under investigation and for who we could find available information on the studied manager demographic variables: gender, tenure, birth year and stock ownership. We also kept only those CEOs that stayed in each company for a period of at least two years and who, together with their family own less than 20% of the firm's equity. The results from the individual

regressions estimated for each analyzed corporate variable are reported in Table VIII.

**TABLE VIII**  
**CEOs CHARACTERISTICS' EFFECTS ON FIRM POLICIES**

<i>Panel A: Non-Family and Family Firms</i>						
	(2)	(3)	(4)	(5)	(6)	(7)
	Leverage	Cash Holdings	Dividend Ratio	Interest coverage	ROE	ROA
CEO Ownership	0.1564** (0.0790)	-37.1363 (31.1401)	0.1464 (0.1791)	-4.3298 (48.3991)	0.8317** (0.3832)	0.1309* (0.0706)
CEO Tenure	-0.0028* (0.0015)	0.4800 (0.6129)	0.0041 (0.0035)	0.7184 (0.6998)	0.0045 (0.0076)	0.0009 (0.0011)
CEO Birth Year	0.0005 (0.0007)	0.5411* (0.3045)	0.0020 (0.0016)	0.4044 (0.3498)	0.0078** (0.0035)	0.0015*** (0.0006)
CEO Gender	0.0034 (0.0149)	3.0063 (6.2316)	-0.0278 (0.0511)	9.8505 (11.4618)	-0.0232 (0.1010)	0.0022 (0.0120)
<i>Panel B: Non-Family Firms</i>						
	(2)	(3)	(4)	(5)	(6)	(7)
	Leverage	Cash Holdings	Dividend Ratio	Interest coverage	ROE	ROA
CEO Ownership	0.1471 (0.0989)	-68.6676 (53.7681)	0.3219 (0.2811)	-19.9835 (95.0786)	0.8802 (0.6092)	0.2195* (0.1179)
CEO Tenure	-0.0022 (0.0015)	0.8353 (0.6944)	0.0030 (0.0035)	0.6339 (0.7524)	0.0037 (0.0080)	0.0010 (0.0012)
CEO Birth Year	0.0004 (0.0007)	0.6188** (0.3051)	0.0012 (0.0017)	0.1935 (0.3787)	0.0068* (0.0037)	0.0018*** (0.0006)
CEO Gender	-0.0010 (0.0152)	2.9308 (6.5343)	-0.0401 (0.0517)	9.2828 (12.0630)	-0.0143 (0.1059)	0.0007 (0.0128)
<i>Panel C: Family Firms</i>						
	(2)	(3)	(4)	(5)	(6)	(7)
	Leverage	Cash Holdings	Dividend Ratio	Interest coverage	ROE	ROA
CEO Ownership	-0.0704 (0.0828)	5.2857 (7.1402)	0.0449 (0.3872)	0.1822 (45.5629)	-0.7162** (0.2995)	-0.1291** (0.0523)

CEO Tenure	-0.0076 (0.0074)	0.4227 (0.3466)	0.0432 (0.0343)	2.8013 (3.4170)	-0.0642* (0.0365)	-0.0083 (0.0063)
CEO Birth Year	-0.0020 (0.0044)	0.4758* (0.2688)	0.0370 (0.0242)	2.9164 (1.8266)	-0.0275 (0.0234)	-0.0051* (0.0028)
CEO Gender	0.1748*** (0.0471)	-34.9961*** (6.8667)	0.5313 (0.3604)	12.1535 (73.9421)	-1.7155*** (0.2867)	-0.1867*** (0.0678)

Each row reports the estimated coefficients for the respective independent variables (column 1) from different independent regressions. Regressions are run on the Manager characteristics sample that is the sample of firm-year observations for the subset of 13675 family and non-family firms that have at least two CEOs during the observed period and for which information on CEO characteristics such as gender, year of birth, tenure is available (as described in Table I). There are 924 family firms and 12751 non-family firms. . Family firms are defined following the approach of Janis Berzins and Øyvind Bøhren (2013) as being the companies where family ownership surpasses 50%. Each regression also includes year fixed effects, firm fixed effects, logarithm of total assets, ROA and a dummy to control for whether the CEO is a board member or not. Other included controls: column (1) asset's tangibility; column (2) dividend ratio; column (3) and (4) cash holdings. Robust standard errors clustered at the individual manger level are reported in parentheses. Significance levels are marked as follows: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

We can identify a positive and statistically significant relationship between CEO ownership and performance (ROE, ROA). Seemingly, a higher CEO equity holding translates into better firm performance, a 10% increase in ownership being associated with a 8.3% and 1.3% rise in ROE and ROA respectively. One could argue that more shares ties the CEO to the company performance and thus incentivizes him/her to take performance enhancing actions. However, the positive and statistically significant link between ownership and leverage adds some controversy. An increase in leverage increases the riskiness of equity, boosting the ROE. At the same time, an increase in the riskiness of assets would pump up the ROA. Thus, since we cannot disentangle whether the rise in ROA and ROE is a consequence of better performance (i.e. if they are abnormal returns) or a result of higher risk on either assets or equity side, the positive correlation between ownership and performance should be interpreted with caution. Next, the positive link between ownership and leverage is also a bit puzzling since it goes against the agency theory. According to it, a higher stake in the company translates into higher at-risk wealth of the managers which could lead to increased risk aversion. That would indicate a preference for lower leverage.

We hypothesized that older generations of managers are more conservative which would indicate a more risk-averse approach when it comes to financial decisions. That would entail taking on less debt, opting for higher levels of cash



holdings, etc. The results show a statistically significant positive relation between CEO's birth year and cash holdings, each ten-year increase in year of birth appearing to lead to a 5.4% higher level of cash holdings. The point estimate on the effect of CEO birth year on a firm's financial leverage is, statistically insignificant. However, we do observe an even though weak but robust negative link between CEO's tenure and leverage. Since the average age of the CEO in our sample is 56 years, we might try to infer that the longer-tenured CEOs are also those from older generations and thus the decrease in leverage associated with longer tenure seems to be consistent with the theory.

Older generation managers are also assumed to be less aggressive and more risk-averse in their strategies. They might exhibit a disinclination to risky though most likely more profitable projects and a reluctance in the ability to come up with new ideas. However, they are more experienced and can successfully make use of their knowledge in their decision-making process. The results reported in Table VIII appear to support this view. We see a positive and statistically significant relationship between CEO's year of birth and the performance variables (ROA and ROE) but the impact per se seems to be rather small: each 10-year increase in the year of birth seems to rise ROE by only 0.08% and ROA by 0.02%. Should be pointed out that it is unclear what could actually drive this increase in company performance. Theory implies that older managers opt for less risky assets and lower debt which would depress ROA and ROE respectively. Hence the reported increases would point to better CEO management. Nonetheless whether or not these returns are abnormal it is hard to tell.

Moving further, theory states that gender diversity is correlated with better firm performance (Smith et. al, 2006; Carter et. al, 2003). At the same time, theory points to the overconfidence exhibited by men in a managerial position. This means that male CEOs are, generally, more inclined to overvalue the precision of the available to them information, subsequently their ability to generate positive results, and can overstate the outcomes of investments. Thus, they might take on suboptimal projects that can turn out to be detrimental to the company's performance in the long run. This view is undermined by the results reported in panel A and B of Table VIII, the point estimates on the effect of gender on corporate variables being statistically insignificant for all of them. Nevertheless, as panel C of Table VIII shows, if we look solely at family firms, the results, seemingly, uphold the theory. Hence, male CEOs in family owned firms appear to opt for policies that, on average,

translate into higher levels of financial leverage, lower levels of cash holdings and overall firm performance seems to slump. Though all point estimates are statistically significant at 1% level, we ought to remark that the results might be sample specific given that only 924 out of the 13675 firms in the sample are family firms and thus might not depict a true picture of all Norwegian family firms. It should also be noted that, for the sample in question, CEOs' ownership stake in the company, tenure and age are all negatively related to company performance with statistical significance ranging from 5 to 10% level. Even though, as mentioned, this might be a consequence of sample size it still might be an indication of family power to overrule CEO or being unable to pay professional CEOs competitive salary and, thus, failure to recruit the best match.

The effect of CEO observable traits on decisions related to dividend ratio and interest coverage appear to be driven by other observable or unobservable manager traits than the ones included in this study, the coefficients estimates for all of them being statistically insignificant.

All in all, it seems that observable managerial traits might hold some explanatory power when it comes to variability in corporate decisions. Nonetheless, we cannot rule out that most of the above reported findings on the effect of CEO specific characteristics on corporate variables could be potentially driven by the ubiquitous endogenous CEO-firm matching. It is hard to proclaim with certainty that CEO traits drive firm decisions nor can we disregard their impact. Even though we try to account for endogeneity by controlling for firm observable and unobservable factors the issue still prevails and further studies focused on tackling better CEO-firm matching are needed.

## 9. CONCLUSION

The main question we set to answer in this research paper is whether or not CEO idiosyncratic characteristics affect a company's corporate policies and to what extent by focusing on Norwegian firms. To accomplish that we looked at firms' financial policy (by analyzing their leverage, cash holdings, dividend payout ratio and interest coverage) and performance (by analyzing their ROE and ROA) and researched the impact that CEO's tenure, gender, age and stock ownership have on them.

We do indeed observe that CEO fixed effects hold an explanatory power when it comes to explaining the changes in the aforementioned corporate variables. Moreover, as hypothesized, the impact is moderate but statistically significant for all of the variables. Although our results are pretty similar to the results observed in the papers focused on US companies, the impact is slightly higher (as seen in the adjusted  $R^2$  increases). This fact is in line with the view of De Vries and Miller (1986) but did not really support our hypothesis which is based on the view advocated by Papadakis and Barwise (2002) that CEO characteristics are significantly and positively related to the degree of hierarchical decentralization. Hence, given the Norwegian highly egalitarian culture with flat organizational structures but more centralized than the one on the US market, we expected a lower explanatory power embedded in manager effects compared to Bertrand and Schoar's (2003) findings. We assume that the refuted hypothesis might be caused by the fact that, as opposed to Bertrand and Schoar (2003), we primarily looked into privately-owned firms where managers might have more discretion based on the extent of shareholders' involvement.

Further on, after identifying a statistically significant impact of managerial fixed effects on a company's corporate environment, we looked into which, out of the observable and available to us CEO characteristics (gender, tenure, age and ownership) translate into the decision-making process of the firm. Our findings mostly concur the views postulated by theory and other researches. In other words, we observe a positive link between a manager's age and firm performance, supporting the view that older CEOs have more experience and knowledge that they make use of when running the company. Next, tenure is associated with lower levels of leverage bringing forward the more conservative strategy and risk-averse approach followed by long-tenured CEOs. The positive relationship between CEO's

stake in the company and firm's performance point to the alignment of interests of the manager with the shareholders and the higher interest in the company's performance. Nonetheless, we are very wary in interpreting the effects of managerial specific traits on performance given that we cannot disentangle whether the increases in returns are abnormal or in line with the risk embedded in a company's strategies. It is important to highlight that we do not infer a causal link between managerial traits and the analyzed corporate variables. The aim of the paper was to identify a correlation, a link between the two, assess and quantify its impact.

At the same time, although manager fixed effects are statistically significant for all corporate variables, this explanatory impact could not be explained by any of the observed analyzed characteristics for decisions related to dividend payout ratio and interest coverage. Even though the coefficients' direction is in line with the theory, the results are insignificant. That entails that some other, unobserved characteristics such as maybe CEO's optimism, confidence, education, work experience, talent, etc. might be more important to explain changes in corporate decisions.

In addition, we investigated how compensation is related to manager and firm fixed effects. We showed that managerial effects seem to hold a significant explanatory power when it comes to explaining heterogeneity in CEO compensation levels. We also found that unobservable company and observable and unobservable executive management characteristics appear to be equally important. In other words, our results do not support John Graham et al. (2008) finding that manager fixed effects have significant incremental explanatory power beyond what can be explained by firm level factors. This may be due to the unique features of Norway's social and economic structure that is characterized by moderate executive compensation tight to the market average compensation levels rather than CEO attributes.

We also want to acknowledge that the findings presented in this paper might be driven by endogeneity related to CEO-firm matching. According to Gabaix and Landier (2008), CEOs have different talents and are matched to firms in a competitive assignment model. Hence, firms, focusing on observable managerial traits, seek out those managers whose skills set match the strategy they choose to implement forward. Moreover, as Eisfeldt and Kuhlen (2013) remark productivity declines whenever firms' skill demands are no longer compatible with their CEO's

skill set. Hence, whether CEOs impose their style in the decision-making process of the firm or they are being carefully chosen because of their attributes still remains an open question that we could not fully answer in this paper.

Consequently, implementing a better model that could tackle in more depth the endogeneity concern opens doors for future research. At the same time, extending the list of CEO characteristics to include CEO's education, work experience, and personal traits such as confidence, optimism, etc. might give a better insight as to what heterogeneous CEO traits exactly might drive the difference in corporate decisions across firms. Another interesting further analysis might involve looking solely at listed Norwegian companies. Given the information disclosure requirements for listed firms, more policies such as investment or organizational one can be analyzed to see where exactly do CEO traits map into the corporate decision-making process more. This will also provide an opportunity to test the internal validity of the results reported in this paper.

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## APPENDIX 1

### DATA APPENDIX

The corporate variables used in this study are extracted from the Centre for Corporate Governance Research (CCGR) database. The CCGR was founded in 2005 and is located at BI Norwegian Business School in Oslo, Norway. The objective of the database is to improve the insight into how the governance of firms influences the welfare of its stakeholders. The database pays special attention to the private industry in general and to non-listed firms and family firms in particular.

The quality control devices of the CCGR are a careful selection of research teams, a commitment to publishing in reputable academic journals, close interaction with the business community and regulating bodies, and a policy of disseminating the findings to the general public through the media.

The specific variables used in the analysis are defined as follows:

**Total assets** is defined as sum of long-term debt (CCGR item 98 - “Total other long-term liabilities”) plus short-term debt (CCGR item 109 - “Total current liabilities”) plus the book value of total equity (CCGR item 87 - “Total equity”).

**Total debt** is defined as sum of long-term debt (CCGR item 98 - “Total other long-term liabilities”) plus short-term debt (CCGR item 109 - “Total current liabilities”).

**Leverage** is defined as long-term debt (CCGR item 98 - “Total other long-term liabilities”) plus short-term debt (CCGR item 109 - “Total current liabilities”) over long-term debt plus short-term debt plus the book value of total equity (CCGR item 87 - “Total equity”).

**Cash Holdings** is defined as cash and equivalents (CCGR item ) over total fixed tangible assets at the beginning of the fiscal year (CCGR item 51 - “Total fixed assets (tangible”).

**Interest Coverage** is interest coverage grade (CCGR item 123 - “Interest coverage grade”).

**Dividend ratio** is the ratio of dividends (CCGR item 41 - “Dividends”) over operating income (CCGR item 19 - “Operating income”).

**Return on assets** is the ratio of net income (CCGR item 39 - “Net Income”) over total assets (long-term debt plus short-term debt plus the book value of common equity).

**Return on equity** is the ratio of net income (CCGR item 39 - “Net Income”) over the book value of total equity (CCGR item 87 - “Total equity”).

**Assets’ tangibility** is the ratio of total fixed tangible assets (CCGR item 51 - “Total fixed assets (tangible)”) over total assets (long-term debt plus short-term debt plus the book value of common equity).

**CEO compensation** is CEO salary (CCGR item 114 - “CEO salary”).

## **APPENDIX 2**

### **PRELIMINARY REPORT**

#### **ABSTRACT**

This study aims to investigate whether and how CEO characteristics influence company economic performance and shape financial, investment and organizational behavior. In particular the study will concentrate on Norwegian CEOs and the following characteristics: gender, age, tenure, education and ownership. Prior research has proven that CEO characteristics are related to a significant extent to the heterogeneity in financial, investment and organizational practices. However, while most of the previous papers are based on the US data the current study intends to test the external validity of those results.

The study will be built on the approach undertaken by Marianne Bertrand and Antoinette Schoar in their research paper “Managing with style: the effect of managers on firm policies”. Following their approach, we intend to construct a CEO-company matched panel data set that will enable us to track down CEO’s employment history across firms. This would make it possible to estimate how much of the unexplained variation in firm practices can be attributed to manager fixed effects, after controlling for firm fixed effects and time-varying firm characteristics.

We hypothesis that CEO characteristics, in the case of Norwegian companies, should matter less for performance and would influence company policies to a lesser degree due to the presence of dominant shareholder and to the specific Norwegian egalitarian business culture in general.

#### **1. INTRODUCTION**

While most former studies are based on US firms (Bertrand and Schoar (2003), Custodio and Metzger (2013), Adams, Almeida and Ferreira (2005)) the current study intends to test the external validity of the prior results, i.e. see if they hold across countries/cultures. In particular, the study will concentrate on Norwegian companies and is intended to determine and quantify the impact of CEO’s gender, age, tenure, education as well as stock ownership on firm’s policies.

The reason why this study will focus on Norwegian companies arises from the fact that, to our knowledge, no such research using Norwegian data has been conducted. At the same time, Norway is known to have a highly egalitarian culture with flat organizational structures where, as a result, CEOs would be less powerful. Moreover, unlike the US, where dispersed ownership structure prevails, the Nordic markets are generally characterized by a high degree of ownership concentration and an environment with strong shareholder rights' protection. According to a study conducted by SIS Ägarservice, approximately two thirds of all listed companies in Norway have at least one shareholder in control of more than 20 % of the votes. Nonetheless, the ownership structure of Norwegian companies is not as concentrated when compared to other European countries (except UK), making Norway an outlier and thus further deepening the interest of our research.

That being said, Nordic corporate governance model allows the shareholder majority to effectively control and take long-term responsibility for the company that they own. Consequently, since major owners take active participation in outlining company behavior, the power of the CEO in the decision-making process is restrained, he or she being forced to act in the best interest of the shareholders. On that account, the extent to which CEOs heterogeneous talents and abilities map into firm performance and corporate policies would be limited. We thus hypothesize that, in our sample, CEO's fixed effects should matter less for a wide range of corporate decisions but more when compared to previous studies based on US firms.

The study will be built on the approach undertaken by Marianne Bertrand and Antoinette Schoar in their research paper "Managing with style: the effect of managers on firm policies". Firstly, we would need to construct a CEO-company matched panel data set that will enable us to track down CEO's employment history across firms. This would make it possible to estimate how much of the unexplained variation in firm practices can be attributed to manager fixed effects, after controlling for firm fixed effects and time-varying firm characteristics.

The specific corporate variables they study relate to investment policy (capital expenditures, investment to Q sensitivity, investment to cash flow sensitivity, and acquisition policy), financial policy (financial leverage, interest coverage, cash holdings, and dividend payouts), organizational strategy (R&D expenditures, advertising expenditures, diversification policy, and cost cutting policy), and performance. The managerial characteristics they look at are birth cohort and MBA graduation. We intend to analyze roughly the same corporate

variables with some variation in the corporate performance measures (look at stock returns, Tobin's Q) to test the robustness of our results. Moreover, we plan on extending the list of CEO characteristics by also looking at the effect of gender, tenure, stock ownership and possibly work experience.

At the same time, we do bear in mind to account for the endogeneity issue that might arise because of the CEO-firm matching, i.e. CEOs might choose those companies that follow the strategy that they prefer or the firm will hire the CEO that will be best suited to optimally implement a chosen strategy, and the choice will be driven by the observable CEO characteristics. That would lead to biased coefficient estimates and will temper with the statistical inference of the significance of our results.

## **2. LITERATURE REVIEW AND THEORETICAL BACKGROUND**

### **2.1. WHY CEOs MATTER?**

A plethora of studies focused on the analysis of corporate practices and their subsequent effect on firm performance implicitly assume the neoclassical view of markets. They argue that economic behavior is postulated by rational choice theory, implying that the agents on the market are rational individuals. Bearing this view in mind, when looking at the decisions taken at the microlevel (i.e. firm level), can be stated that a firm's main strategy is to seek one goal only which is: profit maximization. That being said, given that managers are rational agents of their shareholders it is plausible to assume that two managers will behave similarly in apparently similar economic environments. That, in itself, entails that managers, in particular their personal and demographic traits, do not matter for company's corporate decisions and that industry-, firm-, and market characteristics are enough to explain differences in cross-firm practices.

Nonetheless, research studies show the contrary. They stipulate that even when controlling for industry fixed effects or firm level characteristics (such as market-to-book ratios, the type of assets a firm operates or non-debt tax shields, etc.), a large amount of variation in corporate practices remains unexplained (Bradley, Jarrell, and Kim (1984)). This gives rise to the question: why do managers of firms that share similar technologies, factor and product market conditions engage in different corporate practices? In other words, what drives the heterogeneity in corporate behavior and performance of firms exposed to similar conditions?

An explanation is being put forward by the supporters of behavioral economics. According to economist Richard Thaler who was awarded the Nobel Memorial Prize in Economic Sciences (2017) for his contributions to behavioral economics, people are predictably irrational – in that they consistently behave in ways that defy economic theory . In other words, there are various factors which affect the financial decision making of an individual such as age, gender, occupation, personal financial risk tolerance, etc. (Chavali and Mohan Raj (2016)). Thus, could be argued that managers are not substitutes for one another and their heterogeneous traits, preferences, skills, risk aversion levels or opinions are not redundant when it comes to making decision at the firm level.

This view of individuals not behaving rationally that contradicts the traditional theory of the firm surmises that managers might not necessarily seek the same goal as the firm. Turning to standard agency models, managers are thought of being those individuals who have discretion inside their firm, which they can use to alter corporate decisions and advance their own objectives (Bertrand and Schoar (2003)). These models put forward the idea that heterogeneity in firm's ability to control managers gives the latter the opportunity to behave in a more opportunistic way and pursue their own preferences and, consequently, impose their idiosyncratic style on the firm they lead.

On the basis of what was stated above, it is reasonable to assume that manager effects are significant when it comes to corporate decisions. To investigate the impact of CEO characteristics in Norwegian companies, we will start with a comprehensive literature review to figure out what are the most likely effects of different CEO characteristics on firm policies. In their article on the impact of board of directors on corporate financial performance, Zahra and Pearce (1989) remark that CEOs have considerable power within the organization and that even the board input is thought to be valued only if it is compatible with CEO objectives, preferences, and style, thus stressing the importance of CEOs on firm corporate behavior overall.

Following Kesner and Sebor, (1994) selecting the CEO is a key organizational decision, which has important implications for firm effectiveness. It is crucial for the near future of the company to succeed in finding a good 'fit' between the characteristics of the company and the individual who will fulfil the CEO position. In their study, Pfeffer and Salancik (1978) came to the conclusion that most firms under all conditions strive to recruit and hire CEOs with backgrounds and skills fitting the company's needs. Consequently, prior research implies that CEOs have specific characteristics that matter for corporate practices and performance.

Bertrand and Schoar (2003) hypothesized that differences in CEOs' managing style are driven by some specific personal characteristics and that these fixed effects matter for corporate decisions such as investment, financial policy, organizational structure and corporate performance. The characteristics they chose to look at were birth cohort and MBA graduation. The data they analyzed has shown that managers from earlier birth cohorts appear on average to be more conservative



and that managers who hold an MBA degree seem to follow on average more aggressive strategies, etc.

The results presented by Bertrand and Schoar (2003) allow for two alternative interpretations: (1) CEOs impose their idiosyncratic styles on companies, and (2) boards choose CEOs because of their attributes, in case firms' optimal strategies change over time. Both of the two interpretations support the hypotheses that CEOs have specific traits that further translate into company policies and, thus, account for the variation in company performance.

On that account, the next question that emerges is what are those managerial characteristics and abilities that matter? Different studies sought to answer this question by looking at different CEO attributes: work experience (Custódio and Metzger (2013)), overconfidence (Malmendier and Tate (2005)), age and education (Bertrand and Schoar (2003)), ownership, tenure and optimism (Ben Mohamed, Souissi, Baccar, and Bouri (2014), Barker III and Mueller (2002)), gender (Barber and Odean (2001), Faccio, Marchica, and Mura (2016)), etc.

## **2.2. CEO's AGE**

There are various researchers who investigated the impact of CEO's age on the financial implications of the firm. As postulated above, according to Bertrand and Schoar (2003), CEOs from earlier birth cohorts (i.e. older generation executives) appear to be less aggressive, on average, and their strategies are founded on lower capital expenditures levels, higher interest rate coverages, higher levels of cash holdings and lower financial leverage. This can be explained by the willingness of CEOs to maintain a legacy of success and hence the avoidance of those strategic choices that might dampen down firm performance in the short run and taint their reputation in the last years of employment (Matta and Beamish (2008)).

Furthermore, Hambrick and Mason (1984) argued that older CEOs are less likely to bring up new ideas, because they are more conservative. They feel comfortable in the way they are currently leading the company and are unlikely to change their style even under pressuring circumstances. Their higher degree of risk aversion and reluctance to new ideas can be attributed, to a greater extent, to their few years left until retirement. Chown (1960) also supports the idea that the lack of change is due to the fact that they are less able to come up with new ideas.

Next, Child (1974) stated that executive youth is associated with economic growth. However, older executives have more experience in seeking and evaluating

new market information. They take more time to make decisions as they incorporate prior knowledge into their decision-making process. MacCrimmon and Wehrung (1986) argued that risk aversion increases with executives' age. Young optimism will fade away and they prefer secured profits over risky more profitable projects. To corroborate that view comes the study of Barker III and Mueller (2002) where they advocate that older CEOs invest less in R&D projects because of the respective projects' higher risk and longer-term payoff that the older CEO might not get to personally benefit from.

### **2.3. CEO's TENURE**

The impact of tenure is more unclear and uncertain than the impact of age. Some studies suggest a positive relationship while other results point to a negative one. According to Ben Mohamed et al. (2014), short tenure provides an incentive to managers to opt for short-term outcome strategies to build up their reputation, while long-tenured CEOs can lose touch with the organizational environment. The latter view is also shared by Miller (1991) who argues that strategies and structures of firms may deviate from the requirements of the environment the more years the CEO holds the respective position within the company. A logical supporting explanation is the consequent entrenchment of CEOs. Holding the managerial position for too long, CEOs adapt to the environment they are placed in and become more resilient to external pressures regarding changes in corporate strategy and structure. Longer stay converges to greater power, more established personal connections, instill overconfidence and over-optimism, all of which incite irrational behavior, such as investing in negative NPV projects, excessive exploitation of firm's internal funds, etc. Furthermore, it allows managers to harmonize and homogenize the board by recruiting and promoting those who share views similar to their own thus weakening even further the control that might be exerted over them. At the same time, CEOs' policies are less volatile as their tenure increases, since they are more strongly committed to implementing their own paradigm to how the organization should be run (Barker III and Mueller (2002)).

Adams, Almeida, and Ferreira (2005) also argued that CEOs with higher tenure normally gain higher power within the firm. More power on the one hand leads to better stock performance, but on the other hand also to higher volatility. This means that CEOs with a higher tenure prefer higher returns to more secured projects. Furthermore, Adams et al. (2005) tested the impact of CEO power on the

variance of firm performance. Results confirm that the variance of firm performance is higher when CEO has higher power. Thus, CEO who experience higher power do affect the decision-making process and strategic decisions within a firm.

On the other hand, Alutto and Hrebiniak (1975) derived a positive relationship between longer-tenured CEOs and commitment towards their results. Higher commitment led to higher incentives to perform well. Contradicting is the paper of Miller (1991). This paper, as pointed above, argued that CEO's strategies are less likely to change if the tenure increases. They prefer stability and efficiency over inconsistency. This can either be the result of the fact that the CEO is convinced about their own strategy or the fact that interests in firm environment is lost and they stopped reinventing.

#### **2.4. CEO's GENDER**

The papers of Smith, Smith, and Verner (2006) and Carter, Simkins, and Simpson (2003) both found a positive relationship between gender diversity and firm performance. Consequently, CEO gender is another important variable that induces divergences in corporate strategic decision-making. These differences are built on the premise that men are more overconfident when it comes to financial and investment decisions. Consequently, theory predicts that men will trade more excessively than women (Barber and Odean (2001)). The reason behind it is that individuals who exhibit overconfidence traits, overvalue their abilities to generate returns, their knowledge and future prospects and thus will engage in more trading behavior compared to the rational investor. The gender driven heterogeneity aligned with the theory of overconfident investors also implies that men are more confident that their investment will result in profit, regardless the level of knowledge they have on their investment opportunity. This might make them more likely to engage in suboptimal investment behavior such as overinvesting when they have abundant internal funds and curtail investment when they require external financing (Malmendier and Tate (2005)).

At the same time, women are proven to exhibit a lower propensity to risk-taking behavior which, as Faccio et al. (2016) document, will lead to the avoidance of riskier investment and financing opportunities. In other words, women are more risk averse than men (Weber, Blais & Betz, 2002). Hence, firms run by female CEOs will likely take less risky corporate choices, experience less volatile outcomes

(earnings), will have lower leverage and a higher chance of survival which might come at the expense of capital allocation inefficiencies (Faccio et al. (2016)).

## **2.5. CEO's EDUCATION AND WORK EXPERIENCE**

Research studies also advocate the prevalent importance of CEOs education and work experience's correlation and potential impact on corporate practices. Bertrand and Schoar (2003) find that managers who hold an MBA degree seem to follow, on average, more aggressive strategies. This view is also shared by Custódio and Metzger (2013) who study the link between CEO's financial expertise and firm's financial policies and performance. They find that financial expert CEOs tend to hold less cash, have higher leverage ratios, engage in more share repurchases, have a higher propensity to pay money to shareholders. At the same time firms lead by CEOs with significant financial background exhibit more retained earnings, are characterized by lower levels of R&D expenses and investments in innovation projects. The later finding is also posited by Barker III and Mueller (2002) who argue that CEOs with experience in throughput functions (i.e. accounting, finance, production, law, etc) perceive R&D spending as a discretionary expense subject to efficiency concerns.

In addition to that, Malmendier and Tate (2005) show that firms with CEOs with financial education or employment experience tend to have lower investment-cash flow sensitivity compared to those with engineering (scientific) background. That is because these managers have a good understanding in terms of financial literature, investment strategies, and implications of financing strategies which reduce the probability of an irrational decision-making behavior.

## **2.6. CEO's OWNERSHIP**

Another factor that correlates to how managers get involved in the strategic decision-making process is the stake that they own in the company, i.e. ownership that drives the risk-taking incentives of the manager. Barker III and Mueller (2002) test and provide support to the hypothesis that a firm's R&D spending is positively associated to the extent of its CEO's stock ownership. This is due to R&D being rather risky expenses and which payoff in the long run. Therefore, a bigger stake in the company will increase their propensity to riskier investments because they are rewarded by capital markets. Consequently, in accordance with agency theory, the greater the ownership percentage, the higher the at-risk wealth of the manager and

thus the willingness to have more long-term oriented view which encourages both R&D spending and investment. Furthermore, CEO ownership is negatively associated with investment – cash flow sensitivity (Ben Mohamed et al. (2014)) since a higher stake in the company is expected to boost cooperation and align the management’s focus with that of the shareholders.

Prior research on CEO characteristics has proven that CEO age, tenure, gender and education are related, to a significant extent, to the heterogeneity in financial, investment practices and performance. However, while most former studies are based on the US data (Bertrand and Schoar (2003), Custodio and Metzger (2013), Adams, Almeida and Ferreira (2005)) the current study intends to test the external validity of the prior results. We are convinced that it will be beneficial to do further research on these topics across countries and cultures, due to the plentitude and availability of data that is yet to be investigated. However, not all CEO characteristics can be studied as easy as CEOs’ age, tenure and gender. Therefore, the most accessible CEO characteristics will be used for the current study. In particular, the study will concentrate on Norwegian companies and is intended to determine and quantify the impact of CEO’s gender, age, tenure, education as well as stock ownership on firm’s policies.

## **2.7. RESEARCH QUESTION AND HYPOTHESES**

It is important to point out that the study does not seek to prove that some CEO-specific characteristics are better than others, but rather to show that the fact that managers don’t act entirely rational combined with them being different in terms of their preferences, opinions, traits and abilities, correlate to and potentially impact the corporate practices of the firm they manage. Accordingly, the research question the study aims to answer is: Do CEO-specific characteristics affect firm’s policies and to what extent?

Following the above arguments and various research studies (Papadakis and Barwise (2002), De Vries and Miller (1986)), should be highlighted that the magnitude of the CEOs’ traits and abilities that maps into corporate decisions is conditioned on the level of discretion they possess which is thought of being a function of firm’s ownership concentration, organizational and environment regulation, etc. Thereafter, De Vries and Miller (1986) hypothesis that the more centralized the organization the more powerful the CEO, the greater the impact of his/her traits. Papadakis and Barwise (2002) share that view and argue that CEO

characteristics are significantly and positively related to the degree of hierarchical decentralization. In his paper, Bøhren (2000) looks at the ownership structure of Norwegian companies and finds that the latter have a rather flat power structure. The largest investor holds, on average and quite stable over time, 28% of outstanding equity per firm entailing that the largest owner has insufficient power on his/her own to influence the management.

That would lead us to hypothesize that CEO characteristics, in Norwegian companies would have a pronounced impact on firm's policies. On the other hand, the coalition of the three largest owners amount to a cumulative equity holding of 47% (Bøhren (2000)) that translates into a majority and implies that the concerted actions of the group of largest owners in Norwegian firms is the key to effective CEO monitoring. That leads to the hypothesis that, controlling for ownership concentration under the assumption of a joint effort of shareholders, CEO characteristics link to and impact on Norwegian firms' policies is limited.

At the same time, we also hypothesis that the correlation and effect of CEO traits would be more pronounced in our sample when comparing to other studies that focus on US traded companies. The reason is that the latter exhibit a decentralized ownership structure, where only about 2% have a majority shareholder and the holding of the largest shareholder is less than 10%, while the one of the five largest owners - below 30% . Supporting this latter hypothesis is the fact that the institutional framework for corporate governance in Norway provides a relatively high protection of shareholder rights. In other words, the Norwegian regulatory environment ensures that both stockholders as a group and small stockholders as a subgroup can effectively exert their ownership rights which reduces managerial discretion within firms.

### 3. METHODOLOGY

Our paper will closely follow the methodology outlined in Bertrand and Schoar (2003) study “Managing with style: the effect of managers on firm policies” with a focus on CEO fixed effects. We will look at listed and non-listed Norwegian companies, the relevant data being gathered from the Center for Corporate Governance Research. We attempt to construct a manager-firm matched panel data set to be able to track the same top managers across different firms over time. The reason for analyzing the movement of CEOs from one company to another lies in our attempt to properly track CEO’s style and quantify how much of the observed variation is attributed to CEO characteristics. Moreover, this will help avoid the problem of manager and firm fixed effects being perfectly collinear which might happen if the respective CEO stays and grows with the same company.

Similar to Bertrand and Schoar (2003) we plan to restrict our sample to those firms that have a CEO observed in at least one other firm. We believe that to be a reasonable filter and plausible approach to follow given the limited pool of “good” candidates on the market, thus their interchangeable movement from one company to another. At the same time, we intend to also filter based on the number of years that the CEO has held the position in all the companies he managed (at least 2-3 years) so that his traits and “style” had enough time to become an integrated component of firm’s practices.

For this paper we intend to use a quantitative approach and run a set of regressions and statistical tests to test the validity of our hypotheses and the significance of our results. Following Bertrand and Schoar (2003) we intend to analyze how CEO fixed effects relate to a firm’s investment policy, financial policy, organizational strategy and performance. We plan to study the following corporate variables chosen to represent the most the aforementioned policies:

- a) Investment policy: capital expenditures, investment to Q sensitivity, investment to cash flow sensitivity;
- b) Financial policy: financial leverage, interest coverage, cash holdings, dividend payouts;
- c) Organizational strategy: R&D expenditures;
- d) Corporate performance: ROA, Tobin’s Q and possibly stock returns.

While the authors focus only on 2 CEO traits, i.e. birth cohort and education (MBA graduation) we want to also look at the importance of a broader range of demographic variables including tenure, gender and, if possible, work experience.

Hence, we plan to run several regressions with different specifications that are yet to be established but that would follow the setup of Bertrand and Schoar (2003). Thus, we propose to estimate the following regression model:

$$y_{ijt} = \beta X_{it} + \delta \text{Education}_j + \mu \text{Age}_j + \lambda \text{Tenure}_j + \gamma \text{Gender}_j + \eta \text{Experience}_j + \alpha_i + \varepsilon_{ijt}.$$

Where:  $y_{ijt}$  is the dependent variable represented by the corporate variables specified above (except investment to Q and cash flow sensitivity);

$i, j,$  and  $t$  index respectively firms, CEOs and time;

$X_{it}$  is the vector of controls (firm characteristics)

$\text{Age}_j$  is the age (in years) of CEO  $j$ ;

$\text{Tenure}_j$  is the number of years CEO  $j$  has been in office;

$\text{Gender}_j$  is a dummy variable =1 if CEO  $j$  is a woman and 0 if a man;

$\alpha_i$  are firm fixed effects;

$\text{Education}_j$  and  $\text{Experience}_j$  can be split into several dummy variables corresponding to the relevant educational background of the CEOs

$\varepsilon_{ijt}$  is the error term.

Again, following Bertrand and Schoar (2003) methodology, to study the effect of CEO characteristics on investment to cash and investment to Q sensitivities, at this moment, the empirical specification we intend to use is:

$$I_{ijt} = \beta X_{it} + \delta_1 \text{Education}_j + \delta_1 \text{Education}_j * \text{CFit}_{Ki(t-1)} + \delta_2 \text{Education}_j * \text{Qi}(t-1) + \mu_1 \text{Age}_j + \mu_2 \text{Age}_j * \text{CFit}_{Ki(t-1)} + \mu_3 \text{Age}_j * \text{Qi}(t-1) + \lambda^{-1} \text{Tenure}_j + \lambda_2 \text{Tenure}_j * \text{CFit}_{Ki(t-1)} + \lambda_3 \text{Tenure}_j * \text{Qi}(t-1) + \gamma_1 \text{Gender}_j + \gamma_2 \text{Gender}_j * \text{CFit}_{Ki(t-1)} + \gamma_3 \text{Gender}_j * \text{Qi}(t-1) + \eta_1 \text{Experience}_j + \eta_1 \text{Experience}_j * \text{CFit}_{Ki(t-1)} + \eta_1 \text{Experience}_j * \text{Qi}(t-1) + \alpha_{i1} * \text{CFit}_{Ki(t-1)} + \alpha_{i2} * \text{Qi}(t-1) + \varepsilon_{ijt}.$$

Where:  $\alpha_{i1} * \text{CFit}_{Ki(t-1)}$  is a vector of interactions between firm fixed effects and cash flow;

$\alpha_{i2} * \text{Qi}(t-1)$  is a vector of interactions between firm fixed effects and lagged Tobin's Q.

In order to disentangle and quantify the existence and possibly infer a subsequent impact of CEO fixed effects on corporate practices it is important to control for all relevant firm-level characteristics. For example, Papadakis and Barwise (2002) find that the size of the firm is negatively related to the CEO's



ability to influence the decision-making process because of the more decentralized and formal nature of this process in larger firms compared to smaller ones. This entails that CEO's power is reduced in large organizations and the extent to which their characteristics relate to corporate practices is limited. Thus, we plan to control for: lagged Tobin' Q, cash flow, size, ROA, ownership. Nonetheless, persistent heterogeneity in firm's policies is also driven by some unobservable characteristics, some third factors that might be correlated with manager fixed effects. This leads us to try and control for firm fixed effects to separate them from manager fixed effects, the presence of which we seek to establish. The use of firm-fixed effects will also help tackle the endogeneity issue that will be discussed later.

We hypothesize that, similar to Bertrand and Schoar (2003), including CEO fixed effects, while controlling for observable and unobservable firm characteristics will increase the adjusted R<sup>2</sup> of the estimated models thus proving the correlation between CEO-specific idiosyncratic traits and firm's policies. Inferring a causation between the two might be a more of a difficult task because of the inherent endogeneity issue related to CEO-firm matching that has been present in many other relevant studies as well (Malmendier and Tate (2005), Custódio and Metzger (2013), Kaplan, Klebanov, and Sorensen (2012)). Here, endogeneity might be driven by simultaneity or reverse causality. More precisely, CEO picking is not random, meaning that they are being chosen by the firms because of their observable characteristics so that they best match the view of the organization. In this case it is hard to disencumber whether CEO style or traits affect corporate decisions or whether the policies already embedded in the firm's strategy determines the selection of that particular manager.

Hence, to try and mitigate the endogeneity concern and to be able to derive an accurate statistical inference from our data (i.e. make sure our estimated coefficients are unbiased), we intend to use in our OLS regressions control variables as well as firm fixed effect. Moreover, we plan to use clustered robust standard errors. Default standard errors can greatly overstate estimator precision. In other words, failure to control for within-cluster error correlation leads to misleadingly small standard errors which, in turn, determine narrow confidence intervals, high t-statistics and low p-values. That increases the probability of "false positives" (type I error), i.e. rejecting the null hypothesis when it is, in fact, true. As such, since we plan to use firm fixed effects to control for the unobserved variation of firm-specific traits, we plan to use errors clustered at the firm level.

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