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CEO Characteristics and Compensation in Fortune 100 Companies

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CEO CHARACTERISTICS AND COMPENSATION IN FORTUNE 100 COMPANIES

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DEDICATION

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CEO CHARACTERISTICS AND COMPENSATION IN FORTUNE 100 COMPANIES

Adam C. Carroll

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The existing literature on CEO compensation places heavy emphasis on the interrelationships between educational background and personal experiences of a CEO and how it affects a firm's performance and, in-turn, how the firm's performance impacts the CEO compensation. However, there is sparse research on the direct impact that socio-demographic factors and other variables have on CEO compensation. This dissertation's aim is to identify if socio-demographic factors play a role in how a firm compensates its CEOs by using information gathered from the CEOs of the top Fortune 100 companies.

Given the non-random and limited sample, the primary research methods in this dissertation are a detailed literature review followed by descriptive analysis of the variables of interest such as the salary, bonus stock, and total compensation given to CEOs in the Fortune 100 firms from the year 2020. The socio-demographic characteristics such as gender, age, race, experience in the field, educational attainment, educational institution, and whether the individual was a founder of the company were gathered individually using various resources, since this datum is not easily available in annual reports of all firms. The other independent control variables such as market value of firm in billions, industry sector to which the firm belongs, and whether the firm is a public company or not were also included in the analyses.

The primary finding of the dissertation was that the trends in the compensation variables for CEOs of the Top Fortune 100 firms are consistent, for the most part, with what the literature suggests. Given the small and non-random sample, making large-scale conclusions regarding how all CEOs are compensated would be erroneous. However, one of the most important findings of the analysis is that neither gender nor race play a significant role in the way CEOs are compensated (there is no discrimination). CEOs attending private universities for their highest degree and CEOs that work for consumer product industries tend to have higher compensations than their counterparts.

While the study includes linear regressions more as a theoretical construct due to the sample limitations, they do indicate a weak level of causality between some socio-demographic background variables and the compensations of the CEOs. If this type of individual datum was collected on larger samples of CEOs and randomized, one can expect a more generalizable result, but this type of datum collection can be costly in terms of time and resources. The author concludes that there appears to be some relationship between certain achievement-based socio-demographic variables and the compensation packages which needs to be analyzed further.

TABLE OF CONTENTS

TABLE OF CONTENTS—Continued

TABLE OF CONTENTS—Continued

LIST OF TABLES

CEO Compensation

Background of the Problem

The Chief Executive Officer (CEO) is one of the most recognized faces in a firm and is expected to demonstrate competence and resilience to internal and external shareholders. A CEO influences a firm's values and norms, formulates, and decides upon a firm's strategy, and serves as a key representative and the public face of the firm to external constituencies (Gomulya et al., 2017).

The CEO is the leader of a firm and should demonstrate vision, inspiration, financial acumen, entrepreneurship, trustworthiness, and other core values. Hambrick and Quigley (2014) found that CEO leadership matters to a firm and accounts for a 20% variance in profitability. According to Jack Welch, famed former CEO of General Electric, "genuine leadership comes from the quality of your vision and your ability to spark others to extraordinary performances" (McGrath, 2016, para 2). These traits are essential for people to trust and rely on your word (McGrath, 2016).

Leadership is the ability to turn ideas into actions. Characterized by altruism, perseverance, focus, confidence, and determination; people with these traits become our greatest leaders and make significant managerial decisions today (Moore & Prabhu, 2018). A majority of the successful CEOs today exemplify these qualities and lead some of the greatest companies on earth such as Amazon, Berkshire Hathaway, and Apple. According to CEO data of 1,631 private firms from 2018 to 2019, there is a wide disparity between the compensation of one CEO over the compensation of another (Cooper, 2019). The median salary/bonus was $321,022 with 25% making $190,000 and 75% making $550,000. It seems that these leadership qualities are a

prerequisite of a CEO so there must be other alternatives as to why there is such disparity in CEO compensation.

Corporate boards and compensation committees around the country are tasked to decide upon how much these values and tenets are worth in deciding on the CEO compensation package. The board must create a compensation package that aligns both the goals of the CEO and the goals of the firm. The usual compensation package includes many factors such as salary, stock options, bonuses, and other non-pecuniary compensations such as the use of the firm's private jets or luxury company-owned corporate retreats (White, 2012). However, the methods and qualifications used in designing such a compensation package are abstruse due to the intricacies involved in balancing the science and art of identifying the right amount to be paid using the right vehicles (Hellerman, 2019). Identifying the right mix of pay is key to providing the right amount of incentive and inducing maximum results. The disparity in compensation between CEOs at large firms around the country is confounding. Most of the literature on CEO compensation discuss how a CEO's background like age, education, and career experiences affects firm performance and how firm performance affects a CEO's compensation; there is little to no research on how a CEO's background affects CEO compensation, specifically socio-demographic background.

Statement of the Problem

CEO compensation is exorbitant and historically, the vast majority have been two demographics: white and male (Zweigenhaft & Dana, 2020). Although many theories expound upon the various contributors towards CEO compensation, it is important to determine which factors determine CEO compensation. This study needs to be conducted to see if there is socio-demographic bias in CEO salary, bonus, and total compensation. The purpose of this study is to

analyze the factors that most widely contribute to higher salary and compensation and determine if a disparity gap exists.

Research on the determining factors of CEO compensation does not indicate any unanimity or agreement regarding which factors matter. Some of the key factors that have been considered in existing research are CEO background and experience, firm performance, firm size, the gender-wage, gender-hiring gap, CEO education, and the board of directors. However, socio-demographic background may be an underlying key missing variable that has not been addressed in previous research. It has been observed in leadership literature, especially within the Upper Echelon Theory introduced by Hambrick and Mason (1984) that executives' experiences, values, and personality influence their decision-making choices. Therefore, it comes as no surprise that a CEO's background, education, and experiences affect their decision-making and will ultimately affect firm performance.

In examining if there is a relationship between firm performance and CEO compensation, the evidence is incongruous. While there are times there seems to be a correlation between the two factors in literature (Barnhart et al., 2000; Campbell & Weese, 2017; Hall & Liebman, 1998), there are also instances when these factors do not align. For instance, CEO compensation does not always line up with stockholder return as there are numerous instances where the opposite holds true as the CEO made an exorbitant amount of compensation while the firm had miserable earnings (DeCarlo, 2005). The structure and size of the board of directors affects CEO compensation positive and negatively (Matiur & Mustafa, 2018; Moriarty, 2005; Zorn et al., 2017). In addition, firm size seems to account for more variance in CEO pay than firm performance (Tosi et al., 2000). Research on the determining factors of CEO compensation have found elements such as gender disparity which has plagued firms for many years and has

contributed towards the wage-gap of CEOs (Artz & Taengnoi, 2019). Studies have found that female CEOs made 22% less than their male CEO counterparts with similar education and experience (Song et al., 2019). According to Lublin (2017), women must show more successes and more proven results in their career to get promoted to CEO than their male counterpart. However, it appears the trend may be changing as studies have shown that gender-pay disparity has decreased to the lowest point in decades as women's employment and education levels have increased (England et al., 2020). Even so, women are largely underrepresented in CEO leadership roles and the gender hiring disparity of female CEOs in large *Fortune 500* firms is astounding (Dwivedi et al., 2018). Furthermore, an analysis of educational background has found that firms run by CEOs with Ivy-League education had a greater chance of being associated with firms with high market valuation as opposed to those without Ivy- League education (Miller et al., 2015). Saidu (2019) also found that CEO education improves profitability and innovation of a firm. However, there needs to be more in-depth research on which types of degrees are contributing or underlying factors and there is uncertainty as to whether education effects CEO compensation (O'Brien et al., 2010) or not (Camuffo et al., 2009).

A CEO's ability to be mobile and maneuver between firms has also shown to affect compensation. General management skills such as setting a vision, motivating employees, organizing, budgeting, and monitoring performances are skills that transfer well to any firm (Groysberg et al., 2006; McGrath, 2016). Therefore, further research needs to be done that examines if the socio-demographic background of a CEO affects their compensation and could explain the disparity in various firms. To study the impact of socio-demographic background on compensation, this study obtained CEO data from the top Fortune 100 firms in the United States. One of the main reasons to limit the study to only the top 100 firms is to control for the impact of

a firm's success on the CEO compensation variables to some extent. Moreover, since the top 100 firms are determined based on firm characteristics such as total revenues for their respective fiscal years, selecting the sample for this study allows us to remove any external noise that may or may not be directly measurable.

The independent socio-demographic factors considered in this study are gender, age, ethnicity, and level of education, whether the type of university attended by the CEO was private or public, the sector of the firm, total years of experience in the sector, and whether the current CEO or their immediate family founded the business. The control variables considered are the market value of the company, the sector type, and if the company is public or not. The three dependent variables are CEO salary, bonus, and total compensation because of the wide disparity between their values based on the datum collected. Its market value ($M) is also included to measure firm performance in relation to other firms.

Significance of the Study

The results of the study will provide information regarding which characteristics are associated with CEO salary, bonus, and total compensation in the top Fortune 100 companies. These results could help to highlight socio-demographic biases and reduce potential disparities in current practices and pave the pathway for a more diversified and inclusive future. If the these factors are identified to be significant in the top 100, they can determine how companies in general might be making decisions on CEO compensations.

Research Question/Hypothesis

Since the purpose of this study is to focus on the impact of socio-demographic and other characteristics of a CEO on their compensations, the hypotheses that are being tested are as follows:

Null Hypothesis: There is not a statistically significant relationship between socio-demographic characteristics of a CEO and the CEO salary, bonus, and total compensation offered to them. The impact of socio-demographic factors and other CEO characteristics on CEO salary, bonus, and total compensation is not both numerically and statistically significant.

Hypothesis: There is a statistically significant relationship between socio-demographic characteristics of a CEO and the CEO salary, bonus, and total compensation offered to them. The impact of socio-demographic factors and other CEO characteristics on CEO salary, bonus, and total compensation is both numerically and statistically significant.

There will be a thorough review of the existing literature, with primary focus on the factors that influence and do not influence CEO salary, bonus, and total compensation. In addition, the dataset and the quantitative model will be discussed before offering the data analysis and conclusions on which factors affect CEO salary, bonus, and total compensation in the Fortune 100 companies at the current time.

Limitations/Delimitations

Limitations are factors that are beyond control and may influence their findings and conclusions. Delimitations are boundaries that are intentionally placed to manage the extent of the research. One limitation of this research is that the sample consists of only the top 100 out of the *Fortune 500* companies in the list. Since the datum had to be manually collected for each CEO and the relevant individual characteristics, the decision to include only the top 100 firms was made to keep the data manageable.

Another limitation of this research is the non-random nature of the data. These data were specifically chosen because the set represented the top tier companies and CEOs in the United

States. This is also a delimitation as Fortune 100 companies and CEOs were chosen because it represented the top 100 companies and CEOs in the United States.

Definition of Terms

Chief Executive Officer. A CEO is the highest-ranking executive in a firm, whose primary responsibilities include making major corporate decisions, managing the overall operations and resources of a firm, acting as the main point of communication between the board of directors (the board) and corporate operations and being the public face of the firm. A CEO is elected by the board and its shareholders.

Fortune 100. A list of the top 100 companies in the United States. It is a subset of the Fortune 500, a list of the 500 largest U.S. public and privately held companies published by Fortune magazine. Fortune creates the list by ranking public and private companies based on annual revenue figures.

Socio-Demographic. A combination of social and demographic factors (age, gender, ethnicity, education level, income, years' experience, etc.).

Data Collection

The quantitative data was collected manually using the internet to search firm profile websites for the CEO's biographies to gather information such as age, gender, ethnicity, and level of education for the year 2020. If a firm did not provide sufficient information on each of these variables, then a more detailed investigation took place to gather any missing data through multiple sources. Once one piece of information was gathered then it built upon itself in gathering the next missing piece of information; for example, Tim Cook of the firm Apple graduated with an MBA from Duke University so the education variable could be filled in as Master and the type of institution could be filled in as private as well.

Sector types were gathered manually as well using stock trading software and websites to verify which sector type each firm could be labeled. Various sources were used to verify each firm was correctly associated with its sector type. In addition, the same methods were used to verify if the CEO of a firm was the founder or a member of the founding family. This was verified through various internet sources. A few were easy to verify such as Jeff Bezos of Amazon, Mark Zuckerberg of Facebook, Michael Dell of Dell Technologies, and Larry Page of Alphabet (Google). However, a few were much tougher to ascertain such as Frederick Smith of FedEx, Kelcy Warren of Energy Transfer, Brian Roberts of Comcast, and Richard Fairbank of Capital One Financial. Salary, bonus, and total compensation sources were manually gathered as well using various internet sources such as 10-K, Proxy statements, Salary.com, Money Inc., and Wallmine.com.

Summary

This dissertation is organized using a five-chapter dissertation structure. The primary purpose is to examine which factors contribute towards CEO compensation in the top Fortune 100 companies. This chapter provided an overview of the background, the problem, and its significance as it related to which factors contribute the most towards CEO compensation.

Chapter two presents a thorough literature review that discusses main factors such as background and experiences, firm performance, firm size, the gender wage gap, education credentials, CEO mobility, and board of directors that typically are recognized as contributors to the compensation structure for CEOs.

Chapter three discusses the data collection process, sources of obtained data, and the quantitative methodology of analysis used to test the hypothesis. It discusses the primary characteristics of the collected data on top Fortune 100 companies by using various types of

descriptive statistics and present a simple Ordinary Least Squares (OLS) regression models, which will be used to identify which socio-demographic and other select factors are significant contributors to CEO compensations in those companies.

Chapter four presents the results of the analyses conducted using STATA based on the descriptive and analytical models presented in the previous chapter. Discussion regarding the limitations and delimitations of obtained results will also be a part of chapter four. The dissertation culminates into chapter five, which contains the summary and conclusions of the research findings regarding which factors affect CEO compensation the most in the top 100 *Fortune* firms and implications of these findings for future CEOs and other firms.

Literature Review

This chapter focuses on the documented literature relevant to this dissertation discussing the main factors that are usually considered to be determinants of CEO compensation. However, it is important to initially examine the function and roles of a CEO to properly understand the many nuances involved in establishing a CEOs compensation. Thereafter, to begin their exploration of the literature by first discussing how a CEO's background and experience, the components of Upper Echelon Theory, play a significant role in a company's performance. The next section examines how a firm's performance impacts CEO compensation and how incentives factor into that success. The following section examines the hypothesis that firm size is directly related to CEO compensation. Thereafter, it analyzes studies that focus on the gender-wage gap at the CEO level and demonstrate how it is an ongoing concern in many industries.

The section also examines educational credentials of the CEO to determine whether they impact on the total compensation offered to a CEO and whether a degree from a public or private institution matters to the final compensation. Next, the literature on the mobility of a CEO between industries is addressed to see whether "job hopping" impacts a CEO's level of compensation. Finally, the role of the Board of Directors is discussed and has found to play a significant part in CEO compensation.

Function and Roles of the CEO

A CEO has many functions, roles, and demands within a firm. A successful CEO is expected to maneuver between various duties and identities to navigate the numerous functions of a leader and must do them all simultaneously according to the multiple identities' framework based on a study by Meeks (2015). This study used a ground theory methodology approach by interviewing 12 CEO executives on their duties and responsibilities and concluded their duties

were unimaginably broad and are “fragmented, disparate, and chaotic”. The Meeks (2015) study found that a CEO must focus externally and internally for threats while leading the firm with a vision of success and these job demands affect the strategic decisions made on a frequent basis. Using meta-analysis of previous studies, Hambrick et al. (2005) found that CEO job demands derive from task challenges, performance challenges, and executive aspirations.

Analysts are constantly analyzing financial performances and comparing them to other competitors, which increases the CEOs vulnerability to being terminated, which gives rise to increases pressure and demands (Flavelle, 2013; Zhang and Gimeno, 2016;). These pressures affect CEO behavior and decisions. Glick (2011) examined the roles associated with a CEO in recent years and found they spend most of their time on strategic duties such as data analysis and research to guide their decision making and less time on interpersonal duties such as leadership, motivating others, decisional duties, and operational duties. Glick (2011) used convenience sampling using email and paper surveys of 127 CEOs and an additional population of CEOs that were purchased from a database. Glick (2011) found that 94% of the responses indicate a strong agreement that the CEO is the “vision setter” of the organization and should spend most of their time in that strategic role.

Research on CEO duties has focused on how job demands affect mental stress and health issues and that these manifest when CEOs have lack of control. Finkelstein and Boyd (1998) found a firm’s performance is directly linked to a CEO’s freedom to make decisions. As a result, CEO compensation is expected to be higher as firm performance and decision-making freedom increases. Finkelstein and Boyd (1998) used a cross-sectional random sample of 600 firms from the Fortune 100 and found a strong positive relationship between CEO discretion and compensation in firms with high performance.

After a series of discussions with numerous CEOs, Hsieh and Bear (1994) found that a CEO should focus on what direction to take the firm. It is essential to have clear goals of where you want to end up to not waste time and goodwill on reversing earlier decisions. A CEO must understand how all the pieces fit together within a firm and get a clear lay of the land by communicating with people inside and outside the firm. He must also understand the expectations that placed upon the CEO and be realistic if they need to be changed if they are not reasonable. Instead of making everything a priority, focusing on just a few reachable goals at a time creates a clear roadmap to move with purpose and focus.

Understanding the culture and insider mantra is an essential duty for any CEO. Karaevli (2007) found that a firm that hires an "outsider" CEO often results in disaster because of internal conflicts and unwillingness to change by employees. While an outsider CEO brings fresh perspectives and skills to lead a firm in growth, it often results in pushback from employees that leads to low firm performance. It is crucial for the outsider CEO to spend a considerable amount of time getting familiar with the culture and way of doing things before initiating any substantial changes. Karaevli (2007) used OLS hierarchical regression on the 90-firm sample to test the hypotheses and found that a new "outsider" CEO is positively associated with post-succession firm performance when pre-succession firm performance is low. However, swift strategic changes must be slow to reduce any resistance from employees.

This is further proven by Schepker at al. (2017) that long-term performance is affected by inside vs outside CEO origin. Inside CEOs were more likely to be successful long-term due to their propensity not to make drastic and sudden changes to disrupt the culture. However, outside CEOs are more likely to make sudden changes which leads to lower long-term firm performance. Schepker at al. (2017) used meta-analysis of different studies related to CEO succession,

strategic change, and performance to gather a comprehensive understanding of the topic. Random sampling of 339 studies was used to decide upon 60 samples that fit specific criteria and found that “inside and outside” CEOs both had their advantages. While the “insider” CEO had positive relationship with short and long-term performance, an “outsider” CEO enables a firm to break away from established practices and take more risks.

Stakeholder strategy also plays a key part in the actions the CEO uses to connect and engage with shareholders to build consensus and value. How a CEO views their role and duties affect how they prioritize shareholder’s interests. Gamache at al. (2020) founded the regulatory focus theory which states people are motivated by two independent, self-regulatory systems: the prevention focus, and the promotion focus. The prevention focus is when people seek to avoid undesirable end-states or losses–based on what they should do. This view is accountable to shareholders by avoiding unnecessary costs which includes limiting management compensation and increasing transparency. In comparison, the promotion focus is when people are driven by desirable end-states and gains – based on what could be. This view focuses on environmental causes and corporate philanthropy which does not necessarily increase shareholder value but the advancement and growth of the cause. Gamache at al. (2020) collected data from each *Fortune 500* company each year from 2005 to 2013 and selected a sample of 2,186 observations. Using Compustat to perform Tobit regression, it concluded that CEOs with a prevention focus are positively correlated to engage in governance-oriented activities, such as being accountable to shareholders and reduce expenses.

CEOs in different industries also differ in their duties and roles. Henderson at al. (2006) found in a stable consumer goods industry, a CEO steadily increased firm performance the longer he remained as CEO. The environment was stable enough for the CEO to learn and

change strategies overtime to become more successful. In contrast, in examining the everchanging computer industry, a CEO was found to be the best initially and firm performance decreased progressively the longer he remained as CEO. They concluded that the CEO in the computer industry was so entrenched in what proved to work in the past that he could not learn and shift strategies quick enough. CEOs in dynamic industries become obsolete rather quickly as opposed to slower changing industries. Henderson at al. (2006) collected samples from 228 computer and 98 brand-food industries due to their differences in dynamism between 1955 – 1994. Performance improvements were found to be contingent upon the degree of dynamism of the firm's environment.

A CEO in non-profit firms must have the same competencies as those in the private sector such as management skills, experience in leadership, and values (Ahmed, 2005). Ahmed (2005) used content analysis in analyzing CEO job advertising for *The Nonprofit Times* and found many of the same job requirements are requested as in private sector firms. However, their top duty is fundraising as opposed to increasing shareholder value. These duties and skills mentioned often relate to CEO compensation, either to be decreased or increased, depending on how well they were performed. Kolb (2011) argues that a CEO has the moral obligation and fiduciary duty to negotiate a fair market return for those skills just as a doctor or lawyer for their services.

Background and Experiences (Upper Echelon Theory)

There are proven results that there is a clear link between CEO background and experiences and firm performance. Hambrick and Mason (1984) founded the Upper-Echelon Theory which suggests CEO background and experiences affect a firm's performance and outcomes. In effect, Hambrick and Mason (1984) theorized those organizational outcomes are

partially predicted by background characteristics such as age, career experiences, education, and socio-demographic background of the CEO.

Explained later by Wang et al. (2016), background and experiences such as age, previous firm experience, and education were significantly correlated with firm's future performance. Wang et al. (2016) used meta-analysis with other research studies on CEO characteristics, such as education and prior career experience, to find that these characteristics matter to firm performance. One key finding is that age has a significant determinant on firm performance. Younger CEOs pursued riskier ventures, more M&A opportunities, and more innovation than older, more experienced CEOs.

In addition, those same firms performed better than the industry average due to those riskier endeavors. According to Awa et al. (2011), age, experience, and gender were a significant factor in IT adoption. Field surveys of 758 small-to-medium sized firms were used from various industries to gather the data and multiple regression to analyze the data. Career experience has also shown to affect firm performance but there is much debate as to the benefits and drawbacks due to the nuances involved.

Elsaid et al. (2011) found that the stock market reacts favorably to a firm hiring a CEO with prior experience as opposed to without any previous CEO experience. However, the firm's that hired a CEO with prior experience had a greater likelihood of underperformance and bankruptcy. Prior studies with probit regression and OLS regression methodology were used on a sample of 289 firms that had CEO turnover between 1993 to 2008 to examine the effects of firm performance and CEO compensation of prior and post CEO succession.

Hamori and Koyuncu (2015) found like results in that previous experience as a CEO was negatively associated with firm performance. Even a CEO with experience in a similar industry has shown significantly lower firm performance than a CEO without previous experience. Hamori and Koyuncu (2015) sampled 500 CEOs from the 2005 Standard & Poor's 500 companies and calculated firm performance and post-succession using ROA and ROS following the succession. Using OLS regression, a CEO's prior experience was found to interfere with the performance of the current firm.

In many cases, CEOs with prior experience tended to underperform their first-time CEO peers due to the fact being too ingrained in firm specifics of the previous firm and could not unlearn their previous experiences (Bragaw & Misangyi 2017). The CEOs were slower to adapt to the nuances of the new environment. Even so, it was found that previous experience as a CEO often resulted in higher compensation than first-time CEOs. Bragaw and Misangyi (2017) used a sample of 654 CEOs succession events between 2001 to 2004 to conclude prior experience affects subsequent firm performance.

Other research has found that CEOs with a financial background were more likely to increase profitability, reduce the likelihood of bankruptcy, and pay fewer auditing fees due to their finance background and experience (Kalelkar & Khan 2016). 577 CEOs between 2004 to 2013 were sampled that fit criterion of firms changing their CEO from one with financial background to nonfinancial background, or vice versa. Experienced CEOs are more aggressive and use more financial leverage to increase firm performance than less experienced CEOs (Ting et al., 2015). A sample size of 793 firms were pooled with OLS regression and fixed effects panel regression methodologies to draw a parallel between CEO personal characteristics and financial leverage used by the firm.

CEOs with broad outside experience make more changes as opposed to those with limited inside perspectives. These changes could affect a firm either positively or negatively. CEOs with prior board of director experience at other firms were more likely to initiate strategic changes than new insider CEOs with no prior board of director experience (Zhu et al., 2019). This gives the CEO a breadth of experience to be open minded about strategic alternatives. The S&P 1500 Index from 2001 to 2012 were used as their sample to conclude that prior board experience affects strategic change.

Zhu and Shen (2016) found that new CEOs from firms with a diverse board of directors were less likely to have CEO turnover and more likely to have better firm performances. Contributing to Upper Echelon Theory, the background of a CEO with work experiences in firms with a diverse board of directors leads to better firm performances and less likelihood of CEO turnover. Zhu and Shen (2016) used a sample of 188 outside CEOs from the *Fortune 500* company list to conclude that the Upper Echelon Theory is significant in that a CEO's background influences future outcomes.

Leaders with a certain level of formal education have a contributing affect to innovation, which could also influence firm performance. Miller and Xu (2019) found that CEOs with elite Ivy-League educations are successful because their elite education provides confidence and competency which leads to greater strategies and firm performance. In effect, their motivations and drive that led them to receive top-tier educations are correlated with firm performance. A leader's characteristics present themselves in the decisions they make which affect a firm's future performance.

The Upper Echelon Theory is also used to forecast differences in corporate social performance (CSP) between firms in how much a firm uses its resources to solve social problems

and is considered a good corporate citizen. It is found that CEOs that are female with an education in humanities and have considerable work experience are more likely to have high social performance ratings (Manner, 2010). A sample of 650 public United States firms were used with the Upper Echelon Theory and KLD Research Analytics CSP ratings to show the differences in corporate social performance (CSP) between firms.

However, those CEOs that based their compensation on firm performance were more likely to have lower corporate social performance by not spending money on potentially risky social goals (McGuire et al., 2019). Therefore, there is a clear relationship between CEO background and experiences and firm performance.

Firm Performance

Hodak (2004) found that incentives were the key to align CEO interests with shareholder interests. Firms performed better when they are aligned with a CEOs interest. Firms with lower alignment did not perform as well. Hodak (2004) used the entire population of basic materials sector companies with over $500 million in sales between 1996 to 2004 to compare their proxy statements with compensation types to analyze company alignment and found firms with better alignment had better returns. However, it is found that CEOs receive exorbitant base salaries, averaging $822,256, that is not contingent upon any performance metrics by the CEO but simply a baseline. (Salary.com, 2020). The CEO is rewarded this salary regardless upon if the firm does well or performs poorly, which, in turn, provides little incentives for CEOs to be motivated to work hard and increase shareholder value (Jensen & Murphy, 2010).

Moriarty (2005) authored the utility view which suggests incentives be used to attract the best talented CEOs and paying them for performance with bonuses, profit sharing, and stock options. The board of directors must weigh short-term fixed compensation and long-term

incentive compensation when hiring a CEO (Gallani at al., 2015). These must be weighed independently and align with both the CEOs and firm's goals. Hall and Liebman (1998) found there is a strong relationship between CEO total compensation and firm performance. They argue this is entirely due to incentives and the value of bonuses and stock options. Hall and Liebman (1998) used CEO compensation data from 1980 to 1994 to measure of all stock options that were owned by CEOs and found that firm performance increased as compensation incentives increased.

Incentives can either motivate or demotivate a person in their performance. Barnhart et al. (2000) found that by the board of directors introducing an antitakeover amendment in its policies that it negatively affected firm performance. By protecting the firm from being taken over by an outside investor, the CEO was disincentivized to raise shareholder value thus lowering firm performance. The CEO could deliver a less competitive firm to the shareholders and not worry about recourse from investors. Barnhart et al. (2000) used a sample of 253 large firms and regression to find a negative relationship between firm performance and antitakeover provisions.

However, stock options are a positive incentive and gives the CEO the ability to buy firm shares in the future, at today's market price. This allows the CEO to benefit if the firm's stock price rises and there is a direct link between CEO total compensation and how well the firm performs. Added to by Campbell and Weese (2017), that by increasing stock options while decreasing other compensation types like salary and bonuses has a large impact of CEO contribution on firm performance. Stock options incentivize the CEO to not take such risky maneuvers in the short-run with the firm and to stick with proven result-oriented ideas. Campbell

and Weese (2017) used a sample of all CEOs of S&P 1500 firms between 2007 to 2011 and OLS regression and Stepwise regression.

Spraggon and Bodolica (2011) found that boards of directors tend to incentivize their CEO to take on acquisitions by paying them with stock options with the notion that the stock price will increase in the future. These findings are consistent in that market-based performances are indicative of CEO total compensation. Using a sample of 148 deals of acquisitions between 1996 and 2009, Spraggon and Bodolica (2011) found stock options as opposed to equity ownership is preferential to reduce risk and optimize CEO incentives. Fosberg (2001) found that when firms are expecting a poor quarterly performance and omit paying a stock dividend, the CEO compensation was reduced shortly afterwards. Fosberg (2001) used a sample of 44 firms between 1987 and 1992 that reduced dividend pay and did not resume in the following year and found that CEOs that once dividend payment was stopped and the CEOs compensation was reduced, 61.4% also lost their job as CEO. In a recession, Hansen (2010) found that CEO pay decreases and remains flat in the short-term. However, performance-based compensation metrics take their place and provide an alternate form of compensation to the CEO.

Mukherjee and Nguyen (2018) examined if the stock market evaluates a CEO based on his job performance at a previous firm. After thorough research, found that the stock market reacted according to how well the CEO performed their duties. When a “better” performing CEO resigned from a firm, the stock market reacts more negatively than when a “good” CEO resigns and more positively when the “better” CEO was hired by a new organization. Organizations that hired the “better” CEOs were found to have better long-term performance and returns. It follows that firm performance is at least partially related to compensation. Mukherjee and Nguyen (2018) used a sample of 48 CEOs of S&P 500 firms who resigned from firms to obtain a new CEO

position between 2004 to 2012 and found the stock market reacted based on how the old firm performed under the CEO.

Moriarty (2005) established the desert view on compensation that CEOs should be paid what he/she deserves. If the contribution to the firm is great and firm performance increases, then the CEO will make more money. However, if firm performance decreases, then CEO pay will fall. However, Wang et al. (2012) argue that short-term compensation of a CEO such as salary is measured by accounting-based measures such as EBIT and ROE. Higher earnings positively affect CEO salary which could influence the risk tolerance of a CEO. Wang et al. (2012) used compensation data of 2,448 CEOs from 1,622 firms to find that the higher the diversification then the higher in CEO is paid in fixed salary.

Seo et al. (2015) found if compensation is not in alignment with their CEO peers, then more risky ventures would be pursued so the firm could become more profitable thereby the possibility of making more compensation. In addition, the CEO would more than likely finance the risky activities with stock than cash to hedge the risks and further attribute to their low compensation. Seo et al. (2015) used a sample of 1,468 firms between 1996 to 2008 and generalized estimating equations (GEE) and random effects regression and found CEO pay standing against other CEOs resulted in higher acquisition activity. In addition, this also resulted in a higher level of stock used in those acquisitions. Fong et al. (2010) found that CEOs that feel they are underpaid in the labor market attempt to grow the firm size to increase their compensation and will even withdraw voluntarily if they feel their compensation is too undervalued. Fong et al. (2010) used a sample of 932 CEOs across 30 industries between 1990 to 2000 with hierarchical linear modeling (HLM) and found CEO underpayment is associated with an increase in firm size.

On the other hand, a CEO that feels they are overcompensated have a positive effect on the firm's ROA. Therefore, CEO compensation that differs from the perceived market rate will have significant effect on firm performance. CEOs compare themselves across the globe and if there is a perceived unfair association between their compensation and their peers, then actions are taken to rectify the situation. The board of directors rectify the compensation discrepancy between CEOs with similar background and experiences (Fredrickson et al., 2010). This is further found in literature when analyzing CEO pay practices around the world.

Gerakos et al. (2013) found that United States firms had higher CEO compensation than United Kingdom firms due to long-term incentive pay structure. To combat pay disparities, United Kingdom firms that sold products in the United States were forced to match United States pay practices to attract the best talent. This practice increased CEO compensation and reduced the pay gap between the two countries. Gerakos et al. (2013) used a sample of 416 publicly traded United Kingdom firms between 2002 and 2007 and using pooled, cross-sectional models to find that United States product market influence is associated with a higher CEO compensation and incentive structure thus reducing the United Kingdom-United States pay gap.

CEO compensation has garnered poor publicity and criticism in recent years due to the exorbitant compensation amounts paid to CEOs (Denner et al., 2018). Due to this bad public perception, firms have reduced the most often condemned form of compensation: stock options. The compensation shifted to other types of pay that had little public awareness, such as salary, stock grants, and bonuses. If the compensation disparity between the CEO and other senior executives is minimal then firm performance is affected (Ang et al.,1998).

DeCarlo (2005) found that CEO compensation does not always line up with stockholder return. Numerous companies had great earnings but had low CEO compensation while others

had miserable earnings while the CEO made exorbitant amount of compensation. Sigler (2011) found there was no explanation between return on assets (ROA) and return on equity (ROE) and CEO compensation.

In certain industries such as the media industry, research found that companies still wanted to pay their CEOs significantly because of the "star effect." Many of the stars employed by media companies such as CBS, NBC, and ABC make more than $40 million per year so media companies do not want their CEOs to make less that their employees which would give the impression that their CEO was not really the one in charge but the employees instead. Tien et al. (2013) demonstrated that by studying the relationship between CEO power, pay structure, and firm performance. They found that CEO power – the ability to sustain control over a firm, had a positive impact on return on assets (ROA) and return on equity (ROE) but had a negative effect on short-term and long-term compensation. Tien et al. (2013) used a sample of 112 companies from 2001 to 2005 and used Tobins Q ratio and cross-sectional time series regression to conduct this study.

CEO compensation is also found to be based on the concurrent industry performance and prior firm performance. The board of directors would evaluate the average CEO compensation in the industry and rate itself based in comparison with other firms in the industry. Then, award the CEO somewhere in the middle between the best and worst competitors in the industry (Miller, 1995). If the CEO performed well in the previous firm and was reflected in the stock market price dropping as a reaction to his departure, then the CEO will likely have higher compensation (Gorman 2010). This shows that CEO pay reflects a CEOs ability when considering the market for CEOs.

Firm Size

Matiur and Muhammad (2018) found that firm size (in terms of market value) has a significantly positive influence on CEO compensation. As the size of the firm increases, its market value then CEO compensation rises. This is suggesting that the best talented CEOs want to work for the largest, most valuable firms. These exemplary CEOs will demand market value compensation for their services thus increasing CEO compensation. Matiur and Muhammad (2018) used a sample of 249 United States firms from 2004 to 2012 along with Pedroni's panel cointegration and OLS methodologies to support their findings.

Between 1980 and 2003, the *Fortune 500* average market value increased by 500%. Assuming all else held constant, CEO compensation also increased by 500%, called the "size of stakes" theory (Gabaix & Landier, 2008). This suggests that as market size increases so does CEO compensation. In another study, firm size accounted for nine times the amount of CEO compensation variance as the closest correlated performance measure (Tosi et al., 2000). Meta-analysis was used to examine if CEO compensation is linked to firm performance and CEO compensation is linked to firm size. This is backed up further by Marin et al. (2010) who found in the automotive industry a positive correlation between CEO compensation and firm performance when firm size (in terms of market value) was used as a predictive value. Automotive firms on the S&P 500 between 2006 to 2007 were used as their sample and Pearson correlation coefficient, OLS, and ANOVA as their methodology to conduct their study. This is even further highlighted in another study that compared firm size, in terms of revenue, and firm performance, in terms of average shareholder return over three years, to CEO compensation. Firm size accounted for 29% of the variance in CEO compensation while firm performance only

accounted for 1% (O'Reilly & Main, 2010). A sample of 306 firms in 2003 was used and meta-analysis to support their findings.

Subramanian (2013) found that within the firm size and CEO compensation correlation that two factors contribute towards its outcome, namely, firm quality and productivity shocks. He found that firm size and firm quality are related in that high-quality firms have high quality CEOs who generate greater than expected revenues and then receive greater compensation, thereby firm size relates to firm quality. In addition, increased effort by the CEO through CEO compensation incentives causes a favorable productivity shock which, in turn, increases firm size.

In addition, in other countries, such as China, there is evidence to suggest that firm size and CEO compensation are related as well (Rickne, 2014). Larger firms pay higher compensation and other non-compensation benefits than smaller firms, on average, from 30% to 50% higher.

Gender Wage-Gap Among CEOs

According to the United States Census Bureau (2020), median weekly earnings of full-time workers were $994 in the third quarter of 2020. Women had median weekly earnings of $902, or 81.7 percent of the $1,104 median for men. The predominant research findings indicate there has historically been a wage discrepancy between men and women. Though some research has found compensation between male and female CEOs are similar and do not favor one gender over the other using data for years (Gupta et al., 2018). A sample of 1,853 firms was used from 1996 to 2005 and found a lack of evidence of any significant differences between male and female CEO compensations.

Song et al. (2019) examined gender pay differences of CEOs at non-profit hospitals and found that female CEOs made 22% less than their male CEO counterparts with similar education and experience. One can speculate that unfairness exists but another reason for the wide gap could be weak negotiation during the hiring process. Song et al. (2019) used IRS forms 990 from 2009 to gather firm information of non-profit status. A sample of 1,045 hospitals and CEOs were gathered using descriptive statistics and OLS to conclude their findings.

Males have a larger raise magnitude than females among hourly workers (Artz & Taengnoi, 2019). This could be due to biases or ingrained stereotypes of women. Artz and Taengnoi (2019) used data from surveys to examine the gender-gap in raise magnitude between men and women. Katila and Eriksson (2013) found that female CEOs were depicted as successful leaders but lacking in interpersonal skills such as caring, nurturing, emotional, and timid. However, male CEOs were viewed as naturally competent leaders of people. This shows that while female CEOs can be viewed as equal to male CEOs in terms of successful leaders, female CEOs still had an expectation to be more sensitive than their male counterparts.

Firms are more likely to take a chance on a male than a female with similar work experience when hiring a CEO. A woman must have made more successes in their career than their male counterpart to ultimately get promoted to CEO (Lublin 2017). Men were promoted based on potential while women had to show actual results to be considered for the CEO position. Lublin (2017) used data from S&P 500 companies between 2012 to 2016 in their study to conclude their findings.

Bertrand et al. (2010) found this could be due to interruptions in career progress and hours worked. They found that males and females with MBAs from top business schools fresh out of college have identical earnings. However, after 10 years there is a clear divergence in

compensation between males and females. According to several factors such as training, work experience, career interruptions, and weekly hours worked; career progress and hours worked, namely those associated to motherhood, were the most significant factors in less female earnings. Bertrand et al. (2010) used a web-based survey conducted by the University of Chicago to MBA students between 1990 to 2006.

However, female CEOs were more likely to have a greater compensation and the gender gap between male and female CEOs are narrowed when more women sit on the compensation committee of the board of directors. The glass ceiling barrier is removed when other women in positions of power have a direct influence on compensation (Shin 2012). Shin (2012) used a sample of 7,711 CEOs from 831 firms on the S&P 1500 between 1998 to 2005. Using random-effects regression and OLS to find that while men are paid on an average than women, the latter managed firms with more women on the board of directors than their male counterparts and the gap in compensation is smaller as well.

This is proven by other research by Zhang and Wang (2018) on the influence of gender diversity on CEO compensation on firms in China. Boards with female directors and boards that have a diverse selection of female and male members were found to have a better chance of aligning CEO compensation and firm performance. Female directors do a better job at monitoring CEO activities and setting limits on CEO pay than male directors. Zhang and Wang (2018) used a sample of firms from China between 2006 to 2015 to test their hypotheses and pooled OLS methodology to find that a diversity of genders on the compensation committee significantly affects CEO compensation and strengthens the ties between compensation and firm performance.

A liberal board of directors that adhere to the “all are equal” mantra is more likely to reduce gender pay gaps than their conservative counterparts (Chin & Semadeni, 2017). Chin and

Semadeni (2017) used a sample of 176 CEOs of the S&P 500 between 2007 to 2010 to conduct their study. Female leadership increase a firms' performance as more female workers are hired within the firm (Flabbi et al., 2019).

Female leaders are better interpreting signals from their female employees which resulted in better organizational results. However, wages and job satisfaction of female employees have shown to have a negative correlation in firms with a female CEO (La Mattina et al., 2018). One theory as to why a female CEO would not seek to diminish the wage gap between male and female employees is the "queen bee" syndrome, which suggests that women in high positions seek to take on male traits to fit in and prove they belong while also preventing other women from rising to lessen any competition.

These results are profound because Gupta et al. (2020) found that female CEOs had a greater likelihood of being terminated than male CEOs. Female CEOs had an equal chance of being terminated when firm performance was low or high, while male CEOs only had a chance of being terminated when firm performance was low. This means that male CEOs were relatively safe if the firm's performance was high. Gupta et al. (2020) sampled 2,390 firms between 2000 to 2014 and used a probit model to test their hypotheses.

Waterman (2013) found that female CEOs were more open towards change and using different methods than their male counterparts. When a firm had a female CEO and an active recruitment of women, there was a significant chance that more women would be in managerial positions (Ng & Sears, 2017). However, as a firm expands abroad into foreign markets this becomes less the case. Women are less likely to receive advanced roles due to perceived gender biases in various foreign countries. Female CEO leaders are underrepresented in the global workplace today and could result in greater outcomes should more females be promoted to

leadership positions. Ng and Sears (2017) surveyed 278 firms and found the presence of women CEOs were negatively associated with international firms.

However, women are still experiencing a "glass ceiling" when it comes to advancing to the CEO position in *Fortune 500* firms (Dwivedi et al., 2018). According to Cech and Blair-Loy (2010), this is caused by two primary ideologies. The first explanation is that systemic biases within society such as prejudice, stereotyping others, and discrimination are the root cause of inequity. The second explanation is that the person with the required education and experience will succeed and those that do not must only blame themselves (Schmader, 2002). Cech and Blair-Loy (2010) surveyed 494 women in science, technology, and other similar fields to examine if meritocracy or systemic biases explained their position in their organization. Using multinomial logistic regression (MLR), the results found those with longer tenures and advanced degrees were more likely to use meritocratic explanations rather than systemic biases. However, women working in unsupportive organizations were more likely to blame systemic biases for their positions.

Educational Credentials of a CEO

The Master of Business Administration (MBA) has been the hallmark of higher education for anyone with aspirations in attaining a CEO role with a top firm. In a recent study, 66% of CEOs of *Fortune 500* companies had an MBA and mostly graduated from private universities (Martelli & Abels, 2010). Martelli and Abels (2010) used a cross-sectional study of all *Fortune 500* firms in 2008 to gather their findings. It has been found that an MBA results in enhanced economic value and increased future salaries for those that have it as compared to those without an MBA (O'Brien et al., 2010). A sample of 658 AACSB business schools over an 8-year period

was used to conduct their study of economic value of an MBA. Using the Tobit model, an MBA was found to be significant in terms of increasing compensation and economic value.

Camuffo et al. (2009) found that earning an MBA increases capabilities and skills like planning, organization, networking, and use of technology which leads to enhanced career advancement. Especially, those with an MBA from a top Ivy-League school had a greater chance of being associated with firms with high market valuation than those without an Ivy-League education (Miller et al., 2015). Miller et al. (2015) used a sample of 444 CEOs that were covered on the top-three business journals in the United States: Business Week, *Fortune*, and Forbes between 1970 to 2008. Using Tobin's Q methodology, Ivy-League CEOs was found to do better in their early career due to connections with other Ivy-Leaguers.

In fact, Datta and Iskandar-Datta (2014) found CFOs with a generalist MBA from an Ivy-League school often commanded a higher compensation than a non-MBA degree from an Ivy-League school. They concluded that the Ivy-League generalist MBA is considered a scarcer resource thus demanding a higher compensation. However, no significant relationship was found between skills learned during an MBA and compensation (Camuffo et al., 2009). Behavioral interviews and surveys of 44 MBA students and statistical analysis of the data was used to analyze the relationship between learned competencies in an MBA program and career advancement.

Jalbert et al. (2011) found that top ranking Ivy League schools (Harvard, Princeton, and Stanford) dominate the CEO positions of large U.S. firms and correlations between CEO compensation and firm performance. However, those top Ivy-League schools were not correlated to total compensation of its graduates. They were not even in the top 50 of the compensation listing. Sowell (2008) found that students do not always get a better education just because the

university is an Ivy-League prestigious school since prestige depends primarily on publications and research of the professors. He found that graduates from prestigious Ivy-League universities more than likely earned more from career opportunities through their family's connections or earnings from inherited assets than from what was learned at the prestigious university. Jalbert at al. (2011) used a sample of over 500 firms between 1997 to 2006 to examine the educational background of CEOs. Using regression, their findings were able to be concluded.

Saidu (2019) found that CEO education improves performance and profitability of a firm measured by ROA by equipping them to make better informed decisions for the firm. Saidu (2019) used a sample of financial firms in Nigeria between 2011 to 2016 and OLS to conclude that CEO education firm profitability. A growing percentage of younger CEOs that use riskier maneuvers to increase firm performance have a business degree (Iqbal, 2015). Iqbal (2005) examined the age of CEOs of 168 firms in the oil & gas industry between 1994 to 2010 that used hedging instruments such as derivatives and found that younger CEOs initiated hedging instruments in their company as opposed to their older CEO colleagues. In a recent study of finance companies, 55% had a CEO with a business education and those firms performed significantly better than CEOs with other types of degrees (Pascal et al. 2017).

However, Lindorff and Prior Jonson (2013) found there was no significant relationship between CEOs with an MBA degree and firm financial performance, measured by stock price. Lindorff and Prior Jonson (2013) examined the shareholder return over 3 to 5 years by dividends and change in share price and did not find any correlation between a CEO having an MBA and firm performance. Elsaid (2014) found there was a negative correlation between firm performance and CEO education. This could be that the CEOs had limited influence on the firm's financial performance due to short tenure. Elsaid (2014) used OLS and paired sample t-

tests on their sample of 46 CEOs to show that when a firm changed their CEO from a female to a male, firm performance increased, and bankruptcy probability decreased. Therefore, there seems to be a mixed consensus on the correlation between education and compensation. However, when it comes to disclosure of a firm's environmental impact information, studies have shown that CEOs with MBAs were more likely to disclose their environmental impact as opposed to firms with CEOs with JDs (Lewis et al., 2014). 589 United States firms between 2002 to 2008 and a Carbon Disclosure Project (CDP) survey were used to find more CEOs with an MBA disclosed their environmental impact information.

CEO Mobility

The ability of a CEO to maneuver between firms and industries affects compensation. The same skills as mentioned above are critical skills in demand in every firm and a CEOs ability to meet that need is critical. Groysberg et al. (2006) found the market seems to think a CEO is portable, in some cases. Groysberg et al. (2006) used a sample of 20 GE CEOs from 1989 to 2001 to conduct their study and findings.

General management skills like setting a vision, motivating employees, organizing, budgeting, and monitoring performance seem to transfer well while other, industry specific skills, like knowledge of processes do not seem to transfer well to other industries. Certain companies like GE, McKinsey, IBM, and AT&T are renowned as "talent generators" and train their managers and leaders with first-rate transferable skills. The core competencies that determine a successful CEO hold true across all business lines and from industry to industry (McGrath, 2016).

For a firm to be successful, a leader needs to have strong financial competencies of modeling and budgeting to drive creative ideas to the forefront of the business. Entrepreneurship

is another skill that CEO's must have to lead a firm through the many challenges of business and changes of the economy.

In addition, trustworthiness and values are also important characteristics of a leader because they are the foundation upon which honesty is built and people can rely on your word. These characteristics are essential in building transferable skills that a CEO can take and use whichever industry or sector they work. A CEO with these transferable skills can create high demand for his services thereby increasing compensation (McGrath, 2016).

Board of Directors

The board of directors are the governing members of a firm elected to represent the shareholder's interests. The board members set firm's policies, supports executive decisions, and hiring of the CEO (Ruigrok et al., 2006). They are responsible for establishing a compensation package of short-term and long-term payments to the CEO. However, many factors tend to skew these compensation results such as an arms-around vs. arm's-length relationship between the board and the CEO, dependent vs. independent board members, and the size of the board.

Van Essen et al. (2015) found that CEOs received significantly more compensation in situations where CEOs had power over the process in an arms-around relationship with the board. Van Essen et al. (2015) used meta-analysis of 219 studies and found that a CEO's compensation is higher when a CEO has power over the compensation process. Hambrick and Finkelstein (1995) found that in these management-controlled firms where there is not a majority shareowner of the firm on the board of directors, the philosophy is to pay the CEO as high as possible and have the CEO prove they are worth it. This arms-around compensation philosophy is usually directed by the CEO since there are no majority-shareholders on the board to say otherwise. Hambrick and Finkelstein (1995) used a sample of 188 firms over a five-year period

and found that CEO compensation is decided by different metrics, depending upon control of the firm.

CEOs with non-independent board members made a higher compensation than those with independent board members (Kuo & Shih-Ti, 2014). In these management-controlled firms it has been found that firm size is an indicator of compensation. The larger the firm, the higher the compensation (Werner et al., 2005). A sample of 407 firms and measured criteria using COMPUSTAT between 1997 and 1998 were used to find CEO compensation is related to firm size and financial performance. Ueng et al. (2000) found that CEO influence on the board significantly affects their compensation in large firms. Ueng et al. (2000) used a sample of 424 firms with OLS to find that firm size affects CEO compensation.

In contrast, CEOs received less compensation when the board of directors had more power over the process in an arms-length relationship. In these owner-controlled firms where there is a majority shareowner of the firm on the board of directors, the philosophy is to pay the CEO as low as possible and have the CEO prove they are worth it. This arms-length relationship between the CEO and board of directors provides an unbiased negation which often resulted in a compensation package that better aligned with shareholders' interests. Owner-controlled firms have a closer relationship between compensation and performance rather than firm size. Van Essen et al. (2015) also found that when the board of directors controlled the CEO's compensation then it was significantly lower and depended upon performance. Hambrick and Finkelstein (1995) also found that in externally controlled firms the CEO was paid less than in management-controlled firms.

Moriarty (2005) established the agreement view which theorizes that most of the CEOs that are overpaid are paid without independent board members. There is bias involved which, in

effect, pays the CEO too much. Zorn et al. (2017) found that boards of directors have become more independent of the firms within which they govern due to firm scandals and the introduction of Sarbanes-Oxley legislation. Thereby leaving the CEO as the only member of the firm that sits on the board of directors, calling these CEOs as "lone-insiders." Zorn et al. (2017) found that these "lone insider" CEOs had excess compensation a larger pay gap between CEO and other executives.

Firms that have this scenario experience were found to have an excess in CEO compensation, a wider gap in the CEO-employee relationship, a heightened probability of financial scandal, and lower firm performance. This appears to go against the goal of the existence of the board of directors in a firm. However, boards were found to often prefer to form arms-around relationships with the CEO, which further skews compensation negotiations.

The size of the board of directors has also been found to affect CEO compensation. Matiur and Mustafa (2018) found that large board size has a negative correlation on total CEO compensation. As board size increases, CEO compensation decreases. As the size of the board grows it becomes increasingly harder to form consensus and make decisions. Matiur and Muhammad (2018) used Pedroni's panel cointegration and OLS of 249 firms between 2004 to 2012 to find that board size should be limited. This is proven by Seo (2017) that found as the board of director grows there is less correlation between firm performance and CEO compensation.

The political ideologies of the members on the board have shown to be significant. Gupta and Wowak (2017) showed that conservative boards paid CEOs more and had stronger relationships between firm performance and CEO compensation than liberal boards. Gupta and Wowak (2017) sampled of 4,000 CEOs between 1998 and 2013 to conduct their findings.

Bryan and Hwang (1997) found that firms subjected to increased amounts of regulatory constraints were more likely to negatively impact CEO compensation packages. Firms that were affected by political regulation were more closely watched and scrutinized than other firms that did not have such constraints. Due to this nature, the board had a smaller influence on CEO compensation such as bonuses, options, and salary.

Social norms also affect how a board of directors structures a compensation package. The public consensus is that CEOs get paid too much and it goes against fairness in wages as it relates to performance (Rost & Weibel, 2013). A vignette-survey method was used to sample over 800 people and concluded that norm infringer CEOs should be punished. People get paid based upon their performance or contribution to a specific occupation. However, CEOs are not always paid this way. The boards of directors want the best of the best to steer the ship of the firm, so they compete with compensation to attract the best talent, so these do not always line up. It may be best to not commit to a long-term compensation deal until after an initial trial period.

Graffin et al. (2013) confesses the difficulty in evaluating a new CEO because of so many things outside of a new CEOs control. The board may ask, "which result is due to the CEOs actions or from environmental factors? Therefore, the board was found to should use outside indicators such as the stock market reaction to the CEO hiring, the CEOs experiences, and their decision-making abilities in the past to evaluate early-stage performance. Graffin et al. (2013) used a sample of all CEO successions between 1999 to 2004 in Fortune 100 firms to conclude these results.

Conclusions From Literature

The literature provides strong evidence linking a CEO's background and experience such as age, career experiences, education, and socio-demographic background to firm performance.

However, the literature is mixed on the link between firm performance and CEO salary, bonus, and total compensation. CEOs are paid both with short-term and long-term compensation measures. According to Hodak (2004), incentives such as stock options are a long-term compensation metric that provides a way for the CEO to be paid based on how well the firm performs and contributes towards shareholder value. Yet, short-term compensation metrics such as salary and bonuses are paid regardless of if the firm does well or not (Jensen & Murphy, 2010). The literature also connects the significant relationship between firm size and CEO compensation. As firm size increases, CEO compensation rises as well. It is clear from the literature that certain variables such as firm size and education influence CEO compensation. However, my dissertation is attempting to add to these conclusions' other variables such as socio-demographic background, age, ethnicity, the level of education, the type of educational institution attended, the sector type of the firm, years' experience in the sector, if the CEO's immediate family founded the firm, and if the company is public to see how each affects CEO salary, bonus, and total compensation. The goal of this dissertation is to highlight socio-demographic biases in Fortune 100 firms which could reduce disparities in current practices of the U.S. firms.

Research Methodology and Data Description

This chapter primarily focuses on data collection and statistical model that is used to test the hypothesis that the socio-demographic background of a CEO can impact the compensation they receive in the Fortune 100 firms. The sources of data that were used to obtain the information on the CEOs in the Fortune 100 in 2020 were also discussed.

Research Question and Hypothesis

While the bulk of the available literature on CEO compensation discusses how a CEO's background like age, education, and career experiences affects firm performance and how firm performance affects a CEO's compensation, there is little to no research on how a CEO's background affects CEO compensation, specifically socio-demographic background. Therefore, further research needs to be done that examines if the socio-demographic background of a CEO affects their compensation and could explain the disparity gap in compensation between each other. Since the purpose of this study is to focus on the impact of socio-demographic and other characteristics of a CEO on their compensations, the hypotheses that are being tested is as follows:

1. There is not a statistically significant relationship between the CEO salary, bonus, and total compensation offered and the socio-demographic characteristics of a CEO.
2. There is a statistically significant relationship between CEO salary, bonus, and total compensation offered and the socio-demographic characteristics of a CEO. It expects to find that middle-aged white males with high education dominate the CEO roles and are therefore paid higher as compared to other characteristics. The impact of socio-demographic factors and other CEO characteristics on CEO salary, bonus, and total compensation is both numerically and statistically significant.

The independent socio-demographic factors considered in this study are gender, age, ethnicity, level of education, whether the type of university attended by the CEO was private or public, the sector of the firm, experience in the sector, and whether the current CEO or their immediate family founded the business. The control variables considered are the market value ($M) of the company, the sector type, and if the company is public or private. The three dependent variables are CEO salary, bonus, and total compensation because of the wide disparity between their values based on the data collected to study if CEO salary, bonus, and total compensation levels are affected by socio-demographic background.

Methodology

This study consists of two main parts from a methodology perspective. First, a descriptive analysis of all variables is utilized to describe and extract the extent of relationships between independent and dependent variables. This research does not manipulate the independent variables and will examine if the fluctuations in the dependent variables can be explained using the observed fluctuations in the independent variables. This method examines the relationships between the dependent and the independent variables without assuming that there is a causation link (Balnaves & Caputi, 2001). Second, this research proceeds to test whether there is evidence of a causal relationship between the dependent and independent variables by presenting a simple Ordinary Least Squares (OLS) regression methodology. This second methodology will help us to confirm if the hypotheses, evaluated using the first methodology, provides evidence of causal relationships or not.

Sampling and Data Collection

This study is conducted by utilizing the information of CEOs in the Fortune 100 list from the year 2020. Single-stage sampling design was used since each participant is known and can be

used in the sample as well as both purpose and convenience sampling methods. This sample of 100 CEOs is a non-random sample and the dependent variables information such as CEO salary, bonus, and total compensations were gathered from sources such as proxy statements, the 10-K annual reports, registration statements filed by the company, current reports on the 8-K, and other various places such as salary.com, moneyinc.com, yahoo finance, and wallmine.com. Moreover, CEO's personal characteristics such as gender, age, ethnicity, and level of education, and type of education were collected from various sources such as the company's executive biography page on its website, personal biographies on LinkedIn, and university press releases detailing a certain CEO graduated from its program. Other characteristics such market value, sector type, founding of the firm, and its IPO status were found through similar methods as above but different verified sources such as fortune.com, yahoofinance.com, sec.gov, and the company's website. Table 1 gives the details about the variables used for this dissertation based on the information gathered from these various sources.

Research Methodology

The primary methodology for analyzing the non-random sample is the descriptive analysis of the trends found in the characteristics of CEOs as compared to their compensations. A simple linear regression model and *t*-tests is also presented to test the hypothesis of causality between the dependent and independent variables.

As can be seen in Table 1, three dependent variables used in this study are the salary of each CEO in the year 2020 measured in millions of dollars (*salary*), the bonuses paid to each CEO in 2020 in millions of dollars (*bonusstock*), and the total compensation value in millions of dollars that a CEO received in 2020 (*totalcomp*). The primary independent variables consist of socio-demographic factors such as whether the CEO is male (*male*); age of CEO in years (*age*);

Table 1

Summary Statistics of Relevant Variables

Variable	Mean	Std. dev.	Min	Max	Description
Dependent Variables					
salary	1.29	0.64	0	3	CEO salary in 2020 ($M)
bonusstock	14.75	12.75	0	107	CEO bonus stock options in 2020 ($M)
totalcomp	16.46	12.78	0	108	CEO total compensation in 2020 ($M)
Independent Variables					
CEO Personal					
age	59.69	6.92	35	89	Age of CEO in 2020 (years)
experience	34.23	8.93	9	65	Number of Years worked in Sector
education	1.63	0.72	0	3	= 0 if nodegree, 1 if bach., 2 if master, 3 if phd
nodegree	0.03	0.17	0	1	= 1 if CEO does not have college degree
bachelor	0.42	0.50	0	1	= 1 if CEO has Bachelor's Degree only
master	0.44	0.50	0	1	= 1 if CEO has a Master's Degree
phd	0.11	0.31	0	1	= 1 if CEO has Ph.D. or equivalent
privateuni	0.56	0.50	0	1	= 1 if CEO attended a Private University
male	0.91	0.29	0	1	= 1 if CEO is male
white	0.90	0.30	0	1	= 1 if CEO is non-Hispanic white
founder	0.09	0.29	0	1	= 1 if CEO started or owns Company
Company Related					
mktvalueB	120.29	210.01	0	1200	Company Market Value in 2020 ($B)
publicco	0.92	0.27	0	1	= 1 if the company is public
sector	2.99	1.65	0	5	= 0 through 5 in following order
utilenergy	0.10	0.30	0	1	= 1 if Utilities/Energy Company
industmat	0.13	0.34	0	1	= 1 if Industrials/Materials Company
healthcare	0.14	0.35	0	1	= 1 if Health Care Company
commtech	0.17	0.38	0	1	= 1 if Communications/Technology Company
consumers	0.23	0.42	0	1	= 1 if Consumer Staples/Discretionary Company
financials	0.23	0.42	0	1	= 1 if Financial Company

whether the CEO is non-Hispanic Caucasian or not (*white*); the maximum level of education received by the CEO (*education*), where education is an ordered variable constructed using the sub-variables of *nodegree, bachelor, master, or phd*; whether the CEO attended a private

university to get their highest degree (*privateuni*); number of years of experience that the CEO has in current industrial sector (*experience*); and whether the CEO or their immediate family started the company (*founder*). The control variables consist of the market value of the firm in billions of dollars (*marketvalue*), the sector type defined as *sector* (*commtech, consumers, utilenergy, financials, healthcare, industmat*) of the company, and whether the company is public (*publicco*). Table 1 also includes the relevant summary statistics for all these variables. More detailed analyses of what the values of each variable indicate are presented in Chapter 4 since descriptive analysis is a critical part of this dissertation.

Two-Sample *T*-Test Model

As a part of the descriptive analysis, a two-sample *t*-test is used to compare the differences in the dependent variable data for the categorical binary variables such as *male*, *white*, *private*, *founder*, and *publicco*. The groups are independent of each other, normally distributed, and homogenous. However, it is critical to note that since the sample is fairly limited and non-random, some of the results of the *t*-tests are likely to yield insignificant outcomes within the sample. The inclusion of *t*-tests in this dissertation is to establish a methodology that can be used in the future using a more extensive sample.

The null hypothesis assumes the means between the two groups are equal, or that both groups belong to the same population and the alternative hypothesis is that the means between the two groups are different and therefore the two groups belong to different populations. In the case of this dissertation, a rejected null hypothesis would indicate that there is a difference in the compensation variables for CEOs belonging to different categories of the binary independent variables.

$$H_0: \mu_1 = \mu_2$$

$$H_1: \mu_1 \neq \mu_2$$

Thus, if $\bar{x}_1$and $\bar{x}_2$ are the means of the two groups being compared, s^2 is the sample variance between two groups, and $n1$ and $n2$ are the sample sizes of the two groups under consideration (Kim, 2015), the test-statistic t can be calculated using the following formula and then compared with the critical t-value of the distribution at the significance level $\alpha = 0.05$. If the test statistic is lower than the critical t-value, the null hypothesis fails to be rejected and the outcome indicates that both groups belong to the same population, or that there are no significant differences between the two samples.

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{(s^2(\frac{1}{n_1} + \frac{1}{n_2}))}}$$

Regression Model

Based on the dependent variables and independent variables, the following base models for each of the dependent variables (*salary, bonusstock, totalcomp*) as a function of the CEO and market characteristics for the top Fortune 100 sample is presented. It is critical to note that while the regression estimates might not be fully generalizable to all CEOs in all industries, they do provide a base line that can be used for further analysis because the success of each firm in the sample can be assumed to be assured, whereas that might not be true for all the firms in the population. The null hypothesis for the OLS is that the slopes (βi) are statistically equal to zero, or that the independent variables have no causal effect on the compensation variables for the CEOs. The alternative hypothesis is that the slopes (βi) are not equal to zero, or that the

independent variables have a statistically significant causal effect on the compensation variables for the CEOs. The first estimated model includes only the socio-demographic characteristics of the CEOs whereas the second full model includes both the socio-demographic characteristics as well as the control firm-related variables.

$$Model\ 1: Y_i = \beta_0 + \beta_{1i}age + \beta_{2i}experience + \beta_{3i}education + \beta_{4i}privateuni + \beta_{5i}male + \beta_{6i}founder + \varepsilon_i$$

$$Model\ 2: Y_i = \beta_0 + \beta_{1i}age + \beta_{2i}experience + \beta_{3i}education + \beta_{4i}privateuni + \beta_{5i}male + \beta_{6i}founder + \beta_{7i}mktvalueB + \beta_{8i}publicco + \beta_{9i}sector + \varepsilon_i$$

where Y_i represents the three dependent variables (*salary*, *bonusstock*, and *totalcomp*) as functions of the socio-demographic background of the CEO controlled for the value and industry sector of the company. Through information gathered through online public profiles of the top Fortune 100 company CEOs, it is expected to find that socio-demographic factors impact the salary, bonus, and total compensation of a CEO in the top Fortune 100 firms.

Now that the methodology and data collection methods have been described, the next chapter discusses the results of various types of analysis that are being performed in this dissertation. Chapter 4 starts by providing the descriptive analysis and *t*-tests of the relevant variables followed by the regression analysis for each dependent variable.

Results and Discussion

This chapter primarily focuses on the discussion of the results obtained from the collected data and the described methodology in Chapter 3. The first section of this chapter covers descriptive analysis of the dependent variables. The second section provides a descriptive analysis of how the socio-demographic independent variables differ alongside the *t*-tests for differences in means of the dependent variables for characteristics such as male, white, private, and founder. The third section provides a descriptive analysis of how the control variables of the industry differ alongside the *t*-tests for differences in means of the dependent variables for public IPO versus non-IPO companies, sectors, and market values in the Fortune 100 companies for the year 2020. The final section of this chapter explores the regression analysis using OLS method and discusses the results of the causality testing for all independent variables. Table 2 presents the summary statistics and the descriptions for all the variables included in this analysis.

To reiterate, the dataset contains information about the CEOs and related socio-demographic and control variables for the top Fortune 100 firms ranked in order by total revenue for the year 2020. The data were gathered for each CEO's socio-demographic background (*male*, *age*, *white*, *experience*, *education*, *privateuni*, *founder*). The control variables included are *marketvalue*, type of industrial sector (*commtech*, *consumers*, *utilenergy*, *financials*, *healthcare*, *industmat*), and *publicco*.

Table 2

Summary Statistics and Descriptions of All Variables Included in Analysis

Variable	Mean	Std. dev.	Min	Max	Description
Dependent Variables					
salary	1.29	0.64	0	3	CEO salary in 2020 ($M)
bonusstock	14.75	12.75	0	107	CEO bonus stock options in 2020 ($M)
totalcomp	16.46	12.78	0	108	CEO total compensation in 2020 ($M)
Independent Variables					
CEO Personal					
age	59.69	6.92	35	89	Age of CEO in 2020 (years)
experience	34.23	8.93	9	65	Number of Years worked in Sector
education	1.63	0.72	0	3	= 0 if nodegree, 1 if bach., 2 if master, 3 if phd
nodegree	0.03	0.17	0	1	= 1 if CEO does not have college degree
bachelor	0.42	0.50	0	1	= 1 if CEO has Bachelor's Degree only
master	0.44	0.50	0	1	= 1 if CEO has a Master's Degree
phd	0.11	0.31	0	1	= 1 if CEO has Ph.D. or equivalent
privateuni	0.56	0.50	0	1	= 1 if CEO attended a Private University
male	0.91	0.29	0	1	= 1 if CEO is male
white	0.90	0.30	0	1	= 1 if CEO is non-Hispanic white
founder	0.09	0.29	0	1	= 1 if CEO started or owns Company
Company Related					
mktvalueB	120.29	210.01	0	1200	Company Market Value in 2020 ($B)
publicco	0.92	0.27	0	1	= 1 if the company is public
sector	2.99	1.65	0	5	= 0 through 5 in following order
utilenergy	0.10	0.30	0	1	= 1 if Utilities/Energy Company
industmat	0.13	0.34	0	1	= 1 if Industrials/Materials Company
healthcare	0.14	0.35	0	1	= 1 if Health Care Company
commtech	0.17	0.38	0	1	= 1 if Communications/Technology Company
consumers	0.23	0.42	0	1	= 1 if Consumer Staples/Discretionary Company
financials	0.23	0.42	0	1	= 1 if Financial Company

Descriptive Analysis of Dependent Variables

The primary methodology for analyzing the non-random sample of the Fortune 100 companies for the year 2020, included in this dissertation, is through a descriptive analysis of the

trends found in the CEOs compensations taking into consideration various socio-demographic and industrial control variables.

The dependent variables or the primary variables of interest are *salary*, *bonusstock*, and *totalcomp*. As seen in Table 2, the average CEO salary is $1.29M per year with a standard deviation of $0.64M. This indicates that about 67% of all Top 100 CEOS earn between $0.65M and $1.94M per year. Interestingly, five of the 100 CEOs earn a salary of either $0 or $1 per year as shown in Table 3. The maximum CEO salary in 2020 in this sample was $3.2M per year earned by Brian L. Roberts of Comcast Corporation.

Table 3

Lowest Salaries of CEOs in Fortune 100 in 2020

Name of Company	CEO Name	salary ($)
Alphabet	Larry Page	1
Walgreens Boots Alliance	Stefano Pessina	0
Facebook	Mark Zuckerberg	1
American Airlines Group	Doug Parker	0
Capital One Financial	Richard Fairbank	0

As seen in Table 2, the second dependent variable *bonusstock* is spread with a mean of $14.75M per year with a standard deviation of $12.75M in the year 2020. This indicates that about two-thirds of the Fortune 100 CEOs earned between $2M and $27.5M in bonus stock options from their respective companies. It is interesting to note that five CEOs in the Fortune 100 companies got $0 worth of stock options, as listed in Table 4, whereas the highest amount of bonus stock options was given to Safra Catz of Oracle for a whopping $107M in the year 2020.

Table 4

Lowest Bonus/Stock of CEOs in Fortune 100 in 2020

Name of Company	CEO Name	bonusstock ($)
Alphabet	Larry Page	0
Energy Transfer	Kelcy Warren	0
New York Life Insurance	Theodore A. Mathas	0
Nationwide	Steve Rasmussen	0
USAA	Stuart Parker	0

For the third dependent variable, *totalcomp*, Table 2 indicates that the average total compensation for CEOs of Fortune 100 firms in 2020 was $16.46M per year with a standard deviation of $12.78M. Thus, about 67% of the CEOs obtained a total compensation in the range of $3.69M to $29.24M. Interestingly the lowest total compensation of $1 was obtained by Larry Page of Alphabet whereas Safra Catz of Oracle had the highest total compensation of $108M Safra Catz of Oracle can be considered to be an outlier for both the *bonusstock* and *totalcomp* variables. If the outlier is excluded, then the mean value *bonusstock* goes down from $14.74M to $13.81M with the new standard deviation being $8.71M and the mean value of *totalcomp* goes down from $16.46M to $15.53M with the new standard deviation being $8.83M. A major point to be noted as to why this outlier is not being excluded from the data used for further analysis is that the outlier in this case is a female CEO. Excluding one out of the nine female CEOs in the sample could potentially skew the comparison results by gender.

Descriptive Analysis of Socio-Demographic Independent Variables

As seen in Table 2 and as discussed earlier, the socio-demographic independent variables being considered are *male*, *age*, *white*, *experience*, *founder*, *education*, and *privateuni*. Of these, *age* and *experience* are continuous variables measured in number of years, *education* is an

ordinal variable taking the values between 0 and 3, and the variables *male*, *white*, *founder*, and *privateuni* are binary variables taking the value of 1 or 0. This section consists of descriptive analysis of all variables as well as the relevant *t*-tests using some of the binary variables included in the data to test for differences in means of compensation variables.

Continuous Variables: Age and Experience

The *age* variable refers to the age in years of the CEO of an included company in the year 2020. The youngest CEO in the sample is Mark Zuckerberg of Facebook (now called Meta) who was 35 years old in 2020 and the oldest is Warren Buffet of Berkshire Hathaway who was 89 years old in 2020. The variable has a mean of 59.69 years with a standard deviation of 6.92 years and Table 5 shows that 51% of the CEOS are 60 years old or younger implying that about 49% are over 60 years of age.

The *experience* variable refers to the number of years of experience a CEO of an included company has in the current sector. In the dataset, the least *experience* value is 9 years and pertains to CEO Juan Ricardo Luciano of Archer Daniels Midland whereas the maximum *experience* value is 65 years for CEO Warren Buffett of Berkshire Hathaway. The mean value of *experience* is 34.23 with a standard deviation of 8.93 years which indicates that the range of experience in the industry falls between 25 and 45 years with a 67% probability. As seen in Table 5, only 5% of the CEOs had less than 20 years of experience in their respective industries and a whopping 29% had more than 40 years of experience.

Table 5

Tabulation of Age and Experience in Fortune 100 CEOs in 2020

	Experience in years				
Age Range	Below 20	Between 20 and 30	Between 30 and 40	Over 40	TOTAL
Below 50	1	2	0	0	3
Between 50 and 60	2	14	29	3	48
Between 60 and 70	2	6	15	21	44
Over 70	0	0	0	5	5
TOTAL	5	22	44	29	100
Correlation Value = 0.5895					

One would expect that the years of experience within an industry would be a major contributor to an individual being made the CEO of a Fortune 100 company and therefore experience can be expected to be very highly correlated with age. However, the correlation coefficient value for age and experience was an ordinary 0.5895, although expected it to be higher, it indicates that there might be CEOs in the dataset that either switched industries during the course of their careers or had a late start in their careers.

Ordinal Variable: Education and Binary Variable: Privateuni

The variable *education* refers to the highest achieved college degree by the CEOs of the included companies in 2020. If the CEO did not have any official college degree, *education* takes the value 0; for CEOs who had only a Bachelor's degree, *education* takes the value 1; for CEOs that had a Master's Degree *education* takes the value 2 and for CEOs that had a doctorate or equivalent terminal degree *education* takes the value 3. The mean value of *education* is 1.63 with a standard deviation of 0.72, which by itself does not clarify the educational attainment of the CEOs of the Fortune 100 firms. However, when the educational attainment variable is analyzed, it is evident (as shown in Tables 2 and Table 5) that only 3% of the CEOs did not have any college education, 42% had a Bachelor's Degree, 45% had a Master's Degree and 11% of the

CEOs had a doctorate or equivalent terminal degree. It is important to note that the data does not reflect whether the highest degree attained by the individuals is in the same field as the business they are leading or not.

Table 6

Tabulation of Education and Institution in Fortune 100 CEOs in 2020

	Institution		
	Public	Private	TOTAL
No Degree	3	0	3
Bachelor's	25	17	42
Master's	13	31	44
PhD or equal	3	8	11
TOTAL	44	56	100

A related variable included in the analysis is the variable *privateuni* which indicates whether the highest degree attained by the CEO was at a private or a public institution. Table 6 shows that of the 42 CEOs with a Bachelor's Degree, 17 or 40% of the CEOs attended a private institution; of the 44 CEOs with a Master's Degree, 31 or 70% of the CEOs attended a private institution; and of the 11 CEOs with a doctorate or equivalent terminal degree, 8 or 73% attended a private institution. Thus, overall, 3% of the CEOs did not attend college at all, 41% of all CEOs went to a public institution for their higher education, and 56% attended private institutions for pursuing and finishing their higher education.

When conducting a *t*-test for the difference of means between groups based on whether a CEO attended a private institution or not, the difference between the two groups failed to be significant for salaries and total compensation. However, the difference between the two groups was significant at $\alpha = 0.10$ for *bonusstock* with a p-value of 0.078. Table 7 shows the outcomes of *t*-tests for multiple socio-demographic binary variables, including *privateuni*. This implies that

in real terms we cannot reject the null hypothesis that there is no difference between the salaries and total compensation given to CEOs based on whether they attended private institutions or not. However, we can reject the null hypothesis that there is no significant difference between the bonus given to CEOs based on whether they attended a private university or not. An $\alpha = 0.10$ significance level was used because the data is small and non-random to show there are still marginally significant results even though an $\alpha = 0.05$ was not used.

Table 7

Results for T-*Tests for Differences in Means of Groups*

Variable	*salary*		*bonusstock*		*totalcomp*			
	Difference	*p*-value	Difference	*p*-value	Difference	*p*-value	"yes" values	TOTAL
privateuni	0.1635	0.194	-4.1791[a]	0.078[a]	-3.5655	0.133	56	97
male	0.1061	0.531	10.37	0.357	11.6805	0.290	91	100
male - outlier	0.1611	0.370	-0.0197	0.994	1.5319	0.488	91	99
white	-0.2058	0.183	-1.1347	0.676	-1.8078	0.522	90	100
founder	0.6279	0.118	5.3562	0.176	6.4452	0.127	9	100

Note. H_0: Difference = mean(0) - mean(1) = 0. *p*-value refers to the *P*(Difference =/= 0).

[a] values significant at 10%.

Binary Variable: Male

The data in Table 2 indicates there is not enough diversity in the Fortune 100 CEOs in 2020 since 91 are male and only 9 are female. However, when we consider the information obtained from Table 7, performing *t*-tests on differences of means for *salary*, *bonusstock*, and *totalcomp* between males and females, it can be seen that the differences are not statistically significant. The differences are numerically high for *bonusstock* and *totalcomp.* As noted previously, CEO Safra Catz can be considered to be an outlier. If this outlier is removed and the *t*-test is performed again, it is clear that the differences go down numerically as well. This

implies that even though at first glance there is a disparity in the sheer numbers of female versus male CEOs in the Fortune 100 list from 2020, there is really no significant difference in the various types of compensations offered to either male or female CEOs.

Binary Variable: White

The data Table 2 indicates there is not enough diversity in the Fortune 100 CEOs in 2020 since 90 are white and 10 are non-white. However, when we consider the information obtained from Table 7, performing *t*-tests on differences of means for *salary*, *bonusstock*, and *totalcomp* between *white* and non-white, it can be seen that the differences are not statistically significant and there is insufficient evidence to suggest that the various types of compensations offered for *white* CEOS are different than their counterparts.

Binary Variable: Founder

The data in Table 2 indicates that among the Fortune 100 CEOs in 2020 only 9 are founders and 91 are non-founders. When considering the information obtained from Table 7, performing *t*-tests on differences of means for *salary*, *bonusstock*, and *totalcomp* between *founder* and non-founder, it can be seen that the differences are not statistically significant and there is insufficient evidence to suggest that the various types of compensations offered to a *founder* are different than their counterparts.

Descriptive Analysis of Control Variables

As seen in Table 2 and as discussed earlier, the control variables being considered are *mktvalueB*, *sector*, and *publicco*. Of these, *mktvalueB* is a continuous variable measured in the market value of the firm in 2020 in billions of dollars, *sector* is a nominal variable taking the values between 0 and 5 based on binary variables *utilenergy*, *industmat*, *healthcare*, *commtech*, *consumers*, and *financials*; and *publicco* is a binary variable representing whether a company is a

public company or not. This section consists of descriptive analysis of these variables as well as the relevant *t*-tests using some of the binary variables included in the data to test for differences in means of compensation variables.

Continuous Variable: MktvalueB and Binary Variable: Publicco

The market value variable is a nominal response variable used to measure firm performance in relation to other firms in the Fortune 100. Table 8 shows 8 firms with zero market value, which indicated these are private firms. These firms were coded as "0" in the binary variable *publicco*, implying that the rest of the 92 firms are coded as "1" in the *publicco* variable. Table 2 indicates that the average market value (*mktvalueB*) was $120.29 billion dollars with a standard deviation of $210 billion dollars. This range can be misleading because there are 8 firms with a market value of 0 and 4 firms with over $500 billion market value in 2020. The highest valued firm, Microsoft under CEO Satya Nadella, was worth about $1.2 Trillion in 2020. Apple under CEO Tim Cook with $1.1T, Amazon under CEO Jeff Bezos with $971B, and Alphabet under CEO Larry Page with $799B are the other firms valued over $500B in the dataset. Of the remaining 88 firms between $0 and $500B market evaluations, the mean market value is $90.31B with a standard deviation of $98.17B. Table 8 shows that 9 of the Fortune 100 firms are valued at less than $10B, 34 firms valued between $10B and $50B, 18 firms valued between $50B and $100B and 27 firms valued between $100B and $500B.

Table 8

Tabulation of Market Value and Sector in Fortune 100 CEOs in 2020

	Industrial Sector						
Market Value of Firm	*utilenergy*	*industmat*	*healthcare*	*commtech*	*consumers*	*financials*	TOTAL
Private ($0)	0	0	0	0	1	7	8
Between $0 and $10B	2	1	0	1	2	3	9
Between $10B and $50B	6	4	6	2	11	5	34
Between $50B and $100B	0	8	3	1	2	4	18
Between $100B and $500B	2	0	5	9	7	4	27
Over $500B	0	0	0	4	0	0	4
TOTAL	10	13	14	17	23	23	100

Note. Correlation Value = -0.1424.

Table 9

Results for T-*Tests for Differences in Means of Groups*

Variable	*salary*		*bonusstock*		*totalcomp*			
	Difference	p-value	Difference	p-value	Difference	p-value	"yes" values	TOTAL
utilenergy	0.0846	0.677	2.436	0.332	2.9878	0.264	10	100
industmat	-0.1464	0.181	1.4417	0.544	-1.8731	0.292	13	100
healthcare	-0.1525	0.148	-1.681	0.371	-1.3444	0.482	14	100
commtech	-0.0624	0.804	-8.6708	0.198	-8.2266	0.225	17	100
consumers	0.1448	0.293	3.0463	0.125	3.7373[a]	0.062[a]	23	100
financials	0.0592	0.737	2.8461	0.255	3.4088	0.178	23	100
publicco	0.2777	0.409	-8.7127[b]	0.017[b]	-8.8921[b]	0.012[b]	8	100

Note. p-value refers to the *P*(Difference =/= 0). H_0: Difference = mean(0) - mean(1) = 0.

[a] values significant at 10%. [b]values significant at 5%.

The data in Table 2 indicate there is not enough diversity in the Fortune 100 CEOs in 2020 since 92 are public and 8 are private firms. However, when we consider the information obtained from Table 9, performing *t*-tests on differences of means for *salary*, *bonusstock*, and *totalcomp* between public and private firms, the results proved to be significant between the *bonusstock*, and *totalcomp* of CEO's that worked at a public company. The *p*-values were .017 and .012, respectively. This resulted in rejecting the null hypothesis and showed there was

evidence to say the mean bonus and mean total compensation for a public company is different from a private company. The variable *publicco* is significant for both $\alpha = 0.05$ and $\alpha = 0.10$.

Nominal Variable: Sector and Related Binary Variables

The sector variable is constructed to indicate the type of industrial sector a given firm belongs to. Binary variables were also created to flag companies in each of the six major sectors considered in the analysis. Thus, utilities or similar energy firms were coded as "1" for the *utilenergy* variable; industrial materials firms were coded as "1" for the *industmat* variable; healthcare firms were coded as "1" for the *healthcare* variable; communications and technology firms were coded as "1" for the *commtech* variable, Consumer Staples or Consumer Discretionary purchases firms were coded as "1" for the *consumers* variable; and financial institutions were coded as "1" for the *financials* variable. Tables 2 and Table 8 indicate the number of firms in each of these sectors. Interestingly, the 4 firms that are valued at over $500B belong to the *commtech* sector and of the 8 private firms, 7 belong to the *financials* sector.

The data Table 9 indicates there are 10 firms in the *utilenergy* category, 13 firms in the *industmat* category, 14 firms in the *healthcare* category, 17 firms in the *commtech* category, 23 firms in the *consumers* category, and 23 firms in the *financials* category. When we consider the information obtained from Table 9, performing *t*-tests on differences of means for *salary*, *bonusstock*, and *totalcomp* between sectors, the null hypothesis cannot be rejected and there was insufficient evidence to suggest the various types of compensation offered for one sector is different than another sector. However, the only results that proved to be significant were the *totalcomp* of CEO's that worked in the *consumers* category at an $\alpha = 0.10$. The p-value was 0.062. This resulted in rejecting the null hypothesis and showed there is evidence to say the mean total compensation for *consumers* sector is different from other sectors.

Correlation and Regression Analysis

Testing for correlations between the variables allows one to identify if linear relationships exist between the variables or not. The Ordinary Least Squares (OLS) linear regression analysis method is used to check for causal relationships between the dependent and independent variables. The slopes obtained from OLS indicate the amount of change, either an increase or decrease, in the dependent variable when the value of an independent variable increases by one unit (Pandis, 2016). A linear correlation analysis followed by linear regression analysis allows the ability to identify which variables are important and which are not, to draw conclusions about the fluctuations in the dependent variables (Fitzmaurice, 2016). However, a drawback of a linear regression analysis research design is that it can only be used if there are linear relationships between the dependent and independent variable, the data are independent of each other, and any outliers are acknowledged as having a significant effect on the model (Schneider et al., 2010).

In the case of the dataset used for this dissertation, the linear relationship strengths are uncertain, as discussed in the first subsection below, Correlations between Variables. Moreover, while the data on socio-demographic backgrounds of the CEOs are independent of each other, there are significant outliers in many of the data values. The data for the control variables is not entirely independent and the selective data methodology is likely to prevent meaningful outcomes of the regression analysis. Some of these issues can be addressed in future research by having a larger and random dataset of CEOs of various sized firms in the economy. However, the results obtained from the Correlation and Regression analysis on this dataset can reveal exactly which types of variables are likely to yield meaningful results if the sample size was larger and collected in a random manner.

Correlations between Variables

Table 10 shows the Pearson's Correlation Coefficients between the dependent and all independent variables included in the regression analysis, with their significance tested at 5% and at 10%. The most important thing to note is that since a selective sample is used in this dissertation, a majority of the linear correlations are either not statistically significant and/or numerically, so it is expected that the regression models for the dependent variable are likely to yield uncertain or ungeneralizable results when testing for linear causality. Most of the statistically significant correlations are expected.

For instance, there is an almost perfect correlation between the dependent variables *bonusstock* and *totalcomp* since *totalcomp* is obtained by adding *salary* to the *bonusstock* values. Similarly, *age* and *experience* have a high correlation of about 0.59 indicating that older CEOs are likely to have more experience in their fields. However, as discussed earlier, the fact that this correlation is not extremely high (greater than 0.7), indicates that older CEOs might have switched fields during their careers. Another interesting observation is that *publicco* is positively correlated with *bonusstock*, *totalcomp*, and *mktvalueB* indicating that CEOs of public companies are likely to be compensated better than their counterparts in private companies. This confirms the results of the *t*-test for difference of means between *bonusstock* and *totalcomp* with respect to *publicco*. The variable male is found to have statistically significant linear correlations with bonusstock, totalcomp, and privateuni, even though the numerical value of the correlations is low. Some of this is being driven by the CEO of Oracle, receiving the highest *bonusssstock* and *totalcomp* values being female. However, the results also indicate that male CEOs are less likely than female CEOs to have attended private universities for their highest degree.

Table 10

Correlations Between all Variables in Dataset

	salary	bonusstock	totalcomp	age	experience	education	privateuni	male	white	founder	mktvalueB	publicco	sector
bonusstock	0.25[a]												
totalcomp	0.31[a]	0.98[a]											
age	0.08	0.04	0.02										
experience	0.11	-0.06	-0.06	0.59[a]									
education	-0.14	0.13	0.11	-0.02	-0.34[a]								
privateuni	-0.14	0.18[b]	0.15	-0.11	-0.31[a]	0.33[a]							
male	-0.05	-0.23[a]	-0.26[a]	0.13	0.11	-0.11	-0.21[a]						
white	0.10	0.03	0.04	0.02	0.14	-0.17[b]	-0.16	-0.10					
founder	-0.28[a]	-0.12	-0.15	-0.08	-0.02	-0.18[b]	0.00	0.10	0.10				
mktvalueB	0.01	0.07	0.06	-0.19[a]	-0.15	0.06	0.21[a]	0.08	-0.09	0.24[a]			
publicco	-0.12	0.19[b]	0.19[b]	0.06	0.07	-0.15	0.11	-0.09	0.02	0.09	0.17[b]		
sector	-0.07	-0.04	-0.08	0.05	-0.05	0.22[a]	0.12	0.06	-0.02	-0.13	0.02	-0.34[a]	

Note. [a]Significant at the 5% level; [b]Significant at the 10% level.

Ordinary Least Squares Regression Analysis

The null hypothesis for the OLS is that the slopes (β_i) are statistically equal to zero, or that the independent variables have no causal effect on the compensation variables for the CEOs. The alternative hypothesis is that the slopes (β_i) are not equal to zero, or that the independent variables have a statistically significant causal effect on the compensation variables for the CEOs. The first estimated model, *Model 1*, includes only the socio-demographic characteristics of the CEOs whereas the second full model, *Model 2,* includes both the socio-demographic characteristics as well as the control firm-related variables.

$$Model\ 1: Y_i = \beta_0 + \beta_{1i} age + \beta_{2i} experience + \beta_{3i} education + \beta_{4i} privateuni + \beta_{5i} male + \beta_{6i} founder + \varepsilon_i$$

$$Model\ 2: Y_i = \beta_0 + \beta_{1i} age + \beta_{2i} experience + \beta_{3i} education + \beta_{4i} privateuni + \beta_{5i} male$$

$$+ \beta_{6i} founder + \beta_{7i} mktvalueB + \beta_{8i} publicco + \beta_{9i} sector + \varepsilon_i$$

where Y_i represents the three dependent variables (*salary*, *bonusstock*, and *totalcomp*) as functions of the socio-demographic background of the CEO controlled for the value and industry sector of the company. Table 11 presents the results of the OLS analysis of the two models for the three dependent variables. Model 1 for each of the three dependent variables excludes the outlier for the *bonusstock* and *totalcomp* variable resulting in only 99 observations, whereas Model 2 for each variable includes all 100 observations.

The estimated models for the *salary* variable are the only models that are statistically significant based on the *F*-values. This implies that these are the only two models where the independent variables actually have a statistically valid impact on the dependent variable, *salary*. For the remaining four models (two for *bonusstock* and two for *totalcomp*), the *F*-values are not significant implying that there is no statistical impact of any of the chosen independent variables on the dependent variables, or that all the slopes in these four models are statistically equivalent to zero. The R-squared values for Models 1 and 2 for the *salary* variable are 13.4% and 19.3% respectively, indicating that even though the models are significant statistically, they only explain between 13% and 19% of the variation in the annual salary of the CEOs. The R-squared values for *bonusstock* and *totalcomp* models are numerically low as well as statistically insignificant so there is little point in dwelling on these values. However, it is definitely clear that if the data was selected randomly with higher fluctuations allowed in the independent control variables, these models can yield more meaningful results.

On checking the slopes in Models 1 and 2 for salary, the variables *education*, *founder*, *mktvalueB*, and *publicco* have statistically significant (either at 5% or at 10%) causal impact on the annual salary of the CEO. Interestingly, if the CEO is a founder, their salaries are lower than

their counterparts by between $692,000 to $793,000 based on the two estimated models. With each additional level of educational attainment, the CEOs are expected to lose about $171,000 in salary. Similarly, CEO salary increases by about a $1,000 for each additional billion dollars in market value of the company. If a company is a public company, the CEO is likely to earn about $475,000 less than their counterparts at a private company.

Table 11

Regression Model for Salary

	Models 1 & 2 *salary*			
Variables	Slope	*P* > |t|	Slope	*P* > |t|
Constant	1.327[a]	0.043 [a]	1.578[a]	0.021[a]
age	0.006	0.599	0.011	0.333
experience	-0.002	0.826	-0.002	0.835
education	-0.144	0.159	-0.171[b]	0.092[b]
privateuni	-0.105	0.456	-0.093	0.513
male	-0.145	0.548	-0.175	0.445
white	0.183	0.399	0.219	0.305
founder	-0.692[a]	0.003[a]	-0.793[a]	0.001[a]
mktvalueB			0.001[b]	0.064[b]
publicco			-0.475[b]	0.062[b]
sector			-0.053	0.193
	$R2$	Prob > F	$R2$	Prob > F
	0.134[b]	0.061[b]	0.193[a]	0.030[a]

Note. Model 1 $N = 99$; Model 2 $N = 100$.

[a] = Values significant at the 5% level; [b] = Values significant at the 10% level.

While it is disappointing that none of the estimated for *bonusstock* and *totalcomp* are significant, it is also likely that the interrelationships between *bonusstock* and variables such as *education*, *founder*, *privateuni*, *publicco*, and *male* go beyond the superficial. For instance, an individual with a higher level of education might we willing to take a lower salary (as seen in the results from the regression analysis of salary) but negotiate for a higher *bonusstock* option.

Table 12

Regression Model for Bonusstock

	Models 1 & 2 *bonusstock*			
Variables	Slope	*P* > |t|	Slope	*P* > |t|
Constant	4.402	0.627	1.816	0.896
age	0.083	0.611	0.181	0.449
experience	0.059	0.667	0.066	0.737
education	1.055	0.457	1.413	0.497
privateuni	4.062[a]	0.041[a]	2.128	0.468
male	1.464	0.663	8.363 [b]	0.078 [b]
white	1.080	0.722	2.361	0.591
founder	4.846	0.126	5.535	0.240
mktvalueB			0.005	0.421
publicco			7.325	0.160
sector			0.174	0.836
	R2	Prob > F	***R2***	Prob > F
	0.074	0.415	0.129	0.234

Note. Model 1 *N* = 99; Model 2 *N* = 100.

[a] = Values significant at the 5% level; [b] = Values significant at the 10% level.

Table 13

Regression Model for Totalcomp

	Models 1 & 2 *totalcomp*			
Variables	Slope	*P* > |t|	Slope	*P* > |t|
Constant	1.327	0.043	1.578	0.021
age	0.006	0.599	0.011	0.333
experience	-0.002	0.826	-0.002	0.835
education	-0.144	0.159	-0.171	0.092
privateuni	-0.105	0.456	-0.093	0.513
male	-0.145	0.548	-0.175	0.445
white	0.183	0.399	0.219	0.305
founder	-0.692	0.003	-0.793	0.001
mktvalueB			0.001	0.064
publicco			-0.475	0.062
sector			-0.053	0.193
	R2	Prob > F	***R2***	Prob > F
	0.134	0.061	0.193	0.030

Note. Model 1 *N* = 99; Model 2 *N* = 100.

[a] = Values significant at the 5% level; [b] = Values significant at the 10% level.

Similarly, individuals educated at private universities or those that have founded the company or those that are working for a public company might choose to take the lower salary-higher *bonusstock* trade-off as well. The *founder* variable had significance in *totalcomp* as well. In addition, males were statistically significant in *bonusstock* and *totalcomp* which meant they more than likely negotiated it for a lower salary in exchange.

Conclusions from Results

In this chapter, a descriptive analysis of the dependent variables is provided. Next, a descriptive analysis of how the socio-demographic independent variables differ alongside the *t*-tests is provided for differences in means of the dependent variables for characteristics such as male, white, private, and founder. When a *t*-test for the difference of means between groups based on whether a CEO attended a private institution or not is conducted, the difference between the two groups failed to be significant for *salary* and *totalcomp*. However, the difference between the two groups was significant for *bonusstock*. In addition, *t*-tests on differences of means for *salary*, *bonusstock*, and *totalcomp* between male/female, white/non-white, and founder/non-founder the differences were not statistically significat. Thirdly, a descriptive analysis of how the control variables of the industry differ alongside the *t*-tests for differences in means of the dependent variables or public IPO vs. non-IPO companies, sectors, and market value in the Fortune 100 companies for the year 2020 is provided. The results proved to be significant between the *bonusstock*, and *totalcomp* of CEO's that worked at a public IPO company. The null hypothesis is rejected because there was evidence to say the *bonusstock*, and *totalcomp* for a public company is different from a private company. In the sector category, the only results that proved to be significant was the *totalcomp* of CEO's that worked in the *consumers* category, so they rejected the null hypothesis. However, the null hypothesis cannot be

rejected in all the other sector categories that the various compensation offered for one sector is different than another sector. Finally, the regression analysis using the OLS method is explored and the results of the causality testing for all independent variables is discussed. A very close correlation between the dependent variables *bonusstock* and *totalcomp* is found because *totalcomp* is obtained by adding *salary* to the *bonusstock* values. Similarly, *age* and *experience* have a high correlation of about 0.59 indicating that older CEOs are likely to have more experience in their fields. The variable *male* is found to have statistically significant linear correlations with *bonusstock, totalcomp,* and *privateuni* and *white* has a significant relationship with *education*. Interestingly, *education* and *experience* have an inverse relationship. Another interesting observation is that *publicco* is positively correlated with *bonusstock*, *totalcomp*, and *mktvalueB* indicating that CEOs of public companies are likely to be compensated better than their counterparts in private companies. This confirms the results of the *t*-test for difference of means between *bonusstock* and *totalcomp* with respect to *publicco*. even though the numerical value of the correlations is low. In causality testing for the independent variables, two models were found where the independent variables have a statistically significant impact on the dependent variable, *salary*. The variables *education*, *founder*, *mktvalueB*, and *publicco* were found to have statistically significant causal impact on the annual salary of the CEO.

Interpretations, Conclusions, and Recommendations

This chapter summarizes the research findings regarding which factors affect CEO compensation the most in the top Fortune 100 firms and the implications of these findings for future CEOs and other firms. The intent of this dissertation was to obtain a comprehensive understanding of the topic to break through the stereotypical reasonings for CEO compensation. This allowed for a deeper analysis of the variables that actually contributed to CEO compensation in the top Fortune 100 firms with a view to assisting the decision makers in the future in identifying the best compensation metrics.

Discussion

As noted in chapters 1 and 2 of this dissertation, the existing literature on CEO compensation focuses heavily on the interrelationships between the educational background and experiences of a CEO affects a firm's performance and in turn how the performance of the firm impacts the compensation meted out to the CEOs. However, the literature is sparse when it comes to analyzing how the socio-demographic background of CEO's directly impacts the compensation they receive from the firm. This dissertation has aimed to identify if there are any biases in determining a CEO's salary, bonus, and total compensation, when their socio-demographic backgrounds are taken into consideration. Using compensation and CEO background data from the top Fortune 100 firms, this dissertation discusses current practices in terms of various types of compensations provided to their CEOs.

Limitations

The main limitations of this research are the small sample size and non-random nature of the data. It consisted of only the top Fortune 100 of the much larger *Fortune 500*. In future research, a larger and fully randomized sample of CEOs from corporations should be used for

more meaningful results of significance of relationships between variables. One of the main reasons why a larger and randomized sample would be beneficial is to ensure the generalizability of the results because a random sample is likely to be free from biases, outliers, and other issues that plague a small non-random sample. The primary reason or justification for using such a small non-random sample (as compared to the population of CEOs) is that many of the variables included in this study are not a part of the general publicly available datasets or information from corporations. For instance, the type of university that a CEO attended requires additional effort to identify. This is what makes collecting larger samples, particularly in a randomized manner from the population of CEOs more challenging. Many CEOs of smaller corporations or firms are not as well-known or considered as "public figures," which can make collecting socio-demographic information on them very challenging.

Conclusions from Research Findings

This dissertation found that the average CEO *salary* was about $1.29M per year, $14.75M per year in *bonusstock*, and $16.46M per year in *totalcomp*. This data collection was original research and had not been captured before so when comparing it to available literature it is impossible to verify if the results confirmed or contrasted it. There were outliers in both directions of the spectrum with 5 CEOs making between $0 and $1 annual *salary* and one CEO making $3.2M in annual *salary*. The same holds true for *bonusstock*, there were 5 CEOs that had $0 in *bonusstock* compensation and one CEO making a whopping $107M in annual *bonusstock*. Similarly, there was one CEO that made $1 in *totalcomp* per year and another one that made $108M annual totalcomp. This is important to note because ordinarily the outliers would be excluded but, in this case, the main outlier is a *female* so it would further skew the results in a negative way in gender category. In addition, the sample size being so small it was difficult to

ascertain that it was indeed an outlier to the general population. It is expected to find that middle-aged white males with high education dominated the CEO roles and were paid the most. However, the findings were that while middle-aged white males did dominate the CEO position in the Fortune 100 firms, they were not paid the most. This section includes the key conclusions drawn from the research and it is not exhaustive by any means. *T*-tests for the differences of means of the dependent variables were conducted for the socio-demographic independent variables such as *male*, *white*, *founder*, and *privateuni*. The only socio-demographic independent variable that was significant was *bonusstock* at 0.078 at $\alpha = 0.10$ level for *privateuni*. The null hypothesis was rejected that there was not a significant difference between the bonus given to CEOs based on whether they attended a private university or not. The alternative hypothesis was supported and the *bonusstock* of CEOs that attended private universities was statistically significant. The other socio-demographic independent variables such as male, white, and founder were not statistically significant. A limited diversity and restricted sample data was one of the main reasons for this outcome.

As described below, some of the literature review findings were confirmed while others were not. The Upper Echelon Theory from the literature review suspected that the CEO's background and experiences such as age, previous firm performance, and education were significant in determining future firm performance (Wang et al., 2016). Contrary to these expectations, this dissertation finds that socio-demographic factors like age, white, and previous firm performance were not significant in determining CEO compensation in the top 100 firms. However, a CEOs going to a private university was found to be significant in determining the bonus given to a CEO. But one can easily suggest that this was related to the firm performance and the private university background could be coincidental. This is something that needs to be

tested in a larger and randomized sample to derive more definitive conclusions regarding the role of socio-demographic factors in the compensation offered to the CEO of a firm.

The literature review discusses firm performance as having a possible connection to CEO compensation when firms offer incentives such as performance bonuses to attract the best talented CEOs (Moriary, 2005). However, this dissertation did not find that *bonusstock* was significantly related with *mktvalueB*. This is also something that would be important to examine with a much larger data sample for a definite conclusion.

The literature review also discussed educational degree credentials as a possible connection to higher CEO compensation. Datta & Iskandar-Datta (2014) found CEOs with an MBA from an Ivy-League school were compensated more than a non-MBA degree from an Ivy-League school. In the dissertation, no evidence was found of compensation significance between the types of education credentials between no degree, bachelors, masters, or PhD. However, this dissertation did find significant evidence that privately educated CEOs received higher bonuses than their counterparts. Within the narrow sample used in this dissertation one can ascertain that the type of degree a CEO has or even if they have one does not impact their compensation in the top 100 firms.

Gender-wage gap (GPG) between males and females is often considered to be of significant interest to the public. As discussed in the literature review, male and female CEO compensations were found to be similar and do not favor one gender over the other (Gupta et al., 2018). This dissertation confirms this result in the context of the sample used since there are no significant differences in the various forms of compensation between males and females in the Fortune 100 firms.

Upon testing for differences in means of the dependent variables for the firm-based control variables such as *mktvalueB*, *sector*, and *publicco,* it was found that only *totalcomp* was significant with a value of 0.062 at $\alpha = 0.10$ for CEOs that worked in the *consumers* sector. For the most part, there were no significant differences found in the CEO compensations in the top Fortune 100 firms.

In the literature review, this study found that the CEOs in different industries often had different duties and roles from each other. CEOs in the consumer goods industry were found to have increased firm performance the longer they were the CEO because the industry was stable enough for the CEO to make strategy changes overtime to be successful (Henderson et al., 2006). In this dissertation found that CEOs in the *consumers* sector had a significance in their total compensation than other sectors. This could be because it is a more stable environment than the *commtech* sector and the CEOs had more time to increase firm performance and thereby their *totalcomp*.

In addition, the results of the *t*-tests showed for the various forms of compensation between public and private firms proved to be significant between *bonusstock* at 0.017 and *totalcomp* at 0.012 at $\alpha = 0.10$ for CEOs that worked at a public company, *publicco.* The null hypothesis was rejected and found there was evidence to say that there was a difference between the bonus and total compensation given to CEOs based on whether they work for a public or a private company.

The literature review discussed firm size as a possible factor in determining CEO compensation. It found that firm size (market value) has a significant influence on CEO compensation (Matiur & Mohammad, 2018). As firm size increases, market value increases, then CEO compensation increases. Matiur and Mohammad (2018) argued that the best CEOs would

work for the most valuable and largest firms thus demanding higher compensation. Even though this dissertation found higher *bonusstock* and *totalcomp* for CEOs in public companies, it doesn't line up with the literature review because some private companies are larger than public companies in terms of total revenues.

Conclusions Using Correlations and Ordinary Least Squares (OLS) Regression

Given the small and non-random nature of the Top 100 CEOs data, most of the linear regressions were found to be insignificant, yielding uncertain results for causality. None of the variables had high correlations between each other. This is unsurprising considering that the sample is highly selective to begin with. However, this can be an important factor to analyze in a larger and randomized sample.

Using Model 1 & Model 2 from the Chapter 4 shown in Table 11, only the *salary* variable models have some level of significance. The independent variables *education*, *founder*, *mktvalueB*, and *publicco* have causal effect on CEO *salary* even though it is a very weak one at 13% and 19%. There were no meaningful results for the other two variables. It is acknowledged that while this is a flaw due to the sample size and attributes, it is necessary to include these results as a part of the research design in order to ensure that future research using larger randomized sampling can test (and hopefully find significance in) these relationships.

Recommendations for Future Research

This study could be used a spring-board study for future research. It could be done using this dataset's results but with a much larger sample size and randomized sampling methods to have more meaningful outcomes and generalizable results (i.e., 500 random public companies). This would provide certainty in the linear relationship's strengths between the dependent and independent variables. There are many outliers as well in the data that could be brought back into

alignment with a larger dataset and provide insight in a possible linear relationship. While this study found that *bonusstock* was significant for CEOs that attended private universities, there needs to be more in-depth research that examines some of the socio-demographic background issues that were found. For example, this dissertation did not find any correlation between any of the CEO compensation metrics and the *education* variable. It would be good to further research which types of degrees are contributing factors to CEO compensation or whether education affects CEO compensation at all. Including the list of universities that the CEOs attended would also categorize the quality of the university that each CEO attended in order to better understand why private university was significant and if a relative quality differential exists between public vs private. In addition, future research could include profitability metrics into the data like earnings per share to examine how well the CEOs generate profit in relation to their market value because the market value of a firm is controlled by the government is highly regulated markets. Also, the " degree to government intervention" metric could be added because it's not the biggest firms that matter but it's the biggest and most profitable firms that are important. Males and females were found to not be paid differently; however, it appears males were more likely to be paid. Further research could be done to determine if women were given the same chance as men or if women prefer to do other work because they are not motivated by money.

This section concludes this dissertation research study. This research is important because knowing what doesn't matter, as far as significance levels, still gets us closer to the truth. Non-significant findings are still important and contribute to the overall body of knowledge. It goes against the common perceptions that only variables that are significant matter and even dispels the common myths that age, ethnicity, and experience matter. CEO compensation has been a controversial topic for years in the media and a very emotional one for outsiders that do not

understand why there is such a disparity in income between CEOs and their employees. It was an exciting topic to research and discover the many factors that contribute to the various forms of CEO compensation. This research could be used by past, current, and future CEOs to know that socio-demographic bias/discrimination does not take place in determining compensation.

It is my hope that this study provides insight into the above and assists the research community in further future research.

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Appendix A: Raw Data (Top 25)

Company	Name	Salary	Bonus/Stock Options	Total Compensation
Walmart	Doug McMillon	1,276,892.00	21,250,357.00	22,527,249.00
Amazon	Jeff Bezos	81,840.00	1,600,000.00	1,681,840.00
Exxon Mobil	Darren Woods	1,400,000.00	14,400,290.00	15,800,290.00
Apple	Tim Cook	3,000,000.00	12,682,219.00	15,682,219.00
CVS Health	Larry Merlo	1,630,000.00	20,309,098.00	21,939,098.00
Berkshire Hathaway	Warren Buffett	100,000.00	288,968.00	388,968.00
UnitedHealth Group	David Wichmann	1,300,000.00	16,807,356.00	18,107,356.00
McKesson	Brian Tyler	929,375.00	11,660,691.00	12,590,066.00
AT&T	Randall L. Stephenson	1,800,000.00	23,800,312.00	25,600,312.00
AmerisourceBergen	Steven Collis	1,240,000.00	10,274,115.00	11,514,115.00
Alphabet	Larry Page	1.00	-	1.00
Ford Motor	James Hackett	1,800,000.00	15,952,835.00	17,752,835.00
Cigna	David Cordani	1,476,923.00	17,467,122.00	18,944,045.00
Costco Wholesale	W. Craig Jelinek	800,000.00	6,500,625.00	7,300,625.00
Chevron	Michael Wirth	1,468,750.00	17,942,321.00	19,411,071.00
Cardinal Health	Michael Kaufmann	1,193,288.00	14,377,716.00	15,571,004.00
JPMorgan Chase	James Dimon	1,500,000.00	28,519,840.00	30,019,840.00
General Motors	Mary T. Barra	2,100,000.00	19,770,450.00	21,870,450.00
Walgreens Boots Alliance	Stefano Pessina	-	13,542,260.00	13,542,260.00
Verizon Communications	Hans Vestberg	1,235,385.00	20,970,701.00	22,206,086.00
Microsoft	Satya Nadella	1,500,000.00	24,343,263.00	25,843,263.00
Marathon Petroleum	Gary Heminger	1,687,500.00	17,187,297.00	18,874,797.00
Kroger	Rodney McMullen	1,311,984.00	10,389,933.00	11,701,917.00
Fannie Mae	Hugh Frater	113,077.00	139,615.00	252,692.00