Insights from the First Year of Dodd Frank's Pay Ratio Disclosure

An empirical study on Dodd-Frank's Pay Ratio Provision to determine relationships between median employee and CEO compensation

Vivian Hu

Organizational Studies Honors Thesis

University of Michigan

Ann Arbor, MI 48104

Professor Jerry Davis

21st March 2019

Table of Contents

Abstract

This empirical analysis studies the relationship between the pay ratio provision Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 and various financial metrics to determine the association between CEO compensation, median employee compensation, company performance, and company size. Various performance metrics were analyzed across numerous industry sectors determining that changes in pay ratio can be predicted by economic sector of operation. The conclusions drawn from this study lays the foundation for a deeper dive to better combat widening economic inequality in the United States and makes an argument for companies to expand pay for performance compensation for all employees from executive level personal to address the wage gap.

Introduction

This report examines emerging data apropos of executive compensation for all industries impacted by the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010. Seven years after the original bill was passed, in September 2017, the Securities and Exchange Commission (SEC) established interpretive guidance for companies outlining how to implement and comply with the pay ratio disclosure requirement mandated by Section 953(b) of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (United States, 2017). This rule requires public companies to disclose CEOs compensation in comparison with the company's median employee salary. The pay ratio between CEOs and employees is a financial datapoint corporations prefer to keep internal as it will further exhibit the dramatic income inequality in the United States.

The new rule provides shareholders with necessary information to evaluate CEO compensation in comparison to median employee compensation, and it requires disclosure of pay ratio in registration statements, proxy, and information statements. With this information publicly available, companies may feel compelled to change their long-term corporate structure to outsource lower paying jobs to boost the median salary and report a lower pay ratio to assuage shareholders. Short-term implications of the pay ratio vary from giving current employees a benchmark comparison between their personal pay and the company average to more comprehensive deliberations regarding the lack of effect of company performance with median employee salary.

For the last 40 years since 1978, high CEO compensation has been heavily criticized repeatedly in both academic literature and popular media as CEO compensation increased from $1.5 million in 1978 to $16.3 million in 2014 for the top 350 firms in the United States, or 997

percent, a rise that almost doubles stock market growth. Over the same period, typical worker's wages grew very little. After adjusting for inflation, the typical worker wage rose 10.9% (Mishel and Davis, 2015). Hence, high CEO compensation has been reprimanded as a social evil stealing money from the average blue-collar American worker.

Previously, high CEO compensation has been studied in a vacuum with no comparison for median worker pay. However, with the new release of median worker compensation required by the Dodd-Frank, firms have been required to be transparent that CEO's can be compensated over 5,000 times more than the median worker. In other terms, assuming the average worker participates in the workforce for 45 years, it would take over 111 lifetimes for the median employee to match the salary of the CEO. Putting that into perspective, it becomes apparent that inequality is much further entrenched than the dramatic difference between the top 1% and the minimum wage employees. Economic inequality rears its ugly face in all industries, and the disclosed pay wage differential demonstrate the importance of recognizing that the problem of CEO compensation can be solved not only by moderating the amount CEO's are compensated but can also potentially be adjusted by increasing the wages of the median employee.

The contemporary conversation surrounding CEO compensation has extensively studied both the absolute and relative effects of social capital, firm financial performance, and the validity of pay for performance compensation structures even when CEO's underperform company targets (Belliveau, O'Reilly, and Wade, 2017). It fails to address the underlying problem that inequality is a two-faced problem that cannot exist without the other as current research focuses on CEO salary with no relation to median employee compensation. The new information from Dodd-Frank's pay ratio provision sheds light on median salary of employees and provides scholars to continue CEO compensation ratio Research now has access to the flip-

side of the coin and can investigate the importance and change of median employee salary in association with CEO salary.

In this study, I will investigate the relationship between median employee salary and company financial performance by utilizing the pay ratio as the first SEC mandated reporting figure for median employee salary in the United States. Previous academia has proven time and time again that pay for performance practices are ubiquitous in CEO compensation practices, however there is no literature tying median employee compensation with company financial performance. My hypothesis section following the literature review will thoroughly address empirical analysis I have undertaken to build an argument for the necessity of implementing more pay for performance metrics for not only CEO compensation but all wage earners to address the burgeoning problems of income inequality in the United States.

Context

In 2013, Former Secretary of Labor Robert Reich released *Inequality for All*. *Inequality for all* discussed the wage gap in the United States conducting an in-depth historical analysis into the growing wealth disparity in the United States. In 1978, the typical male worker earned $48,302 while the typical 1% earned $393,682 (adjusted for inflation). Fast forward to 2010 and the typical male worker earns $33,751 while the typical 1% earns $1,101,089 (Reich, 2013). The dramatic increase in wealth towards the ultra-rich while typical worker's wage remained stagnant has long been a point of contention for labor unions and the middle class raising the question whether high executive compensation is justified. Until the 2017 Dodd-Frank mandate for corporations to publish executive pay ratios, this inequality has only been discussed on a market scale with no empirical evidence backing the claim on a firm level.

One of the highest paid CEOs in the United States is Steve Schwarzman, the CEO of Blackstone Group LP. He received $786.5 million in compensation in 2017 and using his income as a metric of societal contribution, Schwarzman is 50,000 times more valuable than a full-time minimum wage worker (Reich, 2013). This demonstrates the stark contrast of wealth inequality in the United States Reich discusses in *Inequality for All*. However, it is naïve to directly compare Schwarzman with a minimum wage worker as he brings years of expertise and thought-leadership in a skilled financial industry that requires higher education. A more valid comparison would be between Schwarzman, his employees at Blackstone, and other competitors in the asset management industry.

A comparison between a corporation and their competitor's pay ratio to performance KPIs will reveal if there are financial performance variations between companies with high pay ratios versus low pay ratios and determine the relationship between good financial performance,

CEO compensation, and median employee compensation. Expanded to the entire United States economy, this analysis can determine if there are consistent performance advantages reflected by higher pay ratios, and if this new federal regulation to publish pay ratio drives structural and managerial change to companies in hopes of creating a more just and equal society for all.

Corporations have reported executive compensation since 1992 when the SEC responded to a high level of complaints from shareholders demanding more corporate transparency (Cioppa, 2006; Craighead, Magnan. And Thorne, 2004). Typical compensation packages are typically a mixture of salary, bonuses, equity compensation (stock options), benefits, deferred compensation, and golden parachutes. The mandated compensation disclosure aimed to improve corporate governance by permitting shareholders to enjoin board of directors to reward executives in ways that are aligned with shareholder value creation. Since the mandated compensation disclosure was implemented, academia has witnessed CEO compensation changing from cash compensation and bonuses to equity compensation (Matsumura and Shin, 2005; Conyon and Sadler, 2001). The rapid increase and complicated nature of executive have captured the attention of economists and business researchers trying to determine the justification for the rapid growth. Scholars have not been able pinpoint how executive compensation is determined as it has outpaced CEO productivity growth, US GDP growth, and US corporate profits growth (Bogle, 2008).

The financial crisis of 2007 raised eyebrows when executive compensation packages continued rising when company performance was faltering (Fahlenbrach and Stulz, 2011). Washington D.C. stepped in at that time and instituted a “Say on Pay” resolution for companies with outstanding funds from the Troubled Asset Relief Program (TARP). The “Say on Pay” law gives firm shareholders the right to vote on the remuneration of executives (Thomas, Palmiter,

and Cotter, 2011). In addition, the Dodd-Frank Wall Street Reform Act outlined stricter independence requirements for board members that are members of compensation committees. However, even with these additional guidelines, S&P 500 CEO's still have experienced steady 3-6% yearly increase in 2011-2016 nearly double the wage increase for the average wage worker of 1-3% (Mishel and Davis, 2014; Mishel and Sabadish, 2013; Bout and Wilby, 2017). With the newly required CEO pay ratio datapoint, researchers will be able to conduct internal company analysis to determine whether this inequality occurs at a company or market level.

As income inequality becomes an accessible datapoint for all publicly-held companies, corporations will face pressure from employees to become more equitable or change their corporate structure to appear more equitable. The Dodd-Frank Wall Street Reform Act of 2010 follows a legacy of potential government intervention in the free-market are characteristic of the United States economy. The Department of Justice moderates potential mergers and acquisitions by antitrust regulations set by the Sherman Antitrust Act, the Clayton Antitrust Act, and the Federal Trade Commission Act. These regulations prevent corporations from becoming monopolistic and preserve the free market. Historically, government intervention of the financial sector has regulated firms to comply to government set regulations, however the CEO compensation pay ratio disclosure in Dodd-Frank does not regulate compensation, but rather serves as a reference point to increase transparency, placing the responsibility of addressing systematic economic inequality on shareholders and board of directors.

The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010

The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 was a governmental reaction after the 2008 financial crisis (Wilmarth, 2010). It was designed to increase financial stability and prevent future devastation from financial crisis. Dodd-frank

increases regulatory requirements on financial institutions instating a higher capital requirement as the bankruptcy of Lehman Brothers and Bear Sterns in 2008 proved financial institutions need enough capital to stay solvent if financial stress occurs (Scholes, 2010, Skeel, 2010). This provision in capital requirements aligns the United States with the global Basel III capital standards, a set of international banking regulations developed by the Bank for International Settlements to promote stability in the international financial system. Like Dodd-Frank, Basel III was created to reduce the ability of banks to damage the economy by taking on excess risk (Richardson, 2014; Walker, Pretorius, Zolandz, and Goldberg, 2012).

In an attempt to repeal provisions of Dodd-Frank, congress introduced the Financial CHOICE Act bill in 2017 which, if enacted, would roll back many of the protections included in Dodd-Frank. The bill passed the house on June 8th, 2017 with a new provision that aimed to repeal the CEO pay ratio disclosure rule as the repeal of this regulation was heavily lobbied for by numerous industries and leaders such as Jamie Dimon, the CEO of JP Morgan, who sent a letter to the Trump Administration as the chair of the Business Roundtable, a CEO-led lobby group (Bryan, 2017; Borak, 2017). However, this exact version of the law was heavily modified in the Senate where Senator Mike Crapo from Idaho required bipartisan support to obtain the 60 votes needed to get the bill to President Trump's desk. Due to the need for bi-partisan support, Crapo introduced a new bill named the Economic Growth, Regulatory Relief, and Consumer Protection Act that kept the pay ratio provision intact despite industry pushback (Bryan, 2017; Rappeport, 2017; Finkle. 2017).

Congressmen Keith Ellison from Minnesota's 5th district has conducted an examination of the pay ratio provision contained in Item 402(u) of Dodd-Frank that requires approximately 3,571 companies to file ratio disclosures excluding small reporting companies and companies

defined as “emerging growth” under the Jumpstart our Business Startups Act (JOBS Act) that are exempt from filing a pay ratio disclosure. To meet the “emerging growth” threshold, the company (“issuer”) needs to have total annual gross revenue of less than one billion dollars in the most recent fiscal year (Zott and Amit, 2002). One example of an “emerging growth” company is Snap Inc. because their total reported gross revenue was less than one billion dollars even though the CEO and founder, Evan Spiegel took home over $600 million in compensation.

The succeeding study will build upon Ellison’s study to develop a more complete comprehension of correlations between financial performance, CEO compensation, and median employee compensation determined by the Dodd-Frank Pay Ratio to determine the existence of pay for performance compensation for typical workers the same way it exists for CEO’s.

Literature Review

Corporate structure relatedness to company performance

Corporate ownership structure is an endogenous outcome of corporate decisions which reflect the influence of shareholders and market trading for shares (Demsetz and Villalonga, 2001). While previous literature has pointed that there is no systematic relation between variations in ownership structure and firm performance there have been clear research suggesting social movement frameworks can explain changing capacities of shareholders and managers to act on their own interests in controlling the firm (Davis and Thompson, 1994). As ownership of corporations have become more and more concentrated in the hands of a small group of institutional investors rather than individual shareholders, corporations have been required to be aware of rising shareholder activism where shareholders are demanding abilities to choose compensation consultants and control CEO compensation (Davis and Thompson, 1994). Research has shown the effects of growing income inequality display strong forms of discontent, socio-political instability, political violence, and insurgency giving national governing bodies strong incentive to curb inequality and pressure corporations to change CEO compensation to less contentious forms leading to the increased inclusion of golden parachutes and stock options in executive compensation packages (Kuhnen and Niessen, 2012). Furthermore, research has found inequality in a firm's operating environment shapes cognition, emotion, and behavior of employees within the firm, which in turn affects interactions within teams (Bapuji, 2015). With more information on executive compensation becoming public knowledge due to the 2017 pay ratio provision of the Dodd-Frank Wall Street Reform Act, there is mounting pressure on corporations from shareholders to manage ballooning CEO compensation before firms

experience negative social and economic consequences plainly proved by decades of prior social research.

Corporate structure in the United States is determined by capital structure which dominantly determines how firms fund their operations and the organization of ownership. For publicly-traded companies listed in the U.S. stock exchange (the firms discussed in this paper) the stock market is essential to raise capital and drive investment. Over the last several decades companies have shifted to giving stock-options as an alternative form of compensation for CEO's drawing less public scrutiny than previously popular bonus packages and other compensation tactics. The widening income inequality the United States is currently experiencing is established through formal organizations through hiring, pay negotiation, and promotion practices, and economic research has not yet fully explored the ramifications of a widening inequality gap (Block, 2016). The next step for academia is to understand the connection between income inequality and financial performance to organize the optimal firm structure that maximize societal utility. Through the Dodd-Frank pay ratio, information on income inequality has become clearer from a corporate structure lens requiring a re-examination of CEO pay structure to create a pay for performance system for not only the CEO but also the typical employee.

Corporate structure also has hidden effects on the Dodd-Frank CEO to median pay ratio disclosure. The different types of corporate structure have the potential to skew data to result in results that may not reflective the real pay ratio. More broadly, the corporate structure of a firm stems from the business model where extensive literature has been produced identifying the broad diversity of understanding, usage and places the business model permeates in the firm (Osterwalder, Pegneur, and Tucci, 2005). Some business models that may affect the median pay

ratio may be businesses that utilize the franchise business model or are geographically dispersed into numerous subsidiaries (Sosna, Trevinyo-Rodriquez, and Velamuri, 2010). These business model choices must be taken into consideration in the hypothesis, result, and discussion sections of this paper as they affect the median pay reported.

Pay Inequality in the United States

The increasing disparity between the ultra-wealthy and the poor has been well documented and put into context of organizations in academia research on comparative inequality, poverty, and social mobility in the United States. Income dispersion can be conceptualized in a variety of ways. Keynesian economics researcher Thomas Piketty, a French economist at the London School of Economics, has drawn attention to the increasing concentration of wealth in the United States. Specifically, the top one percent of households took home 21.2% of national income in 2014. Compare that to eight percent in 1980 and there has been a clear and increasingly stark disparity of where money is going. Research demonstrates that inequality is associated with a wide variety of social ills from infant mortality to incarceration (Wilkinson and Pickett, 2009). However, it has proven to be much more difficult to prove a *causal* relationship between economic inequality and social outcomes due to the mass of confounding social, cultural, and other economic variables that appear when comparing different countries, states, or even regions.

Organizational scholars have largely viewed organizational practices the largest source of economic inequality. Jeffrey Pfeffer and Nancy Langton (1988) researched waged inequality and the organization of work through critical examination of 1,805 academic departments in 202 colleges and universities to examine the effect of the organization of work on wage variation within departments finding that private control, larger department size, and a greater tendency to

work alone were all associated with more dispersed wages. Expanding the scope of university departments to the wider corporate society, bigger firms have more layers of hierarchy, greater internal inequality, and higher-paid executives compared to smaller firms (Simon, 1957). The science of organizational theory has largely concluded here, and the financial returns of larger firms has not been thoroughly discussed and deliberated in the field of organizational scholarship specifically linking the disparity between CEO compensation and median worker compensation.

Current State of CEO Compensation

Trends in chief executive officer (CEO) compensation have largely been driven by stock-related components of CEO compensation (stock awards and cashed-in stock options). Measuring CEO compensation inclusive of salary, bonuses, restricted stock, grants, and long-term incentive payouts found that the average CEO of the largest 350 firms in the United States makes $18.6 million in compensation in 2017, a 17.6 percent increase over 2016. In that same period, the typical worker faced stagnant wages, increasing a mere 0.3 percent from 2016 to 2017, lower than the rate of inflation. By the same token, over the past three decades, CEO compensation rose by 979 percent based on stock options granted and 1,070 percent based on stock options realized between 1978 and 2017. Furthermore, in the same timeframe, the stock market grew a corresponding 637 percent and the typical American worker's wages only grew 11.2 percent (Mishel and Schieder, 2018).

Thus, the CEO-to-worker compensation ratio dramatically rose from a 42-to-1 ratio in 1989 to 221-to-1 in 2017 drawing national criticism and leading up to the private industry protested pay ratio provision in the Dodd-Frank Wall Street Reform Act of 2010. The explanation Mishel and Bivens offers to rationalize increasingly high CEO compensation argues that CEO's are collecting rents, an additional amount of money earned that exceeds what is

economically or socially necessary, and the economy is affectively overpaying top ranked business executives (2013). Following this rationalization, to remove this market inefficiency, companies must reduce CEO pay or increase worker pay to be economically efficient. This study seeks to answer the question on whether pay for performance strategy employed for CEO compensation that lead to compensation rents are currently apparent in median salary pay to determine the effect of company performance on median employee salary relative to industry competitors.

The widely held view in the court of public opinion is that CEO pay packages are grossly exorbitant and there is a decry on the increasing earning gap between the executive suite and the median employee (Dash, 2006; Miller, 2006; Swanson and Orlitzky, 2006). However, a primary theoretical critique of the system on the other hand is that an agency-based view of compensation is an under socialized view of organizations where participants are self-interested, atomistic, and uninfluenced by social relations, such that the organization action ignores underlying social structure where managerial decisions are made (Granovetter, 1985). It disregards the fact that compensation decisions can be influenced by factors other than financial incentives and information asymmetry (Lubatkin, 2005).

This theory that compensation decisions are influenced by social structure as well as economic incentives builds upon Pfeffer and Langton's finding that the physical and social networks of workplaces can influence compensation. Adding another dimension to this argument, I argue that when executive suite compensation is collecting rents on compensation, it is fundamental breakdown of the social fabric that regulates compensation decisions argued by Lubatkin. With the release of median salary compensation, there will be newfound intricacy where employees not only can compare their pay to the median colleague, but also develop a

better understanding of how distant the median employee is from the top. To positively rebuild the social relations that discount the agency-based view of compensation where all participants are solely self-interested, companies must either be able to justify the pay differential reported in the Dodd-Frank pay ratio or restore a sense of equity and social connection among the average employee.

Public Perception on CEO Compensation

In a public study by Stanford Graduate School of Business seventy-four percent of American believes CEOs are not paid the correct amount relative to the average worker. While it was found that the general members of the public are not well educated on the subject as the average American grossly underestimated how much CEOs make. In addition to believing CEO's are overpaid, nearly two-thirds (62 percent) of Americans believe that there is a maximum amount CEO's should be paid relative to the average worker, however only 49 percent of the American public believes the government should do something to change the current CEO pay practice. Among those who believe the government has the right to intervene with CEO compensation practices, the proper method to for action is highly debated and no intervention strategy received a majority or even close to near-majority of support (Ellison, 2018; Harris, 2009).

Calculating CEO Compensation

The SEC requires that CEO compensation is the Principal Executive Officer (PEO)'s "Total Compensation" for the last completed fiscal year in the company's annual proxy statements. The PEO of a firm is another term for the more commonly known Chief Executive Offer (CEO's) role. This includes salary, bonus, stock awards, option awards, non-equity incentive plan

compensation, and change in pension value. If a firm has more than one CEO in a fiscal year, they must take the annualized compensation total for the higher paid CEO.

For consistency, it is required that the calculation for annual total compensation of the CEO reflects the same approach as the approach to determine the median employee's salary (United States, 2017).

Calculating Median Employee Compensation

The calculation of median employee compensation is guided by an SEC-issued interpretive guide: Pay Ratio Disclosure Final Rule published on August 18th, 2018. The guidelines allowed companies to calculate median employee salary using several different methods to determine the compensation for the median employee in the statistical sample, excluding the CEO. While firms are required to report their pay ratio every year, companies are given the flexibility to determine the median employee salary once every three years if the firm holds reasonably belief that there have been no substantive changes to the company's population and the company's compensation arrangements from the previous year. The SEC guide requires companies to include part-time, seasonal, temporary, and full-time employees in the calculation and annualization is only permitted for full-time employees who have not worked the full fiscal year (Ellison, 2018).

A company's median employee is identified by using "reasonable estimates" of compensation measures that hold for the entire firm. If a company identifies unusual characteristics in their median employee's salary that would skew the pay ratio (e.g. large one-time bonus), the company may substitute another employee with substantially similar compensation to the original identified median employee based on the compensation measure it used to select the median employee (United States, 2017). In addition, companies have the

autonomy to make cost of living adjustments (COLA) to employee compensation when the employee lives in a jurisdiction other than the one where the CEO resides (Sheifer, 1979).

The SEC guideline also requires both U.S. and non-U.S. employees to be counted in the pay ratio calculations providing a possible explanation for the reason why toy producer Mattel Inc. reported the highest CEO pay ratio in the 2017 Ellison report. An overwhelming majority of the Mattel's factories are overseas where labor costs are much lower compared to the United States. Companies can exempt non-U.S. employees from the pay ratio calculation if they make up less than five percent or less of the total number of company employees. In the case of Mattel, since they have ownership on their international toy production facilities, the labor of these factories comprises of over 5% of their total labor, and the SEC requires Mattel to include international workers in their pay ratio disclosure. If companies choose to exclude non-U.S. employees, it needs to disclose the number of employees being excluded from each geography, and which geographies are included. Additionally, companies must disclose the total number of U.S. and non-U.S. workers employed by the firm, regardless of any exemption enhancing the transparency benefits of the pay ratio provision. The geographical disclosure requirement of Dodd-Frank adds another level of transparency to business practices as the current presidential administration has promoted bringing off-shored jobs back to the United States. Now that the geographical location of employees is public information, companies may experience more political and public pressure to bring jobs back to the United States. However, this provision only applies for firms that own and operate their international offices. Many firms choose to contract out manufacturing work to third-party vendors that are not required to be reported in the company's annual report given that the company does not have a controlling stake in the third-party vendor.

Companies also have the opportunity to provide explanations and present supplemental ratios and information to their reported ratio if they have a significant portion of their workforce abroad and the supplemental ratio is significantly different. This information must be identified as a supplemental ratio and cannot be misleading or more prominently displayed to the shareholder than the required ratio (Serota, Jacobi, and Wong, 2017). Firms may choose to provide a supplemental ratio if they believe it is a better representation of their pay ratio. These supplementary pay ratios are not considered for the purpose of this study to maintain consistency with SEC standard regulations.

Finally, as previously alluded to, third-party contractors and leased workers may be excluded from the ratio as well if they are employees of companies that are consolidated subsidiaries and the reporting company owns less than 50% of outstanding voting shares of the third-party company is contracts or leased employees work (United States, 2017).

Financial Performance Indicators

Numerous financial performance measures have been used to determine the financial success of businesses. Observed in a vacuum, oftentimes these figures do not tell the whole story of financial success due to a multitude of extraneous variables that can skew company performance for a particular year. The Demsetz and Lehn study (2001) used accounting profit rate to measure firm performance. One of the more popular accounting profit ratios used in academia is Tobin's Q Ratio. Referred as the Q ratio, Tobin's Q is the ratio of the market value of a company's assets (as measured by the market value of its outstanding stock and debt) divided by the replacement cost of the company's assets (book value). There are several differences in assessing a company's success dependent on one's choice to utilize a certain metric. Considering the time frame, the accounting profit rate is backwards looking while the

Tobin's Q is forward looking so the first decision researchers must make is if it more sensible to look at the firm as previously accomplished or what the firm is predicted to accomplish in the future. In addition, the accounting profit rate is affected by accounting practices constrained by traditional accounting practices while the Q ratio is predominantly used by a community of investors and economics outside of accounting constraints. However, Tobin's Q also suffers from some accounting artifact problems leading to variations in accounting profit rate as the numerator of Q is the market value of the firm which partly reflects the value investors assign to a firm's intangible assets, yet the denominator of Q is an estimate of the replacement cost of the firm's intangible assets and does not include investments the firm has made in intangible assets. This distorts performance comparisons of firms that rely on differing degrees of intangible assets essentially reinstating that the Q ratio is just another iteration accounting profit rates (Orlitzky Schmidt, and Rynes, 2003). Tobin's Q ratio is one of the financial metrics that will be used in this study to determine the relationship between CEO-median employee compensation and financial performance. Since Tobin's Q ratio provides similar measurement as the market-to-book ratio which is more accurate to calculate with out dataset, I will be using the market-to-book ratio in my analysis as a stand-in for the traditional Tobin's Q ratio.

The intent of the last section was not to strictly argue for the Q ratio as each metric carries its own set of advantages and disadvantages. Taking observations from 63 research studies measuring company financial performance ranging from 1975 to 1997, there were a cumulative 33 measures of corporate financial performance that were used in various studies to quantify financial performance, the most commonly used ones being average yearly return on investment, monthly stock changes, changes in earnings per share, return on equity, price to equity ratio, firm specific return on assets, market-to-book valuation ratio, and the compound

annual growth rate. All these metrics were used extensively to identity statistically significant financial trends to quantitatively measure company performance (Orlitzky, Schmidt, and Rynes, 2003). The financial performance metrics can be split into three broad subdivisions consistent of market-based (investor returns), accounting based (accounting returns), and perceptual (survey).

The determination to concentrate on utilizing a specific subdivision of financial return metrics anchors on the notion of identifying the most relevant stakeholders. First, the market-based measures of financial performance focus on investors as the primary stakeholder group who control the company's fate. Alternatively, the accounting-based indicators captures a firm's internal efficiency and reflect management decisions to allocate funds in most efficient ways. Lastly, the perceptual measures of CFP ask survey respondents to provide a subjective measure on public perception of the business relative to competitors (Orlitzky, Schmidt, and Rynes, 2003).

For the purposes of this study, we will be focusing on two specific accounting metrics to determine the overall correlation between the Dodd-Frank pay ratio and financial performance, in addition to Tobin's Q ratio (designed as market-to-book ratio) extensively discussed above. Out of all the metrics that are extensively used to measure company performance, the two I will focus on are return on investment/asset (ROA) and the differential between expected earnings per share and realized earnings per share (EPS). These two metrics have previously been noted numerous times to affect CEO compensation packages, so this study will build upon current scholarship to determine the effect of ROA and EPS on median worker compensation (Pennathur and Shelor, 2002; Core, Guay, and Verrecchia, 2003; Akhigbe, Madura, and Ryan, 1997; Marquardt, Tan, and Young, 2012).

Dodd-Frank Pay Ratio Disclosure

The Dodd-Frank pay ratio examines the relationship between CEO compensation and median employee compensation to give board of directors and shareholders increased information when setting compensation packages. In addition to providing researchers with new datapoints for analysis, the ratio gives the American public a better sense of the wage gap between the top 1% and the rest of the public. This information will give leverage to labor policy advocates who want to decrease the United States pay gap.

Not much literature has yet been published on the implications of the pay ratio and neither the Dodd-Frank Act or related legislative history has stated the objectives or intended benefits of the pay ratio disclosure. The pay ratio discloses the median employee salary which, according to equity fairness theory, high intra-company pay disparity can hurt morale and productivity, however these long-term affects cannot be analyzed at this time (Crawford, Nelson, and Roundtree, 2014). The release of the pay ratio releases data for organizational salary rather than solely focusing on executive salary. The Dodd Frank Act pay ratio gleams insight into the association between median worker salary and firm financial performance through a variety of independent variables building towards an argument for more pay-for-performance compensation strategies for all employees as companies investors exercise their “say on pay” votes mandated by the Dodd-Frank Act.

Hypothesis

Hypothesis #1: Companies classified by GICS in the *consumer discretionary* sector group will report the highest pay ratio.

The Standard and Poor's Global Industry Standard Classification (GICS) sorts companies into 11 industry groups including the consumer discretionary group. The consumer discretionary group includes: automobiles and components, consumer durables & apparel, consumer services, and retailing. A sizable proportion of low-skill labor in the United States can be found in the service industry which is largely represented by the consumer services and retailing industry groups). Consumer discretionary firms pay a large proportion of their workforce the United States minimum wage (Royle, 2005; Rayton, 2003) . Therefore, due to the high number of unskilled workers required in the consumer services and retailing industry, firms in this categorization will report a higher pay ratio. Comparatively, the CEO of these companies pay should be in alignment with standard CEO salary across the United States (Hogan and Sigler, 1998; Aggarwal and Samwick, 2002). The low wages of the median worker in the consumer discretionary will increase the pay ratio. Specific sub-sectors included in the consumer discretionary group include restaurants, department stores, and hotels.

The flip-side of the same coin introduces my second hypothesis for the GICS industry reporting the lowest pay ratio.

Hypothesis #2: Companies classified by GICS in the *energy* sector group will report the lowest pay ratio.

The Global Industry Standard Classification sorts all companies into 11 industry groups including the energy group. The information technology group includes: energy equipment &

services and oil, gas & consumable fuels. The highest paying jobs in the United States are in engineering fields where a college degree is required and almost all employment opportunities in the energy group require a science, technology, engineering, and mathematics (STEM) background (Granovetter, 2018; Freeman, 2000). Therefore, this hypothesis argues that firms in the energy industry group will have the highest median salary compared to other industries due to the highly educated workforce. Comparatively, there is more alignment among CEO salary across the United States irrespective of industry (Hogan and Sigler, 1998; Aggarwal and Samwick, 2002). This is because CEO's are hired to perform management jobs benchmarked by pay for performance metrics that are consistent across different industry, while employees of various industries may have varying levels of education, skill, and expertise (Tozi and Gomez-Mejia, 1989). The high wages of the median worker in the energy group will decrease the sector's pay ratio. Specific sub-sectors included in the energy group include oil & gas drilling, oil & gas exploration and production, and coal & consumable fuels.

Hypothesis #3: Companies that report higher return on assets than industry competitors will report higher pay ratios.

Return on assets (ROA) tells investors earnings generated from invested capital (assets) (Choi and Wang, 2009). ROA's vary substantially by industry and can only be used as a comparative measure for companies in the same industry. ROA measures how good a firm is at converting invested capital to net income. A company with a higher ROA is better at earning more money on less investment (Antle and Smith, 1986). CEO's of firms with higher ROA's have more leverage when negotiating compensation packages, and companies who are outperforming competitors are more likely to reward the executive for the company's success utilizing the pay for performance theory (Paul, 1992; Carpenter and Sanders, 2002). In addition,

boards of directors will also want to retain top executives that report high ROA's and may be willing to increase compensation to ensure the executive suite remains at the firm (Defeo, Lambert, and Larcker, 1989).

As for the median employee, high ROA will not affect median worker's pay as company success is commonly attributed to leadership success, not median employee success. An anomaly to this hypothesis may be firms that offer employee stock options to personnel giving employees the right to buy a certain number of shares in a company at a fixed price for a certain number of years (Bens, Nagar, Skinner, and Wong, 2003). The option to buy employee stock options will proportionately award all employees for company success and will result in a lack of correlation between pay ratio and return on assets.

Previous research has demonstrated the importance of return on asset as an accounting return highly important in determining executive compensation (Antle and Smith, 1986; Jensen and Murphy 1990; Ely, 1991). This study is to test accounting return ROA as a reliable proxy for median employee compensation and predict a lack of relationship between ROA and median employee compensation proved by the increasing pay ratio between employees and CEO as firm ROA rises.

Hypothesis #4: Companies that have exceeded the market's expected shareholder earning will have higher pay ratio compared to industry competitors.

Earnings per share (EPS) is considered the single most popular and widely used financial performance benchmark (Graham, Campbell, and Rajgopal 2005). Graham, Campbell, and Rajgopal surveyed 400 financial executes across the United States to determine that earnings per share is considered one of the most important financial performance measures for shareholders.

Many shareholders consider earnings per share as an easy to comprehend financial metric to assess company success and will determine CEO compensation packages using EPS as a measure of financial success.

The compensation boost from exceeding EPS expectations will increase CEO compensation, however the median employee will not experience the similar bonus for exceeding EPS expectations because company success is attributed to leadership success, not median employee success. Therefore, firms that report earnings per share that are higher than expected will reward CEO's with larger packages increasing the pay ratio while median employee salary stays constant. Similarly, to the ROA hypothesis, an anomaly to this hypothesis are firms that offer employee stock options to all personnel giving employees the right to buy a certain number of shares in a company at a fixed price for a certain number of years (Bens, Nagar, Skinner, and Wong, 2003). The option to buy employee stock options will proportionately award all employees for company success and will result in a lack of correlation between pay ratio and return on assets.

Hypothesis #5: Companies that report higher market-to-book ratios than industry competitors will report higher pay ratios. These effects will be more significant in the information technology sector.

Market-to-book ratio is commonly used in academic research to determine the ratio of the market value of a company's assets divided by the replacement cost of the company's assets to reflect the market value of the company as a whole, including valuable unmeasured assets. A company with a high market-to-book ratio encourages investment in more capital, because the firm is "worth" more than the price paid for it. Thus, companies with high market-to-book ratios are more likely to invest in leadership increasing CEO compensation compared to industry

competitors because investing in CEO compensation can be viewed as an investment in human capital. An innovative CEO at the helm of a company can make a company get recognized as a market leader pushing the industry to new modernizations. Essentially, investing in an innovative CEO can be viewed as a capital investment for the firm.

In these instances, the median salary wage will not differ across industries as the median worker is not tasked with innovative thinking to drive more firm value. Therefore, firms with a higher market-to-book ratio will have higher CEO compensation while median employee salary for the firm will be consistent with industry standards. I predict this hypothesis may be more significant in certain industries where CEO horsepower is more important to company successful. Specifically, I expect that the relationship between market-to-book ratio and pay ratio are most significant in the information technology industry where Moore's law (technology advancement doubles each year) is widely cited as the industry standard (Schaller, 1999). The fast-paced nature of the information technology industry leads to an increased need for visionary CEO's that can negotiate a higher compensation package for their innovative thinking.

Hypothesis #6 Companies with more employees than industry competitors will report a higher pay ratio.

Companies with more employees than industry competitors will report a higher pay ratio between CEO and median worker compensation. In this hypothesis, franchise companies will be an incongruity that demonstrates an outlier of this claim. The number of employees a firm hires is a direct metric of the company's size of operation because larger firms will require more human capital (Buzby, 1975). With more employees, more divisions, and more areas of operation, there is a need for more middle management positions that require college or graduate educated candidates (Patterson, Warr, and West, 2004). The number of middle management

positions will increase at the same rate as lower-paid positions, therefore there will be no expected effect on the pay ratio.

This hypothesis predicts that CEO compensation is directly correlated with firm size by employment. CEO's of larger firms have more responsibility to manage more business units with more assets and human capital, therefore this additional responsibility CEO's have at larger firms will increase the CEO compensation package. For industries where franchising is not the norm, companies that require more human capital and asset management due to a larger number of employees will report a higher pay ratio compared to industry competitors.

This hypothesis will not hold true for companies that operate a franchise model. Under a franchise model, the corporate parent company do not own the franchised assets and the corporate firm's employees will all be management level employees tasked with overseeing various franchises (Sosna, Treinyo-Rodriguez, and Velamuri, 2010; Baden-Fuller and Morgan, 2010). The lowest paid workers in a franchise model are not paid by the national franchise, but rather by the individual franchisee owner (Ozanne and Hunt, 2011). Therefore, the national franchise will report fewer employees and a higher median wage compared to industry competitors, since the lowest paid employees are not on the national franchise payroll.

Out of the 50 top franchises in the world, many are in the *consumer discretionary* group in the Global Industry Standard Classification (Alon, 2006). This is due to the industry's heavy reliance on an asset structure with a high proportion of fixed assets and the *consumer discretionary* industries heavy reliance on consumers' discretionary spending (Upneja and Dalbar, 1999; Kumco and Kaufman, 2011; Singal, 2012). Therefore, data from this sector may not demonstrate statistically significant conclusions regarding the relationship between number of employees and the Dodd-Frank pay ratio because of the franchise business model.

Hypothesis #7. Companies with a larger number of company sites than industry competitors will report a higher pay ratio.

While the Dodd-Frank pay ratio disclosure allows companies to adjust pay by area cost of living standards so geographic separation should not influence the pay ratio, companies with many company sites will report a higher pay ratio variable (Ellison, 2018). The more dispersion of the workforce opens the opportunity for less transparency for pay equality. The geographical distance between employees increases the difficulty for workers to organize and demand higher wages. In addition, you can imagine that inequality is less evident in firms with dispersed establishments rather than firms where the top and bottom co-mingle. This hypothesis aligns with the social psychological theory of reward allocation that emphasize the importance of social contact and social relations as critical factors to the wage allocation process (Pfeffer and Langton, 1988).

This finding would build upon Jeffrey Pfeffer and Nancy Langton's 1988 study researching wage inequality in academic departments across the United States. As mentioned in the literature review, Pfeffer and Langton found that departments with a higher tendency to work alone and large department size were more likely to experience more dispersed wages. A decrease in social contact among departmental members was also associated with less equal salary distribution.

Pfeffer and Langton's finding in academic research departments could be extrapolated to the private sector which now can be measured through the Dodd-Frank pay ratio disclosure. However, companies do not disclose the number of sites they operate, so to create a proxy for this metric, one can take the total number of company employees divided by the number of single site employees to approximate the number of company sites operated. Previous research

would support the hypothesis that employees at firms with geographically dispersed locations have less social contact with co-workers and will have more wage discrepancy compared to firms with a less dispersed workforce.

Methodology

All public firms registered with the SEC in the United States are required to report their pay ratio other than emerging growth firms, smaller reporting companies, foreign private issuers, MJDS filers, or registered investment companies. In addition, the rule provides a transition period for new companies, companies engaging in business combinations or acquisitions (United States, 2015). Thus, the most relevant group sample for analyzing the impact of the pay ratio provision is the United States Russell 3000 companies which reported the Dodd-Frank pay ratio mandate in 2017, the first year of available data for the ratio. Currently, as this is written in March 2019, available data for 2019 has not yet been compiled and made public.

Sample

The initial sample for this study included all firms in the 2017 Russell 3000 index. This index tracks the performance of the 3,000 largest U.S.-traded stocks, which represent about 98% of all U.S. incorporated equity securities. The Russell 3000 is a building block for a broad range of financial products which include the large-cap Russell 1000 index and the small-cap Russell 2000 index (Chen, 2017). The number of securities in the Russell 3000 index fluctuates yearly according to corporate actions such as mergers, acquisitions, or going private. In 2017, 196 companies were added to the Russell 3000 coming to a total of 2,928 firms classified in the Russell 3000.

Data: Pay Ratio

All pay ratio data analyzed in this study was from the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO). The AFL-CIO is a non-profit, democratic, voluntary federation of 55 national and international labor unions that represent 12.5 million working men and women. They strive to ensure the fair treatment of all working people with

decent paychecks and benefits, safe jobs, dignity and equal opportunity. The AFL-CIO has complied the list of pay ratio between the CEOs and median employee to demonstrate which companies are investing in their workforce to create high-wage jobs. Out of the 2,928 Russell 3000 firms, 1,951 firms reported pay-ratio data analyzed in this study. The rest of the 977 firms that are a member of the Russell 3000 did not have reported pay-ratio data from the AFL-CIO. For companies with more than one CEO in a fiscal year, the AFL-CIO database reported the highest paid CEO salary. The pay ratio data and median employee pay are reported by the AFL-CIO as they were disclosed by each company's proxy statement. The AFL-CIO Executive Paywatch database data is collected by FundVotes LLC from company proxy statements filed with the U.S. Securities and Exchange commission.

Data: CEO-Median Employee Compensation Ratio

To calculate the pay ratio between company CEO and median employee, I took the reported total CEO compensation from AFL-CIO. Total compensation is determined by adding 6 components together: (1) the salary, (2) the bonus, (3) all other compensation, (4) the value of stock and option awards, (5) the value of non-equity incentive plan compensation and the change in pension values, and (6) nonqualified deferred compensation earnings. This total compensation may result in a different pay ratio than the official company report due to differing company methodologies in calculating pay ratio. To rid the variance of different firms using discretionary calculations, I re-calculated CEO compensation using a standard formula.

$$CEO\ to\ Median\ Employee\ Pay\ Ratio = Total\ CEO\ Salary \div Median\ Employee\ Salary$$

Exhaustive financial data on all public firms in the United States were provided by CompuStat - Annual Updates Fundamentals for identification items, balance sheet items, cash flow items, income statement items, supplemental data items, and miscellaneous items; D&B

Hoover Company List for number of employees on all sites and employees on individual sites to determine an proxy for the number of sites a company operates, and I/B/E/S from Thomson Reuters detail history for analyst expected EPS earnings. After excluding 145 companies that had incomplete financial information, analysis based on CompuStat – North America Annual Updates Fundamentals, the effective sample size was 1,805 unique companies for calendar year 2017. To account for a lag effect between company performance and executive compensation, 2016 financial data was used in relation to 2017 CEO to median worker salary compensation. When shareholders and board of directors are determining CEO and median employee compensation for the next year, they only have access to previous year's data to decide proper compensation. Using last year's data removes confounding information which wages are determined in real time rather than decided at the beginning of the year. I cross-checked the AFL-CIO pay ratio to the 2018 report from Minnesota congressman Ellison to ensure validity of 2017 pay ratio data.

CompuStat – North America Annual Updates Fundamentals offers 974 identifying information including balance sheet items, company identifiers and descriptors, income statement items, cash flow items, miscellaneous items, and supplemental data items. CompuStat North America is a database of U.S. and Canadian fundamental and market information on both active and inactive publicly held companies. CompuStat draws its data from SEC filings which it standardizes for better comparison.

Data: Industry Classification

For the purposes of this study, I started with determining the best method to organizing into different industries for intra-industry comparison. Previous research has shown that accurate industry classification is essential for drawing valid statistical inference from empirical samples

(Hrazdil and Zhang, 2011). The legacy industry classification system is the CompuStat Standard Industry Classification (SIC) system and remains the industry standard to remain consistent with prior work. However, the Standard and Poor's Global Industry Classification Standard (GICS), has proven to be more consistent than the SIC system in identifying firms with similar operating characteristics (Kahle and Walkling, 1996; Bhojraj et al,. 2003). The GICS significantly outperforms both the SIC system and the North American Industry Classification System (NAICS) in terms of explaining variation in valuation multiples, growth rates, and various financial and accounting ratios (Bhojraj et al., 2003). As a result, GICS should be the preferred method to group firms by sector and industry in most research settings.

Based on new academic theory, I chose to utilize the GICS industry codes to segment my companies into eleven industries. The eleven sectors GICS divided firms into are: energy, materials, industrials, consumer discretionary, consumer staples, healthcare, financials, information technology, communication services, utilities, and real estate. One step further, GICS sectors got segmented into industry groups, industry and sub-industry

GIC Codes were used to test Hypothesis 1 and Hypothesis 2 to determine the industry with the highest pay ratio and the industry with the lowest pay ratio. Backed by previous research that GICS sector is the preferred method to group firms by sector, I bucketed companies into GICS sectors and disregarded industry groups, industry, and sub-industries for the purpose of analysis. Splitting the companies into their respectful sectors, the smallest sector was consumer staples with 52 firms and the largest sector was the financial sector with 348 firms. This led to my decision to use the financial sector as the default sector using dummy variables for the ten other sectors to determine the expected pay ratio of each individual industry. Each

GICS sector is represented by a binary dummy variable indicating pay ratio for the specific industry.

To match the correct company data from CompuStat to the firm, I utilized each company's unique GVKEY when collecting the data from CompuStat. The GVKEY is the Global Company Key that is a unique six-digit number key assigned to each company (issue, currency, index) in the Capital IQ CompuStat database. It is a similar identifier to a TICKER symbol and represents the primary key for a company that is an index constituent. Through my research I found GVKEY was a more reliable company identifier than TICKER as the TICKER changed with mergers, acquisitions, or corporate name changes while the GVKEY stayed constant. However, GVKEY was only accessible for data collected from CompuStat. Data gathered from other databases did not come attached with a GVKEY requiring me to determine other methods to match company data efficiently and accurately. The methods I used for collecting other data outside of CompuStat data will be discussed later in this section

Data: Normalized Return on asset

From the CompuStat – North America Annual Updates Fundamentals database, I was able to collect all the financial data needed to test Hypothesis 3 seeking to determine a relationship between *return on asset* and pay ratio. To calculate return on asset for Hypothesis 3, I compiled *2016 net income* and *total assets* data from CompuStat. The dataset was complete for all 1,805 unique companies with no missing data. Both *net income* and *total assets* datapoints are publicly available information required by the Securities and Exchange Commission. My measures for *net income and total assets* are for the company's 2016 fiscal year to account for the lag affect. The complete dataset for 2016 *net income* and *total assets* financial metrics

increases my confidence that results will be inclusive of all companies with no systematic anomalies.

To calculate industry normalized return on assets to account for the various industries, I took the average return on asset for each industry and subtracted the average return on asset from the company specific return on asset to normalize the return on asset by industry.

$$Return\ on\ Asset = Net\ Income\ \div Total\ Asset$$

$$Normalized\ Return\ on\ Asset = Return\ on\ Asset - Average\ Industry\ Return\ on\ Asset$$

Data: Estimated EPS and realized EPS

Hypothesis 4 required looking into both forecasted earnings per share data as well as realized earnings per share as expected profitability measures versus actual profitability measures for the company. CompuStat – North America Annual Updates Fundamentals gave several different versions of 2016 yearly earnings per share that could be utilized for analysis. For the purpose of this study, I chose to use EPSPI which is earnings per share (basic)/including extraordinary items deviating from the finance industry standard to use earnings per share (basic)/excluding extraordinary items (EPSPX). Other EPS measurements included EPSFI and EPSFX which is earnings per share (diluted)/including extraordinary items and earnings per share (diluted)/excluding extraordinary items, respectfully. Diluted EPS statistics were not applicable for this study as diluted EPS not only takes into consideration a company's common shares, but also all convertible securities such as convertible bonds or convertible preferred stock. These convertible securities are not considered in my study to determine firm probability expectations compared to analyst expectations. Contrary to standard financial modeling, I used EPSPI which includes extraordinary items. An extraordinary item consists of gains or losses

included in a company's income statement from events that are unusual and infrequent in nature. They are non-recurring items that are separately classified, presented, and disclosed in a company's financial statement. For CEO compensation, extraordinary items have shown an impact on pay when companies get acquired, merge, or have other large one-time financial activity (Gaver and Gaver, 1998; Wells, 2002). Therefore, it is logical to include extraordinary items in EPS when calculating the difference between analyst estimated earnings per share and realized earnings per share.

Data for analyst estimated earnings per share was collected from Thomson Reuters Institutional Brokers' Estimate System (I/B/E/S) estimates. I/B/E/S focuses on collected earnings estimates for U.S. companies both yearly and quarterly. The I/B/E/S database currently covers over 40,000 companies in 70 markets and the historical forecasts, which was utilized for collecting earnings per share information for this study enables research against historical market trends. To calculate the percentage difference between predicted EPS and realized EPS, the predicted EPS data was collected from I/B/E/S while realized EPS data was gathered from CompuStat.

I/B/E/S does not have unique GVKEY's for individual companies so the CUSIP alphanumerical identification code was used as an alternative. CUSIP is the committee on Uniform Security Procedures and the nine-digit alphanumeric CUSIP number is used to identify securities and bonds. Each company has a unique CUSIP number that can be matched with the CompuStat actual EPS figures. Estimated EPS ($EPS_{expected}$) is updated throughout the year and may change 30-40 times as new information becomes public to the market and analyst. To make the best estimate for expected earnings, I utilized the last reported expected EPS for the fiscal year. At this time, the market should have the most information to make an informed decision on

what actual earnings per share should be based on market and company expectations. For estimated EPS data collected from I/B/E/S, there was expected earnings per share information on 1,502 of the original 1,805 companies. The other companies that could not be found through CUSIP may have outdated CUSIP information or may be too small to have analysts tracking its earnings since not all companies are tracked. The 303 companies that did not have predicted EPS were excluded from this part of the study as I did not have the proper analyst predicted EPS to calculate the EPS difference. To scale all company's EPS, I looked at the percentage difference between estimated EPS and actual EPS (EPS_{actual}), as firms with fewer publicly traded shares that are worth more should expect larger real EPS estimates than firms with more shares that are cheaper per share.

$$\%\ Difference\ in\ EPS = \frac{Actual\ EPS - Estimated\ EPS}{Estimated\ EPS}$$

Data: Market to Book Ratio

As previously discussed in the literature review, market-to-book value is a popular accounting ratio used in academic research as an alternative to Tobin's Q ratio which has more nuances in calculation. Market-to-book ratio is the ratio of the market value of a company's assets divided by the replacement cost or book value of the company. Market-to-book ratio reflects how much the market values the company as a whole, including valuable unmeasured assets, relative to its existing exchangeable assets. Market-to-book ratio ratio can be calculated using Compustat – North America Annual Updates Fundamentals for 2016. Similarly like the previous two financial metrics, I chose to use 2016 financial data to analyze 2017 pay ratio due to a lag affect where company performance will not instantly be reflected in compensation

packages, rather CEOs and employees alike are compensated based on last fiscal's year performance.

The following variable construct was determined as the calculation of market-to-book ratio from Compustat – North America Annual Updates Fundamentals data.

$$Market\ to\ Book\ Ratio = \frac{CSHO\ \times PRCC\_F}{CEQ}$$

To understand the calculation of market-to-book ratio, I will discuss each component of the market-to-book ratio.

1) CSHO is the number of common shares outstanding at year end in millions on the balance sheet. In the United States it follows GAAP definition representing the net number of common shares outstanding, excluding treasury shares. This item excludes escrow shares and shares held by a subsidiary against the capital amount.

2) PRCC_F is the annual closing price for the security at the end of the fiscal year.

3) CEQ represents the common shareholders' interest in the company. It is a sum of common/ordinary stock (Capital) (CSTK), capital surplus/ share premium reserve (CAPS), and retained earnings (RE) less treasury stock total (All Capital) (TSTK). This figure is not adjusted for excess liquidating value over carrying value of preferred stock or for intangibles.

The calculation for market-to-book ratio represents the market value of all the claims of the firm (stocks and debt). The market value of the firm is calculated by multiplying the number of common shares outstanding at year end (CSHO) by the security price at year end (PRCC_F). The book value of the equation is common shareholders' interests (CEQ).

Data: Employees

Number of employee data was collected from CompuStat which includes all employees of consolidated subsidiaries, all significant (10 percent or more) part-time and seasonal employees, full-time equivalent employees and officers. It excludes consultants, contract workers, directors, and employees of unconsolidated subsidiaries. The CompuStat database had complete data for number of employees employed by each firm allowing me to use all 1,805 Russell 3000 companies with reported pay ratios in my analysis. The total number of employees each company hired was then cross-referenced with D&B Hoover's database that will be discussed in detail in the next section.

Data: Number of Company Locations

The number of company locations is not disclosed by any database as it is not a mandated SEC filing requirement. Therefore, the information was not found in CompuStat. However, D&B Hoovers is another research company that provides information on companies and industries with more than 300 million companies in the database. It is often used for sales, marketing, and business development purposes. For the purpose of my study, I discovered that D&B Hoovers discloses the number of employees a company has at a single site as well as total company employees across all sites. The single site information gave me access to individual companies and company locations that match the number of employees at a single site, while the all sites finds companies with one or more locations in which the combined employee count for all locations matches the entered number. However, the dataset for companies that have reported single site information is not complete for all 1,805 companies in my original dataset. The single site information is missing for 978 companies, therefore my sample size for the number of company locations is decreased to 827 companies. In addition, the lack of SEC oversight onto

the reporting of employee count by single site also leads to data validity uncertainty in my dataset. With these limitations in mind, the results from the number of locations is merely a proxy of the actual number of company locations, and significant results should be replicated in future studies with better data proxies. With current data available, I used the number of total employees divided by the number of employees at single sites to create a proxy number of locations.

$$Number\ of\ sites = Number\ of\ Total\ Employees\ \div Number\ of\ Employees\ per\ Site$$

Control Variables

There may be several factors not included in the discussion of the hypotheses are also likely to be related to the pay ratio between CEO and median employee compensation. The most important one to consider is the size of the firm as firm size dictates the amount of resources firms have to pay CEO's and employees. The relationship between CEO compensation and median worker compensation should be segmented by firm size to account for varying levels of responsibility, oversight, and experience the CEO has.

In my study, the proxy used to control for size of firm is enterprise value. Enterprise value is the is the values of common stock, preferred stock, and debt, minus cash. Using CompuStat – North America Annual Updates Fundamentals enterprise value was calculated using the following equation.

$$Enterprise\ Value = MKVALT + DLC - CH$$

To understand the calculation of enterprise value, I will discuss each component of enterprise value.

1) MKVALT is the total consolidated company-level market value for the fiscal year

2) DLC represents the total amount of short-term notes and current portion of long-term debt on the balance sheet on an annual basis.

3) CH is the amount of cash a firm holds at the end of the fiscal year on the balance sheet. It includes bank and finance company receivables, bank drafts, bankers' acceptances, cash on hand (including foreign currency), certificates of deposits included in cash by the company, checks, demand certificates of deposit, demand deposits, letters of credit, and money orders.

All 1,805 companies included in this study were bucketed into 3 categories based on their enterprise value. 663 companies were categorized into the "small" company group with an enterprise value of less than one billion dollars. The "median" company group consisted of 667 companies with enterprise values that fell between one billion and five billion dollars, inclusive. Finally, the last group of companies were categorized as "large" firms with enterprise values of over five billion dollars and 475 firms were classified in this category. This control variable was included in regression analysis to account for compensation differences due to company size when determining the relationship between CEO median employee pay ratio and financial metrics.

Statistical Technique

The primary form of analysis I used multiple linear regressions to discover the relationship, if any, between the response Y and the explanatory variables (Seber and Lee, 2012). For my study, the dependent variable is 2017 pay. The variables of interest are differences in median employee compensation based on company performance, size, and industry with enterprise value used as a control variable. A multiple linear regression was employed over a multiple linear regression because I wanted to isolate the relationship between the dependent

variable and a single casual independent variable accounting for the size confounding variables that may impact results.

The goal of my study was to explain variation in the response variable (pay ratio) that could be attributes to variation in the explanatory variable, given the control variable. This regression was used to quantify the strength of the relationship between the response and explanatory variable to determine the effect of the explanatory variable on the response variable.

An issue that arises with using an applied multiple linear regression is determining the right regression coefficients. While some studies prefer to use a fitted model to better understand how well the model fits and to modify the model to the fit the data, this method was passed upon due to the significant number of model variations that could have been constructed to fit desired results. With hundreds of company performance metrics to select, I stuck to my stated hypothesis to test significance across the 11 various industries and 3 company sizes.

In addition, a commonly used variable to determine the accuracy of a multiple linear regression is the R^2 variable. However, for the case of my study, the R-squared value is not relevant information and p-value is a much more significant variable to draw results from. A low R-squared value or high standard error of the regression describes the variability between specific data points and the line of best fit. A low R-squared graph demonstrated that even noisy, high variability data can have significant trends. This finding indicated that the predictor variable still provides significant information about the relationship even though data points fall further from the regression line however the prediction interval will be larger with a low R-squared number. The interpretation of significant variables stays constant for both high and low R-squared models as I am not seeking precision in my prediction. In addition, my use of dummy

variables for different industries rejects the validity of R-squared as I did not expect different industries to fit to one line of best fit.

Results

The following section will display all my multiple linear regressions organized by hypothesis highlighting results that had p-values under 0.10, which were deemed significant.

Hypothesis 1 Result:

Companies classified by GICS in the *consumer discretionary* sector reported the highest pay ratio across all three-enterprise value-controlled groups. As shown in [Table 1], [Table 2], and [Table 3], the consumer discretionary sector reported average pay ratios of 211 times, 332 times, and 534 times, respectfully. All these regressions were significant with p-values less than 0.10.

Hypothesis 2 Result:

No conclusion can be drawn on the pay ratio for the energy sector because the p-value was not significant for companies of any size in the energy sector. The finance sector had the lowest pay ratio across all three-enterprise value-controlled data sets at 54 times for small EV firms, 61 times for medium EV firms, and 140 times for large EV firms shown in [Table 1-3]. No conclusion can be drawn on which sector has the smallest pay ratio due to lack of significant data.

Table 1: Small companies with EV less than $1 billion

Regression Statistics	
Multiple R	0.26347498
R Square	0.06941906
Adjusted R Square	0.05514635
Standard Error	247.989012
Observations	663

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Finance	**54.0000911**	**19.18996596**	**2.81397**	**0.00504083**	**16.3184995**	**91.6816826**	**16.3184995**	**91.6816826**
Energy	-5.22019855	47.85482731	-0.10908	0.91316938	-99.1883722	88.7479751	-99.1883722	88.7479751
Materials	-0.94601677	52.28368445	-0.01809	0.98556946	-103.610734	101.718701	-103.610734	101.718701
Industrials	10.1683041	32.42795124	0.31356	0.75395094	-53.5075155	73.8441238	-53.5075155	73.8441238
Consumer Discretionary	**211.39112**	**34.47079151**	**6.13247**	**1.49973E-09**	**143.703960**	**279.078279**	**143.703960**	**279.078279**
Consumer Staples	-6.35865512	89.75284735	-0.07085	0.94354182	-182.598161	169.880851	-182.598161	169.880851
Healthcare	-11.8457470	30.62165601	-0.38684	0.69899929	-71.9747090	48.2832149	-71.9747090	48.2832149
Information Technology	41.5736218	37.79648965	1.09993	0.27176708	-32.6439086	115.791152	-32.6439086	115.791152
Communication Services	1.89775481	52.28368445	0.03629	0.97105644	-100.766963	104.562472	-100.766963	104.562472
Utilities	-40.3995071	95.67529467	-0.42226	0.67297707	-228.268385	147.469370	-228.268385	147.469370
Real Estate	42.7027976	36.05622018	1.18433	0.23671034	-28.0975238	113.503119	-28.0975238	113.503119

Table 2: Medium companies with EV between $1 billion and $5 billion, inclusive

Regression Statistics	
Multiple R	0.398306757
R Square	0.158648273
Adjusted R Square	0.145822789
Standard Error	264.2466652
Observations	667

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Finance	**60.76014933**	**24.42961284**	**2.487151546**	**0.01312449**	**12.79048355**	**108.7298151**	**12.79048355**	**108.7298151**
Energy	10.21555019	51.48320786	0.198424897	0.842774117	90.87619819	111.3072986	90.87619819	111.3072986
Materials	32.92827567	48.39900294	0.68035029	0.496522728	62.10736858	127.9639199	62.10736858	127.9639199
Industrials	55.14587629	35.17689925	1.567673031	0.117439674	13.92701944	124.218772	13.92701944	124.218772
Consumer Discretionary	**331.7659959**	**37.40865052**	**8.868697248**	**6.95807E-18**	**258.3108628**	**405.221129**	**258.3108628**	**405.221129**
Consumer Staples	**295.5432105**	**61.40625957**	**4.812916673**	**1.84766E-06**	**174.9666886**	**416.1197325**	**174.9666886**	**416.1197325**
Healthcare	36.1616521	39.08738055	0.925149028	0.35522859	40.58981315	112.9131174	40.58981315	112.9131174
Information Technology	**94.90832282**	**36.71003152**	**2.585351166**	**0.00994258**	**22.82498878**	**166.9916569**	**22.82498878**	**166.9916569**
Communication Services	**230.3149845**	**59.21347105**	**3.889570741**	**0.000110657**	**114.0441932**	**346.5857757**	**114.0441932**	**346.5857757**
Utilities	23.36190256	62.6248185	0.373045433	0.709235137	146.3311707	99.60736562	146.3311707	99.60736562
Real Estate	17.88066924	46.35193136	0.385758882	0.699800314	73.13537224	108.8967107	73.13537224	108.8967107

Table 3: Large companies with EV over $5 billion

Regression Statistics	
Multiple R	0.432306892
R Square	0.186889249
Adjusted R Square	0.16936531
Standard Error	378.2044263
Observations	475

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Finance	**140.938422**	**47.27555329**	**2.981211477**	**0.003022049**	**48.03771574**	**233.8391284**	**48.03771574**	**233.8391284**
Energy	11.98497788	77.45418846	0.154736343	0.877096461	164.1894115	140.2194558	164.1894115	140.2194558
Materials	51.07113241	84.66016209	0.603248696	0.546638012	115.2936863	217.4359512	115.2936863	217.4359512
Industrials	72.67500562	64.35960778	1.129202121	0.259396025	53.79740145	199.1474127	53.79740145	199.1474127
Consumer Discretionary	**534.1964824**	**65.40937502**	**8.166971207**	**3.01888E-15**	**405.6611885**	**662.7317763**	**405.6611885**	**662.7317763**
Consumer Staples	**195.5015017**	**91.94589162**	**2.126266854**	**0.034008318**	**14.81957039**	**376.1834331**	**14.81957039**	**376.1834331**
Healthcare	70.39785065	68.2595106	1.031326624	0.30292494	63.73821558	204.5339169	63.73821558	204.5339169
Information Technology	114.2144073	73.57726028	1.552305793	0.12127085	-30.3715144	258.8003291	-30.3715144	258.8003291
Communication Services	149.4380084	98.8095374	1.512384455	0.131116859	44.73160309	343.6076198	44.73160309	343.6076198
Utilities	-45.4867838	87.95716057	0.517147024	0.605299954	218.3305005	127.356933	218.3305005	127.356933
Real Estate	4.13333547	86.7911483	0.047623929	0.962036452	166.4190625	174.6857334	166.4190625	174.6857334

For Hypothesis 3-7, I first ran a regression with all the variables (both excluding and including the number of firm locations) to determine which variables were significant. I also determined the correlation matrix to relate each individual factor to each other, again both excluding and including number of firm locations. The number of company sites data was incomplete and decreased the number of firms in the sample size, therefore it was removed from one regression to maximize the number of valid data points and added to the other regression

Table 4: Dodd-Frank Pay Ratio factors excluding number of company locations in 2017

Factors affecting Dodd-Frank Pay Ratio Disclosure among 1,805 Russell 3000 Firms in 2017

Regression Statistics	
Multiple R	0.380489092
R Square	0.144771949
Adjusted R Square	0.137601228
Standard Error	300.0673326
Observations	1805

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	74.051752	16.34541071	4.530430792	6.27556E-06	41.99364673	106.1098573	41.99364673	106.1098573
Energy	-14.96195802	34.07506158	-0.439088216	0.660650643	-81.79306618	51.86915015	-81.79306618	51.86915015
Materials	29.59118448	34.88394751	0.848275112	0.396398255	-38.8263843	98.00875326	-38.8263843	98.00875326
Industrials	43.52283672	24.47310003	1.778394918	0.075508809	-4.476031636	91.52170507	-4.476031636	91.52170507
Consumer Discretionary	354.104714	25.53862175	13.86545905	1.34109E-41	304.0160476	404.1933804	304.0160476	404.1933804
Consumer Staples	166.7615614	46.11483701	3.616223588	0.000307217	76.31695124	257.2061715	76.31695124	257.2061715
Healthcare	24.48663325	25.37716611	0.964908105	0.334721253	-25.28537167	74.25863817	-25.28537167	74.25863817
Information Technology	80.54764238	26.84896404	3.000027944	0.002736841	27.88901357	133.2062712	27.88901357	133.2062712
Communication Services	115.4565537	39.66443166	2.910833431	0.003649253	37.66306489	193.2500425	37.66306489	193.2500425

Utilities	-24.76497324	44.02488183	-0.562522197	0.573830763	-111.1105733	61.58062681	-111.1105733	61.58062681
Real Estate	25.92736456	30.22842577	0.857714681	0.39116492	-33.35937179	85.2141009	-33.35937179	85.2141009
Market Cap	0.001938635	0.00041051	4.722498717	2.51115E-06	0.001133505	0.002743766	0.001133505	0.002743766
Market Book	-0.007412434	0.073431325	-0.100943762	0.919606415	-0.151432623	0.136607755	-0.151432623	0.136607755
Normalized ROA	92.46737645	38.12518788	2.425361856	0.015391521	17.69279244	167.2419605	17.69279244	167.2419605
EPS Differential	0.031318587	0.089436825	0.350175527	0.726248194	-0.144093044	0.206730219	-0.144093044	0.206730219
Employees (thousands)	-0.047528395	0.103218558	-0.46046366	0.645239413	-0.249970014	0.154913223	-0.249970014	0.154913223

Table 5: Dodd-Frank Pay Ratio factors including number of company locations in 2017

Factors affecting Dodd-Frank Pay Ratio Disclosure among 825 Russell 3000 Firms in 2017

Regression Statistics	
Multiple R	0.376885706
R Square	0.142042836
Adjusted R Square	0.125074585
Standard Error	358.1165162
Observations	826

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	68.2825157	26.80647301	2.547239828	0.011041914	15.66407236	120.900959	15.66407236	120.900959
Energy	-15.67124875	63.4454748	-0.247003412	0.80496825	-140.2084126	108.8659151	-140.2084126	108.8659151
Materials	27.09272441	66.35376701	0.408307254	0.683156159	-103.1531281	157.3385769	-103.1531281	157.3385769
Industrials	51.61490443	42.79609737	1.206065683	0.228144761	-32.38958301	135.6193919	-32.38958301	135.6193919
Consumer Discretionary	408.1528481	42.92623099	9.508238637	2.14778E-20	323.8929213	492.4127749	323.8929213	492.4127749
Consumer Staples	152.6657142	90.87573118	1.679939321	0.093355199	-25.71431784	331.0457461	-25.71431784	331.0457461
Healthcare	25.37869264	42.58623402	0.595936533	0.551384316	-58.21385389	108.9712392	-58.21385389	108.9712392

Information Technology	111.0568746	44.02476967	2.522599786	0.011839821	24.64062545	197.4731237	24.64062545	197.4731237
Communication Services	83.37485865	72.97910735	1.142448321	0.253605713	-59.87587874	226.625596	-59.87587874	226.625596
Utilities	-16.41915239	106.988059	-0.153467149	0.878068166	-226.4260832	193.5877784	-226.4260832	193.5877784
Real Estate	1.728543147	55.89622863	0.030924146	0.975337661	-107.9902005	111.4472868	-107.9902005	111.4472868
Market Cap	0.00244693	0.000792337	3.08824255	0.002082216	0.00089165	0.004002209	0.00089165	0.004002209
Market Book	0.603578808	0.535921798	1.126244185	0.260396148	-0.448382438	1.655540055	-0.448382438	1.655540055
Normalized ROA	65.05454112	61.96624798	1.049838311	0.294105967	-56.57904745	186.6881297	-56.57904745	186.6881297
EPS Differential	0.716352978	1.180274595	0.606937556	0.544062646	-1.600408793	3.03311475	-1.600408793	3.03311475
Employees (thousands)	-0.028032673	0.131047484	-0.213912335	0.830669321	-0.285265864	0.229200518	-0.285265864	0.229200518
Sites	0.007987105	0.013506965	0.591332336	0.554462953	-0.018525726	0.034499937	-0.018525726	0.034499937

Table 6: Descriptive Statistics and Correlation Matrix for 2017 (excluding number of location)

Descriptive Statistics and Correlation Matrix for 2017 (excluding location)

	2017 Pay Ratio	*Energy*	*Materials*	*Industrials*	*Consumer Discretionary*	*Consumer Staples*	*Healthcare*	*Information Technology*	*Comunication Services*	*Utilities*	*Real Estate*	*Market Cap*	*Market Book*	*Normalized ROA*	*EPS Differential*	*Employees (thousands)*
2017 Pay Ratio	1															
Energy	-0.05501	1														
Materials	-0.03255	-0.05832	1													
Industrials	-0.04125	-0.10444	-0.09955991	1												
Consumer Discretionary	0.332325	-0.09502	-0.09057503	-0.16222263	1											
Consumer Staples	0.077485	-0.04303	-0.04101905	-0.07346637	-0.06683633	1										
Healthcare	-0.06921	-0.09736	-0.09280213	-0.16621143	-0.15121152	-0.06847973	1									
Information Technology	0.00382	-0.08635	-0.08231439	-0.14742758	-0.13412284	-0.06074071	-0.13742071	1								
Comunication Services	0.02782	-0.04932	-0.04701815	-0.08421094	-0.07661125	-0.03469522	-0.078495	-0.06962414	1							
Utilities	-0.05161	-0.04345	-0.04141605	-0.0741774	-0.06748319	-0.03056136	-0.06914249	-0.06132857	-0.03503101	1						
Real Estate	-0.05002	-0.07091	-0.06759013	-0.12105597	-0.11013116	-0.04987551	-0.11283911	-0.10008696	-0.05716988	-0.05036	1					
Market Cap	0.120785	0.129097	0.00385246	0.00055213	-0.0030592	0.125725135	0.007090563	-0.00603829	0.036863725	0.021341	-0.06261	1				
Market Book	0.000202	0.005699	0.00512542	-0.05382849	0.001408878	0.007244682	0.011852638	0.015344142	0.012775286	0.004242	0.004118	0.00908	1			
Normalized ROA	0.090743	-0.0003	-0.00028989	-0.01040371	0.017354658	0.266945471	-0.13288963	0.000644699	-0.01055102	0.005722	-0.00304	0.098676	0.009313	1		
EPS Differential	0.00892	0.008156	0.00342487	0.006281402	0.009638301	0.003132693	-0.05766795	0.004271879	0.00165668	0.001332	0.004336	-0.00035	-0.00053	-0.03240245	1	
Employees (thousands)	-0.01754	-0.04576	-0.04876517	-0.08050533	-0.02839358	-0.01149596	0.00296437	0.106835841	0.018126122	-0.0282	-0.02067	-0.00908	0.006196	-0.00142293	0.00450126	1

Table 7: Descriptive Statistics and Correlation Matrix for 2017 (including number of location)

Descriptive Statistics and Correlation Matrix for 2017 (including location)

	2017 Pay Ratio	*Energy*	*Materials*	*Industrials*	*Consumer Discretionary*	*Consumer Staples*	*Healthcare*	*Information Technology*	*Comunication Services*	*Utilities*	*Real Estate*	*Market Cap*	*Market Book*	*Normalized ROA*	*EPS Differential*	*Employees (thousands)*	*Sites*
2017 Pay Ratio	1																
Energy	-0.051334143	1															
Materials	-0.032279712	-0.047453091	1														
Industrials	-0.039468392	-0.09118398	-0.085024796	1													
Consumer Discretionary	0.336043088	-0.090267445	-0.084170171	-0.161738067	1												
Consumer Staples	0.042681576	-0.033670479	-0.031396147	-0.060329593	-0.059723191	1											
Healthcare	-0.064647046	-0.092096494	-0.085875673	-0.165015293	-0.163356644	-0.06093333	1										
Information Technology	0.027594347	-0.085618338	-0.079835096	-0.153407959	-0.151865981	-0.05664723	-0.15494317	1									
Comunication Services	-0.001654387	-0.04225677	-0.039402461	-0.075714209	-0.074953169	-0.02795813	-0.07647191	-0.0710928	1								
Utilities	-0.030563632	-0.027390322	-0.025540195	-0.049077026	-0.048583729	-0.01812212	-0.04956816	-0.0460815	-0.022743431	1							
Real Estate	-0.064096075	-0.059069992	-0.055080005	-0.105839556	-0.104775711	-0.03908218	-0.10689873	-0.0993794	-0.049048503	-0.03179	1						
Market Cap	0.115551559	0.106055583	0.016138119	-0.002385477	-0.001495058	0.09368638	0.04925654	0.0220843	0.022521961	0.02669	-0.06028	1					
Market Book	0.013823225	0.01078901	0.009238076	0.014679935	-0.082059894	0.0097803	0.01297704	0.0479122	0.02955253	0.00375	-0.0057702	0.0027	1				
Normalized ROA	0.066915993	-0.009059617	-0.004988979	-0.012371627	0.033357206	0.21185755	-0.11153143	0.0212415	-0.032863782	0.01369	-0.003025	0.08919	-0.01156	1			
EPS Differential	0.042060026	-0.056601226	-0.028477669	-0.038998795	0.049796088	-0.00393801	0.00444496	-0.0001436	-0.046945734	-0.02668	-0.003609	0.05891	0.00166	0.022849242	1		
Employees (thousands)	-0.018007765	-0.04727684	-0.048262788	-0.088090632	-0.04638506	-0.02486714	0.00370007	0.0929953	0.036070019	-0.01596	-0.0198046	-0.0133	0.00349	0.00038747	0.012262849	1	
Sites	0.042189834	-0.034859812	-0.031698358	-0.059197929	0.076483234	-0.01622321	0.00293915	0.0101546	-0.032919931	-0.02628	0.0585667	-0.01423	-0.00353	0.010943289	0.026130323	0.127743361	1

From [Table 4] and [Table 5], the results show the significance of *market cap* and *normalized ROA* when number of company sites is not included in the regression. When the number of company sites is included in the regression, *normalized ROA* becomes insignificant leaving only *market cap* as the significant variable. It has become clear that *market cap* of the firm is highly significant to pay ratio, therefore for the following hypothesis, I will segment the firms by market cap to isolate the potential association between my independent variables and pay ratio.

Hypothesis 3 Result:

Controlling for firm size based on enterprise value, the *healthcare, financial, and real estate* sectors resulted in significant data that companies in those specified industries with higher return on assets than industry competitors reported higher pay ratios.

In the healthcare sector, the pay ratio is 54 times when the normalized ROA is zero and this increases by 44 times for each percentage increase in ROA controlling for firm size [Table 8].

In the financial sector, the pay ratio is 53 times when the normalized ROA is zero and this increases by 546 times for each percentage increase in ROA controlling for firm size [Table 9].

In the real estate sector, the pay ratio is 97 times when the normalized ROA is zero and this increases by 1184 times for each percentage increase in ROA controlling for firm size [Table 10].

Table 8: Healthcare Sector Normalized ROA

Regression Statistics	
Multiple R	0.524804
R Square	0.27542
Adjusted R Square	0.266286
Standard Error	113.5872
Observations	242

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	54.9621	12.1715	4.51564	9.94E-06	30.98447	78.93972	30.98447	78.93972

2016 ROA	44.41927	18.57383	2.391497	0.017557	7.829163	81.00937	7.829163	81.00937
Medium Company	47.90173	17.3128	2.766839	0.006105	13.79583	82.00763	13.79583	82.00763
Large Company	154.0094	19.45234	7.91727	9.22E-14	115.6887	192.3302	115.6887	192.3302

Table 9: Financials Sector Normalized ROA

Regression Statistics	
Multiple R	0.408675
R Square	0.167015
Adjusted R Square	0.159772
Standard Error	81.07536
Observations	349

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	53.85021	6.274057	8.582997	3.2E-16	41.51	66.19043	41.51	66.19043
2016 ROA	546.4839	207.0344	2.63958	0.008678	139.2754	953.6923	139.2754	953.6923
Medium Company	4.402986	9.815258	0.448586	0.654012	-14.9023	23.70826	-14.9023	23.70826
Large Company	85.64721	11.98695	7.145038	5.38E-12	62.07052	109.2239	62.07052	109.2239

Table 10: Real Estate Sector Normalized ROA

Regression Statistics	
Multiple R	0.309432
R Square	0.095748
Adjusted R Square	0.075503
Standard Error	106.1918

Observations	138

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	96.9291	13.07158	7.415257	1.24003E-11	71.07579605	122.782395	71.07579605	122.7823954
2016 ROA	1184.454	434.1959	2.727924	0.007227933	325.6896966	2043.21735	325.6896966	2043.217345
Medium Company	-31.1162	21.07967	-1.47612	0.142256612	-72.80813384	10.5757032	-72.80813384	10.57570323
Large Company	35.1533	24.73833	1.421005	0.157638091	-13.77480207	84.0813957	-13.77480207	84.08139569

Hypothesis 4 Result:

There were no significant results in any GICS sector between percentage difference between analyst expected EPS and actual EPS and pay ratio with enterprise size as a control variable. This was predicted in [Table 4] and [Table 6].

Hypothesis 5 Result:

Controlling for firm size based on enterprise value, the *healthcare, financial, information technology, and real estate* sectors resulted in significant data that companies in those specified industries with higher market-to-book ratio than industry competitors reported higher pay ratios.

Table 11: Healthcare Sector Market-to-Book Ratio

Regression Statistics	
Multiple R	0.557973
R Square	0.311334
Adjusted R Square	0.301588
Standard Error	104.401
Observations	216

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	51.27768	11.49921	4.459236	1.33E-05	28.61024	73.94511	28.61024	73.94511
MTB	-1.90594	1.029292	-1.8517	0.06546	-3.93489	0.12302	-3.93489	0.12302
Medium Company	51.06108	16.97995	3.00714	0.002956	17.58992	84.53225	17.58992	84.53225
Large Company	163.7805	17.51705	9.349777	1.28E-17	129.2506	198.3105	129.2506	198.3105

Table 12: Financials Sector Market-to-Book Ratio

Regression Statistics	
Multiple R	0.396148
R Square	0.156933
Adjusted R Square	0.149292
Standard Error	82.24159
Observations	335

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	40.54268	9.798701	4.137556	4.46E-05	21.2671	59.81826	21.2671	59.81826
MTB	15.43238	8.525048	1.810239	0.071165	-1.33773	32.20248	-1.33773	32.20248
Medium Company	5.876751	10.18198	0.577172	0.564216	-14.1528	25.90631	-14.1528	25.90631
Large Company	88.41737	12.23726	7.225259	3.47E-12	64.34476	112.49	64.34476	112.49

Table 13: Information Technology Sector Market-to-Book Ratio

Regression Statistics	
Multiple R	0.28812
R Square	0.083013
Adjusted R Square	0.066926
Standard Error	242.3117
Observations	175

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	147.4474	39.06588	3.774327	0.000221	70.33396	224.5609	70.33396	224.5609
MTB	-27.0469	11.81882	-2.28846	0.023334	-50.3765	-3.71734	-50.3765	-3.71734
Medium Company	75.83232	42.72349	1.774956	0.077684	-8.50102	160.1657	-8.50102	160.1657
Large Company	171.6382	50.09621	3.426172	0.000767	72.75161	270.5248	72.75161	270.5248

Hypothesis 6 Result:

Controlling for firm size based on enterprise value, the *industrials and financial* sectors resulted in significant data that companies in those specified industries with more employees than industry competitors reported higher pay ratios.

Table 14: Industrials Sector Number of Employees

Regression Statistics	
Multiple R	0.381329
R Square	0.145411
Adjusted R Square	0.135881
Standard Error	168.9183
Observations	273

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	57.12661	17.91303	3.18911	0.001596	21.85905	92.39418	21.85905	92.39418
Employees (thousands) - CompuStat	0.686455	0.191002	3.593974	0.000387	0.310407	1.062504	0.310407	1.062504
Medium Company	37.37625	24.3881	1.532561	0.126559	-10.6396	85.39209	-10.6396	85.39209
Large Company	137.2818	26.76248	5.129638	5.56E-07	84.59128	189.9724	84.59128	189.9724

Table 15: Financials Sector Employees

Regression Statistics	
Multiple R	0.419242
R Square	0.175764
Adjusted R Square	0.168597
Standard Error	80.64848
Observations	349

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	49.14173	6.415017	7.660421	1.89E-13	36.52427	61.7592	36.52427	61.7592
Employees (thousands) - CompuStat	0.516351	0.157829	3.271587	0.001177	0.205923	0.826779	0.205923	0.826779
Medium Company	5.647409	9.729033	0.58047	0.561977	-13.4883	24.78309	-13.4883	24.78309
Large Company	88.23506	11.80834	7.472266	6.54E-13	65.00966	111.4605	65.00966	111.4605

Hypothesis 7 Result:

There were no significant results in any GICS sector between number of company locations and pay ratio with enterprise size as a control variable. This was predicted in [Table 4] and [Table 6].

Discussion

These results provided mixed support for the relationship between the Dodd-Frank pay ratio and company performance and somewhat provided stronger support for some industry-based pay ratios. between CEO compensation, median employee compensation, and company performance. Building onto previous work regarding inter-industry CEO salary in which different industries have different norms and structures for building CEO compensation packages, my study demonstrated statistically significant differentials intra-industry for median employee salary (Porac, Wade, and Pollock, 1999; John and Qian, 2003). Companies classified by the Global Industry Classification system in the *consumer discretionary* sector reported the highest significant pay ratios among firms of all sizes. This finding was consistent with the hypothesis that the *consumer discretionary* sector will have the highest pay ratios due to the high proportion of low-skilled labor that are employed in this sector.

The more interesting finding regarding the high pay ratio found in the *consumer discretionary* sector was not discussed in my hypothesis, but rather an externality of utilizing enterprise value as a control variable in my data analysis. By segmenting the firms into under $1 billion, between $1 billion and $5 billion, and over $5 billion in accordance with enterprise value, I found significant data that concluded that as firm enterprise value increases, so does the pay ratio. This finding is aligned with previous research that has found an association between CEO compensation and company size, and further builds on the research to claim that as companies increase, the number of higher paid employees does not increase to the same factor (Mangel and Singh, 1993; Conyon, 1997; Attaway; 2000). This finding supports my sixth hypothesis that the number of skilled jobs created by larger corporations will increase at the

same rate as lower-paid positions, but the CEO compensation increases dramatically as companies grow larger because the CEO has more responsibility and authority.

There was not enough statistical evidence to make a conclusion on the energy sector group for the lowest pay ratio. Other than the *consumer discretionary* sector, the *finance, consumer staples, information technology*, and *communication services* sectors also had significant data. Focusing in on the median sized companies where the largest number of sectors had significant data, the financial industry reported the lowest pay ratio at 61 times the median employee salary. Comparatively, the *consumer discretionary* sector reported a pay ratio of 331 times. This difference in pay ratio can be attributed to two different causes. 1) CEO compensation is much higher in the financial sector than the consumer discretionary sector. 2) The median employee is making much lower wages in the consumer discretionary sector compared to the financial sector. I would like to argue that the difference recognized in pay ratio is most likely a combination of those causes with more weight on the second as CEO compensation is benchmarked by pay for performance metrics showing more consistency across different industries while industry employees have more varying levels of education, skill, and expertise.

My second set of hypotheses related to company performance in relation to pay ratio to empirically prove median employee compensation does not follow the same pay for performance guidelines as CEO compensation widening the income gap and decreasing worker motivation. Taking a closer look at return on asset, percentage differential between expected EPS and actual EPS, as well as market-to-book ratio, it becomes clear that the relationship between pay compensation and company performance has confounding results among different industries.

Focusing on return on asset, the *healthcare, financial and real estate* sectors resulted in significant data with p-values less than 0.10. Specifically, in the financial and real estate sector, the increase in executive compensation is highly linked to return on asset. The financial sector sees a 546 time increase in pay ratio for each percentage increase in return on asset [Table 8]. Even more dramatic, the real estate sector data shows a 1,184 time increase in pay ratio for each percentage increase in pay ratio [Table 10].

The multiple regressions for the percentage difference between analyst expected EPS and realized EPS did not yield significant results for any industry. Academia has well established that CEO compensation and EPS are associated, however this association was not measured in my study, which could have been due to several different reasons. First, my study design did not measure the relationship between actual EPS and pay ratio. I chose to use a calculated difference between analyst estimated EPS and actual EPS under the assumption that CEO's will be compensated more for beating the analyst expected EPS. However, this assumed insight was misleading as board of directors and shareholders can be using historical recognized EPS data to determine company success. Therefore, the percentage difference in analyst expected EPS and realized EPS is not used to determine CEO compensation across an entire industry. Another possible reason percentage difference between analyst expected EPS and realized EPS was not significant for any industry could have been a result of data collection technique. I chose to use the last expected EPS data at fiscal year-end for my analysis because that would be the most accurate EPS data, however if CEO compensation is reviewed on a yearly basis, not only on year end performance, there is an argument that I should have used the median yearly expected EPS or an earlier estimate of the figure. While data was contrary to the hypothesis and there was no significant association between pay ratio and percentage differences between analyst estimated

EPS and realized EPS, this does not remove the possibility that specific companies can use percentage difference in EPS to determine the CEO to medium employee pay ratio, however it is not prevalent across the industry.

Market-to-book ratio is the final financial hypothesis that was tested in this study. After controlling for firm size based on enterprise value, the *healthcare, financial, information technology, and real estate* sectors had significant results between pay ratio and market-to-book ratio. This statistic builds upon the assertion that CEO's with more clout can demand a larger compensation package because the company is valued more by the market.

Across the various financial hypotheses tested in this study, the *financial, healthcare and real estate* industries appeared to be statistically significant in numerous metrics raising the question why those industries appear to be significant when other ones are not. My theory for understanding the significant increases in pay ratio in specifically the financial and real estate industry may be due to the fact that these industries are more likely to use financial metrics for performance tracking, and both the board of directors and shareholders are more likely to reward the CEO for good financial performance. As a continuation of an argument for pay for performance for all employees, the increase in company performance is not tracked to average employee compensation the same way it is reflected in CEO compensation.

The significance of the healthcare system remains to be a field of study going forward as it is hard to draw industry evidence to conclude the reason for significance in the healthcare industry.

Hypotheses based using different metrics to determine the size of the firm by using number of employees and number of company sites resulted in significant results in the

industrials and financial sector. This conclusion determines that like the previous hypothesis, financial sector industries are more likely to pay attention to various quantitative metrics to measure company success. Due to the weak proxy used in the number of company locations analysis, there was no significant data associating pay ratio and number of company locations.

Conclusion

This study aimed to expand the conversation on the current conversation on burgeoning CEO compensation. With the new median employee compensation made available by the Dodd-Frank Wall Street Reform Act of 2010, it has become evident that the wage gap in the United States is heavily tilted towards executive suite compensation. The pay ratio data forces companies to quantitively evaluate the worth of CEO leadership and recognize that CEO compensation is currently collecting rents compared to the rest of the economy.

From my research is has become more apparent that there is much more investigation to be completed analyzing the association between pay ratio and company performance. In the financial, healthcare, and real estate industries, it has become clear that there is a clearly a positive relationship between performance and pay ratio. This leads to the conclusion that while CEO's are being compensated for good company performance through standard pay for performance pay practices, this same practice is not granted for median employees. A typical employee working at a company that reported good performance to the board of directors and shareholders, will not see the same fruits of their labor as the CEO would.

With pay ratio information now becoming public knowledge and new academia research related to this topic, employees have more access to information on how their pay compares to peers and to top management creating social tension resulting in lacking motivation for top performance (Milkovich, Newman, and Milkovich). As we currently only have 2017 information for the Dodd-Frank pay ratio and companies have not yet had the time to change practices or adapt new metrics, it will be critical to keep updated on changes in CEO compensation, median employee compensation, and corporate structure. In the next several decades, firms will face increasing pressure to be more transparent in their wage practices with pressure from both the

government and shareholders, and academic research may witness shifting trends on corporate wage allocation.

Works Cited

Aggarwal, R. K., & Samwick, A. A. (1999). Executive compensation, strategic competition, and relative performance evaluation: Theory and evidence. *The Journal of Finance*, *54*(6), 1999-2043

Akhigbe, A., Madura, J., & Ryan, H. (1997). CEO compensation and performance of commercial banks. *Managerial Finance*, *23*(11), 40-55.

Alon, I. (2006). *Service franchising: A global perspective*. Springer Science & Business Media.

Antle, R., & Smith, A. (1986). An empirical investigation of the relative performance evaluation of corporate executives. *Journal of Accounting Research*, 1-39.

Antle, R., & Smith, A. (1986). Measuring executive compensation: Methods and an application, Journal of Accounting Research 23, 2699325.

Attaway, M. C. (2000). A study of the relationship between company performance and CEO compensation. *American business review*, *18*(1), 77.

Baden-Fuller, C., & Morgan, M. S. (2010). Business models as models. *Long range planning*, *43*(2-3), 156-171.

Bapuji, H. (2015). Individuals, interactions and institutions: How economic inequality affects organizations. *Human Relations*, *68*(7), 1059-1083.

Bebchuk, L. A., & Fried, J. M. (2005). Pay without performance: Overview of the issues. *Journal of applied corporate finance*, *17*(4), 8-23.

Belliveau, M. A., O'Reilly III, C. A., & Wade, J. B. (1996). Social capital at the top: Effects of social similarity and status on CEO compensation. *Academy of management Journal*, *39*(6), 1568-1593.

Bens, D. A., Nagar, V., Skinner, D. J., & Wong, M. F. (2003). Employee stock options, EPS dilution, and stock repurchases. *Journal of Accounting and Economics*, *36*(1-3), 51-90.

Bhojraj, S., Lee, C., Oler, D. (2003). What's my line? a comparison of industry classification schemes for capital market research. Journal of Accounting and Economics 41, 745–769.

Bivens, J., & Mishel, L. (2013). The pay of corporate executives and financial professionals as evidence of rents in top 1 percent incomes. *Journal of Economic Perspectives*, *27*(3), 57-78.

Block, S. (2016). Income Inequality and the Intracorporate Pay Gap. MSCI ESG Research Inc. 1-13.

Bogle, J. C. (2008). Reflections on CEO compensation. *Academy of Management Perspectives*, *22*(2), 21-25.

Borak, D. (2017). House Votes to Kill Dodd-Frank. Now What?. *CNN Money*, *8*.

Bout, A., & Wilby, B., (2017). S7P 500 CEO Compensation Increase Trends. *Harvard Law School Forum on Corporate Governance and Financial Regulation*. Pay Governance LLC.

Bryan, B. (2017). Here's a breakdown of the Republican plan to tear up Wall Street Regulation. *Business Insider.* 6.

Bryan, B. (2017). The House quietly voted to destroy post-financial-crisis Wall Street regulation. *Business Insider.* 7.

Buzby, S. L. (1975). Company size listed versus unlisted stocks, and the extent of financial disclosure. *Journal of accounting research*, 16-37.

Carpenter, M. A., & Sanders, W. G. (2002). Top management team compensation: The missing link between CEO pay and firm performance?. *Strategic management journal*, *23*(4), 367-375.

Chen, J. (2017). Russell 3000 Index. Investopedia. https://www.investopedia.com/terms/r/russell_3000.asp

Choi, J., & Wang, H. (2009). Stakeholder relations and the persistence of corporate financial performance. *Strategic management journal*, *30*(8), 895-907.

Cioppa, P. (2006). Executive compensation: The fallacy of disclosure. *Global Jurist Topics*, *6*(3).

Conyon, M. J., & Sadler, G. V. (2001). CEO compensation, option incentives, and information disclosure. *Review of Financial Economics*, *10*(3), 251-277.

Core, J. E., Guay, W. R., & Verrecchia, R. E. (2003). Price versus non-price performance measures in optimal CEO compensation contracts. *The accounting review*, *78*(4), 957-981.

Craighead, J. A., Magnan, M. L., & Thorne, L. (2004). The impact of mandated disclosure on performance-based CEO compensation. *Contemporary Accounting Research*, *21*(2), 369-398. Available at: http://works.bepress.com/paolocioppa/1/

Crawford, S., Nelson, K. K., & Rountree, B. (2014). The CEO-employee pay ratio. *Available at SSRN 2529112*.

Dash, E.: 2006, 'Off to the Races Again, Leaving Many Behind', April 9, 2006, The New York Times, New York

Davis, G. F., & Thompson, T. A. (1994). A social movement perspective on corporate control. *Administrative science quarterly*, *39*, 141-141.

Defeo, Victor J., Richard A. Lambert, and David F. Larcker, 1989, The executive compensation effects of equity-for-debt swaps, Accounting Review 64,201-227.

Demsetz, H., & Lehn, K. (1985). The structure of corporate ownership: Causes and consequences. *Journal of political economy*, *93*(6), 1155-1177.

Demsetz, H., & Villalonga, B. (2001). Ownership structure and corporate performance. *Journal of corporate finance*, *7*(3), 209-233.

Ellison, K. (2018). Rewarding of Hoarding. An examination of pay ratios revealed by Dodd-Frank. Congressman Keith Ellisons Office, 1-26

Ely, Kirsten M. (1991). Interindustry differences in the relation between compensation and firm performance variables. *Journal of Accounting Research 29*. 37-58.

Fahlenbrach, R., & Stulz, R. M. (2011). Bank CEO incentives and the credit crisis. *Journal of financial economics*, *99*(1), 11-26.

Freeman, R. B., & Oostendorp, R. (2000). *Wages around the world: pay across occupations and countries* (No. w8058). National Bureau of Economic Research.

Finkel. V. (2017). How House bill would dismantle an array of Dodd-Frank reforms. *The New York Times.* 2

Gaver, J. J., & Gaver, K. M. (1998). The relation between nonrecurring accounting transactions and CEO cash compensation. *Accounting Review*, 235-253.

Graham, J. Campbell, J. and Rajgopal,S. (2005) The economic implications of corporate financial reporting, *Journal of Accounting and Economics*, 40(1–3) 3–73.

Granovetter, M. (1985). ‘Economic Action and Social Structure: The Problem of Embeddedness’. *The American Journal of Sociology* 91(3), 481–510.

Granovetter, M. (2018). *Getting a job: A study of contacts and careers*. University of Chicago press.

Harris, J. D. (2009). What’s wrong with executive compensation?. *Journal of Business Ethics*, *85*(1), 147-156.

Hogan, S. and Sigler, K. (1998). "The CEO pay-performance relationship: pooled vs. industry models", Managerial Finance, Vol. 24 Issue: 2, pp.59-77

Hrazdil, K., & Zhang, R. (2012). The importance of industry classification in estimating concentration ratios. *Economics Letters*, *114*(2), 224-227.

Jensen, M. and Kevin J. (1990). CEO incentives - It’s not how much you pay, but how. *Journal of Applied Corporate Finance.* 3649.

John, K., & Qian, Y. (2003). Incentive features in CEO compensation in the banking industry.

Kahle, K., Walkling, R., 1996. The impact of industry classifications on financial research. Journal of Financial and Quantitative Analysis 31, 309–332.

Kuhnen, C. M., & Niessen, A. (2012). Public opinion and executive compensation. *Management Science*, *58*(7), 1249-1272.

Kumcu, A., Kaufman, P. (2011). Food spending adjustments during recessionary times (USDA Economic Research Service).

Lubatkin, M. H.: 2005, 'A Theory of the Firm Only a Microeconomist Could Love', Journal of Management Inquiry 14(2), 213–216.

Mangel, R., & Singh, H. (1993). Ownership structure, board relationships and CEO compensation in large US corporations. *Accounting and Business Research*, *23*(sup1), 339-350.

Marquardt, C. A., Tan, C., & Young, S. M. (2011, November). Accelerated share repurchases, bonus compensation, and CEO horizons. In *2012 Financial Markets & Corporate Governance Conference*.

Matsumura, E. M., & Shin, J. Y. (2005). Corporate governance reform and CEO compensation: Intended and unintended consequences. *Journal of Business Ethics*, *62*(2), 101-113.

Miller, M. (2006). 'The Friendly Vulture', October 9, 2006, Forbes, p. 50.

Milkovich, G. T., Newman, J. M., & Milkovich, C. (2002). *Compensation* (Vol. 8). New York: McGraw-Hill.

Mishel, L., & Davis, A. (2015). CEO pay has grown 90 times faster than typical worker pay since 1978. *EPI. http://www. epi. org/publication/ceo-pay-has-grown-90-times-faster-than-typical-worker-pay-since-1978*.

Mishel, L., & Davis, A. (2014). CEO pay continues to rise as typical workers are paid less. *Issue Brief*, *380*.

Mishel, L., & Sabadish, N. (2013). CEO pay in 2012 was extraordinarily high relative to typical workers and other high earners. *Economic Policy Institute. Issue Brief*, *367*.

Mishel, L., & Schieder, J. (2018). CEO compensation surged in 2017. *Economic Policy Institute*, *16*.

Orlitzky, M., Schmidt, F. L., & Rynes, S. L. (2003). Corporate social and financial performance: A meta-analysis. *Organization studies*, *24*(3), 403-441.

Osterwalder, A., Pigneur, Y., & Tucci, C. L. (2005). Clarifying business models: Origins, present, and future of the concept. *Communications of the association for Information Systems*, *16*(1), 1.

Ozanne, U. B., Hunt, S., & Ozanne, U. (2011). *The economic effects of franchising*. Marketing Classics Press.

Patterson, M., Warr, P., & West, M. (2004). Organizational climate and company productivity: The role of employee affect and employee level. *Journal of Occupational and Organizational Psychology*, *77*(2), 193-216.

Paul, Jonathan M., 1992, On the efficiency of stock-based compensation, Review of Financial Studies 5, 471-502.

Pennathur, A. K., & Shelor, R. M. (2002). The determinants of REIT CEO compensation. *The Journal of Real Estate Finance and Economics*, *25*(1), 99-113.

Pfeffer, J., & Langton, N. (1993). The effect of wage dispersion on satisfaction, productivity, and working collaboratively: Evidence from college and university faculty. *Administrative Science Quarterly*, 382-407.

Pickett, K. E., & Wilkinson, R. G. (2009). Greater equality and better health.

Porac, J. F., Wade, J. B., & Pollock, T. G. (1999). Industry categories and the politics of the comparable firm in CEO compensation. *Administrative Science Quarterly*, *44*(1), 112-144.

Rappeport, A. (2017). Bill to erase some Dodd-Frank banking rules passes in house. *The New York Times.* 3.

Rayton, B. 2003. Firm performance and compensation structure: performance elasticities of average employee compensation. Journal of Corporate Finance 93, 333-352

Reich, R. (2013). “Inequality for all”. http://inequalityforall.com/resources/#/15

Richardson, M. (2014). Regulating Wall Street: The Dodd–Frank Act. In *DODD–FRANK WALL STREET REFORM AND CONSUMER PROTECTION ACT: Purpose, Critique, Implementation Status and Policy Issues* (pp. 33-55).

Royle, T. (2005) ' Realism or Idealism? Corporate social responsibility and the employee stakeholder in the global fast-food Industry '. Business Ethics: A European Review, 14 (1):42-55.

Schaller, R. R. (1997). Moore's law: past, present and future. *IEEE spectrum*, *34*(6), 52-59.

Seber, G. A., & Lee, A. J. (2012). *Linear regression analysis* (Vol. 329). John Wiley & Sons.

Serota, S., Jacobi, J., Wong, B. (2017). Brace for 2018: The SEC's Pay Ratio Rule. Pillsbury Law.

Sheifer, V. J. (1979). Cost-of-living adjustment: keeping up with inflation. *Monthly Lab. Rev.*, *102*, 14.

Simon, H. A. (1957). Models of man; social and rational.

Singal, M. (2012). Effect of consumer sentiment on hospitality expenditures and stock returns. International Journal of Hospitality Management, 31, 511-521.

Skeel, D. (2010). *The new financial deal: understanding the Dodd-Frank Act and its (unintended) consequences*. John Wiley & Sons.

Sosna, M., Trevinyo-Rodríguez, R. N., & Velamuri, S. R. (2010). Business model innovation through trial-and-error learning: The Naturhouse case. *Long range planning*, *43*(2-3), 383-407.

Swanson, D. L. and M. Orlitzky. (2006). 'Executive Preference for Compensation Structure and Normative Myopia: A Business and Society Research Project', in R. W. Kolb (ed.). *The Ethics of Executive What's Wrong with Executive Compensation?* 155 Compensation (Blackwell, Malden, Massachusetts). pp. 13–31.

Thomas, R. S., Palmiter, A. R., & Cotter, J. F. (2011). Dodd-Frank's say on pay: Will it lead to a greater role for shareholders in corporate governance. *Cornell L. Rev.*, *97*, 1213.

Tosi Jr, H. L., & Gomez-Mejia, L. R. (1989). The decoupling of CEO pay and performance: An agency theory perspective. *Administrative Science Quarterly*, 169-189.

United States. (2010). *Dodd-Frank Wall Street Reform and Consumer Protection Act: Conference report (to accompany H.R. 4173)*. Washington: U.S. G.P.O.

United States. (2015). Rule implements Dodd-Frank mandate while providing companies with flexibility to calculate pay ratio. SEC adopt Rule for Pay Ratio Disclosure. U.S. Securities and Exchange Commission. https://www.sec.gov/news/pressrelease/2015-160.html.

Upneja, A., Dalbor, M. C. (1999). An examination of leasing policy, tax rates, and financial stability in the restaurant industry. Journal of Hospitality & Tourism Research, 23(1), 85-99.

Walker, J., Pretorius, R., Zolandz, M., & Goldberg, G. (2012). Reconciling the Dodd-Frank and Basel Committee Capital Requirements. *Banking LJ*, *129*, 627.

Wells, P. (2002). Earnings management surrounding CEO changes. *Accounting & Finance*, *42*(2), 169-193.
https://www.wiwi.uni-muenster.de/uf/sites/uf/files/2017_10_12_wrds_data_items.pdf

Wilmarth Jr, A. E. (2010). The Dodd-Frank Act: A flawed and inadequate response to the too-big-to-fail problem. *Or. L. Rev.*, *89*, 951.

Zott, C., & Amit, R. (2002). *Measuring the performance implications of business model design: evidence from emerging growth public firms*. Fontainebleau: INSEAD.