

Theory and Evidence...

Fortune 500 CEOs: How Does CEO Gender Influence the Pay Gap Between CEO and Top
Management Team?

by

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Abstract

This paper focuses on the pay gap between the CEO and top management team (CEO-TMT) and the influence of the CEO's gender on that gap. The CEO-TMT pay gap reflects the CEO's personality traits and judgement towards the TMT. Past research suggests that self-importance, self-esteem, narcissism, need for power, and hubris are all personality traits that influence the CEO-TMT pay gap. Since females tend to be more egalitarian and have lower self-esteem and self-confidence compared to males, I hypothesize that female CEOs have a smaller CEO-TMT pay gap than male CEOs have. In my study, I incorporate traditional control variables across two different compositions of the sample—companies with female CEOs and companies with male CEOs—and found there to be no significant difference in the CEO-TMT pay gap. Additionally, I found that on average, female CEOs earn the same salaries and higher incentive pay than male CEOs.

I. Introduction

It is unbelievable that in the 21st century, there is still pay inequality between genders. While there is no longer a massive pay gap between female and male CEOs, female CEOs are still never given the excessive compensation packages that male CEOs get. In the fiscal year 15/16 SEC filings, Thomas Rutledge of Charter Communications Inc. reported \$98 million in total compensation and Leslie Moonves of CBS Corp. reported \$69 million. The 2016 *Fortune* 500 female CEO who received the highest total compensation is Safra Catz at Oracle, who took home \$41 million—less than half of what the highest paid male CEO received.¹

Much research has been done on gender's influence on the pay gap of people receiving compensation, but not as much has been done on gender's influence on the people determining their employees' compensation. This paper focuses on the latter. More specifically, it examines the influence of the CEO's gender on the pay gap between the CEO and top management team (CEO-TMT) for *Fortune* 500 companies (by revenue) for the fiscal year 15/16.

The significance of the CEO-TMT pay gap is that it reflects the CEO's personality traits and judgement towards his or her TMT. If genders differ in those aspects, it is expected that a difference in the size of the CEO-TMT pay gap would result. If data supports the notion that female CEOs have a smaller CEO-TMT pay gap than males CEOs have, this could be a cause for concern. It suggests that the gender of the person determining the compensation impacts the size of compensation awarded to the TMT when it really should be based on more objective measures like performance rather than a hidden self-gender bias. I define self-gender bias as the bias one

¹ Oracle 2016 Proxy Statement pp. 44

has when determining their employee's compensation due to their own gender—not the gender of the employee who is receiving the compensation. Many companies have implemented initiatives to avoid using subjective criteria in judging performance by adopting a goal setting program that requires measurable objectives and achievement levels that are agreed upon by both supervisors and subordinates.² Such initiatives could also incorporate eliminating a self-gender bias from the people who determine and approve compensation packages.

Company shareholders should care about this because there should be no self-gender bias when determining the TMT's compensation packages. It would reflect poorly on the company and does not exemplify fair practices. Employees, especially the TMT, should care about this because their compensation would be partly determined by the gender of the CEO, which would not be a fair determinant. However, this cause for concern also brings opportunity for society. If a self-gender bias does exist in which female CEOs have a smaller CEO-TMT pay gap, it could increase the need for more females on boards and as managers not only because we want to see a society where there are equal number of females as males in top positions, but also because it can lead to fairer pay practices and “spreading the compensation” more evenly amongst a company's employees. It could also encourage lawmakers to require public companies to disclose the numerical data on the top management's performance and goals met that justify the compensation figures—more transparency in how compensation is determined.

The only fair justification for a difference in CEO-TMT pay gap based on CEO gender is if on average, male CEOs outperform female CEOs relative to their respective TMTs. Male CEOs

² Prasad, S. B. “Top Management Compensation and Corporate Performance.” *The Academy of Management Journal*, vol. 17, no. 3, 1974, pp. 554–558. JSTOR, JSTOR, www.jstor.org/stable/254657.

would have to objectively provide a larger proportion of value to the company compared to their TMTs than female CEOs provide compared to their TMTs.

II. Compensation Approval Procedure

It is important to know how compensation is determined to understand the significance of the CEO-TMT pay gap. The CEO's compensation is determined and approved by the Compensation Committee, which is appointed by the Board of Directors. The Compensation Committee may make recommendations for the compensation of the rest of the TMT officers, but ultimately it is determined and approved by the Board along with the influence of the CEO.³ Thus, the CEO-TMT pay gap is a reflection of the CEO's judgement and personality traits.

III. Literature Review

General Gender Pay Gap

The gender pay gap is an issue that has been under public scrutiny and has led to greater compensation transparency required by legal authorities. In 2015, women made up almost half of the U.S. workforce, but there was still a pay gap of 20%.⁴ For every dollar earned by men, women only earned 80 cents. The historical trend illustrated by data from the U.S. Census Bureau is that the pay gap is continuously diminishing from the 40% pay gap in 1960.⁵

³ Segal, Michael, et al. "Compensation Committee Guide." Deloitte, *Wachtell, Lipton, Rosen & Katz*, 2015, https://www2.deloitte.com/content/dam/Deloitte/za/Documents/governance-risk-compliance/ZA_Compensation_Committee_Guide_02062015.pdf.

⁴ See Appendix B

⁵ See Appendix B

Gender Pay Gap Amongst Executives

Although the pay gap between genders in the overall workforce is still large, we see that it applies to the lower and middle level employees but when it comes to top executives, the gap disappears. Academic research from the 21st century shows varying results regarding the size of the gender pay gap for executives. Bertrand and Hallock (2001),⁶ Bell (2005),⁷ and Munoz-Bullon (2010)⁸ provide evidence that there is an 8% - 45% pay difference and that male executives are compensated higher than female executives. Other studies provide evidence that at the CEO level, there is no difference in total pay, salary, or bonus between females and males, such as Bugeja, Matolcsy, and Spiropoulos (2012)⁹ and Geiler and Renneboog (2015).¹⁰ The contradicting results from the studies may be due to the different samples of companies or the year the data is from. Perhaps, big public companies such as *Fortune* 500 companies will have a smaller gender pay gap because there are more investors, research analysts, and legal teams that scrutinize their SEC filings compared to smaller companies. Additionally, studies that use older data may reflect a bigger gender pay gap than more recent data because the gender pay gap is constantly diminishing. There is also a much smaller population of female executives the older the data is taken from. The controls of each study varied including one or more of the following variables: firm size, firm industry, firm performance, firm risk, and firm leverage. Even among those variables there was variation such as firm performance determined by an accounting

⁶ Bertrand, Marianne and Kevin F. Hallock. "The Gender Gap in Top Corporate Jobs." *ILR Review*, vol. 55, issue 1, 2001, pp. 3-21, <http://journals.sagepub.com/doi/pdf/10.1177/001979390105500101>

⁷ Bell, Linda A. "Women-Led Firms and the Gender Gap in Top Executive Jobs (July 2005)." *IZA Discussion Paper* No. 1689, <https://ssrn.com/abstract=773964>

⁸ Munoz-Bullon, Fernando. "Gender- Compensation Differences Among High- Level Executives in the United States." *Industrial Relations*, vol. 49, issue 3, 2010, pp. 346-370, <https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1468-232X.2010.00604.x>

⁹ Martin Bugeja, Zoltan P. Matolcsy, and Helen Spiropoulos. "Is there a gender gap in CEO compensation?" *Journal of Corporate Finance*, vol. 18, issue 4, 2012, pp. 849-859, <https://doi.org/10.1016/j.jcorpfin.2012.06.008>

¹⁰ Geiler, Philipp and Luc Renneboog. "Are female top managers really paid less?" *Journal of Corporate Finance*, vol. 55, 2015, pp. 345-369, <https://doi.org/10.1016/j.jcorpfin.2015.08.010>

measure or by a market performance measure. Despite the inconsistencies, there seems to be an overarching trend that amongst CEOs, the pay gap between genders continually narrows and today, no such gap exists.

Additionally, there is an increase in female presence amongst CEOs. The 2016 *Fortune* 500 list includes 21 companies with women CEOs—4.2% of CEO positions in America’s 500 largest companies by revenue. This is a drop of 3 women CEOs from the previous year, but nonetheless the figure is still higher than the historical average.

CEO-TMT Pay Gap

The CEO-TMT pay gap is the difference in compensation between the CEO and the average TMT executive, which excludes the CEO. The purpose and size of the CEO-TMT pay gap could be due to various factors besides the different values or performances of the CEO and TMT.

The tournament theory proposed by Lazear and Rosen (1981)¹¹ could explain why a CEO-TMT pay gap exists: to incentivize and motivate the TMT by promoting competition among them as suggested by Lambert, Larcker, and Weigelt (1993).¹² Contrary to conventional systems in which workers are paid based on output, tournament theory suggests that workers can be paid by rank and this scenario would still produce the same incentive structures but in a more cost-efficient way. Lazear and Rosen (1981)¹³ further suggest that a larger difference in prizes, which

¹¹ Lazear, Edward and Sherwin Rosen. “Rank-Order Tournaments as Optimum Labor Contracts.” *Journal of Political Economy*, vol. 89, no. 5, Oct. 1981, pp. 841–864., doi:10.1086/261010.

¹² Lambert RA, Larcker DF, Weigelt K. 1993. The structure of organizational incentives. *Administrative Science Quarterly*, 38: 438-461.

¹³ Lambert RA, Larcker DF, Weigelt K. 1993. The structure of organizational incentives. *Administrative Science Quarterly*, 38: 438-461.

is analogous to compensation, will increase the investment of a worker to win. This could partially explain the resulting size of the CEO-TMT pay gap. A CEO who favors tournament theory and wants to promote competition to increase motivation may have a larger CEO-TMT pay gap than a CEO who does not.

Another factor that could explain the size of the CEO-TMT pay gap is the CEO's personality traits. One study provide evidence that pay gaps between CEOs and the next highest paid member of their TMTs were large and typically ranged between 30% - 50% and sometimes over 100%.¹⁴ Such a large differential of over 100% reflects the CEO's sense of great personal importance and value. Finkelstein (1992)¹⁵ suggests a large gap may also indicate that the CEO has extraordinary power, however, I concur with Hayward and Hambrick (1997)¹⁶ that it takes both power and a certain personality trait for a CEO to be paid far out of proportion to his or her TMT. Hayward and Hambrick (1997)¹⁷ also used the differences in CEO and TMT pay as an indicator of CEO hubris. Additionally, the most revealing indication of CEOs' self-importance is their pay relative to the other executives in their firms.¹⁸ Self-importance commonly intersects or is composed of other personality traits such as self-esteem,¹⁹ narcissism²⁰, and need for power.²¹

¹⁴ Hayward M, Hambrick D. 1997. Explaining the premiums paid for large acquisitions: evidence of CEO hubris. *Administrative Science Quarterly*, 42: 103-127.

¹⁵ Finkelstein, Sydney. 1992 "Power in top management teams: Dimensions, measurement and validation." *Academy of Management Journal*, 3: 505-538.

¹⁶ Hayward M, Hambrick D. 1997. Explaining the premiums paid for large acquisitions: evidence of CEO hubris. *Administrative Science Quarterly*, 42: 103-127.

¹⁷ Ibid.

¹⁸ Frank, Robert H. 1985 *Choosing the Right Pond: Human Behavior and the Quest for Status*. New York: Oxford University Press.

¹⁹ Brockner, Joel. 1988 "Self-esteem at Work: Research, Theory and Practice." Lexington, MA: Lexington Books.

²⁰ Zaleznik, Abraham, and Manfred F. R. Kets de Vries. 1975 "Power and the Corporate Mind." Boston: Houghton Mifflin.

²¹ House, Robert J., William D. Spangler, and James Woycke. 1991 "Personality and charisma in the U.S. presidency: A psychological theory of leader effectiveness." *Administrative Science Quarterly*, 36: 364-396.

Therefore, hubris, self-importance, self-esteem, narcissism, and need for power are all personality traits that influence the CEO-TMT pay gap.

In addition to the CEO's personality traits, the CEO's perception of his or her TMT may also affect the CEO-TMT pay gap. Cruz et al. (2010)²² suggests that the CEO's perceptions of TMT benevolence and trust in the CEO-TMT relationship substantially affect the features of TMT contracts. For example, the TMT received greater variable pay when the CEO had greater trust in the TMT's ability.²³ Clearly, the CEO's perception of the TMT influences their compensation packages, which affects the CEO-TMT pay gap.

There are many considerations that must be taken into account when examining the CEO-TMT pay gap. The gap is not just a result of the different values or performances of the CEO and TMT. Other factors such as tournament theory, the CEO's personality traits, and the CEO's perception of his or her TMT also affect the CEO-TMT pay gap.

What is the Significance of a CEO-TMT Pay Gap?

The notion that CEO gender influences the CEO-TMT pay gap is important because we have seen a trend in the U.S. towards initiatives for pay transparency²⁴ in order to ensure fairness and equality when it comes to executive compensation, especially for public companies. If a

²² Cruz, Christina, et al. "Perceptions of Benevolence and the Design of Agency Contracts: CEO-TMT Relationships in Family Firms." *Academy of Management Journal*, vol. 53, no. 1, 1 Feb. 2010, pp. 69–89., doi:10.5465/amj.2010.48036975.

²³ Ibid.

²⁴ Prasad, S. B. "Top Management Compensation and Corporate Performance." *The Academy of Management Journal*, vol. 17, no. 3, 1974, pp. 554–558. JSTOR, JSTOR, www.jstor.org/stable/254657.

relationship between CEO gender and CEO-TMT pay gap exists, this would require further initiatives that provide a structure that will protect the TMT's pay from this self-gender bias.

A small CEO-TMT pay gap symbolizes a more egalitarian system and a larger CEO-TMT pay gap symbolizes a less egalitarian system. Some people want to be treated as an equal and would prefer a more egalitarian system. However, others prefer a tall, narrow, hierarchy, which would likely have a less egalitarian system. The CEO-TMT pay gap could reflect whether a CEO's gender determines how egalitarian the organization is set up to be.

IV. Hypothesis

Since the CEO-TMT pay gap is a reflection of the CEO's judgement, it can be predicted that the gap will be different depending on the gender of the CEO due to personality and psychological differences. For example, a CEO who is narcissistic would decide to pay his or her TMT much lower than what he or she receives. A CEO who does not want to create tension or is more egalitarian would pay his or her TMT closer to what he or she receives. Literature on gender-based psychological differences states that values and interests differ based on a person's gender, and that these differences may influence their behavior in work life.²⁵ For example, when making financial decisions, females tend to be more cautious and risk-averse than males²⁶ such as choosing to receive higher salary and lower incentive pay²⁷ and exercising more caution in evaluating acquisitions and issuing debt.²⁸

²⁵ Byrnes, Miller, and Schafer. "Gender differences in risk taking." *Psychological Bulletin*, vol. 125, issue 3, 1999, pp. 367-383, <http://psycnet.apa.org/doiLanding?doi=10.1037%2F0033-2909.125.3.367>

²⁶ William B. Riley, Jr., and Victor Chow. "Asset Allocation and Individual Risk Aversion." *Financial Analyst Journal*, vol. 48, issue 6, 1992, pp. 32-37, <https://doi.org/10.2469/faj.v48.n6.32>

²⁷ Stefania Albanesi, Claudia Olivetti, María José Prados, "Gender and Dynamic Agency: Theory and Evidence on the Compensation of Top Executives, in Solomon W. Polachek, Konstantinos Tatsiramos, Klaus F. Zimmermann

Hypothesis: Female CEOs have a smaller CEO-TMT pay gap than male CEOs have.

I believe female gender will lessen the CEO-TMT pay gap for a variety of reasons. Although conventional firm practices are to use a Compensation Committee to determine and approve CEO pay, it is well known that CEOs have a considerable influence over their own pay²⁹ and substantial control over other executives' pay.

According to Frank (1985),³⁰ the most revealing indication of CEOs' self-importance is their pay relative to the other executives in their firms. As explained earlier, self-importance, self-esteem,³¹ narcissism,³² and need for power³³ are all personality traits that influence the CEO-TMT pay gap. Feingold (1994)³⁴ provides evidence that females on average have lower self-esteem and self-confidence than males. A study by Huang and Kisgen (2013)³⁵ also provides evidence that male executives are overconfident relative to female executives. This suggests that

(ed.) Gender in the Labor Market (Research in Labor Economics, Volume 42)." *Emerald Group Publishing Limited*, 2015, pp. 1-59, <https://www.emeraldinsight.com/doi/abs/10.1108/S0147-912120150000042001>

²⁸ Huang, Jiekun and Darren J. Kisgen. "Gender and corporate finance: Are male executives overconfident relative to female executives?" *Journal of Financial Economics*, vol. 108, issue 3, 2013, pp. 822-839, <https://doi.org/10.1016/j.jfineco.2012.12.005>

²⁹ Tosi, Henry L., and Luis R. Gomez-Mejia. 1989 "The decoupling of CEO pay and performance: An agency theory perspective." *Administrative Science Quarterly*, 34: 169-189.

³⁰ Frank, Robert H. 1985 *Choosing the Right Pond: Human Behavior and the Quest for Status*. New York: Oxford University Press.

³¹ Brockner, Joel. 1988 "Self-esteem at Work: Research, Theory and Practice." Lexington, MA: Lexington Books.

³² Zaleznik, Abraham, and Manfred F. R. Kets de Vries. 1975 "Power and the Corporate Mind." Boston: Houghton Mifflin.

³³ House, Robert J., William D. Spangler, and James Woycke. 1991 "Personality and charisma in the U.S. presidency: A psychological theory of leader effectiveness." *Administrative Science Quarterly*, 36: 364-396.

³⁴ Feingold, Alan. "Gender differences in personality: A meta-analysis." *Psychological Bulletin*, vol. 116(3), 1994, pp. 429-456, <http://psycnet.apa.org/buy/1995-09434-001>

³⁵ Huang, Jiekun and Darren J. Kisgen. "Gender and corporate finance: Are male executives overconfident relative to female executives?" *Journal of Financial Economics*, vol. 108, issue 3, 2013, Pages 822-839, <https://doi.org/10.1016/j.jfineco.2012.12.005>.

female CEOs would have a smaller CEO-TMT pay gap than male CEOs. Also, females tend to be more egalitarian and fair than males are.³⁶ This suggests female CEOs will pay their TMTs similar compensation packages to their own compensation packages. Therefore, since females have lower self-esteem, lower self-confidence, and are more egalitarian, I expect a smaller CEO-TMT pay gap with female CEOs than with male CEOs.

V. Introduction to Data and Methodology

The data collected for all the public companies from the 2016 *Fortune* 500 list (by revenue) is from the Standard and Poors' ExecuComp database, which provides executive compensation data collected directly from each company's proxy statements. This includes comprehensive data on salary, bonus, and options and stock awards. Due to the fact that not all 2016 *Fortune* 500 companies are public, the resulting data set consists of 18 female-led and 397 male-led companies out of the 21 female-led and 479 male-led companies.

In my data analysis, the independent variable is gender and the dependent variables are salary, stock and option awards, total compensation as reported in SEC filings, payment in event of involuntary termination, and payment in event of change in control. The various compensation measures symbolize the perceived value of a person to the firm. The higher the amounts, presumably the more valuable that person is. I chose a variety of measures of pay to understand the nuances of the pay gap more. For example, since research suggests females are more risk averse than males, it is expected that females may negotiate for higher salaries but lower incentive pay that males would. Since gender may affect some measures more than others, it is

³⁶ Andreoni, James and Lise Vesterlund. "Which is the Fair Sex? Gender Differences in Altruism." *The Quarterly Journal of Economics*, vol. 116, issue 1, 2001, Pages 293–312, <https://doi.org/10.1162/003355301556419>

important to observe a variety of them. Each dependent variable is represented as a percent difference between two entities whether that be CEO-CEO or CEO-TMT. To calculate the percent difference, I used the formulas:

Formulas to Calculate Pay Gaps (both are expressed as %)

$$(1) \text{ CEO-CEO \% difference} = 100 * (\text{CEOfemale} - \text{CEOmale}) / \text{CEOfemale}$$

$$(2) \text{ CEO-TMT difference} = 100 * [(\text{CEOfemale} - \text{avgTMTofF}) / \text{CEOfemale}] - [(\text{CEOmale} - \text{avgTMTofM}) / \text{CEOmale}]$$

The equations are based on the methodology used in Henderson and Fredrickson (2001),³⁷ which calculates the CEO-TMT pay gap by the difference between the CEO's compensation and the average pay of other top management team members. In my calculations, *avgTMT* is calculated by taking the pay of the four highest earning officers that are reported in the proxy statements, excluding the CEO, and computing the mean. More specifically, *avgTMTofF* represents the mean pay of the four highest earning officers at female-led companies and *avgTMTofM* represents the mean pay of the four highest earning officers at male-led companies. This is similar to the methodology that Carpenter and Sanders (2002)³⁸ used, which defined the TMT as the four highest paid executives reporting to the CEO.

³⁷ Henderson, Andrew D., and James W. Fredrickson. "Top Management Team Coordination Needs and the CEO Pay Gap: A Competitive Test of Economic and Behavioral Views." *The Academy of Management Journal*, vol. 44, no. 1, 2001, pp. 96–117. JSTOR, JSTOR, www.jstor.org/stable/3069339.

³⁸ Carpenter, Mason, and Gerard Sanders. "Top Management Team Compensation: the Missing Link between CEO Pay and Firm Performance?" *Strategic Management Journal*, vol. 23, no. 4, Apr. 2002, pp. 367–375., doi:10.1002/smj.228.

I performed 2 different studies on the pay gap using both equation (1) and equation (2). Study 2 is sourced from the same place as Study 1. The first study focuses on the CEO-CEO pay gap and CEO-TMT pay gap for the entire sample of 18 female-led companies and 397 male-led companies, which I will refer to as Study 1. The second study also focuses on the CEO-CEO pay gap and CEO-TMT pay gap but uses a paired sample of 18 female-led companies matched with 18 male-led companies, which I will refer to as Study 2. Study 2 is the main focus of this paper.

I believed it was inappropriate to compare 397 male CEOs with only 18 female CEOs since the 18 female CEOs tend to be from the upper half of the 500 companies whereas the 397 male CEOs are spread across the 500 more evenly. The issue with an imbalance in the two groups is that higher ranked companies are larger and likely compensate their CEOs more, which may skew the results. This notion is supported by a study done by McGuire et al. (1962)³⁹ wherein data for 45 large U.S. industrial corporations indicated that sales and executive incomes are significantly correlated while profits and executive incomes are not. Due to the fact that the sample of 18 female-led companies and 397 male-led companies is greatly imbalanced and would not reflect accurate results, I decided a paired sample is a more appropriate approach.

By using a paired sample and running a t-test, it can be assumed that all control variables are the same so any slight difference is a significant difference because a t-test assumes a much smaller variance than analysis of variance (ANOVA) does. However, the issue with using a paired sample is that it is sensitive to outliers, especially when there are fewer data points like in this

³⁹ McGuire, Joseph W., et al. "Executive Income, Sales, and Profits," *American Economic Review*, vol. 52 (1962), 753.

study of only 18 pairs. With a paired sample, each pair is treated as one person and the extreme sensitivity of doing a paired sample can drastically skew the data when there are outliers.

VI. CEO-CEO and CEO-TMT Pay Gap for Entire Sample (Study 1)

In Study 1, I compared the average percent difference of the 18 female-led companies to the average percent difference of the 397 male-led companies for each dependent variable. Below are the results for the CEO-CEO pay gap and CEO-TMT pay gap for the entire sample:

CEO-CEO Pay Gap for Entire Sample Results

Table 1:
Using equation (1)

<i>CEO-CEO Pay Gap for 18 Female-led Companies vs. 397 Male-led Companies (% difference)</i>
Salary: 8.84%
Value of stock + option awards: 37.48%
Total compensation (As reported in SEC filings): 30.72%
Estimated payments in event of involuntary termination: 12.68%
Estimated payments in event of change in control: 39.22%
All other compensation: 41.75%

CEO-TMT Pay Gap for Entire Sample Results

Table 2:
Using equation (2)

<i>CEO-TMT Pay Gap for 18 Female-led Companies vs. 397 Male-led Companies (difference between the %s)</i>
Salary: 1.88%
Value of stock + option awards: 3.39%
Total compensation (As reported in SEC filings): 1.81%
Estimated payments in event of involuntary termination: -9.06%
Estimated payments in event of change in control: -7.34%

VII. CEO-CEO and CEO-TMT Pay Gap for Paired Sample (Study 2)

An ideal paired sample would be if I had the exact same company and obtained compensation data when the company has a female CEO and when the company has a male CEO and all other factors—the control variables—are held constant. However, such a situation is impossible to create so I formed the closest ideal paired sample. For each of the 18 female-led companies on the 2016 *Fortune* 500 list, I identified the closest matched male-led *Fortune* 500 company based on the following control variables in order of importance:

- Standard Industrial Classification code
- Revenue
- Number of employees

The Standard Industrial Classification code ensures the pair of companies produce similar products and services, which presumably would equate with similar margins. Revenue ensures the pair of companies are generating comparable sales and are of similar sizes. According to the study done by McGuire et al. (1962),⁴⁰ revenue and executive incomes are significantly correlated while profits and executive incomes are not. This would suggest that a female CEO and a male CEO of companies in the same industry generating the similar revenues should receive comparable incomes. Number of employees ensures the CEOs of each pair of companies are managing approximately the same number of people, which reflects the degree of authority the CEO has and the height of the company hierarchy. Additionally, it serves as another metric to ensure the pair of companies are of similar size. Here are the following results:

⁴⁰ McGuire, Joseph W., et al. "Executive Income, Sales, and Profits," *American Economic Review*, vol. 52 (1962), 753.

CEO-CEO Pay Gap for Paired Sample Results

Table 3a:
Using equation (1)

CEO-CEO Pay Gap for Paired Sample (% difference)

Salary: 1.32%

Value of stock + option awards: 17.94%

Total compensation (As reported in SEC filings): 11.40%

Estimated payments in event of involuntary termination: 8.09%

Estimated payments in event of change in control: 25.62%

All other compensation: -13.38%

Table 3b:

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Salary (\$)	1333.31872	18	301.928363	71.165198
	M_Salary\$	1315.6620	18	289.84343	68.31675
Pair 2	Value of Stock + Option Awards (L+M)	12739.8738	18	10701.80279	2522.43911
	M_ValueofStockOptionAwardsLM	10454.8791	18	9164.87207	2160.18106
Pair 3	Total Compensation - As Reported in SEC Filings (\$)	19084.80956	18	10633.69684	2506.386381
	M_TotalCompensationAsReportedinSECFilings\$	16908.4641	18	10599.49415	2498.32473
Pair 4	Estimated Payments in event of involuntary termination	18174.54711	18	15509.97182	3655.735418
	M_EstimatedPaymentsin eventofinvoluntarytermination	16703.8778	18	18275.81547	4307.65102
Pair 5	Estimated Payments in event of change in control	42522.91411	18	33411.29705	7875.118238
	M_EstimatedPaymentsin eventofchangeincontrol	31626.9259	18	20215.93761	4764.94219
Pair 6	All Other Compensation (\$)	1090.77750	18	3364.320264	792.977891
	M_AllOtherCompensation\$	1236.7089	18	3776.51574	890.13330

Table 3c:

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Salary (\$) & M_Salary\$	18	.432	.074
Pair 2	Value of Stock + Option Awards (L+M) & M_ValueofStockOptionAwardsLM	18	.111	.661
Pair 3	Total Compensation - As Reported in SEC Filings (\$) & M_TotalCompensationAsReportedinSECFilings\$	18	.094	.710
Pair 4	Estimated Payments in event of involuntary termination & M_EstimatedPaymentsineventofinvoluntarytermination	18	-.173	.493
Pair 5	Estimated Payments in event of change in control & M_EstimatedPaymentsineventofchangeincontrol	18	-.104	.681
Pair 6	All Other Compensation (\$) & M_AllOtherCompensation\$	18	-.004	.987

Table 3d:

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Salary (\$) - M_Salary\$	17.656722	315.605286	74.388879	-139.290094	174.603539	.237	17	.815
Pair 2	Value of Stock + Option Awards (L+M) - M_ValueofStockOptionAwardsLM	2284.99472	13294.16558	3133.46488	-4326.03829	8896.02773	.729	17	.476
Pair 3	Total Compensation - As Reported in SEC Filings (\$) - M_TotalCompensationAsReportedinSECFilings\$	2176.345500	14288.72255	3367.884204	-4929.269058	9281.960058	.646	17	.527
Pair 4	Estimated Payments in event of involuntary termination - M_EstimatedPaymentsineventofinvoluntarytermination	1470.669333	25933.75117	6112.643771	-11425.8817	14367.22038	.241	17	.813
Pair 5	Estimated Payments in event of change in control - M_EstimatedPaymentsineventofchangeincontrol	10895.98822	40810.05224	9619.021559	-9398.373306	31190.34975	1.133	17	.273
Pair 6	All Other Compensation (\$) - M_AllOtherCompensation\$	-145.931389	5067.757152	1194.481816	-2666.067731	2374.204953	-1.122	17	.904

Overall, there was no statistical significance in the dependent variables but there are some findings worth pointing out.

All the dependent variables except all other compensation reflect that female CEOs, on average, are paid more than male CEOs are. However, salary is a 1.32% percent difference whereas total compensation is a 11.40% difference due to the 17.94% difference in value of stock and option awards.⁴¹ The gender pay gap is much larger for incentive pay and nearly non-existent for salary. Female CEOs seem to be doing better than male CEOs in terms of compensation packages.

The results also show that female CEOs have a much higher payment in event of change in control of an average of 25.62% more than their male counterparts, which is equivalent to a \$10,895,988 difference. While the difference is substantive, it is not significant. When removing the two outliers, which are the pairs that include Oracle and IBM, female CEOs are still paid better in event of change in control by an average of \$4,945,365.

Discussion on CEO-CEO Pay Gap for Paired Sample

As mentioned earlier, previous research from the 21st century shows varying results regarding the size of the gender pay gap for executives. The findings from Study 2 refute Bertrand and Hallock (2001),⁴² Bell (2005),⁴³ and Munoz-Bullon (2010),⁴⁴ who all provide evidence that there

⁴¹ See Table 3a

⁴² Bertrand, Marianne and Kevin F. Hallock. "The Gender Gap in Top Corporate Jobs." *ILR Review*, vol. 55, issue 1, 2001, pp. 3-21, <http://journals.sagepub.com/doi/pdf/10.1177/001979390105500101>

⁴³ Bell, Linda A. "Women-Led Firms and the Gender Gap in Top Executive Jobs (July 2005)." *IZA Discussion Paper* No. 1689, <https://ssrn.com/abstract=773964>

⁴⁴ Munoz-Bullon, Fernando. "Gender- Compensation Differences Among High- Level Executives in the United States." *Industrial Relations*, vol. 49, issue 3, 2010, pp. 346-370, <https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1468-232X.2010.00604.x>

is an 8% - 45% pay difference wherein male executives are compensated higher than female executives. Study 2's results are more consistent with Bugeja, Matolcsy, and Spiropoulos (2012)⁴⁵ and Geiler and Renneboog (2015),⁴⁶ who all provide evidence that at the CEO level, there is no difference in total pay, salary, or bonus between females and males. The discrepancy in studies is likely due to the methodology and the time period of the data. Study 2 uses a paired sample and more recent compensation—fiscal year 15/16.

The 11.40% difference in total compensation and only 1.32% difference in salary exemplifies the importance of differentiating the dependent variable—by salary the genders are paid essentially the same but by total compensation females are better off by a relatively large size. Therefore, it is important that researchers examine all measures of pay in order to make accurate conclusions. Study 2's results suggest that the difference in total compensation is from the a difference in variable pay instead of salary, which reflects either more easily achievable goals for female CEOs or that females are higher achieving and add more value to the company. Prior research has shown that females are more risk averse, which results in them negotiating compensation packages with more fixed pay and less variable pay. Goldin (1986)⁴⁷ confirms in her study using historical Census data from 1890 that only 13% of males receive piece rates while 47% of females receive piece rates. Results from Carter et al. (2017)⁴⁸ also support the notion that female executives have significantly lower equity incentives and demand larger salary premiums

⁴⁵ Martin Bugeja, Zoltan P. Matolcsy, and Helen Spiropoulos. "Is there a gender gap in CEO compensation?" *Journal of Corporate Finance*, vol. 18, issue 4, 2012, pp. 849-859, <https://doi.org/10.1016/j.jcorpfin.2012.06.008>

⁴⁶ Geiler, Philipp and Luc Renneboog. "Are female top managers really paid less?" *Journal of Corporate Finance*, vol. 55, 2015, pp. 345-369, <https://doi.org/10.1016/j.jcorpfin.2015.08.010>

⁴⁷ Goldin, Claudia. "Monitoring Costs and Occupational Segregation by Sex: A Historical Analysis." *Journal of Labor Economics*, vol. 4: 1-27, 1986.

⁴⁸ Carter, Mary Ellen, et al. "Executive Gender Pay Gaps: The Roles of Female Risk Aversion and Board Representation." *Contemporary Accounting Research*, vol. 34, no. 2, 17 Nov. 2017, pp. 1232–1264., doi.org/10.1111/1911-3846.12286.

due to risk aversion. However, my results are not consistent with that notion. Study 2 reflects that female CEOs earn similar salaries and actually higher incentive pay than male CEOs. This might be explained by selection bias. Since my study focuses on specifically *Fortune* 500 female CEOs rather than female executives in general, the group of women in the study are a small and elite group of females. The tiny proportion of women who have attained such a coveted position might require different personality traits than those at smaller companies. As a result, they are not a good indicator of all women.

A possible explanation for why female CEOs have higher payouts than male CEOs is that female CEOs are more risk averse. Perhaps, women are more risk averse so when they are negotiating they demand a higher pay out.

In Study 2, I also looked at the CEO-TMT pay gap for the paired sample. Here are the following results:

CEO-TMT Pay Gap for Paired Sample Results

Table 4a:
Using equation (2)

<i>CEO-TMT Pay Gap for Paired Sample (difference between the %)</i>
Salary: -1.10%
Value of stock + option awards: 3.24%
Total compensation (As reported in SEC filings): 2.34%
Estimated payments in event of involuntary termination: -3.16%
Estimated payments in event of change in control: -8.07%

Table 4b:
Using equation (2)

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Salary Perent Difference	.4549304245	19	.1032401814	.0236849220
	m_Salary (\$) % Diff	.4658976619	19	.0693447162	.0159087690
Pair 2	Value of Stock Option Awards - FAS 123R (\$) % Diff	.6766203928	19	.1799596841	.0412855830
	m_Value of Stock + Option Awards (L+ M) % Diff	.6442383667	19	.2292536923	.0525944041
Pair 3	Total Compensation - As Reported in SEC Filings (\$) % Diff	.6274373882	19	.1693518286	.0388519740
	m_Total Compensation - As Reported in SEC Filings (\$) % Diff	.6040184547	19	.1869343411	.0428856791
Pair 4	Estimated Payments in event of involuntary termination % Diff	.6392831613	14	.1465252562	.0391605219
	m_Estimated Payments in event of involuntary termination % Diff	.6708381106	14	.1467384155	.0392174912
Pair 5	Estimated Payments in event of change in control % Diff	.6444426067	17	.1595855159	.0387051728
	m_Estimated Payments in event of change in control % Diff	.7251650841	17	.0781570532	.0189558697

Table 4c:
Using equation (2)

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Salary Perent Difference & m_Salary (\$) % Diff	19	.070	.777
Pair 2	Value of Stock Option Awards - FAS 123R (\$) % Diff & m_Value of Stock + Option Awards (L+ M) % Diff	19	.641	.003
Pair 3	Total Compensation - As Reported in SEC Filings (\$) % Diff & m_Total Compensation - As Reported in SEC Filings (\$) % Diff	19	.392	.097
Pair 4	Estimated Payments in event of involuntary termination % Diff & m_Estimated Payments in event of involuntary termination % Diff	14	.136	.643
Pair 5	Estimated Payments in event of change in control % Diff & m_Estimated Payments in event of change in control % Diff	17	-.080	.760

Table 4d:
Using equation (2)

		Paired Samples Test							
		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Salary Percent Difference - m_Salary (\$) % Diff	-.010967237	.1202890407	.0275961986	-.068944699	.0470102244	-.397	18	.696
Pair 2	Value of Stock Option Awards - FAS 123R (\$) % Diff - m_Value of Stock + Option Awards (L+ M) % Diff	.0323820261	.1790183994	.0410696375	-.053902080	.1186661326	.788	18	.441
Pair 3	Total Compensation - As Reported in SEC Filings (\$) % Diff - m_Total Compensation - As Reported in SEC Filings (\$) % Diff	.0234189336	.1969590842	.0451855128	-.071512306	.1183501734	.518	18	.611
Pair 4	Estimated Payments in event of involuntary termination % Diff - m_Estimated Payments in event of involuntary termination % Diff	-.031554949	.1927400488	.0515119448	-.142839740	.0797298416	-.613	13	.551
Pair 5	Estimated Payments in event of change in control % Diff - m_Estimated Payments in event of change in control % Diff	-.080722477	.1832402186	.0444422809	-.174935904	.0134909495	-1.816	16	.088

Overall, I did not find support for my hypothesis that female-led and male-led firms would have different sized CEO-TMT pay gaps. Regardless if compensation was measured in the four different ways, there was not much difference. However, there are some findings worth pointing out.

Table 4a contains the difference between the percent differences of the CEO-TMT pay gap at female-led companies and male-led companies. Table 4b shows that companies with female CEOs typically have a CEO-TMT salary pay gap of 45.49% and companies with male CEOs typically have a CEO-TMT salary pay gap of 46.59%. This results in a salary percent difference of -1.10%, which means that on average, companies with female CEOs have a slightly smaller CEO-TMT pay gap.

An interesting thing to note is that in Table 3a regarding the CEO-CEO pay gap, the percent difference for estimated payments in event of change in control is 25.62%. In Table 4a regarding the CEO-TMT pay gap, the difference between the percent difference for estimated payments in event of change in control for female CEOs and male CEOs is -8.07%. This means that the CEO-TMT pay gap for change in control is larger by 8.07% at companies with male CEOs.

Table 4b shows that the CEO-TMT pay gap percent difference for all my dependent variables had a high of 67.67% for female-led companies and 72.52% for male-led companies and a low of 45.49% for female-led companies and 46.59% for male-led companies. These lower bounds still seem like a large pay gap.

Discussion on CEO-TMT Pay Gap for Paired Sample

Drawing from social identity theory, organizational demography, and theories about women in leadership, I hypothesized that female CEOs have a smaller CEO-TMT pay gap than male CEOs have. In my study, I found no statistically significant results that support my hypothesis.

Together, the results for change in control from Table 3a (25.63%) and Table 4a (-8.07%) show that female CEOs receive a substantially higher payout than male CEOs, but that the TMT of the female-led companies also receive much higher payouts than the TMT at male-led companies since the CEO-TMT pay gap for change in control is smaller at female-led companies than male-led companies. This suggests that female CEOs receive higher payments when there is a change in control not necessarily because they have more leverage or risk aversion when negotiating their compensation package with the board as mentioned earlier, but perhaps because the company norms that they work at tend to pay all their top executives high payments in the event

of a change in control. Therefore, the CEO-TMT pay gap for change in control may not be an indication of CEO gender but merely a result of a company's practices.

Since the data shows no statistical significance in difference between the CEO genders, it is challenging to draw any real conclusions about the influence CEO gender has on the CEO-TMT pay gap except that CEO gender might not have any influence. However, various literature does confirm that the way the CEO pays his or her TMT is a reflection of the CEO's personality and judgement. Therefore, it can be concluded that since there are similar CEO-TMT pay gaps between the different CEO genders, perhaps amongst *Fortune* 500 companies, CEOs have similar personalities and judgements toward their TMT.

The pay gaps for the various measures of pay in Table 4b confirm the findings in the study by Hayward and Hambrick (1997),⁴⁹ which provide evidence that the pay gaps between CEOs and next highest paid member of their TMTs were large and typically ranged between 30% - 50% and sometimes over 100%. They argued that this large differential reflects the CEO's sense of great personal importance and value. The lowest pay gap percent difference in Table 4b is still high—45.49% for female-led companies and 46.59% for male-led companies.⁵⁰ As CEOs of the 500 largest companies by revenue in the U.S., it is reasonable to believe that they would feel they have a considerable amount of importance and value to the company, which gets reflected in their compensation.

⁴⁹ Hayward M, Hambrick D. 1997. Explaining the premiums paid for large acquisitions: evidence of CEO hubris. *Administrative Science Quarterly*, 42: 103-127.

⁵⁰ See Table 4b

Females who do make it to the top and become a *Fortune* 500 CEO may have similar personalities and judgement styles to their male counterparts. Female CEOs are not only receiving similar pay as males, but also paying their TMTs similarly on a relative basis. Tournament theory may serve as a strategy employed not only by male-led companies, but also female-led companies. The findings from Study 2 may suggest that female CEOs of *Fortune* 500 companies are not as egalitarian as most females are relative to their male counterparts.

VIII. Conclusion

My research focuses on compensation data for a small and elite group of companies. Given the small sample size—only 18 of the 2016 *Fortune* 500 companies have female CEOs of public companies, it is difficult to draw any real conclusions when comparing the genders.

The data shows that female CEOs are doing well—if not better—than their male counterparts. Female CEOs earn similar salaries and higher variable pay than male CEOs. Few women make it to the top of a *Fortune* 500 company and perhaps as a result, the board and Compensation Committee view them as a selective group that should receive comparable compensation packages to their male counterparts. Alternatively, *Fortune* 500 companies might receive such a high degree of public scrutiny that they must ensure there is no gender pay gap.

Ultimately, CEO gender does not influence the CEO-TMT pay gap differently. Females tend to be more egalitarian and have lower self-esteem and self-confidence compared to males, so I expected that female CEOs have a smaller CEO-TMT pay gap than male CEOs have. However, perhaps due to selection bias, the elite group of women are not representative of all women and thus do not have personality traits that fit the gender stereotype.

IX. Implications for Policy, Decisions, etc.

The Study 2 results for the CEO-CEO pay gap show that the gender pay gap does not exist at the top level of firms. However, since there is still a gender pay gap, it must exist more at the middle and lower levels of firms. Since pay transparency is only required at the top, it is possible that pay transparency is what eliminates the gender pay gap. Perhaps, the solution for the U.S. to eliminate the gender pay gap is simply to require more pay transparency throughout the entire firm. By allowing the public to scrutinize a companies' compensation, management will be more incentivized to ensure that the gender pay gap is eliminated at their firm. This initiative would encourage pay to be based on factors like merit rather than a self-gender bias.

Of all the dependent variables, the smallest CEO-TMT pay gap was 45% and the largest was 73%. The question that must be asked is whether this gap is reasonable and if tournament theory really adds value to society. In 2010, at the top U.S. firms CEOs received a pay increase of about 28% while the average worker received an increase of about 3%.⁵¹ CEOs seem to be receiving a disproportionately larger pay increase while the rest of the employees are receiving an increase just above the U.S. inflation rate. Such practices will result in income inequality—the very issue the U.S. is trying to combat. It could be argued that the skills required and responsibilities of the CEO are increasing at a faster rate than those of the average worker, but does it justify that large of a gap in pay increase? 49% of people believe that the government should do something to change current CEO pay practices in the U.S.⁵² Perhaps, the U.S. government needs to implement initiatives such as having a maximum pay or a maximum percent increase in pay for CEOs.

⁵¹ See Appendix C

⁵² See Appendix D

X. Future Research

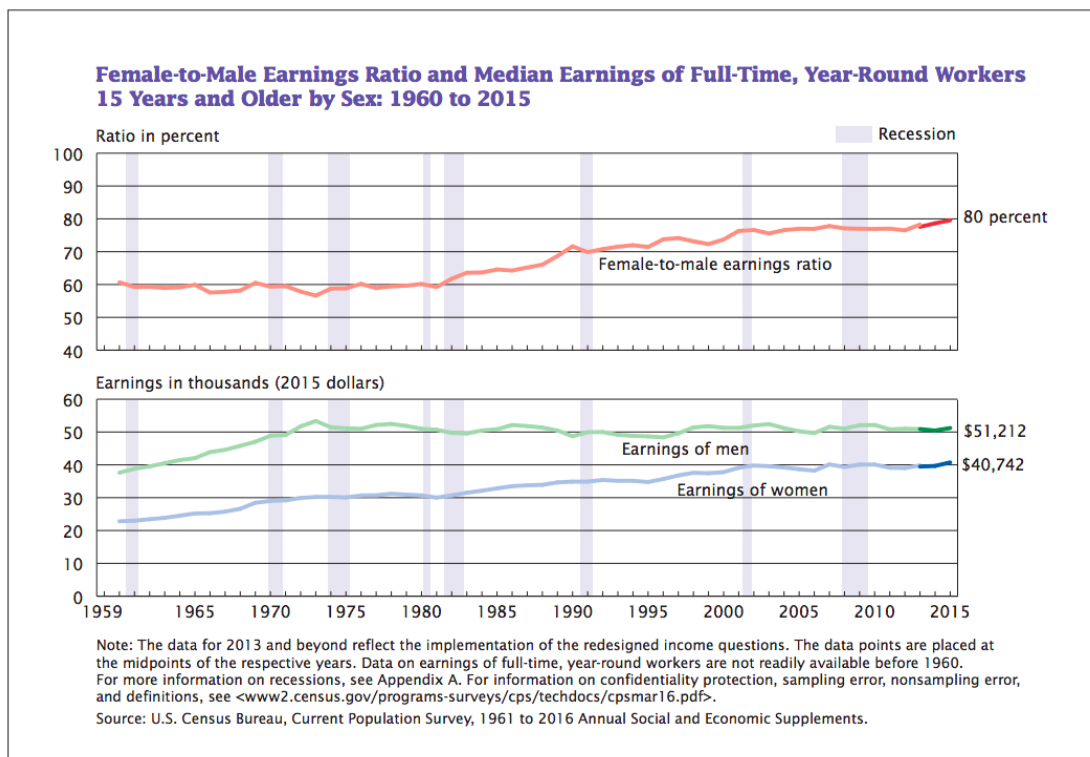
While gender pay discrimination does not exist in top management, it still exists in middle and lower level management. Since there is a gender pay gap in the middle and lower levels of the workforce, women managers might take initiative to close that gap. It would be interesting to study whether the CEO's gender affects the gender pay gap at the lower levels of the firm. I would hypothesize that there is less of a gender pay gap at firms with female CEOs than at firms with male CEOs.

XI. Appendix

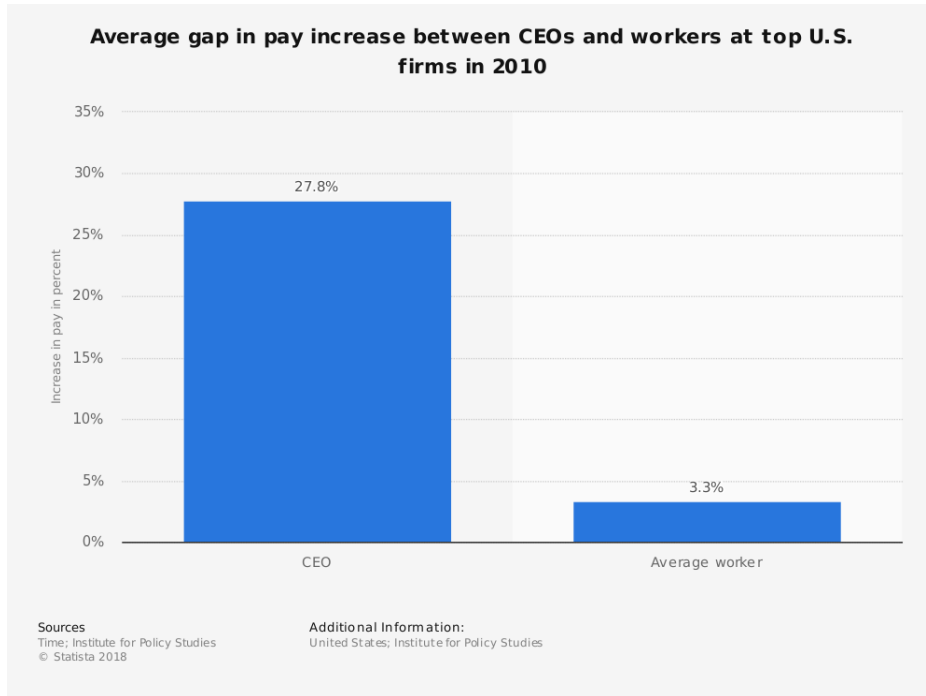
Appendix A

Term	Definition
TMT	Top management team (excludes CEO)
avgTMTofF	The average the 4 highest earners in the top management team makes in a company with a female CEO
avgTMTofM	The average the 4 highest earners in the top management team makes in a company with a male CEO
CEO-CEO pay gap	The pay gap between a female CEO and male CEO
CEO-TMT pay gap	The pay gap between a CEO and his/her top management team
Self-gender bias	The bias one has when determining their employee's compensation due to their own gender—not the gender of the employee who is receiving the compensation

Appendix B



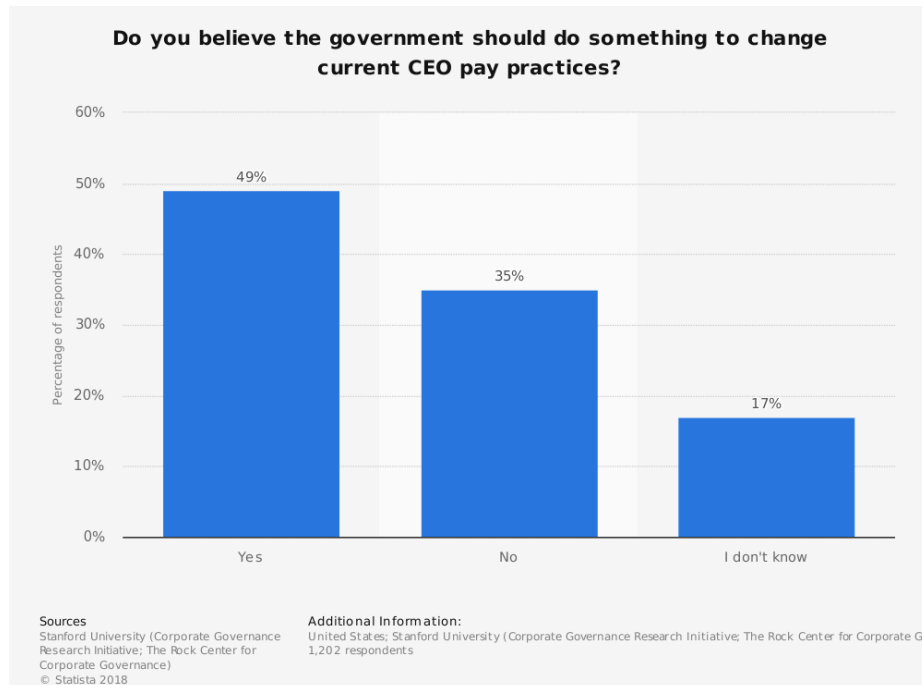
Appendix C:



CEOs received a pay increase of about 28% while the average worker got an increase of about 3%.⁵³

⁵³ “Average gap in pay increase between CEOs and workers at top U.S. firms in 2010.” Statista.

Appendix D



Nearly half of the respondents (49%) believed that the government should do something to change current CEO pay practices in the U.S.⁵⁴

Appendix E

	CEO only (in 000's)			CEO-TMT pay gap (% difference)		
	Female CEO (mean)	Male CEO (mean)	% difference	CEO-TMT (females)	CEO-TMT (males)	$p < .05$
Salary	\$1333	\$1316	1%	45%	47%	NS
Stock + options	12740	10455	18	68	64	NS
Total compensation	19085	16908	11	63	60	NS
Involuntary termination	18175	16704	8	64	67	NS
Change in control	42523	31627	25	64	73	NS

⁵⁴ “Do you believe the government should do something to change current CEO pay practices?” Statista.

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