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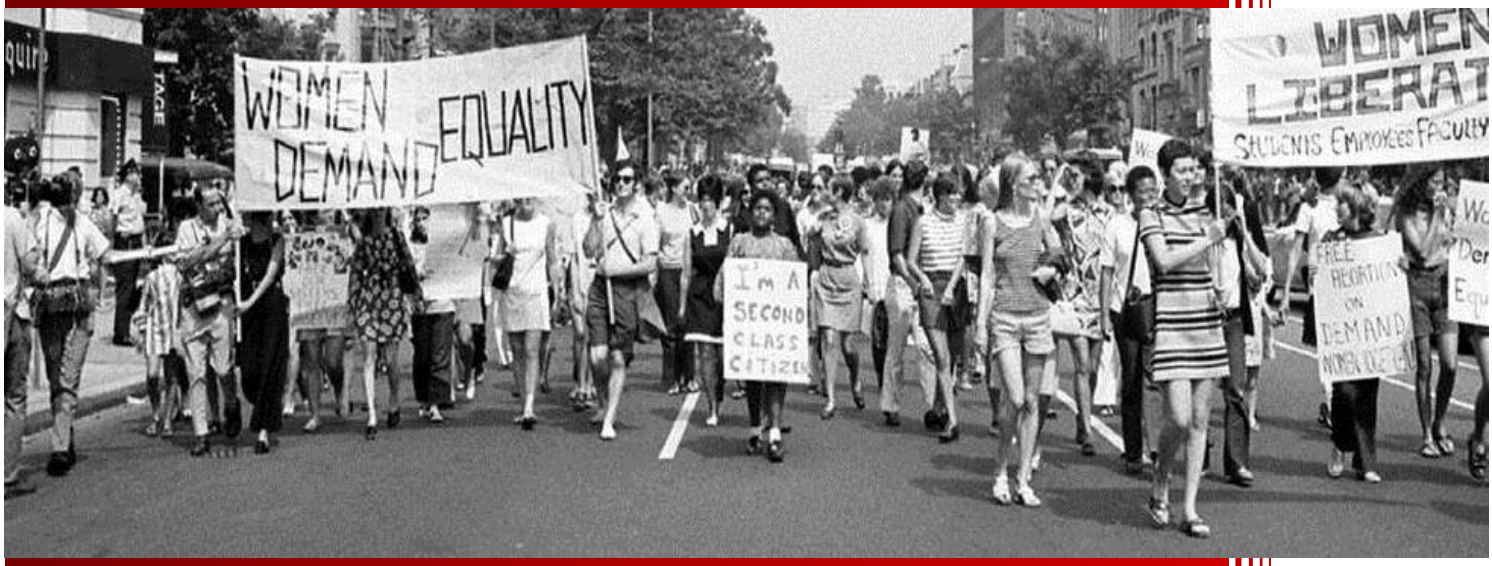

THE GENDER PAY GAP IN CHIEF FINANCIAL OFFICER COMPENSATION

Submitted by

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July 18, 2016

Preface

Before you lies the thesis "The gender pay gap in Chief Financial Officer compensation". This thesis has been written to complete the Master in Accounting and Control at the Erasmus School of Economics at the Erasmus University Rotterdam. It was written to develop my analytical and communication skills, which are important skills for my future career.

The gender pay gap has been a hot topic in recent years. Especially the gender pay gap in top executive positions has drawn much attention from women's activists groups, academics, and the professional community since the largest gender pay gap occurs in top management positions. I decided to focus my research on this topic because I want to reach the top meaning that I would like to become a Company Director, CEO, or CFO within twenty five years. Writing this thesis has been challenging but I have enjoyed the writing process. I have learned a lot and most importantly I can share the acquired knowledge with anyone.

I would like to thank my thesis supervisor Prof.dr. E.A. de Groot for providing me with excellent guidance and support during this process. I would also like to thank my family and friends for their cooperation and support. It was always helpful to share my knowledge, present my ideas, and debate issues with my family and friends. My family deserves a particular note of thanks: your kind words and inspirational long talks, as always, kept me motivated.

I hope you enjoy reading this thesis.

Rotterdam, July 2016

Ghislaine B. Ras

Abstract

This thesis examines the relation between gender and Chief Financial Officer (CFO) compensation for the period of 1998 to 2014. I first investigate whether the total compensation received by individuals holding the CFO title is the same for men and women. I find that gender is not associated with CFO's total compensation with or without taking into account CFO's age, firm size, firm performance, board size, board independence, board composition, compensation committee independence, industry effects and year effects. Next, I examine whether female CFO's receive the same base pay than male CFO's and find that women receive on average similar base pay compared to men, everything else equal. I also examine whether gender affects the level of variable pay received by CFO's. The evidence suggests that gender is not associated with CFO's variable pay holding constant individual, firm and governance characteristics. The Blinder-Oaxaca decomposition method further supports the OLS regression results as the evidence suggests that there are no gender differences in CFO total compensation, base pay, or variable pay. Besides this, additional analyses show that female CFO's earned and still earn similar compensation than their male counterparts regardless of time or the economy. Overall, the results presented in this thesis indicate that gender does not affect the level of CFO compensation. In other words, there is no gender pay gap in CFO total compensation, base pay, or variable pay for the period of 1998 to 2014. Hence, the evidence does not support the notion that women earn significantly less than men in similar positions, well at least not at the CFO level.

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1. Introduction

Worldwide, gender equality in the workplace has been an important topic and ongoing debate for many decades. One of the first and most important legislation passed in the United States (U.S.) focusing on gender equality in the workplace is the Equal Pay Act of 1963. In short, the Equal Pay Act prohibits pay discrimination based on sex and states that men and women must be paid equally[1] for substantially equal work performed in the same establishment. Right after the passage of the Equal Pay Act of 1963, the Civil Rights Act of 1964 was passed prohibiting discrimination in employment on the basis of sex, race, color, religion, and national origin (The White House, 2016).

Since the passage of the Equal Pay Act and the Civil Rights Act, women have made great progress in terms of labor force participation. In particular, women increased their labor force participation substantially since the 1960s, where women account about 50 percent of the total labor force in 2014 (The White House, 2013, 2015). Besides this, women earn higher educational levels than ever before and in 2014 women earned most of the undergraduate and graduate degrees (The White House, 2013, 2015; Cho & Kramer, 2014). Additionally, women are climbing up the corporate ladders, where women made up almost 52 percent of management, professional and related occupations in 2014 (The White House, 2013; Bureau of Labor Statistics, 2016). Women have not only made great strides in terms of representation, education, and positions within organizations but they also made some progress in terms of pay. Specifically, women working full-time year-round earned about 79 cents for every dollar earned by their male counterparts annual earnings in 2014. In 1965 on the other hand, women only earned around 60 percent of what their male counterparts earned. Hence, the gender pay gap[2] – *the difference between men and women average earnings (Institute for Women's Policy Research, 2015)* – has decreased over time but women still earn less than men in a variety of ways. More specifically, earnings differences between men and women varies by state, full-timer/part-timer, age, race and ethnicity, education, career path, and occupation (Lips, 2003; Dey

[1] Equal pay includes an equal salary, overtime pay, bonuses, stock options, profit sharing and bonus plans, life insurance, vacation and holiday pay, cleaning or gasoline allowances, hotel accommodations, reimbursement for travel expenses and benefits. Unequal compensation cannot be justified unless the employer shows that the pay differential is based on a fair seniority, merit or incentive system, or a factor other than sex (The White House, 2016).

[2] In the remainder of this thesis I will use 'gender pay gap' and 'gender wage gap' interchangeably.

& Hil, 2007; The White House, 2013; Institute for Women's Policy Research, 2015; U.S. Bureau of Labor Statistics, 2015; Hallman, 2016).

What is clear since the passage of the Equal Pay Act and the Civil Rights Act is that women have come a long way, however, there is a gender pay gap and some of the greatest differences in the gender wage gap occur in management and related occupations (The White House, 2013, 2015). In particular, women in management, professional and related occupations, that is to say women in high-paying occupations, earn about 73 percent of what their male counterparts earned in 2014 based on the ratio of women's to men's median weekly earnings for full-time workers (The White House, 2013; Cho & Kramer, 2014; Bureau of Labor Statistics, 2016; Hallman, 2016). Accordingly, the purpose of this thesis is to examine the relation between gender and compensation in top management occupations in the U.S. Specifically, this thesis examines the gender pay gap in compensation for those top executives holding the Chief Financial Officer (CFO) title for the period of 1998 to 2014. As such, the research question of this thesis is as follows:

Does gender affect the level of CFO compensation?

Traditionally, CFO's provide financial insights but nowadays CFO´s are more involved in the strategy and operational success of the organization (EY, 2016). Thus while the role of the CFO is without a doubt important and becoming more important as this role is evolving, the gender pay gap in CFO compensation is of equal importance and should be monitored. First, unequal pay can discourage women (or men) at lower levels from pursuing top management positions, while competent women (or men) currently in top management may choose to exit the firm. The consequences hereof are that organizations do not profit of 'best' talents or loose 'best' talents to competitors. Second, unequal pay affects the financial stability of an individual, which in turn impacts their families and the economy since the individual has lower earnings (Dey & Hil, 2007; The White House, 2013; Hallman, 2016). Lastly, equal pay for equal work is a simple a matter of fairness (The White House, 2015). Thus, providing an answer to the research question should be relevant to firms and employees to help them understand gender pay gap in top management positions better.

Actually, there a number of studies that investigates whether there is a gender pay gap in top management positions. For example, Muñoz-Bullón (2010) document those women in the top five executive positions earn approximately 39.9 percent less than their male counterparts in the period of 1992 to 2006. These results indicate that there is a raw gender wage gap – *the difference between men and women average earnings without taking into account any factors* – in total compensation among the top five executives within a company. Similarly, other studies in the gender pay gap literature suggest that there is a raw gender pay gap in total compensation ranging from 24.5 to 44 percent (Bertrand & Hallock, 2001; Bell, 2005; Elkinawy & Stater, 2011; Shin, 2012; Vieito & Khan, 2012). Once controlling for several factors such as individual experience, firm size, occupational segregation, and industrial segregation, however, Muñoz-Bullón (2010) for example shows that the gender pay gap reduces to significantly 7.2 percent. This implies that there is a gender pay gap in total compensation favoring men among the top five executives, all else being equal. In a similar way, other studies show that there is a significant gender pay gap in total compensation among top executives that varies between 7 and 17.1 percent after controlling for several relevant factors (Bell, 2005; Elkinawy & Stater, 2011; Shin, 2012; Vieito & Khan, 2012). Prior studies do not only highlight that there is gender pay gap at top executive levels but they also show the importance of having women in the highest ranks of a company. For example, Shin (2012) examines the effect of women-leaders on the pay of other women executives for the period of 1998 to 2005. The evidence suggests that those companies with women's representation on the board of directors or compensation committee have a positive effect on the gender pay gap (Bell, 2005; Elkinawy & Stater, 2011). Besides this, companies with women's representation on the board of directors or compensation committee also have a positive effect on women's representation at top executive levels (Bell, 2005; Elkinawy & Stater, 2011). All in all, prior studies in the gender pay gap literature document that women in the top five executive positions earn significantly less than men in similar positions without taking into account any factors but even after controlling for relevant factors there is a significant gender pay gap favoring men.

Even though prior studies in the gender pay gap literature show clear gender differences in compensation among the top five executives within an organization, only a few studies directly consider the gender pay gap at specific top executive levels. In particular, Adams et al. (2007) show that for the period of 1992 to 2004 there is no gender pay gap in total compensation for

those top executives holding the CEO title after taking into account individual, firm and governance characteristics. However, Adams et al. do find a gender pay gap in total compensation for those top executives not holding the CEO title. Similarly, Bugeja et al. (2012) also examine the gender pay gap in CEO compensation but using a more recent time period that is for the period of 1998 to 2010. Consistent with Adams et al. (2007), Bugeja et al. (2012) do not find a gender pay gap in total compensation nor in salary or bonus for CEOs. In order to provide more evidence on the gender pay gap at specific top executive levels, I examine the gender pay gap at a level below the CEO that is at the CFO level.

In order to examine whether there is a gender pay gap in CFO compensation, I use the statistical program STATA to estimate the ordinary least squares (OLS) regression. Specifically, CFO compensation is regressed against gender while controlling for CFO's age, firm size, firm performance, board size, board independence, board composition, and compensation committee independence, industry effects and year effects. The dependent variable CFO compensation is measured using three alternative measures. Firstly, total compensation is the sum of annual salary, annual bonus, non-equity incentive plan compensation, grant-date value of stock options using Black-Scholes, grant-date value of stock awards, and all other compensation. Secondly, base pay is the CFO's annual salary. Lastly, variable pay is the difference between total compensation and base pay. The independent variable gender is an indicator variable equal to 1 for female CFO's, and 0 otherwise. I use Wharton Research Data Services to obtain the required data from Compustat and Institutional Shareholder Services database. Additionally, data on Consumer Price Index is obtained from the U.S. Bureau of Labor Statistics. The data obtained is for the period of 1998 to 2014, where the sample consists of 13,798 executive-year observations.

I first examine whether gender is associated with CFO's total compensation. In particular, prior studies indicate that women in the top five executive positions earn significantly less than men in similar positions, except at the CEO level (e.g. Adams et al., 2007; Elkinawy & Stater, 2011). However, some but not all of the gender pay gap can be explained by individual, firm, and governance characteristics. Besides this, prior studies show that the gender pay gap is narrowing and there is also an increased focus on equal pay for equal work (e.g. Vieito & Khan, 2012; The White House, 2015). Hence, I hypothesize that women holding the CFO title earn similar total compensation than men holding the CFO title, all else being equal. Consistent with

predictions, the regression results indicate that gender is not associated with CFO total compensation holding constant CFO's age, firm size, firm performance, board size, board independence, board composition, compensation committee independence, industry effects and year effects. That is to say that there is no gender pay gap in total compensation. Interestingly, female CFO's work in larger firms compared to male CFO's, which contradicts prior studies (Bertrand & Hallock, 2001; Muñoz-Bullón, 2010). Next, I investigate whether gender is associated with CFO's base pay. Specifically, prior studies imply that women are more risk-averse than men and as such possibly prefer compensation packages with more base pay since it's considered less risky (Jianakoplos & Bernasek, 1998; Croson & Gneezy, 2009; Muñoz-Bullón, 2010; Charness & Gneezy, 2011). With the increased focus on equal pay for equal work (The White House, 2015; Hallman, 2016), however, I hypothesize base pay received by individuals holding the CFO title is the same for men and women, all else equal. Consistent with predictions, the regression results suggest that gender is not associated with CFO's base pay once controlling for individual, firm and governance characteristics. Thus there is no gender-based difference in CFO base pay. Lastly, I examine whether gender is associated with CFO's variable pay. Contrary to base pay, variable pay is performance-sensitive and as such women would prefer less variable pay since it imposes more risk (Muñoz-Bullón, 2010; Murphy, 2012). Similarly, if women are seen as incompetent or their performance is devaluated, they would receive less performance-sensitive compensation compared to men who are seen as competent (Oakley, 2000; Heilman, 2001; Catalyst, 2005). Nonetheless, with the increased focus on gender equality in the workplace, I hypothesize that female CFO's receive similar variable pay than male CFO's, all else equal. Consistent with predictions, the regression results indicate that gender is not associated with CFO's variable pay, everything else equal. In other words there is no gender pay gap in variable pay among those individuals holding the CFO title.

Next to testing the hypotheses, I also run some additional tests. First, I use the Blinder-Oaxaca decomposition method next to estimating the OLS regressions in order to examine gender-based differences in CFO compensation (Blinder, 1973; Oaxaca, 1973). The difference between the two methods is that the OLS method is run under the assumption that the slope coefficients for males and females are identical, whereas the Blinder-Oaxaca decomposition method estimates separate OLS regressions for both males and females. Consistent with the OLS regression results, the results indicate that female CFO's earn on average similar total

compensation, base pay, and variable compared to their male counterparts. Second, I examine whether the gender pay gap has changed over time since prior studies suggest that the gender pay gap among top executives is diminishing over time (Bertrand & Hallock, 2001; Vieito & Khan, 2012). The evidence suggests that there is no gender pay gap at the CFO level in 1998 or 2014, all else equal. Thus, women holding the CFO title earned and still earn on average similar compensation compared to those men holding the CFO title. Finally, I investigate whether the economy influences the gender pay gap since over the entire sample of 17 years the economy has gone up and down. In order to investigate this, I have divided the sample in five subsamples in which each subsample reflects the economy going up or down. The results indicate that whether the economy goes up or down, there is no gender pay gap in average total compensation, base pay or variable pay. The exception is in the period from 2010 to 2014 (subsample 5), where there is a significant gender pay gap in the average total compensation and variable pay. Nevertheless, this gender pay gap disappears again in 2014. Interestingly, firm size was and still is important for determining CFO compensation, whereas CFO experience has only become important in the last decade.

This thesis makes the following contributions. Firstly, this thesis contributes to the ongoing debate of gender differences in pay. Secondly, prior studies in the gender pay gap literature focus on gender differences in compensation among the top five executives or at specific CEO level. However, no prior study focuses specifically on gender differences in compensation at the CFO level. As such, this thesis contributes to gender pay gap literature by specifically examining the impact of gender on CFO compensation. Moreover, this thesis extends the study of Adams et al. (2007) and Bugeja et al. (2012) by examining whether there is a gender pay gap at specific executive levels below the CEO that is to say at the CFO level. In particular, this thesis responds the study of Bugeja et al. (2012), which states that *"future research may consider examining whether a gender-pay gap exists at specific executive levels below the CEO (e.g. CFO's) (p. 859)."* Lastly, this thesis contributes to the executive compensation literature by examining the impact of gender on executive compensation.

The structure of this thesis proceeds as follows. Chapter 2 reviews prior empirical evidence and develops the hypotheses. Chapter 3 discusses the research design and chapter 4 presents the empirical results. Chapter 5 summarizes and concludes.

2. Literature Review and Hypotheses Development

The focus of this thesis lies on the relation between gender and CFO compensation. In order to understand this relation better, this chapter reviews prior empirical evidence. The first section covers executive compensation. The second section focuses on women's strive for equality in the workplace. The third section reviews prior empirical evidence regarding the gender pay gap. The last section focuses then on the connection between gender and CFO compensation and develops the hypotheses.

2.1 Executive Compensation

This section focuses on executive compensation, where the first subsection covers the components of executive pay. The second subsection discusses gender differences in risk preferences, which can have an impact on the components of executive compensation.

2.1.1 Components

The board of directors is responsible for monitoring, hiring, firing, and rewarding top executives, whereas the compensation committee is responsible for monitoring and evaluating the executive compensation process (Murphy, 1999). Hence, compensation packages of top executives depend on both the board of directors and the compensation committee that is a part of the board. Moreover, compensation packages are traditionally designed to align the interest of risk-averse self-interested executives with those of the shareholders. Accordingly, boards should design compensation packages that incentive top executives to maximize shareholder value (Murphy, 1999, 2012).

The compensation packages of executives consists of six basic components, which are base salaries, annual bonuses, non-equity incentives, stock options, stock awards, and all other compensation (Murphy, 2012). Specifically, non-equity incentives are those incentives such as bonuses that are based on both annual and multi-year performance measures. Furthermore, stock options are contracts that give the recipient the right to buy shares at a pre-specified "exercise" price, also known as the "strike" price, for a pre-specified term. Executive options usually become "vested", in other words exercisable, over time. Also, executive options are non-tradable thus executives cannot sell the option to an investor. Stock awards on the other hand are "restricted" as the shares are forfeited under certain conditions. At last, all other compensation

includes items such as signing bonuses, termination payouts, payment for unused vacation, and life assurance premiums (Murphy, 1999, 2012; Muñoz-Bullón, 2010). Both the level of executive compensation and the composition of executive compensation have changed dramatically over the last few decades. In particular, the greatest changes in the level and composition of executive compensation are due to stock options and stock awards (Murphy, 2012).

2.1.2 Risk Preferences

Every component of the compensation package imposes different risk on the executive. Specifically, base salaries represents a 'fixed component' of the compensation package that does not depend on performance, whereas all other compensation component does depend on the performance of either the individual or group (Murphy, 1999; Vieito & Khan, 2012). Moreover, stock options are considered more risky than stock awards, which in turn are more risky than annual bonuses (Murphy, 2012). Hence, the risk preference of an individual can affect the level and composition of the compensation package (Murphy, 1999). Actually, there is a widely held belief that women are more risk-averse than men. A study that specifically examines gender differences in risk-taking is the study of Jianakoplos and Bernasek (1998). More specifically, Jianakoplos and Bernasek examine gender differences in household holding of risky assets. The evidence indicates that single women are more risk averse in financial decision making than single men. Similar to Jianakoplos and Bernasek (1998), Charnessa & Gneezy (2011) also examines gender differences in risk-taking. In particular, Charnessa & Gneezy assemble the data from 15 sets of experiments and the evidence suggest than women invest less than men in risky assets. Thus women are more financially risk-averse than men. Furthermore, Croson and Gneezy (2009) state that women are more risk-averse than men because women are more emotional (e.g. nervousness) to risky situations, are less overconfident compared to men, and interpret risky situations as threats rather than challenges. Moreover, Croson and Gneezy (2009) conclude that women are less competitive than men in both competitive situations and in bargaining situations.

In summary, the composition of executive compensation imposes different risks on executives, where women are considered more risk-averse than men.

2.2 Strive for Gender Equality

Women have been paid less than men for doing the same work historically. However, in 1963 the Equal Pay Act was enacted with the intention to eliminate pay discrimination based on gender. Specifically, the Equal Pay Act prohibits sex-based pay discrimination between men and women working under similar conditions and within the same establishment who perform jobs that require substantially equal skill, effort, and responsibility. One year after the passage of the Equal Pay Act, the Civil Rights Act was enacted prohibiting discrimination in employment on the basis of sex, race, color, religion, and national origin. Both the Equal Pay Act of 1963 and the Civil Rights Act of 1964 are enforced by the U.S. Equal Employment Opportunity Commission, where individuals can file a charge against employment discrimination. The Equal Pay Act was the foundation of women's movement and since then a lot of legislations passed focusing on equality in the workplace (The White House, 2013, 2015, 2016).

Since the passage of the Equal Pay Act and the Civil Rights Act, women have made great progress in the labor force. In terms of representation, women account for 50 percent of the total labor force in 2014 (The White House, 2015), which is an increase of more than 50 percent since the 1960s (The White House, 2013). Women did not only increase their labor force participation but they also increased their level of educational attainment. Specifically, men were more likely to earn undergraduate and graduate degrees in the 1960s and 1970s (The White House, 2015). Nowadays, women earn more than 55 percent of all Bachelor's degrees, about 60 percent of all Master Degrees, more than 45 percent of all first professional degrees, and about 50 percent of all Doctoral degrees (The White House, 2013, 2015; Cho & Kramer, 2014). In addition to women's representation and education progress in the labor force, women are climbing up the corporate ladder, where women made up almost 52 percent of management, professional and related occupations in 2014 (The White House, 2013; Bureau of Labor Statistics, 2016). Further, women business owners also increased in the last few decades and they account for about a quarter of all businesses these days (The White House, 2013). Even though women have made very large advancement towards gender equality in the workplace, there is a visible gender pay gap despite the Equal Pay Act's aim to guarantee equal pay for equal work.

2.3 Gender Pay Gap

The gender pay gap can be defined as the difference between men and women average earnings. Moreover, the gender wage gap is usually reported based on weekly earnings or annual earnings and is expressed as either a ratio of women to men earnings or as an actual pay gap (Lips, 2003; Institute for Women's Policy Research, 2015; Hallman, 2016). In order to understand the gender wage gap better, the first subsection discusses how the gender pay gap differs in a variety of comparisons. The second subsection focuses then specifically on prior studies examining the gender pay gap at the highest levels within an organization. The last subsection discusses the causes of the gender wage gap for those individuals in the highest ranks of an organization.

2.3.1 General

Over the years, prior studies document that earnings differences between men and women does not only exist but also varies in a variety of ways. First, the gender pay gap varies with time. In 2014, women working full-time year-round (35 hours or more per week) earned about 79 cents for every dollar earned by their male counterparts based on annual earnings. In 1965, on the other hand, women earned around 60 percent of what their male counterparts earned. This implies that the gender wage gap decreased with less than 4 cents per decade (Cho & Kramer, 2014). Although there is a gender wage gap that seems to be narrowing over time, the gender wage gap in annual earnings remained between 76 and 79 cents since 2001 (The White House, 2013; Institute for Women's Policy Research, 2015). Second, differences between men and women average earnings vary with state. Actually, there is a gender pay gap in every state of the U.S. The gender pay gap is smallest in Washington, D.C., where women earn 90 percent as much as men annual earnings in 2014. Conversely, the gender wage gap is largest in Louisiana where women earn about 67 percent of their male counterparts' annual earnings in 2014 (U.S. Bureau of Labor Statistics, 2015; Hallman, 2016). Third, whether women work full-time or part-time there is a gender wage gap favoring men (Lips, 2003; The White House, 2013). Fourth, the gender pay gap varies with age. In particular, women working full-time who are younger than 35 earn between 90 to 92 percent of what their male counterparts earned in 2014 based on weekly earnings annual averages. On the contrary, women ages of 35 and older earn between 76 and 81 percent of what men earned in 2014. Thus it seems that as women get older, the wider the gender wage gap becomes (U.S. Bureau of Labor Statistics, 2015; Institute for Women's Policy

Research, 2016). Fifth, earnings differences between men and women affects all women, although some more than others depending on race/ethnicity (Lips, 2003; Cho & Kramer, 2014; Institute for Women's Policy Research, 2015, 2016). Specifically, White women working full-time year-round earn approximately 75 percent as much as White men's annual earnings in 2014. On the other hand, Black and Asian American women earn about 82 percent of their male counterparts. With respect to the Hispanic or Latino ethnicity, women earn about 88 percent of men's annual earnings (U.S. Bureau of Labor Statistics, 2015; Institute for Women's Policy Research, 2015, 2016). Sixth, the gender pay gap also varies with the level of educational attainment. In particular, women with less than a high school diploma earn 79 percent of what men with less than a high school diploma earn. However, even women with a bachelor's degree and higher earn 76 percent of men's weekly earnings annual averages with similar levels of education. Thus the higher the level of educational attainment, the wider the gender wage becomes (Lips, 2003; U.S. Bureau of Labor Statistics, 2015; Institute for Women's Policy Research, 2015, 2016). Seventh, the difference between men and women's earnings varies with the workers career paths. In particular, Dey and Hill (2007) examine the gender pay gap for college graduates and the evidence suggests that one year out of college, women working full-time earn 80 percent of their male counterparts. Moreover, 10 years after graduation women earn 67 percent of what men earn. This implies women earn less than their male counterparts at the beginning of their careers and this pay gap grows over time (Dey & Hil, 2007; The White House, 2015; Hallman, 2016). Lastly, the gender pay gap varies with occupation. Specifically, women tend to be concentrated in "female-dominated" occupations such as teaching and nursing, which are those occupations that are low-paying. On the other hand, men tend to be concentrated in "male-dominated" occupations such as engineering, which are high-paying occupations. Nonetheless, women still earn less (in most occupations) than their male counterparts regardless of whether the occupation is "female-dominated", "male-dominated" or "mixed" (Dey & Hil, 2007; The White House, 2013; Hallman, 2016; Institute for Women's Policy Research, 2016). Moreover, the study of Lips (2003) shows that even in the case of literacy awards, i.e. high prestige Pulitzer awards, where the skill between men and women are considered to be at the same level (or even in the advantage of women), women earn less awards than men in the period of 1917 to 2002.

In summary, women working full-time year-round earn less than men working full-time year-round since the 1960s. Notwithstanding that the gender pay gap has decreased over time, women still earn less than men by state, full-timer/part-timer, age, race and ethnicity, education, career path, and occupation. Actually, the largest gender wage gap manifest in management, professional and related occupations, where the gender wage gap was about 27 percent in 2014 based on the ratio of women's to men's weekly earnings for full-time workers (The White House, 2013; Cho & Kramer, 2014; Bureau of Labor Statistics, 2016; Hallman, 2016). Thus, it seems that women who are able to break the "Glass Ceiling" – *an invisible barrier keeping women from moving up the corporate ladder preventing them to reach the top (Oakley, 2000)* – also encounter a gender pay gap.

2.3.2 Top Executives

Breaking the Glass Ceiling is one thing and achieving equal pay at the highest levels within an organization is another. This subsection specifically reviews prior studies that investigate the impact of gender differences in compensation at the highest levels within an organization. An overview of the studies discussed in this subsection is provided in Appendix A.

One of the first studies that focus on gender differences in total compensation among the top five executives within a company is that of Bertrand and Hallock (2001). The results of Bertrand and Hallock suggest that women in the top five highest paying executive positions earn approximately 44 percent less than their male counterparts in the period of 1992 to 1997. However, after controlling for firm size, occupational segregation, age, tenure, industrial segregation and year effects the gender pay gap in total compensation was insignificantly less than 5 percent. Moreover, 75 percent of the gender wage gap can be explained by the fact that women were underrepresented in large firms and were less likely to hold the best three top executive positions that is the CEO, Chair or President Position. In addition, Bertrand and Hallock (2001) show that women's participation in top management positions nearly tripled by going from 1.3 percent in 1992 to 3.4 percent in 1997. Not only did women improve their labor force participation in management positions but they also strongly improved their relative compensation, mainly by gaining representation in larger corporations.

Similar to Bertrand and Hallock (2001), the study of Muñoz-Bullón (2010) examines the gender differences in compensation among the top five executives, however, for a longer period

of time that is for the period of 1992 to 2006. The evidence suggests that women in top executive positions earn about 39.9 percent less than male executives in similar positions. Once controlling for the effects of firm size, tenure, firm performance, occupational segregation, year and industrial segregation the gender pay gap in total compensation is reduced to significantly 7.2 percent. Besides this, Muñoz-Bullón document a gender wage gap in salary of 23.1 percent that reduces to insignificantly 1.8 percent after accounting for the effects of the control variables. Moreover, consistent with Bertrand and Hallock (2001), a substantial part of the gender wage gap reported by Muñoz-Bullón can be explained by firm size and occupational segregation. Additionally, Muñoz-Bullón adds to the study of Bertrand and Hallock by showing that the gender pay gap in total pay is mainly due to the differences in variable pay rather than the base pay. A possible explanation that Muñoz-Bullón provides for this finding is that women are underrepresented in firms with higher levels of variable pay. Another explanation provided is that women are more risk-averse than men, which is why women are more inclined to *"choose those occupations and firms, everything else being equal, that offer compensation plans with less variation in pay between periods (Muñoz-Bullón, 2010, p. 367)."*

A study that specifically takes into account women's risk preference is the study of Vieito and Kahn (2012). In particular, Vieito and Kahn investigate whether women and men in top executive positions receive the same risky and non-risky components in compensation for the period of 1992 to 2004. The evidence suggests that women in top executive positions receive a higher (lower) proportion of salary (bonus) as a compensation component than their male counterparts. On the other hand, women receive a similar proportion of stock options and restricted stock options than male in similar positions. Thus it seems that boards do not take into account how women and men differ in their risk preference. Vieito and Kahn (2012) further find a significant gender pay gap in total compensation of 17.1 percent, holding constant firm size, market reaction to stock split announcements, firm growth, firm risk, firm performance, whether executives are on two boards or not, whether the firm pays for an executive pension plan or not, occupational segregation, tenure, age, industrial segregation and year effects. Besides this, the results of Vieito and Kahn (2012) show that the gender pay gap reduced after 2001, however, the gender wage gap remains statistically significant. Vieito and Kahn interpret this as a sign for a better functioning market for top executives.

While the studies discussed above focus on executive characteristics and firm characteristics in explaining the gender pay gap, the study of Bell (2005) highlights the importance of women in leadership. Specifically, Bell investigates the gender wage gap among the five top executives and the effect of women-leaders (CEOs or Chairs, and Directors of the board) on the pay of other women executives for the period of 1992 to 2003. The evidence suggests that those firms with a female CEO or chair and especially if the female CEO is a member of the Board are associated with positive compensation outcomes for women top executives. Besides this, the evidence suggests that firms with a female CEO or Chair have significantly greater number of women in the highest ranks of the organization compared to firms with men-leaders. Also, the probability of being a female top executive increases significantly when the firm is led by women. Further, Bell also documents a gender wage gap in total compensation among top executives of 25.4 percent. Controlling for firm size, firm performance, occupational segregation, age, industry effects and year effects reduces the gender pay gap to significantly 11.1 percent. Additionally, the evidence documented by Bell suggest that there is a significant gender pay gap in salary compensation and cash compensation of 10 percent and 11.1 percent, respectively, holding constant all factors.

Similar to Bell (2005), Elkinawy and Stater (2011) examine how the gender differences in compensation among the top executives vary with the gender composition of the board of directors for the period of 1996 to 2004. The evidence suggests that an increase in male representation on the board of directors decreases the relative salaries and total compensation for women even more then for men. However, these results are only significant when age and tenure are not included in the model. Consistent with Bell (2005), Elkinawy and Stater also shows that firms with more male-dominated boards or less independent boards have fewer female top executives within the firm. Moreover, these boards have a lower probability of having any female executives at all. Besides this, if the CEO is a woman, then the firm has more female executives and also a higher probability of having female executives working at the firm. Elkinawy and Stater (2011) also show that there is a significant gender pay gap in total compensation of 24.5 percent. However, after accounting for the effects of firm size, firm performance, job title, age, tenure, board size, board composition, board independence, industry and year effects, the gender wage gap in total compensation is reduced to significantly 9.7 percent. Moreover, consistent with Bertrand and Hallock (2001) and Muñoz-Bullón (2010),

gender differences in total compensation exist primarily due to occupational segregation, i.e. in the lower ranks of top management where women are highly concentrated. In addition, the results of Elkinawy and Stater indicate that there is a gender pay gap in salary of about 16.2%, which reduces to significantly 5.6% after accounting for the effects of the control variables.

Another study that highlights the importance of women in leadership is the study Shin (2012). Firstly, Shin examines the period of 1998 to 2005 and finds that female top executives earn 42 percent less than male top executives. Secondly, the evidence indicate that the gender pay gap reduces to significantly 16.6 percent after controlling for occupational title, age, tenure, whether the executive is a board member or not, firm size, firm performance, gender composition of compensation committee, whether compensation committee members and directors of the board are appointed by the CEO or not, board independence, industry effects, and year effects. Thirdly, Shin shows the importance of women's representation on the compensation committee. In particular, the evidence suggests that the gender pay gap decreases as women's representation on the compensation committee or board of director increases. Also, the gender wage gap in total compensation basically disappears if a firm has at least two women on the compensation committee (Shin, 2012, p. 275). Finally, Shin examines whether a female CEO has an effect on the compensation of other female executives within the organization. Contrary to Bell (2005), the results indicate that a female CEO does not influence the compensation of other female top executives.

The studies discussed above all focus on the gender pay gap at the top executive levels, however, some studies focus on gender differences in compensation at specific executive level. In particular, the study of Adams et al. (2007) investigate the impact of gender on the compensation of both CEO and non-CEO top executives for the period of 1992 to 2004. The evidence suggests that there is no gender pay gap in total compensation, salary or total monetary compensation at the CEO level, after controlling for age, years as CEO, firm performance, firm size, firm profitability, industry effects, and year effects. On the other hand, Adams et al. do find a significant gender wage gap in total compensation at the top five executive levels other than the CEO of 15.7 percent, holding constant age, firm size, firm profitability, firm performance, industry effects and year effects. Similar to Adams et al. (2007), the study of Bugeja et al. (2012) examines the gender pay gap in CEO compensation, although for a more recent time period that

is for the period of 1998 to 2010. The results indicate that there are no gender wage gap in CEO total compensation, salary or bonus holding constant CEO tenure, whether the CEO is a chairperson or not, whether it's the CEO first year as a CEO or not, whether the CEO has more than 5 percent stock ownership or not, firm size, investment opportunities, firm performance, firm risk, firm leverage, board size, board independence, compensation committee independence, industry effects and year effects. Actually, running a cross-sectional regression on the full sample or a cross-sectional regression on a matched control subsample provide similar results, that is to say that there is no gender pay gap in CEO compensation (i.e. total compensation, salary or bonus).

In summary, prior studies indicate that women in top executive positions earn significantly less total compensation than men in similar positions without taking into account any factors. This raw gender pay gap in total compensation varies between 24.5 percent and 44 percent (Bertrand & Hallock, 2001; Bell, 2005; Muñoz-Bullón, 2010; Elkinawy & Stater, 2011; Shin, 2012; Vieito & Khan, 2012). Moreover, the gender wage gap decreases significantly after controlling for several factors such as individual experience, firm size, occupational segregation, and industrial segregation (Bertrand & Hallock, 2001; Muñoz-Bullón, 2010). Nonetheless, there is a significant gender pay gap in total compensation after controlling for several relevant factors that varies between 7 percent and 17.1 percent (Bell, 2005; Adams et al., 2007; Muñoz-Bullón, 2010; Elkinawy & Stater, 2011; Shin, 2012; Vieito & Kahn, 2012). Notwithstanding that there is significant gender pay gap, evidence suggest that the gender wage gap is decreasing over time reflecting a better functioning market for top executives (Bertrand & Hallock, 2001; Vieito & Khan, 2012). Besides this, prior studies suggest that the gender pay gap in total compensation is due to the variable pay rather than the base pay (Muñoz-Bullón, 2010). In addition, prior studies show that there is gender pay gap in annual salary ranging from 2 percent to 10 percent holding constant all other factors, however, the gender wage gap is not always significant (Bell, 2005; Muñoz-Bullón, 2010; Elkinawy & Stater, 2011). Furthermore, prior studies show the importance of having women in the highest ranks of an organization. More specifically, women's representations on the board of directors and on the compensation committee have a positive effect on the gender pay gap (Bell, 2005; Elkinawy & Stater, 2011; Shin, 2012). Besides this, having a female CEO within an organization has a positive effect on women's representation at top executive levels. However, there is mixed evidence on whether female CEOs have a positive

effect on the gender pay gap (Bell, 2005; Shin, 2012). With regards to the gender wage gap at specific executive level, that is to say the CEO level, the evidence suggest that there is no gender pay gap in total compensation, salary nor bonus after controlling for several factors (Adams et al., 2007; Bugeja et al., 2012).

2.3.3 Causes

What is clear from the previous subsection is that women at the top executive levels, except at the CEO level, earn less than men in similar positions. Nonetheless, a substantial part of the gender pay gap can be explained by several factors, which can be categorized in three perspectives. The first perspective stems from an economic point of view and relates to the qualifications of an individual. The second perspective stems from a sociological point of view and relates to structural changes in society and economy. Besides this, there is an unexplained gender pay gap that stems from psychological point of view and relates to how individuals are treated.

With respect to an individual's qualifications, the human capital theory helps explain why women can earn less than men. Specifically, the human capital theory focuses on the value of human capital, which is the collection of hours worked, mobility, skills, knowledge, and ability of any individual that affects human capabilities to do productive work (Schultz, 1961). Consequently, the human capital theory hypothesizes that some workers are paid less because of their individual characteristics or qualifications such as education, training, and experience (Oakley, 2000; Alkadry & Tower, 2006; Blau & Kahn, 2007). Actually, prior studies show that education has little contribution in explaining gender differences in compensation (Bell, 2005; Blau & Kahn, 2007; Cho & Kramer, 2014). Besides this, individuals in management positions are expected to invest in education and training (Bell, 2005). Hence, differences between men and women holding the CFO title are expected to be small when it comes to education and training (Bell, 2005; Elkinawy & Stater, 2011). On the other hand, work experience is an important factor in explaining a proportion of the total gender pay gap (Blau & Kahn, 2007; Elkinawy & Stater, 2011). Moreover, prior studies show that women in top executive positions have less work experience than men in similar positions using age and tenure as a proxy for work experience (Bertrand & Hallock, 2001; Muñoz-Bullón, 2010). Nonetheless, women do have impressive work experience and education (Adams et al., 2007). All in all, from the human

capital theory it can be derived that there should be no difference in compensation between men and women holding the CFO title, when both women and men have the same capabilities, in other words the same human capital (Schultz, 1961; Steven, 2000).

Regarding structural differences in society and the economy, various characteristics help explain why women in top executive positions earn less than men in similar positions. First, occupational segregation suggest that individuals are segregated into occupations that are appropriate to their sex. Hence, women are segregated in occupations viewed as "women's work" and men are segregated in occupations viewed as "men's work". Although occupational segregation can be seen as an individual's choice, prior studies show that these female-dominated occupations are low-paying occupations. Nonetheless, whether women work in occupations that are mainly done by women, mainly done by men, or fairly integrated between men and women, women earn less than men (Lips, 2003; Dey & Hil, 2007; The White House, 2013; Hallman, 2016; Institute for Women's Policy Research, 2016). Besides this, prior studies show that a substantial part of the gender pay gap among top executives can be explained by the fact that women in top executive positions are less likely to hold the best three top executive positions (Bertrand & Hallock, 2001; Muñoz-Bullón, 2010; Elkinawy & Stater, 2011). At last, the level of responsibility helps explain gender differences in compensation. In particular, organizational size influences the level of responsibility and complexity and as such the amount of work, which in turn affects the level of compensation of an individual (Steven, 2000; Alkadry & Tower, 2006). Actually, prior studies clearly show that firm size explains a substantial part of the gender pay gap, where women are underrepresented in large firms (Bertrand & Hallock, 2001; Muñoz-Bullón, 2010). Hence, from the level of responsibility it can be derived that CFO's working in large companies earn more than CFO's working in small companies, regardless of gender.

Concerning how individuals are treated, the discrimination theory helps explain why women can earn less than their male counterparts. In particular, the discrimination theory suggests that favoritism or biases cause differential treatments towards some group and their members over other groups and their members. Thus, according to Cho and Kramer (2014) discrimination *"may lead to biased assessments and expectations on productivity, performance evaluation, and appraisal towards one group of workers over others."* Moreover, the

discrimination theory has two components. Firstly, prejudice refers simply to an unjustifiable individual-level attitude towards a social group and their members. Thus gender-based prejudice reflects an attitude towards men or women simply because of their gender. Moreover, Shin (2012) states that social identity theory and organizational demography suggest that an individual evaluates in-group members more favorably than those of out-group members because of demographic characteristics of organizations that shape people attitudes about others. Thus people will evaluate other people of the same sex more favorably than those of opposite sex since a similarity in gender facilitates mutual liking and attraction (Shin, 2012). This in turn affects the performance evaluations of those of the opposite sex. Secondly, gender-based stereotyping reflects the beliefs about how men and women are categorized based on their traits. Specifically, men are categorized as dominant, aggressive, independent, rational, and decisive, whereas women are affectionate, pleasant, helpful, sympathetic, and sentimental (Heilman, 2001; Catalyst, 2005). Moreover, management positions are categorized by men's treats such as dominant and achievement-oriented and these traits are considered necessary for good management (Heilman, 2001; Catalyst, 2005). Besides this, even women in leadership positions are perceived as being more effective in women traits than in men traits, whereas men in leadership positions are perceived as being more effective in men traits then in women traits (Catalyst, 2005). Hence, gender-based stereotyping categorizes women in management positions, such as the CFO, as having women traits and not men traits. The possible consequences hereof is that women are seen as lacking the skills and abilities to perform the required tasks, which in turn affects women's performance evaluation and rewards (Oakley, 2000; Heilman, 2001). Thus, discrimination can help explain why there is an unexplained gender pay gap, which is due to people beliefs that affect how people feel that in turn unjustifiably affects other people's performance evaluations and rewards. Actually, discrimination or gender-based stereotyping can also affect women's path to reaching the top. In other words, gender-based stereotyping can prevent women from breaking the glass ceiling, although breaking the glass ceiling is also a matter of personal choice (Oakley, 2000; Heilman, 2001).

In summary, gender differences in compensation among top executives can be explained by economic characteristics at both the individual level (the human capital theory) and the organizational level (occupation, industry, and firm characteristics). Once all these characteristics are taken into consideration, the unexplained gender pay gap can be explained by

discrimination. In particular, women in top executive positions can be seen as incompetent or may simply be judged based on their gender, which in turn affects women´s performance evaluations and rewards.

2.4 Hypotheses Development

The gender pay gap literature discussed in section 2.3 provides two important insights. Firstly, there exists a significant pay gap in total compensation between male and female executives at the top five executive's levels within a firm, except at the CEO level (e.g. Muñoz-Bullón, 2010; Bugeja et al., 2012). Secondly, some but not all of the gender wage gap can be explained by economic factors at the individual, organizational, and governance level (e.g. Bertrand & Hallock, 2001; Elkinawy & Stater, 2011). Moreover, nowadays there is an increased focus on 'equal pay for equal work'. In particular, President Obama signed the Lilly Ledbetter Fair Pay Act into law in 2009, which compliments the Equal Pay Act. The Lilly Ledbetter Fair Pay Act was enacted with the intention to eliminate pay discrimination by extending the time period in which an employee can file a claim. More specifically, employees first had to file a claim of pay discrimination within 180 days of an employer's decision to pay a worker less and now employees can file a claim within 180 days of a discriminatory paycheck (The White House, 2013; Cho & Kramer, 2014). Furthermore, prior studies suggest that the gender pay gap is narrowing and with the increased focus on equal pay for equal work, companies should by now be aware of the consequences of unequal pay (Bertrand & Hallock, 2001; Vieito & Khan, 2012; Hallman, 2016). Accordingly, I hypothesize that there is a gender pay gap at the CFO level that can be explained by individual, firm and governance characteristics. As such, the first hypothesis stated in the null form is as follows:

Hypothesis 1: Total compensation received by individuals holding the CFO title is the same for men and women, all else equal.

Another important insight provided by the gender pay literature discussed in the previous section is that most of the gender wage gap among the top five executives exists due to variable pay rather than base pay (Muñoz-Bullón, 2010). Also, prior studies show that women are more risk-averse than men and that base pay imposes less risk than variable pay (Jianakoplos & Bernasek, 1998; Croson & Gneezy, 2009; Charness & Gneezy, 2011; Murphy, 2012). Hence, to

the extent that women prefer compensation that is more secure prefer compensation packages with less variation (Muñoz-Bullón, 2010). Similarly, if women are seen as incompetent or their performance is devaluated, they would receive less performance-sensitive compensation compared to men who are seen as competent (Oakley, 2000; Heilman, 2001; Catalyst, 2005). Regardless of the individuals risk preference and the perception of his or her capabilities, there is an increased focus on equal pay for equal work (The White House, 2015; Hallman, 2016). Following these train of thought, I hypothesize that there is a gender pay gap in base pay favoring women that can be explained by individual, firm and governance characteristics. On the other hand, I hypothesize that there is a gender pay gap in variable pay favoring men that can be explained by individual, firm and governance characteristics. As such, the second and third hypotheses stated in the null form are as follows:

Hypothesis 2: Base pay received by individuals holding the CFO title is the same for men and women, all else equal.

Hypothesis 3: Variable pay received by individuals holding the CFO title is the same for men and women, all else equal.

It is possible that there is a difference in total compensation, base pay or variable pay between men and women after controlling for economic factors at the individual, organizational, and governance level. This unexplained gender pay gap can be explained by discrimination that suggests that favoritism and biases cause differential treatments. As mentioned earlier, see subsection 2.3.3 further, women's capabilities can be underestimated due to their traits, which can have an impact on both the level and composition of women's compensation regardless of the increased pressure from the government to eliminate pay discrimination. It is important to note that the discrimination theory 'can explain' rather than 'explains' the gender wage gap. Recall that discrimination can help explain the gender pay gap after controlling for all characteristics, in other words all observable measures. Hence, it may be possible that the unexplained gender pay gap is due to differences between men and women that might not have been included in the model (see section 3.2 and 3.3 for all observable measures). In particular, unobservable human capital characteristics such as motivation to succeed and provide effort in the job, education, long-term career commitments, and family responsibilities can help explain the unexplained compensation differences between men and women. For example, if men

provide more effort than women, then discrimination would be overestimated as effort can influence compensation. On the other hand, if women provide have higher job related education/credentials than men, then discrimination would be underestimated. Alternatively, if a characteristic in the model such as tenure reflects discrimination (breaking the glass ceiling) then discrimination would be underestimated. However, women who manage to hold a CFO title can be considered as having the required education, motivation, and career commitment to pursue a top executive position in the first place. Consequently, I do believe that if there is an unexplained gender pay gap, unobservable characteristics between female CFO's and male CFO's are very small thus the unexplained gender pay gap is more likely to be attributable to discrimination (Bertrand & Hallock, 2001; Bell, 2005; Blau & Kahn, 2007; Elkinawy & Stater, 2011). Nonetheless, interpreting the difference in total compensation, base pay or variable pay between men and women holding constant all observable measures should be interpreted with caution.

3. Research Design

The subject of this chapter is the research design. The first section describes the data collection and sample selection. The second section includes a specification of all the measurements. The last section describes the regression model and explains how the model is used to test the hypotheses.

3.1 Data and Sample

In order to obtain the data required, several databases are used. First, data on executive compensation is obtained from the Compustat Executive Compensation (Execucomp) database. Execucomp provides data on executive compensation for the top five highest-paid executives in the company, including the CFO. In order to specifically gather compensation data on CFO's the variables 'titleann' and 'annual CFO flag' in Execucomp are used. The variable titleann refers to the title the executive had for the indicated fiscal year, whereas the variable annual CFO flag specifically indicates that the executive had the CFO title for all or most of the indicated fiscal year. Since Execucomp has more than 5100 unique titles (Bertrand & Hallock, 2001), I use the variable annual CFO flag whenever possible (available starting 2006) to identify a CFO. Hence, whenever an observation is missing the variable annual CFO flag the variable titleann is used to identify a CFO based on the following titles: 'Chief Finance Officer', 'Chief Financial Officer', and of course 'CFO'. Besides this, Execucomp provides data on executive characteristics, such as age and tenure. Furthermore, the sample gathered from Execucomp consists of U.S. companies in the S&P500, S&PMidCaps and S&PSmallCaps, consistent with prior studies (Bertrand & Hallock, 2001; Bell, 2005; Muñoz-Bullón, 2010; Vieito & Khan, 2012). These companies are listed on NYSE, NASDAQ, or ASE U.S. stock markets (Shin, 2012). Second, data on firm characteristics such as firm size is obtained from the Compustat Fundamentals Annual database. Third, data on governance characteristics is obtained from the Institutional Shareholder Services (ISS) Director database (formerly RiskMetrics), which contain data on the board of directors. At last, data on Consumer Price Index is obtained from U.S. Bureau of Labor Statistics in order to adjust all dollar figures for inflation.[3]

[3] Retrieved from http://www.bls.gov/cpi/cpid1501.pdf - Table 24 'Historical Consumer Price Index for All Urban Consumers (CPI-U): U.S. city average, all items'.

The data gathered is for the period of 1998 to 2014. The reason for gathering the data starting from 1998 is because all the required data is available starting 1998. In particular, ISS database provides data beginning 1996, however, a careful look of the data reveals that data on the compensation committee (see subsection 3.2.2) is available starting 1998. Furthermore, ISS database covers the years up to 2014. Hence, the data is gathered for 17 years, which covers a sample period longer than prior studies in the gender pay gap, see Appendix A.

Initially I obtain a sample of 18,815 executive-year observations reported by CFO's between 1998 and 2014. Subsequently, I merge Execucomp database with both Compustat and ISS database based on the historical CUSIP identifier resulting in 14,686 executive-year observations. Further, I discard those observations with incomplete compensation data from the sample, such as when the total compensation of the CFO is missing. Besides this, I drop those observations with a total compensation or salary of zero in order to focus on more meaningful observations. This procedure results in 14,606 executive-year observations. Finally, an additional of 753 observations is lost by excluding those observations with missing values on Age, which is discussed in more detail in subsection 3.2.2. Dropping observations with incomplete data or compensation data with zero values is consistent with prior studies (Bertrand & Hallock, 2001; Muñoz-Bullón, 2010; Bugeja et al., 2012). The final sample thus consists of 13,798 executive-year observations for the period of 1998 to 2014; where there are 2,914 unique CFO's working for 1,377 unique firms.

3.2 Measuring the Variables

This section explains how the variables are measured, where the first subsection and second subsection discusses the dependent and independent variables, respectively.

3.2.1 Dependent Variables

In order to test the hypotheses, I will run the regression model (1) using three different dependent variables. First, the dependent variable 'total compensation' is measured as the sum of annual salary, annual bonus, non-equity incentive plan compensation, grant-date value of stock options using Black-Scholes, grant-date value of stock awards, and all other compensation in year t. Second, the dependent variable 'base pay' is measured as annual salary in year t. At last, the dependent variable 'variable pay' is measured as the sum of annual bonus, non-equity incentive plan compensation, grant-date value of stock options using Black-Scholes, grant-date

value of stock awards, and all other compensation in year t. Thus, the difference between total compensation and variable pay is base pay. Noticeably, I use the grant-date rather than the realized pay to measure compensation in order to ensure consistency with prior studies. Similarly, I will use the mean to run the regression model rather than the median as this thesis, consistent with prior studies, is interested in assessing the aggregate levels of compensation (Bertrand & Hallock, 2001; Bell, 2005; Adams et al., 2007; Muñoz-Bullón, 2010; Elkinawy & Stater, 2011; Shin, 2012). Further, the compensation data is deflated by the annual Consumer Price Index in order to adjust for inflation. Specifically, I divide the compensation value by the ratio of current year's Consumer Price Index to the Consumer Price Index of 2014. Accordingly, the compensation data is expressed in 2014 dollars.

3.2.2 Independent Variables

The independent variable capturing the gender of CFO's is an indicator variable equal to 1 for female CFO's, and 0 otherwise. Besides this, I include age and age squared in the regression model as a proxy for CFO experience. Age is included in the regression model as prior studies show that this individual characteristic is likely to affect executive compensation (e.g. Schultz, 1961; Bertrand & Hallock, 2001; Adams et al., 2007; Elkinawy & Stater, 2011). Moreover, the age of the CFO is obtained from Execucomp, where the variables 'age' and 'page' are used. The variable age refers to the executive's age in the indicated fiscal year, whereas the variable page is the executive's present age in 2014. Since approximately 22 percent of the total sample is lost because of missing data on the variable age, I use the variable page whenever the variable age is missing in order to measure the executive's age in the indicated fiscal year. For example, if the executive's present age is 50 in 2014, then the executive's age could be 44, 45 or 46 in the fiscal year 2009 depending on the executive's birth date, fiscal year end and when the present age was recorded. However, on average it can be assumed that the executive's age in fiscal year 2009 is 45. This procedure results in a reduction of the total sample of about 5 percent (i.e. 753 observations, see section 3.1). Another individual characteristic likely to affect executive compensation is tenure (e.g. Schultz, 1961; Bertrand & Hallock, 2001; Adams et al., 2007; Elkinawy & Stater, 2011). However, data on the executive's tenure in the company is largely missing in Execucomp, where approximately 73 percent of the final sample is missing. Consequently, I omit tenure from the analysis. Nonetheless, I believe that age alone is a good proxy for CFO experience because age is related to the executives overall experience and not

simply related to the experience gained in the company as with tenure. After all, if a CFO's tenure is 5 years does not mean that the executive only has 5 years of experience. Hence, I believe age alone is a good proxy for CFO experience.

Other variables included in the regression model relate to firm characteristics. Following prior studies, I include firm size measured traditionally as net sales in year t-1 in the regression model as prior studies show that firm size is associated with compensation (Murphy, 1999; Bertrand & Hallock, 2001; Adams et al., 2007; Bugeja et al., 2012; Muñoz-Bullón, 2010; Shin, 2012; Vieito & Khan, 2012). Besides this, prior studies clearly show that firm size is the largest contributor in explaining the gender pay gap (Bertrand & Hallock, 2001; Muñoz-Bullón, 2010). Hence, the variable 'sales' from Compustat Fundamentals Annual database is used as the firm size measure. Further, prior studies suggest that firm performance is associated with compensation (Bertrand & Hallock, 2001; Bell, 2005; Elkinawy & Stater, 2011; Shin, 2012). After all, compensation packages should incentive executives to increase firm performance (Murphy, 1999, 2012). Moreover, the study of Graham et al. (2005) shows that CFO's view earnings (i.e. earnings per share) as the key metric reported to outsiders. Besides this, CFO's also take actions in order to meet or beat earnings benchmark (Graham et al., 2005). Consequently, I use the firm's earnings per share (EPS) in year t-1 as a proxy for firm performance. The variable 'epspx' obtained from Compustat Fundamentals Annual database is used as firm performance measure, which refers to the firm's EPS before extraordinary items as reported in the financial statement. Furthermore, in order to adjust for inflation I deflate both net sales and EPS by the annual Consumer Price Index, were the data is expressed in 2014 dollars.

Regarding governance characteristics, board size measured as the number of directors in year t is included in the regression model as prior studies show that board size is associated with compensation (Core et al., 1999; Elkinawy & Stater, 2011; Bugeja et al., 2012). Besides this, both board independence and compensation committee independence are likely to affect compensation. Following prior studies, board independence is measured as the percentage of the outside directors on the board in year t, whereas compensation committee independence is an indicator variable equal to 1 if the compensation committee consists wholly of outside directors, and 0 otherwise (Elkinawy & Stater, 2011; Bugeja et al., 2012; Shin, 2012). Moreover, outside directors are those directors who are not a current or former employee of the company or who

are not linked to the company such as to professional services (demand or supply side). Furthermore, the board composition is also likely to affect executive compensation. Specifically, prior studies show that firms with more females on the board of director has a positive effect on the gender pay gap (Bell, 2005; Elkinawy & Stater, 2011; Shin, 2012). Accordingly, following prior studies, the board composition is measured as the percentage of female directors in year t (Bugeja et al., 2012; Shin, 2012). Finally, consistent with prior studies in the gender pay gap literature I include dummy variables for the major industry groups using the 4-digit SIC industry category. Apart from industry controls, I also include year controls (e.g. Bell, 2005; Elkinawy & Stater, 2011).

3.3 Regression Model

Overall, I estimate the following OLS regression in order to test the hypotheses:

$$\mathbf{CFO\_Comp_{it} = \alpha + \beta_1 * CFO\_Fem_{it} + \beta_2 * CFO\_Age_{it} + \beta_3 * CFO\_Age^2_{it} + \beta_4 * F\_Size_{it-1} + \beta_5 * F\_Performance_{it-1} + \beta_6 * B\_Size_{it} + \beta_7 * B\_Independence_{it} + \beta_8 * B\_Composition_{it} + \beta_9 * C\_Independence_{it} + \beta_{10} * Industry\_Control + \beta_{11} * Year\_Control + \varepsilon_{it}} \quad \mathbf{(1)}$$

where the dependent variable 'CFO_Comp' refers to the compensation of executive *i* in year *t*. In particular, CFO compensation is measured using three alternative measures in order to test the hypotheses, namely total compensation, base pay and variable pay (see subsection 3.2.1). The independent variable 'CFO_Fem' is the variable of interest for testing the hypotheses and captures the gender of executive *i* in year *t*. The control variables included in the regression model relate to individual, firm and governance characteristics. Regarding individual characteristics, the variables 'CFO_Age and CFO_Age^2' captures the age and age squared of executive *i* in year *t.* With respect to firm characteristics, the variables 'F_Size' and 'F_Performance' refer to the firms' size and performance of where executive *i* is working in year *t-1*. Concerning governance characteristics, the variables 'B_Size', 'B_Independence', 'B_Composition', and 'C_Independence' capture the board size, board independence, board composition, and compensation committee independence, respectively, of where executive *i* is working in year *t*. Further, the variables 'Industry_Control' and 'Year_Control' reflect industry effects and year effects, respectively (see subsection 3.2.2).

Hypothesis 1 predicts that the coefficient β_1 is negative but insignificant indicating that women holding the CFO title earn on average the same total compensation than men holding the CFO title, everything else being equal. This indicates that there is no gender pay gap in total compensation among CFO's. Similarly, hypothesis 2 predicts that the coefficient β_1 is negative but insignificant suggesting that there is no gender pay gap in base pay. Finally, hypothesis 3 also predicts that the coefficient β_1 is insignificantly negative suggesting that there is no gender-based difference in variable pay between female and male CFO's. With respect to the control variables, CFO experience is expected to have a positive effect on compensation, therefore, the coefficient β_2 is expected to be positive (e.g. Bertrand & Hallock, 2001). On the other hand, the coefficient β_3 is expected to have a negative effect on compensation as prior studies suggest that the returns on experience are diminishing over time (e.g. Adams et al, 2007). Further, firm size is expected to have a positive effect on compensation. More specifically, to the extent that larger firms represent greater responsibility and complexity, then compensation is expected to increase as firm size increases reflecting the positive coefficient β_4 (e.g. Muñoz-Bullón, 2010). Moreover, to the extent that executives focus on improving firm performance, i.e. increasing/decreasing EPS in order to meet or beat earnings benchmarks, and greater firm performance results in higher compensation, then the coefficient β_5 is expected to be positive (e.g. Murphy, 1999; Graham et al., 2005). Finally, the coefficients β_6, β_7, β_8 and β_9 are expected to be negative, positive, positive, and positive, respectively. In particular, larger boards are expected to be negatively associated with compensation since larger boards are considered to be less effective monitors (Core et al., 1999; Shin, 2012). Conversely, the more independent the board of directors is, the more effective monitors the board is (Core et al., 1999; Bugeja et al., 2012; Shin, 2012). Besides this, prior studies suggest that having women on the board of directors has a positive effect on the gender pay gap (Bell, 2005; Elkinawy & Stater, 2011; Bugeja et al., 2012). At last, prior studies show that independence of the compensation committee is positively associated with compensation (Bugeja et al., 2012).

4. Empirical Results

In this chapter the empirical results are discussed, where the chapter begins with the descriptive statistics. Subsequently, the regression results for testing the hypotheses are covered in section two. Finally, the chapter ends with some additional analyses.

4.1 Descriptive Statistics

Table 1 presents the descriptive statistics for the period of 1998 to 2014. The total sample consists of 13,798 executive-year observations of which 1,191 observations are female executive-year observations. Moreover, the sample consists of 2,914 unique CFO's were there are 267 unique females holding the CFO title. Consistent with prior studies, this reflects a male-dominated occupation as approximately 9 percent of the total sample is female (e.g. Bertrand & Hallock, 2001; Vieito & Khan, 2012). Further, I have Winsorized all variables at the 1st percentiles and 99th percentiles of their distributions in order to mitigate the possible impact of outliers, which is a commonly used method in the literature (Veenman, 2013). Note that the variables 'CFO_Fem' and 'C_Independence' are indicator variables, thus these variables are not Winsorized. Also, the variables reported in table 1 are in their 'natural form' thus the variables have only been Winsorized but not transformed. However, some variables are not normally distributed and thus are transformed later on leading to a more normal distribution of the variables, see section 4.2.1 further. In particular, all three dependent variables and the independent variable firm size are positively skewed, hence, the natural logarithm of these variables are included in the regressions in order to control for the high skewness of these variables. Including the natural logarithm to control for the skewness of the variables is consistent with prior studies (e.g. Bertrand & Hallock, 2001; Bell, 2005; Elkinawy & Stater, 2011). Besides this, all dollar figures have been deflated by the Consumer Price Index in order to adjust for inflation were the data is expressed in 2014 U.S. dollars.

As can be seen in table 1, the total compensation for all CFO's over the sample of 17 years is on average $2,289,740, where the base average pay is roughly $462,850 per year. Consistent with prior studies, these results indicate that CFOs' compensation packages depend largely on the performance of the executive (e.g. Elkinawy & Stater, 2011). Actually, male CFO's receive more performance-based incentives such as bonuses, stock options, and stock awards than their female counterparts (e.g. Muñoz-Bullón, 2010). In real terms, male CFO's receive on average

$1,825,350 in variable pay and female CFO's receive on average $1,811,300. Nonetheless, the difference of $14,050 is not statistically different from zero using a two-sided t-test. Moreover, male CFO's do not only receive higher variable pay but they also receive on average more base pay than female CFO's of approximately $8,490, although this difference in base pay is also statistically insignificant. Thus table 1 suggests than male CFO's receive on average higher total compensation than their female counterparts, however, the difference in the average total compensation of about $25,370 is not statistically different from zero and on average very small relative to the average total compensation received by CFO's. With respect to the individual characteristics, female CFO's are on average younger than male CFO's, consistent with prior studies (e.g. Bertrand & Hallock, 2001). Specifically, women are on average about 49 years old and men are on average about 51 years old. The difference in ages between female and male CFO's is statistically significant. Regarding the firm characteristics, firm size measured as net sales is on average $7,655,950 and firm performance measured as EPS is on average $2.06. Moreover, it appears that those women holding the CFO title work in larger firms than their male counterparts. Specifically, women work in firms with net sales of $8,278,300, whereas men work in smaller firms with net sales of $7,597,160. Even though women work in larger firms, the difference in means between female CFO' firms and male CFO' firms is statistically insignificant. That women work in larger firms compared to men is surprising since prior studies show that actually male top executives work in larger firms whereas female top executives tend to work in smaller firms (e.g. Bertrand & Hallock, 2001). In terms of firm performance, male CFO's work in firms with better performance compared to those females holding the CFO title. Specifically, men work in firms with an EPS of $2.06, whereas women work in firms with an EPS of $2.01. The difference of $0.05 is not significant and is roughly 2 percent of the average EPS for all CFO's. Finally, the governance characteristics show similar patterns as prior studies (e.g. Shin, 2012). In particular, female CFOs tend to work in firms with smaller boards of directors and greater proportion of females on the board of directors as compared with male CFO's. Besides this, female CFO's work in firms with more compensation committee independence as compared with their male counterparts. In all these cases, the differences in means are statistically significant at the 0.01 level. Contrary to prior studies on the other hand, it seems that women tend to work for less independent board of directors compared to male top executives, although the difference in means is statistically insignificant.

TABLE 1
Descriptive Statistics

	All CFO's			*Male CFO's*			*Female CFO's*			*T-Stat*[a]
	N	***Mean***	***Std. Dev.***	***N***	***Mean***	***Std. Dev.***	***N***	***Mean***	***Std. Dev.***	
Dependent Variables										
Base Pay[b] *($1000)*	13,798	462.12	203.05	12,607	462.85	203.30	1,191	454.36	200.30	1.38
Variable Pay[b] *($1000)*	13,798	1,824.14	2,089.02	12,607	1,825.35	2,080.99	1,191	1,811.30	2,173.05	0.22
Total Compensation[b] *($1000)*	13,798	2,289.74	2,220.83	12,607	2,291.93	2,213.92	1,191	2,266.56	2,293.51	0.38
Individual Characteristics										
CFO_Age	13,798	51.16	6.44	12,607	51.33	6.51	1,191	49.32	5.36	10.33***
CFO_Age^2	13,798	2,658.68	663.23	12,607	2,677.32	671.73	1,191	2,461.35	526.79	10.79***
Firm Characteristics										
F_Size[b] *($1000)*	13,798	7,655.95	16,373.43	12,607	7,597.16	16,300.11	1,191	8,278.30	17,125.08	-1.37
F_Performance	13,798	2.06	2.38	12,607	2.06	2.37	1,191	2.01	2.50	0.73
Governance Characteristics										
B_Size *(#)*	13,798	9.59	2.38	12,607	9.61	2.39	1,191	9.38	2.24	3.12***
B_Independence *(%)*	13,798	75.81	13.21	12,607	75.82	13.19	1,191	75.76	13.39	0.13
B_Composition *(%)*	13,798	11.95	9.59	12,607	11.73	9.48	1,191	14.29	10.38	-8.85***
C_Independence	13,798	0.91	0.29	12,607	0.90	0.30	1,191	0.94	0.25	-3.74***

, and * Indicate significance at the 0.05 and 0.01 level.

[a] T-statistics are reported from a two sample t-test of the difference in means of the indicated variable between male and female CFO's.

[b] The natural logarithm of the variable is NOT taken in this table.

This table reports the descriptive statistics for the 13,798 executive-year observations. The sample includes all CFO compensation data from 1998 to 2014. All variables have been Winsorized at the 1st percentiles and 99th percentiles of their distributions. The variables are defined in Appendix B. All dollar figures are reported in real 2014 U.S. dollars adjusted using the Consumer Price Index obtained from U.S. Bureau of Labor Statistics.

4.2 Regression Results

This section discusses the results based on the OLS method. The first subsection discusses the conditions for linear regressions. The second, third, and last section focuses then on the regression results for testing hypothesis 1, hypothesis 2, and hypothesis 3, respectively.

4.2.1 Conditions for Linear Regression Inference

In order to run an OLS regression for the model(s) specified in section 3.3, a few conditions have to be met in order to be able to draw unbiased and efficient conclusions regarding the results (Moore et al., 2011). First, there must be a linear relation between the dependent and independent variables. Non-linearity can result in wrong estimates and a relationship that is actually there cannot be detected with a linear model. Second, the errors associated with one observation are not correlated with the errors of any other observation, in other words the intercept is not biased. Third, the conditional variance of the error term is constant in all independent variables and over time and this is called homoscedasticity. If the variance of the error term is different across observations, heteroscedasticity is present implying that there might be a measurement error. Lastly, the error term should be normally distributed.

Before proceeding to inference, I verify whether all these conditions have been met or not by examining the histograms, boxplot and scatterplots once I have run the regression. Note that before running the regression I have examined the data by examining the histograms and boxplot of the variables in order to check for normal distribution of the variables and check for outliers (see section 4.1.). An example of how the conditions for OLS regression are examined is presented in Appendix C. After examining the conditions I conclude that the regression models do not satisfy all the conditions mentioned above, however, failure to meet the conditions of OLS is of minor concern. In order to be able to proceed to inference, these minor concerns are dealt with by running the regression model using robust standard errors clustered by executive. Using robust standard errors deals with minor problems of normality, heteroscedasticity, or some observations that exhibit large residuals, leverage or influence (UCLA: Statistical Consulting Group). I cluster the standard errors by executive to indicate that the observations for executive i might be correlated since the same executive can appear multiple times in the data, but would be independent between the executives. Further, other problems can arise when conducting an OLS regression such as multicollinearity. In order to check for multicollinearity, I verify that the

variance inflation factor (VIF) is not high. In other words, I check whether the predictors are not highly correlated with each other as this can inflate the variance of the regression coefficients making them unstable and difficult to interpret (Allison, 2012).

4.2.2 Gender Differences in Total Compensation

Table 2 presents the regression results for the natural logarithm of total compensation, in other words the regression results for testing hypothesis 1. The variable of interest is CFO_Fem, which captures the impact of gender on CFO total compensation. In order to test the hypothesis, three models are estimated. In the first model, model 1, the regression model specified in section 3.3 is estimated without any control variables. Hence, CFO_Fem captures the raw gender pay gap in total compensation where individual characteristics, firm characteristics or governance characteristics are not taken into account. In the second model, model 2, the regression model is estimated with the variables 'F_Size' and 'Industry_Control' as the control variables. Only firm size and industry effects are included in the regression model in order to see what the effect of these variables are on the gender wage gap since prior studies show that these variables explain a substantial part of the gender pay gap (Blau & Kahn, 2007; Muñoz-Bullón, 2010). In the last model, model 3, the regression model is estimated as presented in section 3.3, namely with all the control variables. Hypothesis 1 predicts that CFO_Fem in model 3 is insignificant indicating that women holding the CFO title earn on average the same total compensation than men holding the CFO title, everything else equal.

In model 1, the negative sign for CFO_Fem implies that female CFO's earn about 3.5 percent less than male CFO's. However, since the coefficient is not statistically significant the result indicates that there is no raw gender pay gap in total compensation. This contradicts prior studies that show that there is a raw gender wage gap among top executives ranging from 24.5 percent to 44 percent (Bertrand & Hallock, 2001; Bell, 2005; Muñoz-Bullón, 2010; Elkinawy & Stater, 2011; Shin, 2012; Vieito & Khan, 2012). When firm size and industry effects are included in model 2, CFO_Fem is still negative but decreases slightly to 5.1 percent, although the effect of gender is still insignificant. This result suggests there is no gender pay gap in total compensation, holding firm size and industry effects constant. Note that CFO_Fem decreases from -3.5 to -5.1 percent when firm size and industry effects are included in the model. A possible explanation for the decrease is that women work in larger firms than men, as suggested in table 1, and larger

firms tend to pay more because of the greater responsibility and complexity. Actually, the coefficient for firm size has a positive effect on total compensation and this effect is significant at the 0.01 level. This indicates that total compensation increases with roughly 0.37 percent when firm size measured as net sales increases with one percent. In model 3, CFO_Fem is still insignificantly negative when all the control variables are included in the regression estimates. Contrary to prior studies, these results imply that gender is not associated with CFO total compensation or in other words there is no significant gender wage gap in total compensation, all else equal (Bell, 2005; Adams et al., 2007; Muñoz-Bullón, 2010; Elkinawy & Stater, 2011; Shin, 2012; Vieito & Kahn, 2012). With respect to the individual characteristics, the proxies for CFO experience are as expected, namely CFO_Age is significantly positive and CFO_Age^2 is significantly negative. Both variables are significant the 0.01 level implying that as CFO experience increases, total compensation increases, however, at a decreasing rate. Further, the coefficient for F_Size is significantly positive at the 0.01 level and is similar to the coefficient reported in model 2. On the other hand, firm performance, is not as expected as the coefficient F_Performance is negative but the coefficient is not significant. This indicates that firm performance is not associated with the compensation of CFO's. Finally, board size, board independence, and compensation committee independence all have the expected sign namely B_Size is negative, B_Independence is positive, and C_Independence is positive, respectively. Even though these governance characteristics all have the expected sign, only the coefficient for board independence is significant at the 0.05 level. Besides this, board composition is expected to be positive suggesting that a greater proportion of women on the board of director have a positive effect on executive compensation. However, the coefficient for B_Composition is negative although insignificant. Thus from the governance characteristics is appears that only greater board independence is associated with greater CFO compensation.

TABLE 2
Results for Testing Hypothesis 1 based on OLS

	Model 1		**Model 2**		**Model 3**	
	b/se	**VIF**	**b/se**	**VIF**	**b/se**	**VIF**
CFO_Fem	-0.035	1.000	-0.051	1.008	-0.055	1.029
	(0.057)		(0.037)		(0.037)	
CFO_Age					0.062***	175.898
					(0.021)	
CFO_Age^2					-0.001***	175.728

				(0.000)	
F_Size[a]		0.366***	1.073	0.366***	1.748
		(0.007)		(0.009)	
F_Performance				-0.005	1.164
				(0.004)	
B_Size				-0.002	1.541
				(0.006)	
B_Independence				0.002*	1.481
				(0.001)	
B_Composition				-0.001	1.282
				(0.001)	
C_Independence				0.021	1.272
				(0.032)	
Industry_Control	No	Yes		Yes	
Year_Control	No	No		Yes	
Constant	7.386***	4.477***		2.629***	
	(0.017)	(0.177)		(0.550)	
N	13,798	13,798		13,798	
adj. R^2 (%)	0.007	41.768		43.106	

** and *** Indicate significance at the 0.05 and 0.01 level.

[a] The natural logarithm of this variable is taken.

This table presents the results for testing hypothesis 1 by estimating the following OLS regression model:

$$CFO\_Comp_{it} = \alpha + \beta_1*CFO\_Fem_{it} + \beta_2*CFO\_Age_{it} + \beta_3*CFO\_Age^2_{it} + \beta_4*F\_Size_{it-1} + \beta_5*F\_Performance_{it-1} + \beta_6*B\_Size_{it} + \beta_7*B\_Independence_{it} + \beta_8*B\_Composition_{it} + \beta_9*C\_Independence_{it} + \beta_{10}*Industry\_Control + \beta_{11}*Year\_Control + \varepsilon_{it}$$

The regression model is estimated for 13,798 executive-year observations and includes all CFO compensation data from 1998 to 2014. The standard errors presented in parentheses are clustered by executive. The dependent variable 'CFO_Comp' refers to the natural logarithm of total compensation of executive *i* in year *t*. The independent variable 'CFO_Fem' is the variable of interest for testing the hypotheses and captures the gender of executive *i* in year *t*. The control variables included in the regression model relate to individual, firm and governance characteristics. Regarding individual characteristics, the variables 'CFO_Age and CFO_Age^2' captures the age and age squared of executive *i* in year *t*. With respect to firm characteristics, the variables 'F_Size' and 'F_Performance' refer to the firms' size and performance of where executive *i* is working in year *t-1*. Concerning governance characteristics, the variables 'B_Size', 'B_Independence', 'B_Composition', 'C_Independence' capture the board size, board independence, board composition, and compensation committee independence of where executive *i* is working in year *t*. Further, the variables 'Industry_Control' and 'Year_Control' reflect industry effects and year effects, respectively. All variables have been Winsorized at the 1st percentiles and 99th percentiles of their distributions. The variables are defined in Appendix B. All dollar figures are reported in real 2014 U.S. dollars adjusted using the Consumer Price Index obtained from U.S. Bureau of Labor Statistics.

Focusing further on the explanatory power of the model, the adjusted R^2 suggests that including firm size and industry effects in the regression model leads to an adjusted R^2 of approximately 41.78 percent, whereas including all the control variables in the regression model increases the adjusted R^2 slightly to 43.11 percent. Consistent with prior studies, this indicates

that firm size and industry effects are the largest contributor in explaining total compensation (e.g. Muñoz-Bullón, 2010). Besides this, the adjusted R^2 is relatively in line with previous studies where the adjusted R^2 ranges from 31 to 61% once controlling for all factors (Bertrand & Hallock, 2001; Bell, 2005; Muñoz-Bullón, 2010; Elkinawy & Stater, 2011; Vieito & Khan, 2012). With regards to multicollinearity, the VIF's indicate that the regression estimates are not unreliable or unstable as the level of VIF is low in all the models (Allison, 2012). The exceptions are the variables CFO_Age and CFO_Age^2 that have high levels of VIF's in model 3. However, the high levels of VIF's are not surprising since CFO_Age^2 is the squared of CFO_Age. The consequence hereof is that these variables are highly correlated and looking at the Pearson's correlation between the variables reveals that these variables are strongly correlated with a correlation of 0.997. As such, I conclude that there are no multicollinearity concerns regardless of the high levels of VIF's for the variables CFO_Age and CFO_Age^2.

Overall, the evidence presented in table 2 supports hypothesis 1 that predicts that total compensation received by individuals holding the CFO title is the same for men and women, all else equal.

4.2.3 Gender Differences in Base Pay

Table 3 presents the results for testing hypothesis 2. Consistent with table 3, three models are estimated. The first model captures the raw gender pay gap in base pay, the second model controls for firm size and industry effects, and the last model includes all the control variables. Hypothesis 2 predicts that CFO_Fem in model 3 is insignificant indicating that base pay received by individuals holding the CFO title is the same for men and women, all else equal.

In model 1, the variable of interest CFO_Fem is negative but insignificant implying that there is no raw gender pay gap in base pay. This result is contrary to prior studies that show a raw gender pay gap ranging from 16.2 percent to 23.1 percent (Muñoz-Bullón, 2010; Elkinawy & Stater, 2011). In model 2, CFO_Fem is still negative but becomes significant at the 0.05 level. This result suggest that female CFO's earn on average 3.9 percent less in base pay than their male counterparts. Consistent with expectations, the coefficient F_Size capturing firm size is significantly positive at the 0.01 level indicating that the larger the firm, the greater the level of base pay is. In model 3, the negative coefficient of CFO_Fem increases to 3.2 percent and becomes insignificant when all the control variables are included in the regression model.

Consistent with the study of Elkinawy and Stater (2011), this implies that gender is not associated with CFO base pay, that is to say that female CFO's earn on average similar base pay than male CFO's, all else being equal. With respect to the individual characteristics, CFO_Age and CFO_Age^2 are significantly positive and negative, respectively, at the 0.01 level similar to results presented in table 2. Regarding the firm characteristics, F_Size is significantly positive at the 0.01 level and F_Performance is insignificantly negative. These results indicate that increases in net sales are associated with increases in base pay, whereas increases in EPS are not associated with decreases in base pay. With regards to the governance characteristics, B_Size is significantly positive at the 0.01 level implying that larger boards pay CFO's more base pay. Conversely, B_Independence is significantly negative at the 0.01 level indicating that more independent board of directors pay CFO's less base pay. Both B_Size and B_Independence are not as expected and could suggest monitoring problems since larger and less independent boards are considered less effective monitors reflecting the greater base pay paid to CFO's (Core et al., 1999; Shin, 2012). On the other hand, B_Composition is significantly positive at the 0.05 level as expected. This suggests that as the proportion of women on the board of directors increases so does CFO base pay. Finally, C_Independence is also consistent with expectations and is significantly positive at the 0.01 level implying that the greater the compensation committee independence is, the greater the level of base pay is.

TABLE 3
Results for Testing Hypothesis 2 based on OLS

	Model 1		**Model 2**		**Model 3**	
	b/se	**VIF**	**b/se**	**VIF**	**b/se**	**VIF**
CFO_Fem	-0.026	1.000	-0.039**	1.008	-0.032	1.029
	(0.030)		(0.020)		(0.020)	
CFO_Age					0.038***	175.898
					(0.011)	
CFO_Age2					-0.000***	175.728
					(0.000)	
F_Size[a]			0.186***	1.073	0.172***	1.748
			(0.004)		(0.005)	
F_Performance					-0.002	1.164
					(0.002)	
B_Size					0.014***	1.541
					(0.003)	
B_Independence					-0.002***	1.481
					(0.001)	

B_Composition			0.002**	1.282
			(0.001)	
C_Independence			0.043**	1.272
			(0.017)	
Industry_Control	No	Yes	Yes	
Year_Control	No	No	Yes	
Constant	6.039***	4.486***	3.383***	
	(0.009)	(0.112)	(0.309)	
N	13,798	13,798	13,798	
adj. R^2 (%)	0.017	35.296	37.910	

** and *** Indicate significance at the 0.10, 0.05, and 0.01 level.

[a] The natural logarithm of this variable is taken.

This table presents the results for testing hypothesis 2 by estimating the following OLS regression model:

$$CFO\_Comp_{it} = \alpha + \beta_1*CFO\_Fem_{it} + \beta_2*CFO\_Age_{it} + \beta_3*CFO\_Age^2_{it} + \beta_4*F\_Size_{it-1} + \beta_5*F\_Performance_{it-1} + \beta_6*B\_Size_{it} + \beta_7*B\_Independence_{it} + \beta_8*B\_Composition_{it} + \beta_9*C\_Independence_{it} + \beta_{10}*Industry\_Control + \beta_{11}*Year\_Control + \varepsilon_{it}$$

The regression model is estimated for 13,798 executive-year observations and includes all CFO compensation data from 1998 to 2014. The standard errors presented in parentheses are clustered by executive. The dependent variable 'CFO_Comp' refers to the natural logarithm of base pay of executive *i* in year *t*. The independent variable 'CFO_Fem' is the variable of interest for testing the hypotheses and captures the gender of executive *i* in year *t*. The control variables included in the regression model relate to individual, firm and governance characteristics. Regarding individual characteristics, the variables 'CFO_Age and CFO_Age^2' captures the age and age squared of executive *i* in year *t*. With respect to firm characteristics, the variables 'F_Size' and 'F_Performance' refer to the firms' size and performance of where executive *i* is working in year *t-1*. Concerning governance characteristics, the variables 'B_Size', 'B_Independence', 'B_Composition', 'C_Independence' capture the board size, board independence, board composition, and compensation committee independence of where executive *i* is working in year *t*. Further, the variables 'Industry_Control' and 'Year_Control' reflect industry effects and year effects, respectively. All variables have been Winsorized at the 1st percentiles and 99th percentiles of their distributions. The variables are defined in Appendix B. All dollar figures are reported in real 2014 U.S. dollars adjusted using the Consumer Price Index obtained from U.S. Bureau of Labor Statistics.

Similar to the adjusted R^2 discussed in subsection 4.2.2, firm size and industry effects have the greatest effect on base pay (e.g. Muñoz-Bullón, 2010). Besides this, the adjusted R^2 is relatively in line with previous studies where the adjusted R^2 ranges from 28 to 38 percent when all control variables are included in the regression model (Bell, 2005; Muñoz-Bullón, 2010; Elkinawy & Stater, 2011). Additionally, I check whether there are multicollinearity problems and I conclude that the regression estimates are not unreliable or unstable as the levels of VIF's are all below 2 (Allison, 2012). The exceptions are of course the variables CFO_Age and CFO_Age^2 that have a high level of VIF in model 3. As already discussed in subsection 4.2.2, the high levels of VIF's are because these variables are highly correlated since CFO_Age^2 is the square of CFO_Age. Consequently, I conclude that there are no multicollinearity problems.

Overall, the evidence presented in table 3 supports hypothesis 2 that predicts that base pay received by individuals holding the CFO title is the same for men and women, all else equal.

4.2.4 Gender Differences in Variable Pay

Table 4 reports the results for testing hypothesis 3 where the dependent variable is the natural logarithm of variable pay. In line with subsection 4.2.2 and 4.2.3, three models are estimated. Hypothesis 3 predicts that CFO_Fem in model 3 is insignificant suggesting that there is no gender-based difference in variable pay between female and male CFO's.

Model 1 captures the raw gender pay gap in variable pay. As can be seen in the table, the variable of interest CFO_Fem is negative, however, insignificant. Thus there is no raw gender pay gap in variable pay. Model 2 includes firm size and industry effects as control variables. Including these control variables in the regression model increases CFO_Fem. This negative sign of the coefficient indicates that women holding the CFO title earn on average 3.2 percent less than those men holding the CFO title. However, since the impact of gender on CFO variable pay is not significant, the result suggest women do not earn significantly less than their male counterparts holding constant firm size and industry effects. Looking at firm size, again, the coefficient is significantly positive at the 0.01 level indicating that larger firms are associated with higher levels of variable pay. Model 3 captures the gender wage gap in variable pay after accounting for the effects of all the control variables. As can be seen, CFO_Fem is still negative and insignificant. Similar to model 2, the negative sign implies that female CFO's earn 7.9 percent less than male CFO's. Nonetheless, the impact of gender on variable pay is not statistically significant suggesting that gender is not associated with CFO variable pay. In other words, female CFO's earn on average similar variable pay compared to their male counterparts. Further, CFO_Age and CFO_Age^2 are significantly positive and negative, respectively, at the 0.01 level as expected. These results suggest that greater CFO experience increases variable pay, although the effect is diminishing over time. F_Size is also as expected, namely the coefficient is significantly positive at the 0.01 level. On the other hand, F_Performance does not have the predicted sign but the coefficient is insignificant. Finally, the governance characteristics are all insignificant except for the variable B_Independence that is significantly positive at the 0.01 level. As expected, this indicates that the more independent the board of directors is, the greater the variable pay received by CFO is.

Further, the adjusted R^2 in model 2 is about 32.05 percent and in model 3 it is 33.65 percent. Similar to the results discussed in subsections 4.2.2 and 4.2.3, firm size and industry effects have the greatest effect on variable pay. Furthermore, the VIF's indicate that there are no multicollinearity problems as the level of VIF's are all below 2 (Allison, 2012). Again, the exceptions are the variables CFO_Age and CFO_Age^2 and as discussed in the previous subsections I conclude that there are no multicollinearity problems.

Overall, the evidence presented in table 4 supports hypothesis 3 that predicts that variable pay received by individuals holding the CFO title is the same for men and women, all else equal.

TABLE 4
Results for Testing Hypothesis 3 based on OLS

	Model 1		**Model 2**		**Model 3**	
	b/se	**VIF**	**b/se**	**VIF**	**b/se**	**VIF**
CFO_Fem	-0.047	1.000	-0.063	1.008	-0.079	1.029
	(0.076)		(0.053)		(0.054)	
CFO_Age					0.098***	175.898
					(0.031)	
CFO_Age2					-0.001***	175.728
					(0.000)	
F_Size[a]			0.463***	1.073	0.455***	1.748
			(0.010)		(0.013)	
F_Performance					-0.000	1.164
					(0.006)	
B_Size					-0.006	1.541
					(0.008)	
B_Independence					0.005***	1.481
					(0.001)	
B_Composition					0.000	1.282
					(0.002)	
C_Independence					0.002	1.272
					(0.047)	
Industry_Control	No		Yes		Yes	
Year_Control	No		No		Yes	
Constant	6.938***		3.378***		0.544	
	(0.023)		(0.203)		(0.809)	
N	13,798		13,798		13,798	
adj. R^2 (%)	0.005		32.048		33.654	

** and *** Indicate significance at the 0.05 and 0.01 level.

[a] The natural logarithm of this variable is taken.

This table presents the results for testing hypothesis 2 by estimating the following OLS regression model:

$$CFO\_Comp_{it} = \alpha + \beta_1*CFO\_Fem_{it} + \beta_2*CFO\_Age_{it} + \beta_3*CFO\_Age^2_{it} + \beta_4*F\_Size_{it-1} + \beta_5*F\_Performance_{it-1} + \beta_6*B\_Size_{it} + \beta_7*B\_Independence_{it} + \beta_8*B\_Composition_{it} + \beta_9*C\_Independence_{it} + \beta_{10}*Industry\_Control +$$

β_{11}*Year_Control + ε_{it}

The regression model is estimated for 13,798 executive-year observations and includes all CFO compensation data from 1998 to 2014. The standard errors presented in parentheses are clustered by executive. The dependent variable 'CFO_Comp' refers to the natural logarithm of variable pay of executive *i* in year *t*. The independent variable 'CFO_Fem' is the variable of interest for testing the hypotheses and captures the gender of executive *i* in year *t*. The control variables included in the regression model relate to individual, firm and governance characteristics. Regarding individual characteristics, the variables 'CFO_Age and CFO_Age^2' captures the age and age squared of executive *i* in year *t*. With respect to firm characteristics, the variables 'F_Size' and 'F_Performance' refer to the firms' size and performance of where executive *i* is working in year *t-1*. Concerning governance characteristics, the variables 'B_Size', 'B_Independence', 'B_Composition', 'C_Independence' capture the board size, board independence, board composition, and compensation committee independence of where executive *i* is working in year *t*. Further, the variables 'Industry_Control' and 'Year_Control' reflect industry effects and year effects, respectively. All variables have been Winsorized at the 1st percentiles and 99th percentiles of their distributions. The variables are defined in Appendix B. All dollar figures are reported in real 2014 U.S. dollars adjusted using the Consumer Price Index obtained from U.S. Bureau of Labor Statistics.

4.3 Additional Analyses

This section focuses on some additional analyses, where the first section discusses another way to examine the relation between gender and CFO compensation. The second section focuses on gender differences in compensation over time. The last section considers the effects of the economy on gender differences in compensation.

4.3.1 Blinder-Oaxaca Decomposition Method

A widely used method to examine mean outcome differences in log wages between men and women is specified in the study of Blinder (1973) and Oaxaca (1973). The method also known as the Blinder-Oaxaca decomposition method decomposes the overall pay gap in two parts: a part that is due to differences in characteristics (e.g. CFO experience) between two comparison groups when both groups receive the same treatment and another part that is still unexplained. The unexplained part is often interpreted as a measure of discrimination or favoritism where one group is more favorable treated then the other group when both groups have the same characteristics. On the other hand, the unexplained part of the overall pay gap may also be due to group differences in unobserved predictors such as effort. As explained in section 2.4, those women holding the CFO title can be considered to be equally qualified, motivated and determined compared to those men holding the CFO title. Hence, the unexplained part of the overall pay gap is more likely to be attributable to discrimination but should nonetheless be interpreted with caution.

The difference between the OLS method and the Oaxaca-decomposition method is that the OLS method is run under the assumption that the slope coefficients for males and females are identical. The Oaxaca-decomposition method on the other hand takes this into account by estimating separate OLS regressions for both men and women where the indicator variable CFO_Fem is excluded from the model. The overall pay gap is then as follows:

$$\hat{Y}_M - \hat{Y}_F = (\bar{x}_M - \bar{x}_F)\beta_M + (\beta_M - \beta_F)\bar{x}_F \quad (2)$$

where $\hat{Y}_M - \hat{Y}_F$ are the predicted average log wages for men and women, respectively. Since there are three alternative compensation measures, the log wages refers to total compensation, base pay or variable pay. $\bar{x}_M - \bar{x}_F$ captures the part of the pay gap that is due to men and women having different characteristics, respectively, which includes those measures that are observable. $\beta_M - \beta_F$ captures the part of the pay gap attributable to the estimated coefficients from the male and female regressions, respectively. Thus first term on the right hand side of equation (2) captures the part of the pay gap that is due to men and women having different characteristics. The second term on the other hand captures the part of the pay gap that is due to men and women having same characteristics, in other words the unexplained part of the pay gap that is due to unobserved factors. Consistent with prior studies in the gender pay gap literature, the overall pay gap is decomposed using the returns to male characteristics as the baseline since the occupation is male-dominated. Recall that roughly 9 percent of the total sample are female CFO's, see section 3.1 further (Bertrand & Hallock, 2001; Muñoz-Bullón, 2010; Elkinawy & Stater, 2011). Hence, decomposing the pay gap shows how women would be compensated if women were treated in the same way as men.

Table B in appendix D presents the Blinder-Oaxaca decomposition results. In this case the following variables are included in regression model (2): CFO_Age, CFO_Age^2, F_Size, Industry_Control and Year_Control. The variables F_Size and Industry_Control are included in the regression model as firm size and industry effects alone have the greatest effect on compensation, as mentioned earlier. Also, both proxies for CFO experience are significantly associated with compensation in tables 2-4. Hence, these variables are also included in the model. Additionally, the variable Year_Control is included in the regression model. First, the overall pay gap in total compensation, base pay, and variable pay is 3.5 percent, 2.6 percent, and 4.7 percent, respectively, favoring male CFO's. These insignificant results suggest that the

average total compensation, base pay, and variable pay are similar for those individuals holding the CFO title, regardless of gender. Second, the unexplained part of the gender pay gap in total compensation, base pay, and variable pay is 5.6 percent, 2.6 percent, and 8.4 percent, respectively. The positive unexplained part suggest that male CFO's would earn on average the same as they presently earn but possible discrimination leads to female CFO's receiving less than a non-discriminating labor market would award them. However, since the unexplained part of the pay gap is insignificant in all the cases, the results thus imply that when both men and women have the same characteristics, men and women are treated in the same way. Finally, the negative coefficient for the explained part of the gender wage gap in total compensation, base pay, and variable pay imply that the individual and firm characteristics would be better among female CFO's. In particular, the proxies for CFO experience are significant determinants of the gender pay gap in total compensation, base pay and variable pay. Recall that the proxies for CFO experience are highly correlated thus these results are not surprising. Besides this, the year effects are also significant determinants of the gender pay gap in total compensation and variable pay. Contrary to prior studies such as that of Muñoz-Bullón (2010), firm size is not a significant determinant of the gender pay gap. However, as seen in table 1, female and male CFO's work in similar sized companies. Overall, the evidence presented in tables 2-4 are similar to the evidence presented in appendix D table B. Hence, the assumption under the OLS method that the slope coefficient for males and females are identical is supported by the Blinder-Oaxaca decomposition method since allowing the slope coefficients to differ between men and women provides similar results. Thus, the Blinder-Oaxaca decomposition results further support the results presented in section 4.2.

4.3.2 Gender Differences in Compensation over Time

Prior studies in the gender pay gap literature suggest that the gender pay gap among top executives is diminishing over time (Bertrand & Hallock, 2001; Vieito & Khan, 2012). Consequently, this section investigates whether at the CFO level this is the case. Specifically, I examine whether there is a gender wage gap at the beginning of the sample year that is 1998 and compare this gender pay gap with the gender pay gap at the end of the sample year that is 2014.

Table C in appendix D provide the results, where two models are presented. The first model only includes the variable of interest, which is the variable CFO_Fem capturing the raw

gender pay gap. Similar to the Blinder-Oaxaca decomposition method, the second model includes the variable of interest, the individual characteristics CFO_Age and CFO_Age^2, the firm characteristic firm size, and industry effects. Results show that in 1998, CFO_Fem is significantly negative in model 1 for total compensation and variable pay. The results indicate that female CFO's received on average 44.9 percent and 44.8 percent less total compensation and variable pay, respectively, compared to their male counterparts. In 2014 on the other hand, CFO_Fem is insignificant for both total compensation and variable pay. Moreover, the column 'diff' compares the regression coefficients and implies that the difference in the raw gender pay gap between 1998 and 2014 is statistically different from each other. Although there is a raw gender wage gap in total compensation and variable in 1998, the gender pay gap disappears at the 0.05 level or better after accounting for the effects of the control variables. Regarding base pay, CFO_Fem is insignificant in both periods in model 1. Comparing the regression coefficients with each other further suggests that the raw gender pay gap between 1998 and 2014 is not statistically significant from each other. Although CFO_Fem is also insignificant in both periods in model 2, the difference in gender pay gap between 1998 and 2014 is significant in model 2. With regards to the control variables, firm size is significantly positive in all the cases in model, consistent with expectations. Interestingly, the proxies for CFO experience are only significant in 2014. These result highlight how important experience has become in 2014 compared to 1998 for determining the average total compensation, base pay and variable pay for CFO's. Further, although not reported in the table, I verified whether the VIF's are not high and conclude that there are no multicollinearity problems. Overall, the results indicate that at the CFO level women earned and still earn on average similar compensation compared to their male counterparts. Thus inconsistent with prior studies, there is no gender pay gap at the CFO level in 1998 or 2014, all else equal (Bertrand & Hallock, 2001; Vieito & Khan, 2012).

4.3.3 Gender Differences in Compensation and the Economy

Over the entire sample of 17 years, the U.S. economy has gone up and down. Hence, it would be interesting to investigate whether the economy influences the gender pay gap. In order to investigate this further, the sample period is divided in five subsamples. The first subsample captures the economy going up from 1998 to 1999. The second subsample captures the economy going down because of the dotcom bubble crash that took place in 2000 up to 2003. The third subsample captures the economy going up from 2004 to 2006 recovering from the bubble. The

fourth subsample captures the economy going down again because of the Housing market crash and financial crisis that took place from 2007 to 2009. Finally, the last subsample starts from 2010 to 2014 and captures the economy going up once again.[4]

Table D in appendix D provide the regression results. The table presents two models where model 1 captures the raw gender pay gap and model 2 captures the gender pay gap after accounting for the effects of the control variables. From the table it can be seen that there is no raw gender pay gap in total compensation, base pay or variable pay in any of the subsamples. Similarly, model 2 suggest that whether the economy goes up or down there is no gender wage gap in total compensation, base pay or variable pay after accounting for the effects of the control variables. However, there are two exceptions. First, subsample 5 suggests that there is a gender pay gap in total compensation of roughly 9.5 percent favoring male CFO's. Second, female CFO's receive on average 14.9 percent less variable pay than their male counterparts in subsample 5. Thus it seems that there is a gender pay gap in average total compensation and variable pay from 2010 up to 2014. Recall, however, that table C suggests that there is no gender pay gap in the year 2014. Further, firm size is significantly positive in all the cases as expected. CFO experience on the other hand becomes significant starting subsample 3 that is starting 2004 but only for total compensation and variable pay. For base pay, CFO experience is only significant starting subsample 4 thus starting 2007. These results contribute to the results reported in table C and also highlight the importance of CFO experience in the last couple of years. Furthermore, although not reported, I check whether there are any multicollinearity problems and conclude that there are no problems. Overall, there is no pattern visible suggesting that whether the economy goes up or down the gender pay gap widens or narrows. Thus it seems that over the entire sample of 17 years, whether the economy goes up or down, there is no gender pay gap in average total compensation, base pay or variable pay. Interestingly, there is a significant gender pay gap in average total compensation and variable pay in the period from 2010 to 2014 but this gender pay gap disappears again in 2014.

[4] Information on the time period of U.S. market crashes retrieved from: http://www.investopedia.com/features/crashes/?o=40186&l=dir&qsrc=999&qo=investopediaSiteSearch.

5. Summary and Conclusion

In this thesis I investigate whether gender is associated with CFO compensation for the period of 1998 to 2014. Prior studies in the gender pay gap literature suggest that women in the top five executive positions within a company earn on average significantly less total compensation than men in similar positions. In other words, there is a significant gender pay gap in total compensation among top executives favoring men after controlling for several factors (Bell, 2005; Adams et al., 2007; Muñoz-Bullón, 2010; Elkinawy & Stater, 2011; Shin, 2012; Vieito & Kahn, 2012). While some studies focus on the gender pay gap among the top five executives, other studies focus on the gender pay gap at specific top executive levels. In particular, prior studies suggest that women holding the CEO title earn on average similar total compensation, salary and bonus compared to those men holding the CEO title, everything else equal (Adams et al., 2007; Bugeja et al., 2012). Thus it seems that those women that are able to break the Glass Ceiling by earning top executive levels earn less than men in similar positions, except at the CEO level. In order to provide more evidence on the gender pay gap at specific top executive levels, I examine the gender pay gap at specific executive level below the CEO that is at the CFO level. In particular, the research question of this thesis is as follows: ***Does gender affect the level of CFO compensation?***

The results presented in this thesis indicate that gender does not affect the level of CFO compensation in the period of 1998 to 2014. In appendix E table E a column ‘conclusion’ is added to table A, which compares whether the regression results presented in this thesis are similar to those results presented in the gender pay gap literature. In particular, the results presented in this thesis suggest that gender is not associated with CFO total compensation, base pay or variable pay. These results are before or after accounting for the age of the CFO, firm size, firm performance, board size, board independence, board composition, compensation committee independence, industry effects and year effects. Inconsistent with prior studies in the gender pay gap literature, the results do not imply that women in top executive positions earn significantly less than their male counterparts with or without taking into account relevant factors (Bertrand & Hallock, 2001; Bell, 2005; Muñoz-Bullón, 2010; Elkinawy & Stater, 2011; Shin, 2012; Vieito & Khan, 2012). On the other hand, the results are consistent with prior studies that suggest that at specific executive levels within an organization there is no gender pay gap.

Actually, prior studies show that female CEO's earn on average similar compensation than male CEO's, whereas the results presented show that female CFO's also earn on average similar compensation than male CFO's. Furthermore, the insignificant difference in variable pay is inconsistent with prior studies that suggest that the gender pay gap is mainly due to variable pay rather than base pay (Muñoz-Bullón, 2010). Thus inconsistent with prior studies, female CFO's are not likely to be more risk-averse than male CFO's and do not receive compensation packages with less variation (Jianakoplos & Bernasek, 1998; Croson & Gneezy, 2009; Charness & Gneezy, 2011; Murphy, 2012). Also, the insignificant gender-based difference in variable pay is inconsistent with prior studies that indicate that gender-based stereotyping can result in women being perceived as incompetent and as such receive less performance-sensitive compensation compared to men who are seen as competent (Oakley, 2000; Heilman, 2001; Catalyst, 2005). Further, prior studies suggest that the gender pay gap can be largely explained by firm size since women tend to work in smaller companies than men (Bertrand & Hallock, 2001; Muñoz-Bullón, 2010). Conversely, the evidence presented in this thesis suggests that female CFO's tend to work in larger companies than male CFO's. Consistent with prior studies on the other hand, CFO's also reflect a male-dominated occupation since the results suggest that only 9 percent of the total sample is female (e.g. Bertrand & Hallock, 2001; Vieito & Khan, 2012). All in all, the results imply that women holding the CFO title earn on average similar total compensation, base pay, and variable pay than men holding the CFO title.

Next to estimating OLS regressions in order to test the hypotheses, I use the Blinder-Oaxaca decomposition method in order to examine gender-based differences in CFO compensation. Similar to the regression results, the results indicate that women holding the CFO title earn on average similar total compensation, base pay and variable pay than men holding the CFO title in the period of 1998 to 2014. Additional analyses further suggest that female CFO's earn on average similar total compensation, base pay, and variable pay than their male counterparts in the period of 1998 and 2014. This result is inconsistent with prior studies that suggest that the gender pay gap among top executives is diminishing over time (Bertrand & Hallock, 2001; Vieito & Khan, 2012). Furthermore, dividing the sample in five subsamples in which each subsample captures the economy going up or down provides similar results. Thus, whether the economy is going up or down there is no gender pay gap in CFO total compensation, base pay, or variable pay. Subsample five is the exception since the results suggest that there is a

significant gender pay gap in total compensation and variable pay in the period from 2010 to 2014, all else equal. However, results also show that the gender pay gap disappears again in 2014. Overall, the results for testing the hypotheses together with the additional analyses suggest that there is no gender pay gap in CFO total compensation, base pay, or variable pay for the period of 1998 to 2014.

The results presented in this thesis make several contributions. First, this thesis contributes to the ongoing debate on gender-based differences in pay by indicating that at the CFO level there is no gender pay gap. Besides this, prior studies in the gender pay gap literature suggest that women in top executive positions earn significantly less than men in similar positions (Bell, 2005; Adams et al., 2007; Muñoz-Bullón, 2010; Elkinawy & Stater, 2011; Shin, 2012; Vieito & Kahn, 2012). As such, this thesis contributes to these studies by showing that not all top management positions encounter a gender pay gap. Actually, prior studies in the gender pay gap literature suggest that at specific CEO level, women earn similar compensation than men (Adams et al., 2007; Bugeja et al., 2012). Therefore, the results presented in this thesis contributes to these studies by showing that not only at the CEO level there is no gender pay gap but also at specific executive level below the CEO there is no gender pay gap, that is to say at the CFO level. Lastly, this contributes to the executive compensation literature by showing that gender is not associated with CFO total compensation, base pay, or variable pay once controlling for relevant individual, firm, and governance characteristics.

Thus, the results of this thesis should be of interest to regulators as the results suggest that there is no gender pay gap in CFO total compensation, base pay, or variable pay. Hence, this thesis highlights the benefits of the passage of the Equal Pay Act of 1963 and all other legislations that focus on equality in the workplace. The results should also be of interest to employees. In particular, women at lower levels within a company aspiring to the CFO position should be encouraged knowing that once they are able to earn the CFO title they face no gender-based bias in compensation. Also, competent women currently holding the CFO title should be put at ease to know that they are equally treated as their male counterparts in terms of compensation. Lastly, academics and the wider professional community should be interested in the results presented in this thesis as the results suggest that once women are able to climb to corporate ladder to the CFO position, they earn similar compensation as men holding the CFO

title. However, a limitation of this thesis is that the data is constrained to the U.S. sample. As such, future research can examine the relation between gender and CFO compensation in another country such as the United Kingdom. Further, future research can also focus on examining the gender pay gap at other specific levels within a company such as the Chief Operating Officer level.

To conclude, gender does not affect the level of CFO compensation. Thus the notion that women earn less than men in similar positions is not supported by the evidence presented in this thesis. On the contrary, those women who are able to break the Glass Ceiling by earning the CFO title are compensated in a similar way as their male counterparts. After all, the financial world has come to realize that women equally contribute to the financial health of the company as men do.

6. References

Adams, S., Gupta, A., Haughton, D., & Leeth, J. (2007). Gender Differences in CEO Compensation: Evidence from the USA. *Women in Management Review*, 22 (3):208-224.

Alkadry, M., & Tower, L. (2006). Unequal Pay: The Role of Gender. *Public Administration Review*, 888-898.

Allison, P. (2012, September 10). *When Can You Safely Ignore Multicollinearity?* Retrieved 06 02, 2015, from Statistical Horizons: http://statisticalhorizons.com/multicollinearity

Bell, L. (2005). Women-Led Firms and the Gender Gap in Top Executive Jobs. *Discussion Paper No. 1689*, 1-40.

Bertrand, M., & Hallock, K. (2001). The Gender Gap in Top Corporate Jobs. *Industrial and Labor Relations Review*, 55 (1):3-21.

Blau, F., & Kahn, L. (2007). The Gender Pay Gap: Have Women Gone as Far as They Can? *Academy of Management Perspectives*, 7-23.

Blinder, A. (1973). Wage Discimination: Reduced Form and Structural Estimates. *Journal of Human Resources*, 8 (4): 436-455.

Bugeja, M., Matolcsy, Z., & Spiropoulos, H. (2012). Is There a Gender Gap in CEO Compensation? *Journal of Corporate Finance*, 18 (2012):849-859.

Bureau of Labor Statistics. (2016, April). *Annual Averages 2014 - Household Data - Table 11 'Employed persons by detailed occupation, sex, race, and Hispanic or Latino ethnicity'*. Retrieved April 2016, from Labor Force Statistics from the Current Population Survey: http://www.bls.gov/cps/aa2014/cpsaat11.pdf

Bureau of Labor Statistics. (2016, April). *Annual Averages 2014 - Household Data - Table 39 'Median weekly earnings of full-time wage and salary workers by detailed occupation and sex'*. Retrieved April 2016, from Labor Force Statistics from the Current Population Survey: http://www.bls.gov/cps/aa2014/cpsaat39.pdf

Catalyst. (2005). *Women "Take Care", Men "Take Charge:" Stereotyping of U.S. Business Leaders Exposed.* New York: Catalyst.

Charness, G., & Gneezy, U. (2011). Strong Evidence for Gender Differences in Risk Taking. *Journal of Economic Behavior & Organization*, 83: 50-58.

Cho, R., & Kramer, A. (2014, September). *Everything You Need to Know about the Equal Pay Act*. Retrieved February 01, 2016, from Re: Gender: http://regender.org/EqualPayAct1

Croson, R., & Gneezy, U. (2009). Gender Differences in Preferences. *Journal of Economic Literature*, 47 (2): 448-474.

Dey, J., & Hil, C. (2007). *Behind the Pay Gap.* Washington, DC: AAUW Educational Foundation.

Elkinawy, S., & Stater, M. (2011). Gender Differences in Executive Compensation: Variation with Board Gender Composition and Time. *Journal of Economics and Business*, 63 (2011):23-45.

EY. (2016). *The evolving role of today's CFO - An Americas supplement to The DNA of the CFO*. Retrieved February 1, 2016, from EY Building a better working world: http://www.ey.com/GL/en/Issues/Managing-finance/The-DNA-of-the-CFO---perspectives-on-the-evolving-role

Graham, J., Harvey, C., & Rajgopal, S. (2005). The Economic Implications of Corporate Financial Reporting. *Journal of Accounting and Economics*, 40: 3-73.

Hallman, L. (2016, Spring). *The Simple Truth About The Gender Pay Gap.* Washington, DC: AAUW Educational Foundation.

Heilman, M. (2001). Description and Prescription: How Gender Stereotypes Prevent Women's Ascent Up the Organizational Ladder. *Journal of Social Issues*, 57 (4):657–674.

Institute for Women's Policy Research. (2015, September). *The Gender Wage Gap: 2014.* Retrieved february 01, 2016, from IWPR Publications: http://www.iwpr.org/publications/pubs/the-gender-wage-gap-2014

Institute for Women's Policy Research. (2016, February). *The Gender Wage Gap and Public Policy.* Retrieved May 2016, from IWPR Publications: http://www.iwpr.org/publications/pubs/the-gender-wage-gap-and-public-policy

Jianakoplos, N., & Bernasek, A. (1998). Are Women More Risk Averse? *Economic Inquiry*, XXXVI: 620-630.

Lips, H. (2003). The Gender Pay Gap: Concrete Indicator of Women's Progress Toward Equality. *Analyses of Social Issues and Public Policy*, 3 (1): 87-109.

Moore, D., McCabe, G., Alwan, L., Craig, B., & Duckworth, W. (2011). *The Practice of Statistics for Business and Economics* (Third Edition ed.). United States of America: W.H. Freeman and Company.

Muñoz-Bullón, F. (2010). Gender-Compensation Differences Among High-Level Executives in the United States. *Industrial Relations*, 49 (3): 346-370.

Murphy, K. (1999). *Executive Compensation.* North-Holland: Amsterdam: Handbook of Labor Economics.

Murphy, K. (2012). *Executive Compensation: Where We Are, and How We Got There.* North-Holland: Amsterdam: Handbook of the Economics of Finance.

Oakley, J. (2000). Gender-based Barriers to Senior Management Positions: Understanding the Scarcity of Female CEOs. *Journal of Business Ethics*, 27:321-334.

Oaxaca, R. (1973). Male-Female Wage Differentials in Urban Labor Markets. *International Economic Review*, 14 (3):693-709.

Schultz, T. (1961). Investment in Human Capital. *The American Economic Review*, 51 (1):1-17.

Shin, T. (2012). The Gender Gap in Executive Compensation: The Role of Female Directors and Chief Executive Officers. *The ANNALS of the American Academy of Political and Social Science*, (639):258-278.

Steven, L. (2000). Factors Affecting CFO Compensation. *Strategic Finance*, 81 (9):38-44.

The White House. (2013, June). *Fifty Years After the Equal Pay Act.* Retrieved February 1, 2016, from The White House: https://www.whitehouse.gov/sites/default/files/equalpay/equal_pay_task_force_progress_report_june_2013_new.pdf

The White House. (2015, April). *Gender Pay Gap: Recent Trends and Explanations.* Retrieved February 1, 2016, from The White House: https://www.whitehouse.gov/sites/default/files/docs/equal_pay_issue_brief_final.pdf

The White House. (2016). *Your Right to Equal Pay*. Retrieved January 31, 2016, from The White House: https://www.whitehouse.gov/issues/equal-pay/rights#top

U.S. Bureau of Labor Statistics. (2015). Highlights of women's earnings in 2014. *BLS Reports*, 1 - 74.

UCLA: Statistical Consulting Group. (n.d.). *Regression with Stata Chapter 4 - Beyond OLS*. Retrieved May 31, 2015, from UCLA: Institute for Digital Research and Education: http://www.ats.ucla.edu/stat/stata/webbooks/reg/chapter4/statareg4.htm

Veenman, D. (2013). *Introductory Guide to Using Stata in Empirical Financial Accounting Research.* Rotterdam: Erasmus University Rotterdam.

Vieito, J., & Khan, W. (2012). Executive Compensation and Gender: S&P 1500 Listed Firms. *Journal of Economics and Finance*, 36 (2012):371-399.

Appendix A: Overview of the Gender Pay Gap Literature

TABLE A
Overview Gender Pay Gap Literature

Author(s)	Research	Sample period	Sample Size	Databases	Research Design	Findings
Adams et al. (2007)	Examine the gender pay gap for CEOs and non-CEO top executives.	1992 – 2004	99,152 total executive-year observations of which 16,779 are CEO executive-year observations.	Execucomp, and SEC website.	Cross-sectional	Total compensation CEOs: The unexplained gender pay gap is insignificantly 0.05% after controlling for: (1) Firm size; (2) Age; (3) Years as CEO; (4) Firm profitability; (5) Firm performance; (6) Industry effects; and (7) Year effects. Total compensation non-CEOs: The unexplained gender pay gap is 15.7% after controlling for: (1) Firm size; (2) Age; (3) Firm profitability; (4) Firm performance; (5) Industry effects; and (6) Year effects.
Bell (2005)	Examine the gender pay gap among the top five executives.	1992 – 2003	108,509 total executive-year observations.	Execucomp, IRRC, Forbes, Hoover, Lexis-Nexus, and archived company websites.	Cross-sectional	Total compensation: The gender pay gap is about 25.4%. The unexplained gender pay gap is significantly 11.1% after controlling for: (1) Firm size; (2) Age; (3) Occupational segregation; (4) Firm performance; (5) Industry effects; and (6) Year effects. Salary compensation: The unexplained gender pay gap is significantly 10% after controlling for: (1) Firm size; (2)

						Age; (3) Occupational segregation; (4) Firm performance; (5) Industry effects; and (6) Year effects. Cash compensation: The unexplained gender pay gap is significantly 11.1% after controlling for: (1) Firm size; (2) Age; (3) Occupational segregation; (4) Firm performance; (5) Industry effects; and (6) Year effects.
Bertrand and Hallock (2001)	Examine the gender pay gap among the top five executives.	1992 – 1997	46,708 total executive-year observations.	Execucomp	Cross-sectional	Total compensation: The gender pay gap is about 44%. The unexplained gender pay gap is insignificantly less than 5% after controlling for: (1) Firm size; (2) Age; (3) Tenure, (4) Occupational segregation; (5) Industry effects; and (6) Year effects.
Bugeja et al. (2012)	Examine the gender pay gap for CEOs.	1998 – 2010	14,759 total executive-year observations.	Execucomp, IRRC, and Compustat.	Cross-sectional	Total compensation CEOs: The unexplained gender pay gap is insignificant using both the full sample and matched sample after controlling for: (1) Firm size; (2) CEO tenure; (3) CEO chairperson; (4) CEO first year; (5) CEO ownership; (6) Investment opportunities; (7) Firm performance; (8) Firm risk; (9) Firm leverage; (10) Board size; (11) Board independence; (12) compensation committee independence; (13) Industry effects; and (14) Year effects. Salary CEOs: The unexplained gender pay gap is significant using the full

						sample but insignificant using a matched sample after controlling for: (1) Firm size; (2) CEO tenure; (3) CEO chairperson; (4) CEO first year; (5) CEO ownership; (6) Investment opportunities; (7) Firm performance; (8) Firm risk; (9) Firm leverage; (10) Board size; (11) Board independence; (12) compensation committee independence; (13) Industry effects; and (14) Year effects. Bonus CEOs: The unexplained gender pay gap is insignificant using both the full sample and matched sample after controlling for: (1) Firm size; (2) CEO tenure; (3) CEO chairperson; (4) CEO first year; (5) CEO ownership; (6) Investment opportunities; (7) Firm performance; (8) Firm risk; (9) Firm leverage; (10) Board size; (11) Board independence; (12) compensation committee independence; (13) Industry effects; and (14) Year effects
Elkinawy and Stater (2011)	Examine the gender pay gap among the top five executives.	1996 – 2004	60,040 total executive-year observations.	Execucomp, IRRC, and Compustat.	Cross-sectional	Total compensation: The gender pay gap in is about 24.5%. The unexplained gender pay is significantly 9.7% after controlling for: (1) Firm size; (2) Age; (3) Tenure; (4) Occupational segregation; (5) Firm performance; (6) Board size; (7) Board composition; (8) Board independence; (9) Industry effects; and (10) Year effects.

						Salary: The gender pay gap is about 16.2%. The unexplained gender pay gap is significantly 5.6% after controlling for: (1) Firm size; (2) Age; (3) Tenure; (4) Occupational segregation; (5) Firm performance; (6) Board size; (7) Board composition; (8) Board independence; (9) Industry effects; and (10) Year effects.
Muñoz-Bullón (2010)	Examine the gender pay gap among the top five executives..	1992 – 2006	69,391 total executive-year observations.	Execucomp	Cross-sectional	Total compensation: The gender pay gap is about 39.9%. The unexplained gender pay gap is significantly 7.2% after controlling for: (1) Firm size; (2) Tenure; (3) Occupational segregation; (4) Firm performance; (5) Industry effects; and (6) Year effects. Salary: The gender pay gap is about 23.1%. The unexplained gender pay gap is insignificantly 1.8% after controlling for: (1) Firm size; (2) Tenure; (3) Occupational segregation; (4) Firm performance; (5) Industry effects; and (6) Year effects.
Shin (2012)	Examine the gender pay gap among the top five executives.	1998 – 2005	27,643 total executive-year observations.	Execucomp, RiskMetrics Directors Database, and Sec archival database.	Cross-sectional	Total compensation: The gender pay gap is about 42%. The unexplained gender pay gap is 16.6% after controlling for: (1) Firm size, (2) Age; (3) Tenure; (4) Occupational segregation; (5) Firm performance; (6)Whether members of the board and the compensation committee are

						appointed by the CEO or not; (7) Board independence; (8) Whether executive is a board member or not; (9) Industry effects; and (10) Year effects.
Vieito and Khan (2012)	Examine the gender pay gap among the top five executives.	1992 – 2004	73,683 total executive-year observations.	Execucomp	Cross-sectional	Total compensation: The unexplained gender pay gap is 17.1% after controlling for: (1) Firm Size; (2) Age; (3) Tenure; (4) Occupational segregation; (5) Firm performance; (6) Firm growth; (7) Firm risk; (8) Market reaction to stock split announcements; (9) Whether executives are on two boards or not; (10) Whether the firm pays for the executive pension plan or not; (11) Industry effects; and (12) Year effects.

Appendix B: Variable Definitions

Base Pay	=	Base pay is measured as annual salary in year t. The data is obtained from Execucomp database.
B_Composition	=	Board composition is measured as the percentage of female directors in year t. The data is obtained from ISS Director database.
B_Independence	=	Board independence is measured as the percentage of the outside directors on the board in year t. The data is obtained from ISS Director database.
B_Size	=	Board size is measured as the number of directors in year t. The data is obtained from ISS Director database.
CFO_Age	=	The age of the CFO is obtained from Execucomp, where the variables 'age' and 'page' are used. The variable age refers to the executive's age in the indicated fiscal year, whereas the variable page is the executive's present age in the fiscal year 2014. Since approximately 28 percent of the total sample is lost because of missing data on the variable age, I use the variable page whenever the variable age is missing in order to measure the executive's age in the indicated fiscal year.
CFO_Age^2	=	CFO_Age^2 is measured as CFO_Age squared in year t. The data is obtained from Execucomp database.
CFO_Fem	=	CFO_Fem is an indicator variable equal to 1 for female CFO's, and 0 otherwise. The data is obtained from Execucomp database.
C_Independence	=	Compensation committee independence is an indicator variable equal to 1 if the compensation committee consists wholly of outside directors, and 0 otherwise. The data is obtained from ISS Director database.
F_Size	=	Firm size is measured as net sales in year t-1. The data is obtained from Compustat Fundamentals Annual database.
F_Performance	=	Firm performance is measured as the EPS before extraordinary items

		in year t-1. The data is obtained from Compustat Fundamentals Annual database.
Industry	=	Dummy variables for the major industry groups using the 4-digit SIC industry category.
Total Compensation	=	Total compensation is measured as the sum of annual salary, annual bonus, non-equity incentive plan compensation, grant-date value of stock options using Black-Scholes, grant-date value of stock awards, and all other compensation in year t. The data is obtained from Execucomp database.
Variable Pay	=	Variable pay is measured as the sum of annual bonus, non-equity incentive plan compensation, grant-date value of stock options using Black-Scholes, grant-date value of stock awards, and all other compensation in year t. The data is obtained from Execucomp database.
Year	=	Dummy variables for the years.

Note: All dollar figures have been deflated by the Consumer Price Index in order to adjust for inflation were the data is expressed in 2014 U.S. dollars.

Appendix C: Example of Examining Conditions for Linear Regressions

In this appendix an example is given on how the conditions for linear regressions are examined. The example relates to the first hypothesis where the following regression model is run:

$$\mathbf{CFO\_Comp_{it} = \alpha + \beta_1 * CFO\_Fem_{it} + \beta_2 * CFO\_Age_{it} + \beta_3 * CFO\_Age^2_{it} + \beta_4 * F\_Size_{it-1} + \beta_5 * F\_Performance_{it-1} + \beta_6 * B\_Size_{it} + \beta_7 * B\_Independence_{it} + \beta_8 * B\_Composition_{it} + \beta_9 * C\_Independence_{it} + \beta_{10} * Industry\_Control + \beta_{11} * Year\_Control + \varepsilon_{it}}$$

where CFO_Comp refers to the total compensation of executive *i* at time *t*. CFO_Fem is the variable of interest for testing hypothesis 1 and captures the gender of executive *i* in year *t*. The other variables are the control variables. I refer to section 3.2 for a specification of all the measurements. Note that running the regression model above is similar to model (3) as specified in section 3.3. Also, before running the regression I have examined the histograms and boxplot of the variables in order to check for normal distribution of the variables and check for outliers (see section 4.1.). Hence, the variables that are skewed have been transformed in order to control for the high skewness and all variables have been Winsorized at their 1st and 99th percentile of their distribution.

The first condition of an OLS regression is linearity. Figure 1 presents the scatterplot of the independent variable F_Size (i.e. the natural logarithm of the variable Firm Size) against the residuals. For simplicity, I only show the scatterplot of this variable in Figure 1. Nevertheless, in every plot, the smoothed line (yellow line) is very close to the ordinary regression line (mint line). Overall, the plots indicate very small deviations from linearity. The second condition is independence of the error term, which is discussed in subsection 4.2.1. The third condition is homoscedasticity. Figure 2 presents the fitted values against the residuals and the figure do not suggest that there is clear indication of heteroscedasticity that would be of great concern. The below and above "line" seen in the plot are due to the variables being Winsorized at their 1st and 99th percentile of their distribution. The last condition is normal distribution, which is presented in figure 3. This figure suggests that failure to meet the normal distribution condition of the error term is of minor concern. Overall, it can be concluded that this regression model does not satisfy

all the conditions, however, failure to meet the conditions of OLS is of minor concern. In order to deal with the minor concerns, the regression model is run using robust standard errors clustered by executive. Refer to section 4.2 for more information.

Figure 1: Linearity Condition

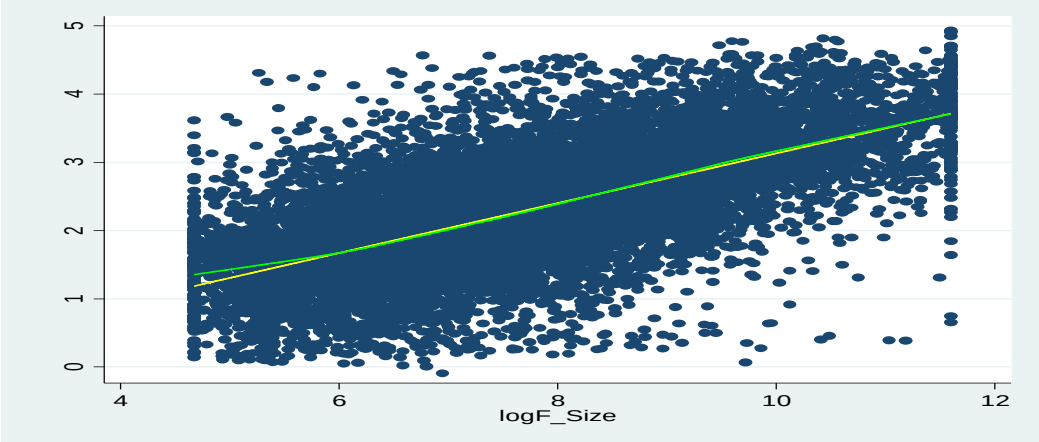


Figure 2: Homoscedasticity Condition

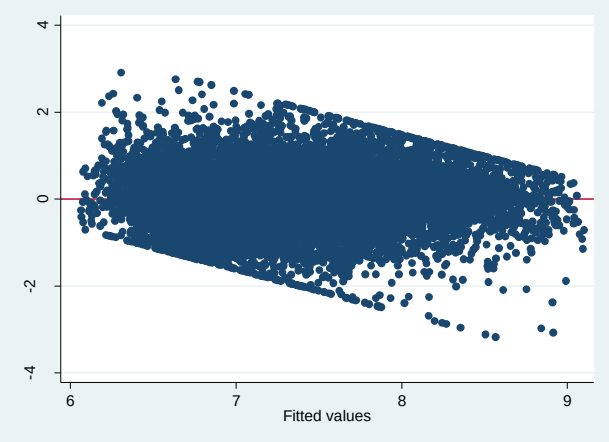
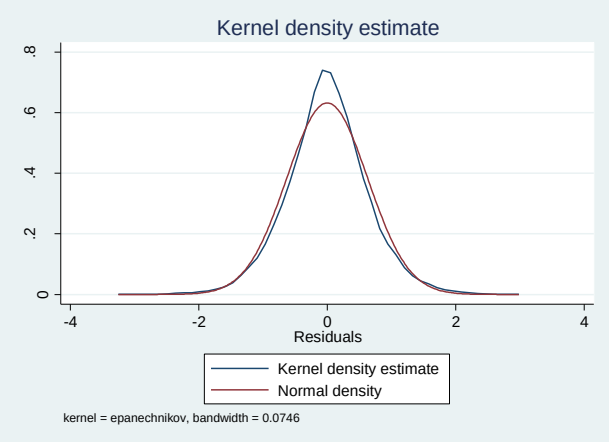


Figure 3: Normality Condition



Appendix D: Results Additional Analyses

TABLE B
Blinder-Oaxaca Decomposition of Gender Differences in Compensation

	Total Compensation [a]			Base Pay [a]			Variable Pay [a]		
	b	**se**	**z**	**b**	**se**	**z**	**b**	**se**	**z**
Total differential	0.035	0.056	0.53	0.026	0.030	0.85	0.047	0.075	0.63
Unexplained	0.056	0.037	1.53	0.026	0.021	1.32	0.084	0.052	1.58
Explained	-0.020	0.041	-0.50	-0.001	0.020	-0.04	-0.036	0.053	-0.70
Explained by									
CFO_Age	0.125	0.048	2.57***	0.072	0.027	2.64***	0.201	0.074	2.73***
CFO_Age2	-0.121	0.049	-2.46**	-0.057	0.027	-2.12**	-0.207	0.075	-2.74***
F_Size [a]	-0.033	0.042	-0.80	-0.017	0.021	-0.80	-0.042	0.053	-0.80
Industry_Control	0.019	0.014	1.40	0.003	0.004	0.66	0.027	0.018	1.50
Year_Control	-0.020	0.003	-3.03**	-0.002	0.001	-1.72	-0.016	0.005	-3.15***
N	13,798			13,798			13,798		

, and * Indicate significance at the 0.05 and 0.01 level.

[a] The natural logarithm of this variable is taken.

This table presents the results for estimating the following OLS regression model separately for men and women:

$$\hat{Y}_M - \hat{Y}_F = (\bar{x}_M - \bar{x}_F)\beta_M + (\beta_M - \beta_F)\,\bar{x}_F$$

The regression model is estimated for 13,798 executive-year observations and includes all CFO compensation data from 1998 to 2014. The standard errors presented are clustered by executive. The dependent variable, $\hat{Y}_M - \hat{Y}_F$, refers to the predicted average log wages for men and women, respectively. Since there are three alternative compensation measures, the log wages refers to total compensation, base pay or variable pay. $\bar{x}_M - \bar{x}_F$ captures the part of the pay gap that is due to men and women having different characteristics, respectively, which includes those measures that are observable. In particular, the observable measures relate to individual and firm characteristics. Regarding individual characteristics, the variables 'CFO_Age and CFO_Age^2' captures the age and age squared of executive *i* in year *t*. With respect to firm characteristics, the variable 'F_Size' refers to the firms' size of where executive *i* is working in year *t-1*. Further, the variables 'Industry_Control' and 'Year_Control' reflect industry effects and year effects, respectively. All variables have been Winsorized at the 1st percentiles and 99th percentiles of their distributions. The variables are defined in Appendix B. All dollar figures are reported in real 2014 U.S. dollars adjusted using the Consumer Price Index obtained from U.S. Bureau of Labor Statistics.

TABLE C
Gender Differences in Compensation for the Period of 1998 and 2014

Model 1	Total Compensation [a]			Base Pay [a]			Variable Pay [a]		
	1998	2014	Diff.	1998	2014	Diff.	1998	2014	Diff.
	b/se	b/se		b/se	b/se		b/se	b/se	
CFO_Fem	-0.449**	-0.020	***	-0.233	0.002	-	-0.448**	-0.026	**
	(0.148)	(0.069)		(0.147)	(0.041)		(0.183)	(0.094)	
Industry_Control	No	No		No	No		No	No	
Constant	7.305***	7.509***	***	6.054***	6.057***	-	6.841***	7.130***	**
	(0.064)	(0.022)		(0.030)	(0.013)		(0.085)	(0.030)	
N	190	1,528		190	1,528		190	1,528	
adj. R^2 (%)	0.178	-0.060		0.299	-0.065		-0.135	-0.061	

Model 2	Total Compensation [a]			Base Pay [a]			Variable Pay [a]		
	1998	2014	Diff.	1998	2014	Diff.	1998	2014	Diff.
	b/se	b/se		b/se	b/se		b/se	b/se	
CFO_Fem	-0.468	-0.074	-	-0.250	-0.030	**	-0.452	-0.093	-
	(0.313)	(0.050)		(0.136)	(0.033)		(0.437)	(0.075)	
CFO_Age	-0.017	0.077**	-	-0.019	0.054***	-	0.017	0.111**	-
	(0.094)	(0.032)		(0.041)	(0.021)		(0.131)	(0.047)	
CFO_Age2	0.000	-0.001**	-	0.000	-0.000**	-	-0.000	-0.001**	-
	(0.001)	(0.000)		(0.000)	(0.000)		(0.001)	(0.000)	
F_Size [a]	0.408***	0.361***	-	0.204***	0.178***	-	0.514***	0.447***	-
	(0.038)	(0.010)		(0.017)	(0.007)		(0.053)	(0.015)	
Industry_Control	Yes	Yes		Yes	Yes		Yes	Yes	
Constant	4.529	2.342***	-	4.639***	2.943***	-	2.633	0.492	-
	(2.385)	(0.885)		(1.038)	(0.580)		(3.329)	(1.314)	
N	190	1,528		190	1,528		190	1,528	
adj. R^2 (%)	39.854	45.882		50.794	34.023		34.108	36.952	

, and * Indicate significance at the 0.05 and 0.01 level.

[a] The natural logarithm of this variable is taken.

This table presents the results for estimating the following OLS regression model:

$CFO\_Comp_{it} = \alpha + \beta_1 * CFO\_Fem_{it} + \beta_2 * CFO\_Age_{it} + \beta_3 * CFO\_Age^2_{it} + \beta_4 * F\_Size_{it-1} + \beta_5 * Industry\_Control + \varepsilon_{it}$

The regression model is estimated for 190 and 1,528 executive-year observations in the year 1998 and 2014, respectively. The standard errors presented in parentheses are clustered by executive. The column 'difference' compares the regression coefficients across the period 1998 and 2014.The dependent variable 'CFO_Comp' refers to the natural logarithm of compensation of executive *i* in year *t*. Since there are three alternative compensation measures, the natural logarithm of compensation refers to total compensation, base pay or variable pay. The independent variable 'CFO_Fem' is the variable of interest and captures the gender of executive *i* in year *t*. The control variables included in the regression model 2 relate to individual and firm characteristics. Regarding individual characteristics, the variables 'CFO_Age and CFO_Age^2' captures the age and age squared of executive *i* in year *t*. With respect to firm characteristics, the variable 'F_Size' refers to the firms' size of where executive *i* is working in year *t-1*. Further, the variable 'Industry_Control' reflect industry effects. All variables have been Winsorized at the 1st percentiles and 99th percentiles of their distributions. The variables are defined in Appendix B. All dollar figures are reported in real 2014 U.S. dollars adjusted using the Consumer Price Index obtained from U.S. Bureau of Labor Statistics.

TABLE D
Gender Differences in Compensation for the Subsamples

	Total Compensation [a]									
	Subsample 1		**Subsample 2**		**Subsample 3**		**Subsample 4**		**Subsample 5**	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
	b/se	**b/se**	**b/se**	**b/se**	**b/se**	**b/se**	**b/se**	**b/se**	**b/se**	**b/se**
CFO_Fem	-0.252	-0.183	0.047	0.087	0.091	0.092	-0.109	-0.095	-0.058	-0.095**
	(0.186)	(0.209)	(0.120)	(0.109)	(0.109)	(0.071)	(0.081)	(0.058)	(0.062)	(0.038)
CFO_Age		0.034		0.037		0.137***		0.083**		0.052**
		(0.080)		(0.062)		(0.045)		(0.034)		(0.025)
CFO_Age2		-0.000		-0.000		-0.001***		-0.001**		-0.000
		(0.001)		(0.001)		(0.000)		(0.000)		(0.000)
F_Size [a]		0.391***		0.355***		0.369***		0.367***		0.363***
		(0.031)		(0.019)		(0.013)		(0.011)		(0.008)
Industry_Control	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Year_Control	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Constant	7.339***	3.508	7.354***	3.746**	7.418***	0.921	7.273***	2.542***	7.440***	2.880***
	(0.052)	(1.991)	(0.037)	(1.563)	(0.029)	(1.171)	(0.023)	(0.873)	(0.018)	(0.661)
N	431	431	1,523	1,523	1,896	1,896	3,122	3,122	6,826	6,826

adj. R^2 (%)	0.054	36.509	-0.046	33.144	0.029	44.498	0.086	41.970	0.030	45.984
Base Pay [a]										
	Subsample 1		**Subsample 2**		**Subsample 3**		**Subsample 4**		**Subsample 5**	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
	b/se	**b/se**	**b/se**	**b/se**	**b/se**	**b/se**	**b/se**	**b/se**	**b/se**	**b/se**
CFO_Fem	-0.179	-0.115	-0.030	0.006	0.013	0.026	-0.051	-0.034	-0.023	-0.039
	(0.115)	(0.086)	(0.070)	(0.044)	(0.054)	(0.032)	(0.045)	(0.035)	(0.032)	(0.022)
CFO_Age		-0.014		0.046		0.056**		0.030		0.040***
		(0.036)		(0.026)		(0.025)		(0.019)		(0.014)
CFO_Age2		0.000		-0.000		-0.000		-0.000		-0.000**
		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)
F_Size [a]		0.207***		0.199***		0.188***		0.179***		0.178***
		(0.014)		(0.009)		(0.007)		(0.006)		(0.005)
Industry_Control	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Year_Control	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Constant	6.034***	4.493***	6.041***	2.671***	6.060***	3.024***	5.999***	3.610***	6.052***	3.228***
	(0.026)	(0.907)	(0.018)	(0.655)	(0.015)	(0.635)	(0.012)	(0.504)	(0.010)	(0.385)
N	431	431	1,523	1,523	1,896	1,896	3,122	3,122	6,826	6,826
adj. R^2 (%)	37.466	49.329	-0.032	50.965	-0.046	44.776	0.045	31.924	0.007	35.234
Variable Pay [a]										
	Subsample 1		**Subsample 2**		**Subsample 3**		**Subsample 4**		**Subsample 5**	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
	b/se	**b/se**	**b/se**	**b/se**	**b/se**	**b/se**	**b/se**	**b/se**	**b/se**	**b/se**
CFO_Fem	-0.205	-0.110	0.086	0.142	0.162	0.168	-0.160	-0.152	-0.092	-0.146***
	(0.236)	(0.275)	(0.160)	(0.153)	(0.141)	(0.100)	(0.121)	(0.101)	(0.083)	(0.055)
CFO_Age		0.076		0.112		0.190***		0.148***		0.075**
		(0.112)		(0.093)		(0.070)		(0.054)		(0.037)
CFO_Age2		-0.001		-0.001		-0.002***		-0.001***		-0.001
		(0.001)		(0.001)		(0.001)		(0.001)		(0.000)
F_Size [a]		0.500***		0.432***		0.468***		0.475***		0.457***
		(0.045)		(0.027)		(0.020)		(0.017)		(0.011)
Industry_Control	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes

Year_Control	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Constant	6.881***	1.327	6.868***	1.142	6.979***	-1.580	6.762***	-0.077	7.028***	1.226
	(0.071)	(2.775)	(0.052)	(2.339)	(0.041)	(1.814)	(0.033)	(1.395)	(0.025)	(0.977)
N	431	431	1,523	1,523	1,896	1,896	3,122	3,122	6,826	6,826
adj. R^2 (%)	-0.132	31.358	-0.035	23.219	0.077	35.755	0.078	31.365	0.042	36.461

, and * Indicate significance at the 0.05 and 0.01 level.

[a] The natural logarithm of this variable is taken.

This table presents the results for estimating the following OLS regression model:

$$CFO\_Comp_{it} = \alpha + \beta_1 * CFO\_Fem_{it} + \beta_2 * CFO\_Age_{it} + \beta_3 * CFO\_Age^2_{it} + \beta_4 * F\_Size_{it-1} + \beta_5 * Industry\_Control + \beta_6 * Year\_Control + \varepsilon_{it}$$

The regression model is estimated for 13,798 executive-year observations that are divided in five subsamples. The first, second, third, fourth, and fifth subsample are from the period 1998 to 1999, 2000 to 2003, 2004 to 2006, 2007 to 2009, and 2010 to 2014, respectively. The standard errors presented in parentheses are clustered by executive. The dependent variable 'CFO_Comp' refers to the natural logarithm of compensation of executive *i* in year *t*. Since there are three alternative compensation measures, the natural logarithm of compensation refers to total compensation, base pay or variable pay. The independent variable 'CFO_Fem' is the variable of interest and captures the gender of executive *i* in year *t*. The control variables included in the regression model 2 relate to individual and firm characteristics. Regarding individual characteristics, the variables 'CFO_Age and CFO_Age^2' captures the age and age squared of executive *i* in year *t*. With respect to firm characteristics, the variable 'F_Size' refers to the firms' size of where executive *i* is working in year *t-1*. Further, the variable 'Industry_Control' and 'Year_Control' reflect industry and year effects, respectively. All variables have been Winsorized at the 1st percentiles and 99th percentiles of their distributions. The variables are defined in Appendix B. All dollar figures are reported in real 2014 U.S. dollars adjusted using the Consumer Price Index obtained from U.S. Bureau of Labor Statistics.

Appendix E: Conclusion of Literature Review

TABLE E
Conclusion Gender Pay Gap Literature Review

Author(s)	Research	Sample period	Sample Size	Databases	Research Design	Findings	Conclusion
Adams et al. (2007)	Examine the gender pay gap for CEOs and non-CEO top executives.	1992–2004	99,152 total executive-year observations of which 16,779 are CEO executive-year observations.	Execucomp, and SEC website.	Cross-sectional	Total compensation CEOs: The unexplained gender pay gap is insignificantly 0.05% after controlling for: (1) Firm size; (2) Age; (3) Years as CEO; (4) Firm profitability; (5) Firm performance; (6) Industry effects; and (7) Year effects. Total compensation non-CEOs: The unexplained gender pay gap is 15.7% after controlling for: (1) Firm size; (2) Age; (3) Firm profitability; (4) Firm performance; (5) Industry effects; and (6) Year effects.	Consistent Inconsistent
Bell (2005)	Examine the gender pay gap among the top five executives.	1992–2003	108,509 total executive-year observations.	Execucomp, IRRC, Forbes, Hoover, Lexis-Nexus, and archived company websites.	Cross-sectional	Total compensation: The gender pay gap is about 25.4%. The unexplained gender pay gap is significantly 11.1% after controlling for: (1) Firm size; (2) Age; (3) Occupational segregation; (4) Firm performance; (5) Industry effects; and (6) Year effects. Salary compensation: The unexplained gender pay gap is	Inconsistent Inconsistent

						significantly 10% after controlling for: (1) Firm size; (2) Age; (3) Occupational segregation; (4) Firm performance; (5) Industry effects; and (6) Year effects. Cash compensation: The unexplained gender pay gap is significantly 11.1% after controlling for: (1) Firm size; (2) Age; (3) Occupational segregation; (4) Firm performance; (5) Industry effects; and (6) Year effects.	n/a
Bertrand and Hallock (2001)	Examine the gender pay gap among the top five executives.	1992–1997	46,708 total executive-year observations.	Execucomp	Cross-sectional	Total compensation: The gender pay gap is about 44%. The unexplained gender pay gap is insignificantly less than 5% after controlling for: (1) Firm size; (2) Age; (3) Tenure, (4) Occupational segregation; (5) Industry effects; and (6) Year effects.	Consistent
Bugeja et al. (2012)	Examine the gender pay gap for CEOs.	1998–2010	14,759 total executive-year observations.	Execucomp, IRRC, and Compustat.	Cross-sectional	Total compensation CEOs: The unexplained gender pay gap is insignificant using both the full sample and matched sample after controlling for: (1) Firm size; (2) CEO tenure; (3) CEO chairperson; (4) CEO first year; (5) CEO ownership; (6) Investment opportunities; (7) Firm performance; (8) Firm risk; (9) Firm leverage; (10) Board size; (11) Board independence;	Consistent

						(12) compensation committee independence; (13) Industry effects; and (14) Year effects. Salary CEOs: The unexplained gender pay gap is significant using the full sample but insignificant using a matched sample after controlling for: (1) Firm size; (2) CEO tenure; (3) CEO chairperson; (4) CEO first year; (5) CEO ownership; (6) Investment opportunities; (7) Firm performance; (8) Firm risk; (9) Firm leverage; (10) Board size; (11) Board independence; (12) compensation committee independence; (13) Industry effects; and (14) Year effects. Bonus CEOs: The unexplained gender pay gap is insignificant using both the full sample and matched sample after controlling for: (1) Firm size; (2) CEO tenure; (3) CEO chairperson; (4) CEO first year; (5) CEO ownership; (6) Investment opportunities; (7) Firm performance; (8) Firm risk; (9) Firm leverage; (10) Board size; (11) Board independence; (12) compensation committee independence; (13) Industry effects; and (14) Year effects	Consistent n/a
Elkinawy	Examine the	1996–	60,040 total	Execucomp,	Cross-	Total compensation: The gender	Inconsistent

and Stater (2011)	gender pay gap among the top five executives.	2004	executive-year observations.	IRRC, and Compustat.	sectional	pay gap in is about 24.5%. The unexplained gender pay is significantly 9.7% after controlling for: (1) Firm size; (2) Age; (3) Tenure; (4) Occupational segregation; (5) Firm performance; (6) Board size; (7) Board composition; (8) Board independence; (9) Industry effects; and (10) Year effects. Salary: The gender pay gap is about 16.2%. The unexplained gender pay gap is significantly 5.6% after controlling for: (1) Firm size; (2) Age; (3) Tenure; (4) Occupational segregation; (5) Firm performance; (6) Board size; (7) Board composition; (8) Board independence; (9) Industry effects; and (10) Year effects.	Inconsistent
Muñoz-Bullón (2010)	Examine the gender pay gap among the top five executives..	1992–2006	69,391 total executive-year observations.	Execucomp	Cross-sectional	Total compensation: The gender pay gap is about 39.9%. The unexplained gender pay gap is significantly 7.2% after controlling for: (1) Firm size; (2) Tenure; (3) Occupational segregation; (4) Firm performance; (5) Industry effects; and (6) Year effects. Salary: The gender pay gap is about 23.1%. The unexplained gender pay gap is insignificantly 1.8% after controlling for: (1) Firm size; (2) Tenure; (3)	Inconsistent Consistent

						Occupational segregation; (4) Firm performance; (5) Industry effects; and (6) Year effects.	
Shin (2012)	Examine the gender pay gap among the top five executives.	1998–2005	27,643 total executive-year observations.	Execucomp, RiskMetrics Directors Database, and Sec archival database.	Cross-sectional	Total compensation: The gender pay gap is about 42%. The unexplained gender pay gap is 16.6% after controlling for: (1) Firm size, (2) Age; (3) Tenure; (4) Occupational segregation; (5) Firm performance; (6)Whether members of the board and the compensation committee are appointed by the CEO or not; (7) Board independence; (8) Whether executive is a board member or not; (9) Industry effects; and (10) Year effects.	Inconsistent
Vieito and Khan (2012)	Examine the gender pay gap among the top five executives.	1992–2004	73,683 total executive-year observations.	Execucomp	Cross-sectional	Total compensation: The unexplained gender pay gap is 17.1% after controlling for: (1) Firm Size; (2) Age; (3) Tenure; (4) Occupational segregation; (5) Firm performance; (6) Firm growth; (7) Firm risk; (8) Market reaction to stock split announcements; (9) Whether executives are on two boards or not; (10) Whether the firm pays for the executive pension plan or not; (11) Industry effects; and (12) Year effects.	Inconsistent