Trends in executive gender pay gaps: the role of females' risk aversion and board composition

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Abstract

Prior research has documented pay gaps between female and male executives. We document recent trends in the gender pay gaps and explore the relative effect of females' appetite for compensation incentives and gender bias in the boardroom as possible explanations for the gaps. Using data from the 1996-2010 period, we find evidence that female executives' pay and incentive gaps are gradually converging towards their male counterparts, but that the wedge between genders still exists because females accept contracts with lower equity compensation incentives. We also find evidence that female representation on boards, and compensation committees in particular, has significantly contributed to mitigating the gaps.

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1. Introduction

Both academics and practitioners have asserted that female executives generally receive lower pay levels than their male counterparts.[1] Yet, the evidence substantiating the source of these pay gaps is quite mixed. While some assert that the reasons are complex, including female executives' systematic segregation in smaller and low-performing firms, females holding lower tiered-positions, and females accepting contracts with lower compensation risk, others suggest that gender bias can be a contributing factor. If the pay gaps are due to females systematically segregating in specific types of firms, then controlling for unobservable time-invariant firm characteristics should attenuate the bias induced by firms' differences in their demand for female executives. If the pay gaps are related to females systematically holding lower-tiered positions, then controlling for executive job titles should attenuate the gaps and the observed gaps should decline over time as women achieve higher executive ranks in their firm. If the pay gaps are due to risk-averse females systematically accepting lower compensation incentives, then this effect should remain relatively constant across time, unless a new population of female executives emerges with a different appetite for risk. Finally, if the gaps are related to a general gender bias, then they should decline as females achieve greater representation on the board and, in particular, on the compensation committee.

In this paper, we revisit this question by examining the trends in female executives' pay gaps, and explore the relative effect of females' appetite for compensation risk and gender bias in the boardroom as possible explanations for the gaps. We first examine the extent to which the gender pay gaps still exist and how they evolved over time. We then examine whether the observed trends in the pay gaps likely reflect concurrent changes in female executives' appetite for compensation risk. Finally, we examine the extent to which

[1] We review the academic literature in Section 2. See Fitzpatrick (2010), Middleton (2010), and Hymowitz (2011), for examples from popular press.

gender bias in the boardroom contributes to the observed pay gaps after controlling for other observable firm- and executive-specific characteristics.

Using a sample of 24,901 unique executives from the ExecuComp database over the 1996-2010 period, we find evidence of gender pay gaps that persist across all years. After controlling for the executive's job responsibilities and other executive- and firm-level determinants of pay, female executives systematically receive lower salary, short term compensation and total compensation relative to male executives. However, we find evidence that the pay gaps significantly declined over time, moving from a 22% to a 11% gap in total flow compensation levels between the 1996-2001 and 2002-2010 sub-periods.

One potential explanation for the observed gender pay gaps is that female executives are more risk averse than male executives and therefore less willing to accept pay packages with greater compensation risk (i.e., incentives). Using the sensitivity of option and total equity holdings to stock prices (delta) and volatility (vega), we find evidence supporting differences in females' willingness to accept riskier pay packages. We find that female executives' pay packages have significantly lower option and portfolio deltas as well as lower option vegas relative to male executives, across all years. As with flow compensation levels, these differences appear to have diminished over time, moving from a 28% to a 11% gap in option vega, and from a 27% to a 11% gap in portfolio deltas between the 1996-2001 and 2002-2010 sub-periods, respectively. These gaps remain after controlling for economic determinants such as the executive's managerial responsibilities within the firm, which have been documented to be related to incentives (Aggarwal and Samwick, 2003) and for known changes in compensation risk over time (Hayes, Lemmon, and Qui, 2012). These results collectively support the hypothesis that female risk aversion, as captured by their ex-post equity incentives, has decreased over time and that this

reduction has likely contributed to a gradual (although incomplete) convergence of female executives' pay levels to their male counterparts.[2]

Finally, we investigate whether reduced gender bias, proxied by female representation in the boardroom, has contributed to mitigating the gender pay and incentive gaps. If female executives face pay discrimination from males in the boardroom, then the effect should be mitigated when the proportion of females on the board is greater. Indeed, we find evidence that female board representation significantly reduces these gender gaps over our sample period. For firms with higher female board representation, the gender pay gap for total flow compensation is reduced by 5% on average. We find similar results for the gender incentive gaps, with the gaps in option delta and vega being reduced by 3% and the gap in portfolio delta being reduced by 12% across all years. That greater female presence on the board is related to lower gender pay gaps suggests that what explains the lower pay levels for female executives is, at least partially, due to some gender bias.

One challenge in documenting the extent of a female pay gap is establishing the counterfactual pay rate – that is, the pay that the female would have earned had she been male, holding all else equal. This challenge is particularly important when considering that at least part of the pay gaps identified in previous studies could be attributable to unobservable (at least to the econometrician) gender differences that would affect pay, such as differences in human capital, career commitment, and preferences towards risk. These unobservable factors may also impact the matching of female executives in specific industries, firms, and job positions. We attempt to address concerns that such factors, causing correlated omitted variables or a simultaneity bias, are influencing our results. In our main analyses, we include firm fixed-effects to control for a firm's time-invariant

[2] The underlying assumption for observing a contemporaneous convergence in pay levels and incentives is that our measures of equity incentives are correlated with the executive's total flow compensation. The correlation between the executive's total flow compensation and the option delta and vega and portfolio delta in our sample are 0.661, 0.688, and 0.423 (all significant at $p<0.01$ levels), respectively.

unobservable demand for female executives. In additional analyses, we include prior year pay to capture executive-specific characteristics that affect pay and we adopt an instrumental variables approach to address the endogeneity of female board representation. We find that our general conclusions are unchanged.

We contribute to the literature as follows. First, using the 1996-2010 time series, we document that the gender pay gaps, although persisting through 2010, have significantly declined over the prior 15 years. Second, while the labor economics literature is replete with studies documenting gender pay gaps, the question of why female executives get paid less than males remains still open. In our study, we provide evidence on two distinct explanations – first, that female executives' greater risk aversion leads to different compensation structures and second, that gender bias by males in the boardroom contributes, at least partially, to the observed gaps. Our time period allows us to take advantage of two institutional changes: (1) the Sarbanes-Oxley Act and concurrent stock exchange requirements mandating more independent representation on the board beginning in 2002, and (2) the NYSE-NASDAQ-AMEX rules requiring the independence of compensation committee members beginning in 2004. These regulatory changes are likely the source of the increased proportion of female board and compensation committee members observed over our sample period. Third, there is mounting pressure for diversity on boards and in particular, on increasing female representation, with some European Union countries beginning to mandate a greater proportion of female directors (Lublin, 2012). However, research suggests that the effect of greater female representation, mandated or not, on governance and performance is mixed. We provide additional evidence by examining a particular aspect of governance, namely, executive pay and show that greater female representation is associated with lower pay gaps for female executives.

Our paper continues as follows. Section 2 summarizes the related literature on gender differentials. Section 3 describes our sample and research design. Section 4 discusses the results of our analyses and Section 5 concludes the paper.

2. Background and Research Questions

Our research is related to three streams of literature. The first stream examines the factors behind pay differentials between male and female executives. The second stream examines the risk preferences of females compared to males. The third stream examines the effect of female representation on the board of directors on firm compensation policies.

2.1. Pay differentials

Bertrand and Hallock (2001), using a sample of executives from the ExecuComp database over the 1992-1997 period, show that female executives get paid less than males after controlling for occupation (job title), firm size (market value of equity), performance (stock returns), and industry. Their evidence indicates that a sizable fraction of the gender pay gaps is accounted for by a systematic allocation of women into lower-paying occupations and smaller companies, but not into lower-paying industries.[3] However, once the authors control for age and tenure, the coefficient on the female dummy remains negative but is no longer significant. They conclude that there are not "significant" gender pay gaps over their sample period, after controlling for executive-level characteristics. One potential explanation for this lack of significance is that their sample size drops considerably when age and tenure are included. In our analysis, we back-fill and hand-collect executives' ages to avoid a severe sample attrition due to missing age fields.

[3] Bertrand and Hallock (2001) document an unconditional gender gap of 47 percent in total compensation over the 1992-2007 period. They also find that 75 percent of the pay differential was explained by company size and only four executive job positions, with female executives being significantly less likely to be employed by bigger firms and to occupy the CEO, Chair, Vice-Chair, and/or President position. In their sample, the pay gap dropped to about 5 percent after accounting for age and tenure.

Munoz-Bullon (2010) revisits the Bertrand and Hallock (2001) results over the 1992-2006 period. He finds that females earn lower total pay after controlling for tenure, job titles, firm size (log of sales) and performance (stock returns). His measure of total pay is ex-post total compensation which includes cash payouts from stock option exercises. When examining base pay (i.e., salary), the coefficient on the female dummy is negative but not significant. He concludes that variable pay is the most important cause of this gap, and, in particular, the fact that male executives' cash payout from stock option exercises is larger than that of female managers. This study leaves open the question of the extent of gender bias because additional firm characteristics that explain pay are not included in the analysis and he does not control for the possibility that females may be under represented in high variable pay industries.

In a more recent work, Bugeja, Matolcsy, and Spiropoulos (2012), using a sample of 210 firm-years representing U.S. female CEOs during 1998-2010, find no evidence that these CEOs are paid less than their male counterparts in firms matched on industry, size, board size and the percent of female directors. They conclude that the gender bias does not exist for women at the very top of the corporate ladder. In our study, we include non-CEO executives in our analyses and attempt to provide explanations for the observed pay gaps in the overall corporate suite.

2.2. Gender and risk aversion

A large experimental literature in labor economics examines whether systematic differences in risk preferences exist between men and women (see Eckel and Grossman, 2008; Croson and Gneezy, 2009; and Bertrand, 2012, for extensive reviews). Many of these studies compare how men and women value risky gambles or choose between gambles with the results being broadly consistent with women being more risk averse than men. Similar evidence is found in investment behaviour, with females investing in less risky

mutual funds than males, after controlling for age, education, income and investment knowledge (e.g., Dwyer, Gilkeson and List, 2002).[4]

This research has also demonstrated that risk aversion affects the occupations that females choose. For example, Bonin et al. (2007) empirically demonstrate that individuals who are less willing to take risk tend to sort into occupations with more stable earnings. These occupations, due to compensating wage differentials in environments with risk-averse agents, also tend to pay less on average. Recent experimental papers have proposed a new explanation for why women may be relatively under-represented in those occupations. These papers suggest that women may systematically under-perform relative to men in competitive pay environments and that many women, even among the most able, may prefer to stay away from such environments. Gneezy, Niederle, and Rustichini (2003) provide experimental evidence that when pay is conditional on the performance of others (i.e., a tournament model), females underperform males. However, this was not true when pay to complete a task was independent of how others performed. In addition, their experiment also demonstrates that women do as well as men in the tournament setting when competing within other females. These findings raise questions about the importance of gender composition when considering the gender competition effect. Along similar lines, Niederle and Vesterlund (2007) show that females shy away from tournaments even when their abilities suggest otherwise and that males compete over and above their abilities. From a payoff maximization perspective, there are too few (high ability) women and too many (low ability) men entering the tournament. These studies suggests that female executives might have less appetite for competition, perform worse than males when forced to compete and, as a results, receive lower ex-post pay.

[4] Somewhat opposite conclusions are reached by Adams and Funk (2011). Using survey data from publicly-traded Swedish firms in 1995, the authors find that female directors displayed more risk-seeking behaviours than males. Females were willing to invest more proceeds of a lottery payout in a risky investment than males.

An additional implication of risk aversion, aside from lower willingness to compete, is the ex-ante selection of pay structures. Agency theory predicts that risk-averse agents are less likely to accept risk-based pay, namely pay that is contingent on performance. Studying the choice of payment structures for a task in a patriarchal society versus a matrilineal society, Gneezy, Leonard and List (2009) examine the frequency with which females choose to accept riskier pay packages. The authors find that in the patriarchal society, females chose a non-competitive pay structure (lower pay per unit of success but based on only the participant's success) with significantly lower frequent than males. However, in the matrilineal society, females chose a competitive pay structure (higher pay per unit of success but based on outperforming other participants) more frequently than males. These results suggest that female executives may be less likely to accept greater compensation risk, but that this tendency is more pronounced in male dominated settings. Consistent with these views, in a recent survey work, Graham, Harvey and Puri (2012) document thatCEOs with less appetite for risk will be less likely to accept compensation packages that have greater proportion of stock, option and bonus pay. They also find that females CEOs are less likely to accept riskier pay packages.

2.3. Female representation in the boardroom

Though there are some studies examining various corporate effects of having females on the board, very few have examined whether their presence influences executive pay. And among those that do examine this, the findings are mixed. Adams and Ferreira (2009) examine differences between male and female board members using a sample of S&P 1500 firms over the 1996-2003 period. While they find greater CEO performance-related turnover, they find no evidence that female representation on the board affects the level or form of CEO pay. As their analysis does not consider the CEO's gender, one

explanation for their lack of results is that females on board have no effect on pay packages for executive positions typically covered by men. An alternative explanation is lack of power in the female board representation variable, and the compensation committee, in particular. In our sample period, we may likely find greater compensation effects because of the board composition changes introduced by the Sarbanes-Oxley Act and the following NYSE-NASDAQ-AMEX rules. Drawing on board members from outside the firm, there may be a favourable shift in the gender board mix for the inclusion of more female independent directors. If that is the case, the increased presence of female members on the board may have greater effects on the pay packages female executives receive.

Matsa and Miller (2011) examine the effect of female board members on the proportion of female executives. Using RiskMetrics and ExecuComp data over 1997-2009, they document that the proportion of females on the board significantly rose over this period. In multivariate analysis, they document that the proportion of females on the board is positively related to the proportion of female executives, the likelihood of a female CEO, and female executives' share of total executive compensation after controlling for industry and year fixed effects. While these findings suggest that greater female board representation positively correlate with female executives' pay, the authors do not control for any executive-level characteristics in their models and do to distinguish between whether this relation is due to female executives also achieving higher responsibilities (and higher pay) when there are females on the board, or whether female board representation lowers the gender pay gaps for similar job positions across men and women.

Finally, Elkinawy and Stater (2011) examine differences in salary and total compensation for female executives and consider, among other variables including job titles, the proportion of male directors. Using ExecuComp data over 1996-2004, they find that salary is lower for all executives when there are more male directors and that this effect

is greater for female executives. However, they do not find significant differences in total compensation after controlling for observable executive- and firm-level characteristics, nor they address potential concerns relating to the endogenous nature of female board representation to the likelihood of employing a female executive.

It is from here that we begin our study. First, we document whether the gender pay gaps still exist and how they evolved over time. Unlike prior research, we consider the pay gaps across the entire executive suite, not just for the CEO, and across a more comprehensive time period. In addition, we consider the effect that different risk preferences of females compared to males may have on compensation structures by examining how the risk profile of the compensation package differs between genders. Finally, we examine the effect of negotiation in the boardroom and test whether increases in female board representation over time had also a role in mitigating the gender pay gaps. This evidence would be of interest to regulators as there is growing pressure to appoint females to director positions (Lublin, 2012).

3. Research Design

3.1 Sample and data

We begin our sample selection with all executives on the ExecuComp database over the 1996-2010 period. We begin our sample with 1996 because RiskMetrics data on board characteristics is available beginning in 1996 only. We provide descriptive information on our initial sample in Table 1. Of the 24,301 unique executives in ExecuComp, about 7% (1,863) are women across all years. In Table 1 Panel B, we report information on executive pay and equity incentives. Sample female executives earn, on average, lower salaries, lower short-term compensation (sum of salary, annual bonuses and LTIP payouts), and lower total compensation relative to males. We also find that female executives have, on average,

equity portfolios with lower sensitivity to stock price changes.[5] Option deltas and vegas and equity portfolio deltas are all significantly lower for females relative to male executives.

Table 1 Panel C provides descriptive statistics on executive ages and tenures and distribution across different job categories. Since age fields are not consistently reported in Execucomp for a large fraction of sample executives (see Bertrand and Hallock 2001), we back-fill the age fields for all those executives reporting at least one non-missing age field over our sample period and hand-collect the age for the remaining female executives missing age fields in all years. Consistent with prior research, we find that female executives are on average younger and have shorter tenures than men.

We identify job titles using the "Title" field in ExecuComp. The title description reported in this field is up to 30 characters in length and includes over 13,500 distinct job descriptions. The field corresponds most closely to the titles reported by the firm in the summary compensation table of its DEF 14A filing to the SEC. We extend the job categories used in Bertrand and Hallock (2001) and extrapolate 11 separate corporate and divisional job titles covered by the executive in a given year: CEO, CFO, COO, Other Chief (e.g., CMO, CAO), President, Vice-President, Chairman, Vice-Chairman, Divisional President, Divisional Chief and Divisional Chair.[6] We then follow an approach similar to Aggarwal and Samwick (2003) and focus on four broad job categories, which likely reflect different types of executive responsibilities: CEO, other corporate positions that are not CEO (i.e., CFO, COO, Other Chief, President, Vice-President, Chairman, Vice-Chairman), divisional positions only (i.e., Divisional President, Divisional Chief and/or Divisional

[5] We follow prior literature (e.g. Guay 1999, Core and Guay, 1999) to calculate accumulated deltas and vegas for each executive in a given year. Executive's option delta measure the dollar change in the executive's stock option wealth for a 1% change in the firm's stock price in a given year; the executive's option vega measure the dollar change in the executive's stock option wealth for a 1% change in the firm's standard deviation of the firm's stock returns in a given year. Finally, the executive's portfolio delta measure the $ change in the executive's stock and option wealth for a 1% change in the firm's stock price in a given year.

[6] The sum of the percentages for job titles exceeds 100% because executives often cover more than one corporate and/or divisional title in one year.

Chair with no other corporate positions), and other job titles only (i.e., any title other than our 11 job categories listed above). As reported in Table 1 Panel C, females are less likely to be CEOs (6% versus 17% for males), less likely to hold any corporate title (65% versus 72% for males), and more likely to hold divisional titles only (31% versus 26%).[7]

Finally, Table 1 Panel D provides summary statistics on the set of firm-level characteristics used as controls in our tests. These statistics suggest that there are differences in gender-year observations related to firm characteristics. In particular, male executives are associated with firms that have more leverage, lower ROA, higher stock returns, more spending on R&D, and lower growth options. These differences reiterate the importance of controlling for these characteristics in our analyses.

In Table 2, we provide similar descriptive statistics over time. We split our sample into three time periods: 1996-2001 (pre-Sarbanes-Oxley and the NYSE-NASDAQ-AMEX regulatory changes), 2002-2005 (post-Sarbanes-Oxley but before the SEC reporting changes), and 2006-2010 (after enhanced disclosures required by the SEC).[8] As reported in Table 2 Panels A and B, the proportion of female executives is steadily increasing and female executives become, on average, older and more experienced over our sub-periods. In 1996-2001, females occupy about 4% of the executive position and about 1% of the CEO positions. However, by 2006-2010, they make up almost 7% of the sample and approximately 3% are CEOs. Similar increases are seen for other executive positions. While the statistics in Panel C reflect a general trend in more female executives and thus greater representation among various job positions, we find evidence that women are achieving positions with greater responsibility over time. In untabulated analyses, we

[7] We tabulate CEO and Chairman separately but our combined proportion of 8.7% is similar to the 8% in Munoz-Bullon (2010) and the 7% in Elkinawy and Stater (2011).

[8] We further split the post-SOX period around year 2006 because the new SEC disclosure rules now require firms to disclose the compensation package for the CFOs as well, a title where females and males are relatively equally represented in our sample. While prior to 2006 firms had to disclose the pay packages for the CEO and the other 4 top-paid "named executives", starting in 2006 firms have to disclose the pay package for both the CEO, other "named executives", and the CFO, independently from her pay rank.

compute job titles frequencies within the sample of female executives only. We find that females have progressed in the c-suite over our sample period. While about 4% of females held CEO positions in 1996-2001, that proportion doubles to almost 8% in 2006-2010. Relative to earlier periods, by 2006-2010 females are also more likely to hold corporate titles (increasing from 61% to 70%) and less likely to cover division titles only (declining from 36% to 26%). These statistics reinforce the importance of controlling for females' job responsibilities when examining differences in the gender pay gaps across sub-periods.

Table 2 Panel D documents a rising trend in female compensation levels over our sample period. Salary increases from an average of $257,000 in 1996-2001 to an average of $406,000 in 2006-2010. We also document increases in short-term compensation and total compensation over these sub-periods. Interestingly, there is little change in the riskiness of female executives' equity portfolios relative to the 1996-2001 period. While option vegas increase in the 2002-2005 period, all other changes are insignificant or decreases. However, we do not interpret this as evidence of no change in compensation risk for females over time as these are univariate statistics and research has documented lower portfolio deltas and vegas after the adoption of SFAS 123R (Hayes et al., 2012)

We further explore trends in the gender pay gaps in Table 2 Panel E. We compute mean and median compensation and equity incentive ratios for female executives relative to *all* other male executives in ExecuComp for that given year. Ratios less than one indicate that female executives receive less than their male counterparts. As reported in Panel E, regardless of the form of compensation or the time period, female executives report mean and median pay levels and equity incentives that are significantly lower than their male counterparts. However, consistent with females rising to positions of greater responsibility over time, we find that the compensation and incentive ratios are increasing over our sample period. Collectively, these data suggest that the gender pay gap still exists, albeit

decreasing over time. However, these univariate statistics do not adequately control for job responsibility and other executive- and firm-level characteristics, and thus present an incomplete picture.

We obtain information on boards of directors from RiskMetrics. Because complete committee membership data from RiskMetrics are available starting from 1998, we report committee membership statistics from 1998 only. As reported in Table 3, there is a trend towards greater female representation on the board of directors from 1996-1997 through 2006-2010. A larger proportion of firms have female board members and female outside directors in 2006-2010 relative to 1996-1997. Similarly, a larger proportion of firms have females serving on the compensation and governance committees in 2006-2010 relative to 1998-2001. The proportion of board seats held by females also increases over time. While there is an average (median) of 4.1% (0.0%) female board members in 1996-1997, that percentage steadily increases to 11.5% (11.1%) in 2006-2010. Considering the representation of females on the compensation and governance committees, these percentages have also steadily increased from an average of 8.1% and 9.6% in 1998-2001 to an average of 13.6% and 13.9% in 2006-2010, respectively. These increases likely reflect the increase in the proportion of outside directors being female as a result of Sarbanes-Oxley (increasing from 4.9% in 1996-1997 to 12.8% in 2006-2010) and the recent NYSE-NASDAQ-AMEX exchange listing requirements that compensation committees must be composed entirely of independent directors starting in 2004.[9]

[9] Consistently with this conjecture, we find that the proportion of females who are outside directors is highly correlated with the proportions of females serving on the board and as members of the compensation and governance committees (i.e., 95%, 59% and 51%, respectively, both at $p<0.01$ levels). Overall, these results confirm that the largest proportions of females on the board and/or committees are outsiders.

3.2 Research methodology

To examine whether a female pay gap still exists and whether it has changed over time, we estimate the following regression model:

$$\begin{aligned} COMP_{ijt} = \quad & \beta_0 + \beta_1 FEMALE_i + \beta_2 CEO_{ijt} + \beta_3 NONCEOCORP_{ijt} + \beta_4 DIV_{ijt} + \\ & + \beta_5 (TENURE)_{ijt} + \beta_6 (TENURE)^2_{ijt} + \beta_7 (AGE)_{it} + \beta_8 (AGE)^2_{it} + \\ & + \beta_9 Ln(Sales)_{jt-1} + \beta_{10} LEVERAGE_{jt-1} + \beta_{11} ROA_{jt-1} + \beta_{12} RET_{jt-1} + \\ & + \beta_{13} RISK_{jt-1} + \beta_{14} CAPEX_{jt-1} + \beta_{15} RD_{jt-1} + \beta_{16} MB_{jt-1} + \\ & + \Sigma \beta_i FIRM_{jt} + \Sigma \beta_i YEAR_t + \varepsilon_{ijt} \end{aligned} \quad (1)$$

where $COMP_{ijt}$ measures the natural log of three flow compensation elements: salary, short term compensation (sum of the salary, annual bonus and cashed-in LTIPs), and total flow compensation (sum of short-term compensation, value of restricted stock grants, value of options granted during the year, and any other annual pay). $COMP_{ijt}$ also measures the executive's equity incentives, our proxy for females' appetite for compensation risk. We focus on the sensitivity of managerial compensation or wealth to stock price (delta) and the sensitivity of expected managerial wealth to stock volatility (vega). Within the principal-agent framework (e.g., Holmstrom, 1979), optimal deltas and vegas will be higher when the manager is more capable to improve the distribution of firm payoffs, either because the marginal product of his inputs through the firm's production function is higher or because the executive is relatively less risk-averse. Consistent with this interpretation, Goel and Thakor (2008) find that more risk-averse managers sort into low-vega contracts. In a more recent work, Coles and Li (2012) find associations between delta and vega executive fixed-effects and proxies for human capital and risk tolerance (i.e., CEO indicator, age, tenure, and the female indicator). Their results suggest that more risk-averse managers are likely to be subject to less risk through lower deltas and vegas.

Our primary variable of interest is FEMALE. A negative coefficient for β_1 indicates that female executives are paid less (and/or receive lower equity incentives) than their male counterparts. We include several executive-specific control variables to isolate any gender

pay effect. First, we control for executive job titles, as prior research has demonstrated that executives with different responsibility receive significantly different pay and incentives (Aggarwal and Samwick, 2003).[10] We include in our models the first three job categories (i.e., CEO, non-CEO corporate positions, and divisional positions only) described in section 3.1, and allow the fourth category, "other titles only", to be included in the intercept.[11] Second, we include the executive's age and tenure in the firm, since prior research has demonstrated that experience raise worker productivity and consequently earnings.[12] Finally, we include several firm level variables to capture other economic determinants of pay and incentives, as documented in prior research (e.g., Gaver and Gaver, 1993; Core et al., 1999; Bizjak et al., 1993; Guay, 1999; Core and Guay, 1999): size (natural log of sales), leverage, performance (return on assets and stock returns), risk (log of variance of stock returns), capital expenditures, research and development expenditures, and growth (market to book value of equity ratio). All variables used in the models are described in the Appendix. Finally, we estimate all our models using year- and firm-fixed effects. We include year-fixed effects to capture labour market trends over time. We include firm- rather industry- fixed effects for two reasons. First, firm-fixed effects may capture time-invariant unobservable firm characteristics (e.g., firm culture) that are likely correlated with the selection of a female in a top-paid executive position at the firm.[13] Second, results in

[10] Aggarwal and Samwick (2003) show that the pay differentials across executives are a function of the job responsibilities covered by the executives and that executives with divisional responsibilities have typically lower pay–performance sensitivities than do other non-CEO executives with oversight authority, who in turn have lower sensitivities than the CEO.

[11] Whether or not job titles should be included as an explanatory variable is debatable. Many studies on pay differentials (e.g., Hoffman, 1976) have opted to omit controls for job positions to avoid the downward bias induced by endogenous job selections. However, not controlling for job titles would overstate the role of gender per se. As a result, the gender-pay gap will tend to be underestimated in our analysis.

[12] We follow Bertrand and Hallock (2001) and include a quadratic term for the age and tenure variables. Since economic models predict the returns on experience to be positive but decreasing over time (Mincer 1974), we expect the coefficient on age and tenure to be positive and the coefficients on the quadratic terms to be negative.

[13] We recognize that the inclusion of firm fixed effects to control for endogeneity or bias from omitted unobserved factors can be a solution only when these factors are time constant or slow moving. On the other hand, should the unobserved factors vary through time, other methods to extract causation, such as instrumental variables, are required. We use two alternative instrumental variable approaches in section 4.3.

Bertrand and Hallock (2001) show no systematic segregation of female executives in low-wage industries.[14] To control for autocorrelations in the errors, we compute robust standard errors clustered at the executive level.

We first estimate equation (1) over our entire sample period 1996-2010. If the female pay gap exists after controlling for the executive's age, job responsibilities and other economic determinants of pay, we predicted a negative coefficient on FEMALE. We then estimate model (1) separately over the two sub-periods 1996-2001 and 2002-2010 and test the significance in differences in coefficients across the first and second sub-periods.[15] If the female pay gap is declining over time, after controlling for any shift in the progression of female executives in the c-suite, we predict that the coefficient on FEMALE will be more negative in the earlier relative to the later time period. If female appetite for compensation risk increases over time, we also predict more negative coefficient on FEMALE in the earlier time period.

Our second set of multivariate tests captures the influence of female representation in the board on female executive pay. If there is bias in female pay when males dominate the pay setting process, then this effect should be mitigated as females hold more seats on the board. To examine this possibility, we estimate equation (1) above but including an interaction term that captures female participation on the board of directors:

$$\begin{aligned} COMP_{ijt} = \; & \beta_0 + \beta_1 FEMALE_i + \beta_2 FEMALE_i * \%FEMALE\_BOARD_{jt} + \beta_3 \%FEMALE\_BOARD_{it} + \\ & + \beta_4 CEO_{ijt} + \beta_5 NONCEOCORP_{ijt} + \beta_6 DIV_{ijt} + \\ & + \beta_7 (TENURE)_{ijt} + \beta_8 (TENURE)^2_{ijt} + \beta_9 (AGE)_{it} + \beta_{10} (AGE)^2_{it} + \\ & + \beta_{11} Ln(Sales)_{jt-1} + \beta_{12} LEVERAGE_{jt-1} + \beta_{13} ROA_{jt-1} + \beta_{14} RET_{jt-1} + \\ & + \beta_{15} RISK_{jt-1} + \beta_{16} CAPEX_{jt-1} + \beta_{17} RD_{jt-1} + \beta_{18} MB_{jt-1} + \\ & + \Sigma \beta_i FIRM_{jt} + \Sigma \beta_i YEAR_t + \varepsilon_{ijt} \end{aligned} \quad (2)$$

where variables are as previously defined and %FEMALE_BOARD is the proportion of female board members. If any bias is mitigated with more female

[14] As discussed in more detail in Section 4.4, our results are robust to the inclusion of industry fixed-effects rather than firm fixed-effects.

[15] We collapse the four time periods used in Tables 2-4 to the two periods mentioned to increase the power of our tests, as more granular time periods reduce the sample sizes.

representation on the board, we predict a positive coefficient on FEMALE * %FEMALE_BOARD. In an alternative model specification, we include two other measures of female board representation measuring the proportion of female compensation and governance committee members, respectively.

4. Results

4.1 Flow compensation gender gap

We present our first set of results in Table 4 where we examine gender differences in flow compensation levels from 1996 to 2010. Column (1-2) presents the results for the full sample period. The next two columns divide the sample in two sub-periods: (1) 1996-2001 and (2) 2002-2010. The last column in Table 4 reports significance levels for F-tests of differences in coefficients between the first and last sub-periods. To compare with the results in later tables, we force our initial Execucomp sample to have available board composition data from Riskmetrics. Each panel of Table 4 presents the results for different flow compensation variables. Across all panels, the FEMALE coefficient is negative and strongly significant. In Panel A, we observe that while in the 1996-2001 sub-period the gender gap for salary is -9%, the FEMALE coefficient decreases to -4% in the 2002-2010 sub-period. In Panel B, we find a similar pattern for short-term compensation levels: while between 1996 and 2001 females earned an average -11% less than males, the pay differential narrowed to an average of -7% over the 2002-2010 sub-period. Finally, Panel C displays the results for total flow compensation, which include the value of the stock and option grants received by the executives during the year. Here the FEMALE coefficient drops from -22% to -11%, equivalent to raw percentage gaps of about 25% and 12%.[16] Note that across all panels and time periods, the model specifications control for our four

[16] These are computed as $(\exp^{0.220}-1)*100)$ and $(\exp^{0.115}-1)*100)$, respectively.

executive job categories, executive age and tenure, firm characteristics and firm and year fixed effects as described in Section 3.2. Similar to Aggarwal and Samwick (2003), we observe that, across all compensation measures, CEOs and other executive with corporate responsibilities earn significantly higher pay levels than executives with divisional titles only. Overall, this initial evidence provides support for a significant reduction in the gender pay gaps across our sample period.

4.2 Equity incentives gender gap

Table 5 reports results using our three proxies for compensation risk. We observe again a pattern of convergence across the three incentive measures. For option delta, the gender incentive gap significantly narrows from 30% in 1996-2001 to 12% in the 2002-2010 sub-period. We observe a similar drop for option vega, where the gender incentive gap is reduced from an average of -28% in 1996-2001 to an average of –10% in 2002-2010. Finally, for the sensitivity measure of portfolio delta, we observe a convergence of 16% between the two sub-periods, which is equivalent to a drop in the raw percentage gap from 31% to 12%.[17] Taken together, the results in Table 5 support the conjecture that the equity incentive packages are also becoming more similar over time. In other words, differences in risk preferences between female and male executives are converging as well.[18]

4.3 The effect of female board representation

In this section, we examine the role of female board representation on the female pay and incentives gaps and how it evolved over time. Tables 6 and 7 report the estimation

[17] These are computed as $(\exp^{-0.271}-1)*100)$ and $(\exp^{-0.115}-1)*100)$, respectively.

[18] Given this evidence, we expect the gender gap in compensation from equity incentives also decreases. In untabulated tests, we test this conjecture by replacing the option deltas and vegas with the incentive pay measure used in Adams and Ferreira (2009). We find that the pay gap is -5 %, with a significant decrease from a -8.9% in the 1996-2001 to a -4.6% in the 2002-2010 sub-period. The interaction with the proportion of females on board also works in reducing the pay gap for this measure.

results from equation (2).[19] We find that the coefficient on Female * % Female_Board is positive and significant across all the flow compensation variables. That is, for firms that have higher percentages of women on the board of directors, the female dummy coefficient is positive, therefore attenuating the gender pay gaps. The interaction effect is both economically relevant and strongly significant to lessen the gender differential in both periods, with the strongest effect coming in the second sub-period. This may be due to greater power in the latter part of our sample because the proportion of females on boards was more than 50% higher than it was in the earlier period. For instance, for total flow compensation reported in Panel C we observe that for the 1996-2001 period the gender gap of 29% is reduced to 24% when evaluating at the average female board representation of 7%. For the 2002-2010 period, the gender gap of 19% is reduced to 13%, after considering the interaction effect evaluated at the average female board representation of 11%.[20] For salary and short-term compensation, the resulting average pay gaps are reduced by approximately 27% and 25% across sub-periods, respectively, with the strongest effect again coming in the second sub-period. These results are in contrast to those in Bugeja et al. (2012) who find lower salary and total pay for female CEOs when there are more females on the board.

The positive effect of the interaction term is also significant across all the equity incentives measures, but only for the 2002-2010 sub-period when using option delta and vega. The reduction in the option delta incentive gap is approximately 3% and is approximately 5% for the option vega incentive gap. The strongest effect is found in

[19] One concern for our estimations would be the multicollinearity induced by a high correlation between FEMALE and %FEMALE_BOARD. However, we observe a rather low correlation between the two variables in our sample (i.e., about 10%, at $p<0.01$ levels). Similarly, we observe low correlations between FEMALE and the two variables measuring the proportion of females on the compensation and governance committees (i.e., about 5% for both variables, at $p<0.01$ levels).

[20] The interaction effects of 5% and 6%, respectively, are computed as the product between the average %FEMALE_BOARD of 7% and 11% in 1996-2001 and 2002-2010 and the estimated coefficients of 0.687 and 0.550.

portfolio delta where the interaction term reduces the gender gap in both periods, with the average effect being around +11% (equivalent to a reduction of more than one third).

In untabulated robustness tests, we use the proportion of females on the compensation committee or on the governance committee in lieu of the overall female board representation. This further specification allows us to tackle the specific board channel through which females on the board may be attenuating the gender pay gaps. Across all models for the flow compensation variables, we still find that the effect of female representation on those committees leads to a lower pay gap for female executives, with the strongest effects coming from female representation in the compensation committee. Like before, the effect is stronger in the later sub-sample. Regarding the effect on equity incentives, we find similar results, though only economically and statistically significant for portfolio delta only. Since we find no effect on option delta, this suggests that the stock portion of the sensitivity measure is the one being adjusted.

Overall, these findings suggest that female representation on the board decreases the gender pay gaps and increases the willingness of female executives to accept higher compensation risks. The results could be attributed to simple gender bias when females are not represented on the board. However, they may also occur if females are more comfortable negotiating pay packages with other females and are therefore negotiate greater pay for themselves. This may occur if pay negotiations have an element of competition and would be consistent with the findings of Gneezy et al. (2003) that females compete more effectively against other females. Alternatively, if greater female board representation has similar effects of a matrilineal society, our results would be consistent with the evidence in Gneezy et al. (2009) in which females are more prone to accept riskier pay packages in less male-dominated settings. A final possibility is that female board members are more willing

to promote females to the CEO position but as we control for job title in our analyses, it is unlikely that this effect is driving our results.

4.4 Additional analyses

In this section, we discuss the results of additional analyses to address concerns that our findings may be driven by omitted correlated variables or other sources of endogeneity. One potential concern in our analysis is that some unobservable firm-level characteristics exist that are related to the decisions to hire female executives, appoint female board members and set pay levels. To the extent that any unobservable firm characteristic is time invariant or slow-moving, the inclusion of firm fixed-effects in our analysis should mitigate this concern. However, these unobservable characteristics may evolve over time. If they do, and to the extent that these characteristics are correlated with the likelihood of having a female executive, we may attribute to a gender pay gap something that is actually firm-specific. A second concern is that there are unobservable executive characteristics that could differ between women and men and give rise to an apparent gender difference in wages. These fall under the broad heading of "unobserved productivity" and include such things as commitment to the labor force, motivation to succeed, innate ability, and family responsibilities (United States General Accounting Office, 2003). Finally, there is the concern that the hiring of females and setting pay levels is simultaneous. For example, the firm may offer a pay contract (with lower pay and/or incentives) that female executives are more likely to accept. If that is the case, the coefficient on FEMALE should not be interpreted as females being forced to receive lower pay but rather females accepting jobs at firms with lower paying contracts (or lower incentives). To address these concerns, we do several additional untabulated analyses.

First, we estimate our models excluding the firm fixed effects. If there is an unobservable, time-invariant firm characteristic that may lead firms to hire more female executives, and this is related to how females are paid, excluding the firm fixed-effects will lead to a correlated omitted variable bias. An indication of this would be that the coefficient on our variable of interest, FEMALE, will loose significance and/or change direction. To test this, we replace the firm fixed-effects in Tables 4-7 with industry fixed-effects to control for differences in pay levels across industries. We continue to find a negative and significant coefficient on FEMALE for all our dependent variables, with the proportion of females on board being still significant in mitigating the gaps.[21] This additional analysis suggests that unobservable firm characteristics are not causing our results.

Second, we estimate our models including prior year pay as an additional control. In this specification, the coefficient on FEMALE can be interpreted as the increase in pay over the prior year for female executives, with the prior year pay potentially capturing all those unobservable executive-level attributes that might be related to lower pay (e.g., being less career oriented, less ambitious, or more risk averse). We continue to find a negative and significant coefficient on FEMALE for all our pay and incentive variables and a positive mitigating effect coming from female board representation.[22] Holding executive characteristics constant, these results suggest that females receive lower pay, at least in part, due to receiving smaller year-to-year pay increases than their male counterparts.

Third, we control for the possibility that the inclusion of a female board member is endogenous to the hiring of a female executive. We use two alternative methods

[21] When including industry fixed-effects, the pay gap in salary is -4 % across all years (with a drop from -6 % to -3 % across sub-periods), short-term compensation is -7.5 % across years (with a drop from -11 % to -5.5 %), total flow compensation is -12 % across years (with a drop from -18 % to -10 %), option delta is -17 % across years (with a drop from -24 % to -15 %), option vega is -13 % across years (with a drop from –21 % to -10 %), and portfolio delta is -21 % across years (with a drop from -28 % to -19 %). The models including the interactions with the proportion of females on board still report a significant effect in mitigating the gaps.

[22] When we include the lagged compensation variables in our models, all the pay gaps are still significant with a gap in salary of -4% across years, short-term compensation of -5%, total flow compensation of – 7 %, option delta of -4%, option vega of -5% and portfolio delta of -2% across years. The models including the interactions with the proportion of females on board still report a significant effect in mitigating the gaps.

incorporating instrumental variables to control for potential endogeneity problems in our female board representation variables (i.e., proportion of females on the board and proportion of females on the compensation and governance committees, respectively). In our first approach, we replace the firm's female board and sub-committees representation variables with their industry averages (at 2-digit SICs levels) in that given year. In our second approach, we replace the firm's female board and sub-committees representation variables with instruments similar to the one used in Adams and Ferreira (2009). These instruments represent the proportion of the firm's male directors who sit in another firm's board (compensation and governance committee) with at least one female board member. For both sets of instruments and methods, we first regress the firm's female board representation measures on the instrument as well as all of the firm-specific control variables in equation (1), including firm fixed-effects.[23] In the second stage, we replace the firm's female board representation measures with the instrumented proxies from the first stage. All our results in Tables 6 and 7 as well as the results with the female sub-committee memberships remain robust to the use of these alternative IV methods.

5. Conclusions

Both academics and practitioners have asserted and documented that female executives generally receive lower pay levels than male executives. In this study, we revisit the question of whether the female pay gap exists and how it evolved over time, examining the longest time series of data available. Using a sample of 24,901 unique executives from the ExecuComp database over the 1996-2010 period, we find evidence of a significant gender pay gap across all years but that the pay gap significantly declined over time, moving from an 22% to an 11% in total flow compensation between the 1996-2001 and

[23] Unreported results show that the coefficients on our instruments are positive and significant at less than the 1% level for all our female board representation variables.

2002-2010 sub-periods. One explanation for the gender pay gap is that female executives are more risk averse and therefore less willing to accept pay packages with greater compensation risk (i.e., incentives). Using option delta, option vega and portfolio deltas as proxies for equity incentives, we find evidence in support of this explanation. We find that female executives' pay packages have significantly lower option and equity portfolio deltas as well as lower option vegas relative to male executives. As with levels of compensations, these differences appear to have diminished over time, moving from e.g., a 28% gap to a 10% gap in option vega, and from a 27% gap to a 11% gap in portfolio deltas between the 1996-2001 and 2002-2010 sub-periods, respectively. As our proxies for compensation risk are highly correlated with total pay, our evidence supports female risk aversion as an explanation for the unconditional gender gap.

We also consider whether the female representation in the board room has significantly contributed in mitigating the gender pay gaps. Indeed, we find evidence that when there is greater female board representation, both the gender pay gap and the gender incentive gap are substantially during our sample period. While effect exists for the overall board, it is also holds, and is stronger, for the compensation committee, further corroborating the relation between female board members and female pay packages. Our findings are robust to alternative model specifications and tests that address the potential endogeneity problems coming from unobservable firm- and executive- specific variables and the firm's decision to have female board members.

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Table 1: Summary Statistics of Executive Compensation, Incentives, and Other Characteristics (ExecuComp: 1996-2010)

Panel A: Observations		*All Executives*	*Men*	*Women*	
# Executive-Year Obs.		166,941	157,021	9,920	
% Executives-Year Obs.		100%	94.06 %	5.94 %	
# of Unique Executives		24,901	23,038	1,863	
Panel B: Pay & Incentives	*N*	*All Executives*	*Men*	*Women*	*p-Value*
Salary	166,941	0.382 (0.239)	0.385 (0.241)	0.330 (0.204)	***
Short-Term Compensation	166,941	0.638 (0.630)	0.646 (0.638)	0.509 (0.472)	***
Total Flow Compensation	148,028	2.196 (3.120)	2.227 (3.156)	1.684 (2.388)	***
Option Delta	137,708	0.098 (0.197)	0.101 (0.200)	0.062 (0.130)	***
Option Vega	137,708	0.046 (0.089)	0.047 (0.090)	0.032 (0.067)	***
Portfolio Delta	131,526	0.226 (0.570)	0.233 (0.580)	0.112 (0.333)	***
Panel C: Age, Tenure & Title	*N*	*All Executives*	*Men*	*Women*	*p-Value*
Age	135,709	51.318 (7.945)	51.608 (7.987)	47.642 (6.337)	***
Tenure	166,941	6.294 (6.680)	6.381 (6.760)	4.929 (5.062)	***
% with Job Title:					
CEO	166,941	0.169 (0.375)	0.176 (0.381)	0.057 (0.233)	***
CFO	166,941	0.149 (0.356)	0.148 (0.355)	0.172 (0.377)	***
COO	166,941	0.062 (0.241)	0.064 (0.244)	0.033 (0.178)	***
Other Chief	166,941	0.075 (0.263)	0.073 (0.259)	0.114 (0.318)	***
President	166,941	0.168 (0.374)	0.174 (0.379)	0.083 (0.276)	***
Vice-President	166,941	0.344 (0.475)	0.339 (0.473)	0.426 (0.494)	***
Chairman	166,941	0.130 (0.337)	0.137 (0.344)	0.032 (0.175)	***
Vice-Chairman	166,941	0.023 (0.151)	0.024 (0.151)	0.019 (0.137)	***
Divisional President	166,941	0.095 (0.293)	0.095 (0.293)	0.088 (0.285)	**
Divisional Chief	166,941	0.254 (0.435)	0.251 (0.434)	0.303 (0.459)	***
Divisional Chairman	166,941	0.008 (0.088)	0.008 (0.089)	0.005 (0.073)	***
Any Corporate Title	166,941	0.717 (0.450)	0.721 (0.448)	0.654 (0.476)	***
Non-CEO Corporate Title	166,941	0.549 (0.497)	0.546 (0.498)	0.596 (0.491)	***
Divisional Titles Only	166,941	0.257 (0.437)	0.254 (0.435)	0.310 (0.463)	***
Other Title Only	166,941	0.025 (0.178)	0.025 (0.156)	0.035 (0.185)	***
Panel D: Firm Characteristics					
Sales ($ millions)	151,913	4,105 (8,508)	4,097 (8,465)	4,229 (9,152)	n.s.
Leverage	151,913	0.226 (0.198)	0.227 (0.198)	0.212 (0.202)	***
ROA	151,913	0.086 (0.097)	0.086 (0.097)	0.091 (0.104)	***
RET	151,913	0.175 (0.468)	0.175 (0.468)	0.162 (0.478)	***
Firm Risk	151,913	0.019 (0.035)	0.019 (0.035)	0.020 (0.041)	***
CAPEX	151,913	0.036 (0.050)	0.035 (0.050)	0.036 (0.050)	n.s.
RD	151,913	0.028 (0.055)	0.029 (0.056)	0.025 (0.054)	***
MB	151,913	2.012 (1.456)	2.006 (1.448)	2.109 (1.586)	***

This table reports mean differences in compensation, incentives and job titles between female and male executives in ExecuComp between 1996 and 2010. Job categories are similar to Bertrand-Hallock (2001) and Aggarwal-Samwick (2003). The sum of the percentages for job titles exceeds 100 because executives often have more than one title. The "Other Titles Only" category is comprised of all remaining executives for whom a job title is reported that is different from any of the listed titles. Flow compensation variables and equity incentive variables are in millions. Standard deviations are in parentheses. P-values reflect tests of differences in means between male and female.

Table 2: Trends in Female Executive Compensation, Incentives, & Other Characteristics (ExecuComp: 1996-2010)

Panel A: Time Windows Obs	(1) 1996-2001	(2) 2002-2005	(2) 2006-2010	*p-Value* (1) – (2)	*p-Value* (2) – (3)	*p-Value* (1) – (3)	Trend (1) – (3)
# of Executive - Year Obs.	71,555	43,668	51,718	--	--	--	--
% of Female - Year Obs.	4.96%	6.76%	6.62%	***	***	***	↑
Panel B: Age and Tenure							
Age	45.438 (6.092)	47.679 (5.967)	49.893 (6.094)	***	***	***	↑
Tenure	4.237 (4.890)	5.031 (4.965)	5.559 (5.229)	***	***	***	↑
Panel C: % with Job Title (overall):							
CEO	0.012 (0.110)	0.021 (0.144)	0.029 (0.169)	***	***	***	↑
CFO	0.056 (0.230)	0.078 (0.268)	0.073 (0.261)	***	***	***	↑
COO	0.025 (0.155)	0.033 (0.180)	0.039 (0.193)	***	**	***	↑
Other Chief	0.074 (0.261)	0.093 (0.291)	0.097 (0.295)	***	***	***	↑
President	0.022 (0.147)	0.032 (0.175)	0.038 (0.191)	***	***	***	↑
Vice-President	0.059 (0.236)	0.086 (0.280)	0.082 (0.274)	***	***	***	↑
Chairman	0.009 (0.095)	0.015 (0.124)	0.022 (0.148)	***	***	***	↑
Vice-Chairman	0.042 (0.199)	0.058 (0.233)	0.063 (0.243)	***	**	***	↑
Divisional President	0.043 (0.203)	0.066 (0.249)	0.063 (0.243)	***	***	***	↑
Divisional Chief	0.067 (0.249)	0.081 (0.272)	0.068 (0.253)	***	***	***	↑
Divisional Chairman	0.021 (0.145)	0.094 (0.293)	0.029 (0.169)	n.s.	***	***	↑
Any Corporate Title	0.042 (0.201)	0.062 (0.241)	0.064 (0.244)	***	***	***	↑
Non-CEO Corporate Title	0.051 (0.220)	0.074 (0.262)	0.075 (0.263)	***	***	***	↑
Divisional Titles Only	0.067 (0.249)	0.082 (0.274)	0.070 (0.256)	***	***	***	↑
Other Titles Only	0.071 (0.256)	0.093 (0.290)	0.086 (0.281)	n.s.	n.s.	***	↑

Table 2: Trends in Female Executive Compensation, Incentives, & Other Characteristics (ExecuComp: 1996-2010) – cont'd

	(1) 1996-2001	(2) 2002-2005	(3) 2006-2010	*p-Value* (1) → (2)	*p-Value* (2) → (3)	*p-Value* (1) → (3)	Trend (1) → (3)
Panel D: Pay & Incentives							
Salary	0.257 (0.160)	0.331 (0.189)	0.406 (0.228)	***	***	***	↑
Short-Term Compensation	0.430 (0.404)	0.617 (0.583)	0.498 (0.409)	***	***	***	↑
Total Flow Compensation	1.447 (2.368)	1.631 (2.235)	1.917 (2.494)	***	***	***	↑
Option Delta	0.062 (0.127)	0.068 (0.129)	0.056 (0.132)	n.s.	***	n.s.	→
Option Vega	0.025 (0.052)	0.038 (0.072)	0.033 (0.071)	***	***	***	↑
Stock + Option Delta	0.121 (0.365)	0.118 (0.325)	0.102 (0.315)	n.s.	*	n.s.	→
Panel E: Pay and Incentive Ratios							
Salary	0.772 (0.799)	0.826 (0.857)	0.900 (0.911)	***	***	***	↑
Short-Term Compensation	0.704 (0.763)	0.777 (0.799)	0.855 (0.911)	***	***	***	↑
Total Flow Compensation	0.691 (0.735)	0.717 (0.753)	0.777 (0.812)	n.s.	**	***	↑
Option Delta	0.590 (0.659)	0.575 (0.672)	0.640 (0.687)	n.s.	**	n.s.	→
Option Vega	0.619 (0.694)	0.631 (0.708)	0.717 (0.726)	n.s.	**	**	↑
Stock + Option Delta	0.480 (0.551)	0.464 (0.602)	0.497 (0.619)	n.s.	n.s.	n.s.	→

This table reports descriptive statistics on female executives' compensation, incentives and job titles. Flow compensation variables are in millions. Equity incentive variables are in thousands. Standard deviations are in parentheses. Statistics in Panel E are the mean and median ratios of female over male executives' compensation and incentive measures. ***, **, * indicate whether the difference between the sub-periods is statistically significant at $p<0.01$, $p<0.05$, $p<0.10$ levels (two-tailed), respectively. See Appendix for variable definitions.

Table 3: Trends in Female Board Representation (ExecuComp-RiskMetrics: 1996-2010)

Time Windows	(1) 1996-1997	(2) 1998-2001	(3) 2002-2005	(4) 2006-2010	*p-Value* (1) → (2)	*p-Value* (2) → (3)	*p-Value* (3) → (4)	*p-Value* (1) → (4)	Trend (1) → (4)
# of Firm-Year Obs.	2,414	5,559	5,400	6,589					
% Firm-Year with:									
>=1 Female_Board	0.318	0.589	0.657	0.693	***	***	n.s.	***	↑
>=1 Female_Out Dir	0.306	0.567	0.635	0.675	***	***	***	***	↑
>=1 Female_Comp Comm	--	0.281	0.350	0.341	--	***	n.s.	***	↑
>=1 Female_Gov Comm	--	0.141	0.329	0.362	--	***	***	***	↑
Mean (Median)Values									
% Female_Board	0.041 (0.000)	0.081 (0.083)	0.100 (0.083)	0.115 (0.111)	***	***	***	***	↑
% Female_Out Dir	0.049 (0.000)	0.096 (0.100)	0.115 (0.125)	0.128 (0.125)	***	***	***	***	↑
% Female_ Comp Comm	--	0.081 (0.000)	0.108 (0.000)	0.136 (0.000)	--	***	***	***	↑
% Female_ Gov Comm	--	0.039 (0.000)	0.100 (0.000)	0.139 (0.000)	--	***	***	***	↑

This table reports descriptive statistics on female executives' representation on the board. Complete Riskmetrics data starts in year 1998. ***, **, * indicate whether the difference in means between the sub-periods is statistically significant at p<.01, p<0.5, p<.10 levels (two-tailed), respectively. See Appendix for variable definitions.

Table 4: Trends in Female/Male Flow Compensation Gaps (Execucomp-Riskmetrics 1996-2010)

Panel A: Salary	(1-3) 1996-2010		(2) 1996-2001		(3) 2002-2010		*p-Value* (1) → (3)
Constant	3.437	(34.36)	3.233	(19.97)	4.005	(32.56)	
Female	**- 0.064**	**(- 8.83)**	**- 0.091**	**(- 7.12)**	**- 0.042**	**(- 5.22)**	***
CEO	0.789	(49.43)	0.728	(28.23)	0.811	(42.54)	
Non-CEO Corporate Title	0.246	(16.94)	0.208	(8.63)	0.257	(14.64)	
Divisional Titles Only	0.177	(12.08)	0.127	(5.19)	0.197	(11.78)	
Other Titles Only	--	--	--	--	--	--	
Tenure	0.343	(35.10)	0.389	(23.33)	0.335	(29.94)	
Tenure ^{2}	- 7.949	(-24.78)	- 9.178	(-18.30)	- 7.882	(-21.45)	
Age	0.195	(8.35)	0.390	(7.06)	0.223	(5.69)	
Age ^{2}	- 2.215	(- 6.38)	- 2.835	(-5.17)	- 1.699	(- 4.50)	
Firm-level controls	YES		YES		YES		
Firm FE	YES		YES		YES		
Year FE	YES		YES		YES		
N	93,660		32,696		60,964		
Adj. R^2	0.631		0.644		0.627		

Panel B: Short Term Comp	(1-3) 1996-2010		(2) 1996-2001		(3) 2002-2010		*p-Value* (1) → (3)
Constant	3.762	(34.13)	3.929	(21.60)	4.403	(29.79)	
Female	**- 0.093**	**(-10.44)**	**- 0.115**	**(- 7.86)**	**- 0.069**	**(- 7.55)**	***
CEO	0.882	(47.95)	0.848	(29.48)	0.899	(42.68)	
Non-CEO Corporate Title	0.265	(15.71)	0.243	(8.99)	0.277	(14.21)	
Divisional Titles Only	0.185	(10.85)	0.147	(5.37)	0.207	(10.54)	
Other Titles Only	--	--	--	--	--	--	
Tenure	0.292	(25.65)	0.350	(18.68)	0.272	(21.12)	
Tenure ^{2}	- 6.385	(-17.46)	- 8.061	(- 14.67)	- 6.023	(-14.26)	
Age	0.301	(7.95)	0.435	(7.53)	0.212	(4.82)	
Age ^{2}	- 2.313	(- 6.27)	- 3.295	(- 5.80)	- 1.650	(- 3.90)	
Firm-level controls	YES		YES		YES		
Firm FE	YES		YES		YES		
Year FE	YES		YES		YES		
N	93,660		32,696		60,964		
Adj. R^2	0.631		0.672		0.637		

Panel C: Tot Flow Comp	(1-3) 1996-2010		(2) 1996-2001		(3) 2002-2010		*p-Value* (1) → (3)
Constant	3.772	(26.69)	3.543	(14.88)	5.043	(28.43)	
Female	**- 0.143**	**(-11.67)**	**- 0.220**	**(- 9.83)**	**- 0.115**	**(- 9.01)**	***
CEO	1.107	(42.63)	1.021	(18.72)	1.137	(40.28)	
Non-CEO Corporate Title	0.313	(12.49)	0.338	(6.33)	0.288	(10.62)	
Divisional Titles Only	0.156	(6.17)	0.126	(2.34)	0.159	(5.83)	
Other Titles Only	--	--	--	--	--	--	
Tenure	0.182	(12.43)	0.064	(2.47)	0.228	(13.82)	
Tenure ^{2}	- 3.973	(- 8.52)	- 0.815	(- 1.11)	- 5.077	(- 9.28)	
Age	0.272	(5.87)	0.412	(6.02)	0.212	(3.88)	
Age ^{2}	- 2.326	(- 5.28)	- 3.528	(- 5.46)	- 1.816	(- 3.49)	
Firm-level controls	YES		YES		YES		
Firm FE	YES		YES		YES		
Year FE	YES		YES		YES		
N	85,563		28,333		57,230		
Adj. R^2	0.672		0.671		0.700		

This table reports results from OLS estimation models that examine gender differences in flow compensations. The sample period is between 1996 and 2010. All non-indicator variables are winsorized at the top and bottom one-percentiles. All models include firm and year fixed-effects. The *t*-values, reported in parentheses, are based on standard errors clustered at the executive level. The set of firm-level controls include: Ln(Sales)_{jt-1}, Leverage_{jt-1}, ROA_{jt-1}, RET_{jt-1}, Firm Risk_{jt-1}, CAPEX_{jt-1}, RD_{jt-1}, MB_{t-1}. All variables are defined in the Appendix. The last column reports significance tests for the differences in the gender dummy coefficients across the two time windows (1993-2001) and (2002-2010). Coefficients in bold indicates significance at p<.10 levels (two-tailed) or better. ***, **, * indicate whether the difference between the sub-periods is statistically significant at p<.01, p<0.5, p<.10 levels (two-tailed), respectively.

Table 5: Trends in Female/Male Incentive Gaps
(Execucomp-Riskmetrics 1996-2010)

Panel A: Option Delta	(1-3) 1996-2010		(2) 1996-2001		(3) 2002-2010		*p-Value* (1) → (3)
Constant	-2.610	(- 7.94)	- 0.838	(- 1.98)	-1.822	(- 4.68)	
Female	**- 0.152**	**(- 6.61)**	**- 0.301**	**(- 7.89)**	**- 0.122**	**(- 5.07)**	***
CEO	1.464	(27.50)	0.972	(10.56)	1.619	(27.30)	
Non-CEO Corporate Title	0.423	(10.22)	0.176	(1.95)	0.611	(10.68)	
Divisional Titles Only	0.336	(6.48)	-0.049	(- 0.53)	0.441	(7.64)	
Other Titles Only	--	--	--	--	--	--	
Tenure	1.111	(34.80)	0.639	(13.14)	1.300	(36.44)	
Tenure ^{2}	- 27.658	(-25.00)	- 15.933	(-10.81)	- 32.065	(-24.76)	
Age	0.897	(7.84)	0.999	(7.24)	0.868	(6.81)	
Age ^{2}	- 8.338	(- 7.54)	- 9.450	(- 7.10)	- 7.929	(- 6.47)	
Firm-level controls	YES		YES		YES		
Firm FE	YES		YES		YES		
Year FE	YES		YES		YES		
N	82,407		27,071		55,336		
Adj. R^2	0.656		0.711		0.684		

Panel B: Option Vega	(1-3) 1996-2010		(2) 1996-2001		(3) 2002-2010		p-Value (1) → (3)
Constant	-2.995	(-10.34)	- 2.766	(- 7.39)	-2.404	(- 6.96)	
Female	**- 0.131**	**(- 6.42)**	**- 0.283**	**(- 8.55)**	**- 0.100**	**(- 4.62)**	***
CEO	1.348	(28.39)	0.938	(10.42)	1.477	(28.76)	
Non-CEO Corporate Title	0.457	(10.02)	0.152	(1.72)	0.544	(10.98)	
Divisional Titles Only	0.280	(6.06)	- 0.060	(- 0.68)	0.389	(7.78)	
Other Titles Only	--	--	--	--	--	--	
Tenure	0.796	(27.99)	0.348	(8.22)	0.995	(31.61)	
Tenure ^{2}	- 19.728	(-20.36)	- 8.580	(- 6.74)	- 24.332	(- 21.71)	
Age	0.745	(7.53)	0.825	(6.86)	0.757	(6.84)	
Age ^{2}	- 7.141	(- 7.46)	- 8.140	(- 7.03)	- 7.038	(- 6.59)	
Firm-level controls	YES		YES		YES		
Firm FE	YES		YES		YES		
Year FE	YES		YES		YES		
N	82,407		27,071		55,336		
Adj. R^2	0.646		0.694		0.687		

Panel C: Portfolio Delta	(1-3) 1996-2010		(2) 1996-2001		(3) 2002-2010		p-Value (1) → (3)
Constant	2.404	(7.64)	3.621	(8.00)	2.946	(7.57)	
Female	**- 0.154**	**(- 5.89)**	**- 0.271**	**(- 6.72)**	**- 0.115**	**(- 4.19)**	***
CEO	1.773	(33.99)	1.413	(16.03)	1.879	(32.56)	
Non-CEO Corporate Title	0.608	(12.07)	0.401	(4.60)	0.659	(11.79)	
Divisional Titles Only	0.329	(6.46)	0.030	(0.35)	0.420	(7.47)	
Other Titles Only	--		--	--	--	--	
Tenure	1.220	(42.68)	0.944	(19.35)	1.309	(41.21)	
Tenure ^{2}	- 25.454	(-26.45)	- 19.529	(- 13.40)	- 25.955	(- 23.09)	
Age	- 0.8112	(- 7.19)	- 0.631	(- 4.07)	- 0.827	(- 6.10)	
Age ^{2}	10.040	(9.23)	8.856	(5.94)	9.937	(7.63)	
Firm-level controls	YES		YES		YES		
Firm FE	YES		YES		YES		
Year FE	YES		YES		YES		
N	79,537		25,288		54,249		
Adj. R^2	0.687		0.726		0.703		

This table reports results from OLS estimation models that examine gender differences in stock and option incentives. The sample period is between 1996 and 2010. All non-indicator variables are winsorized at the top and bottom one-percentiles. All models include firm and year fixed-effects. The *t*-values, reported in parentheses, are based on standard errors clustered at the executive level. The set of firm-level controls include: Ln(Sales)_{jt-1}, Leverage_{jt-1}, ROA_{jt-1}, RET_{jt-1}, Firm Risk_{jt-1}, CAPEX_{jt-1}, RD_{jt-1}, MB_{t-1}. All variables are defined in the Appendix. The last column reports significance tests for the differences in the gender dummy coefficients across the two time windows (1993-2001) and (2002-2010). Coefficients in bold indicates significance at p<.10 levels (two-tailed) or better. ***, **, * indicate whether the difference between the sub-periods is statistically significant at p<.01, p<0.5, p<.10 levels (two-tailed), respectively.

Table 6: Effect of Female Board Representation on Female/Male Compensation Gaps (ExecuComp-Riskmetrics 1996-2010)

Panel A: Salary	(1-2) 1996-2010		(1) 1996-2001		(2) 2002-2010		*p-Value* (1) → (2)
Constant	3.362	(34.70)	3.243	(20.00)	4.000	(32.54)	
Female	**- 0.106**	**(- 9.78)**	**- 0.130**	**(- 7.70)**	**- 0.079**	**(- 5.87)**	***
Female * % Female_Board	**0.328**	**(5.39)**	**0.389**	**(3.31)**	**0.254**	**(3.66)**	***
% Female_Board	0.073	(2.26)	-0.068	(- 1.26)	0.139	(3.47)	
Executive-level controls	YES		YES		YES		
Firm-level controls	YES		YES		YES		
Firm FE	YES		YES		YES		
Year FE	YES		YES		YES		
N	93,660		32,696		60,964		
Adj. R^2	0.631		0.644		0.628		
Panel B: Short-Term Comp	**(1-2) 1996-2010**		**(1) 1996-2001**		**(2) 2002-2010**		***p-Value*** **(1) → (2)**
Constant	3.781	(34.26)	3.940	(21.63)	4.401	(29.76)	
Female	**- 0.149**	**(-11.15)**	**- 0.164**	**(- 8.39)**	**- 0.117**	**(- 7.22)**	***
Female * % Female_Board	**0.435**	**(5.55)**	**0.487**	**(3.46)**	**0.328**	**(3.84)**	***
% Female_Board	0.089	(2.16)	- 0.006	(- 0.09)	0.114	(2.19)	
Executive-level controls	YES		YES		YES		
Firm-level controls	YES		YES		YES		
Firm FE	YES		YES		YES		
Year FE	YES		YES		YES		
N	93,660		32,696		60,964		
Adj. R^2	0.632		0.672		0.638		
Panel C: Tot Flow Comp	**(1-2) 1996-2010**		**(1) 1996-2001**		**(2) 2002-2010**		***p-Value*** **(1) → (2)**
Constant	3.795	(26.83)	3.557	(14.94)	5.057	(28.49)	
Female	**- 0.220**	**(-11.43)**	**- 0.290**	**(- 9.45)**	**- 0.195**	**(- 8.85)**	***
Female * % Female_Board	**0.579**	**(5.36)**	**0.687**	**(3.38)**	**0.550**	**(4.88)**	***
% Female_Board	0.058	(1.09)	0.083	(0.79)	0.024	(0.41)	
Executive-level controls	YES		YES		YES		
Firm-level controls	YES		YES		YES		
Firm FE	YES		YES		YES		
Year FE	YES		YES		YES		
N	85,563		28,333		57,230		
Adj. R^2	0.672		0.671		0.700		

This table reports results from OLS estimation models that examine effect of female board representation on the gender differences in flow compensation. The sample period is between 1996 and 2010. All non-indicator variables are winsorized at the top and bottom one-percentiles. All models include firm and year fixed-effects. The *t*-values, reported in parentheses, are based on standard errors clustered at the executive level. The set of executive-level controls include: CEO_{ijt}, Non-CEO Corporate $Title_{ijt}$, Dividional Titles $Only_{ijt}$, $Tenure_{ijt}$, $Tenure^2_{ijt}$, Age_{it}, Age^2_{it},The set of firm-level controls include: $Ln(Sales)_{jt-1}$, Leverage $_{jt-1}$, ROA $_{jt-1}$, RET $_{jt-1}$, Firm Risk $_{jt-1}$, CAPEX $_{jt-1}$, RD $_{jt-1}$, MB_{t-1}. All variables are defined in the Appendix. The last column reports significance tests for the differences in the gender dummy coefficients across the two time windows (1993-2001) and (2002-2010). Coefficients in bold for the variables of interest indicates significance at p<.10 levels (two-tailed) or better. ***, **, * indicate whether the difference between the sub-periods is statistically significant at p<.01, p<0.5, p<.10 levels (two-tailed), respectively.

Table 7: Effect of Female Board Representation on Female/Male Incentive Gaps (ExecuComp-Riskmetrics 1996-2010)

Panel A: Option Delta	(1-2) 1996-2010		(1) 1996-2001		(2) 2002-2010		*p-Value* (1) → (2)
Constant	- 2.592	(- 7.89)	- 0.833	(- 1.97)	- 1.803	(- 4.62)	
Female	**- 0.203**	**(- 6.02)**	**- 0.345**	**(- 7.46)**	**- 0.180**	**(- 4.72)**	***
Female * % Female_Board	**0.385**	**(2.01)**	0.408	(1.33)	**0.407**	**(1.99)**	***
% Female_Board	- 0.081	(- 0.78)	0.184	(1.14)	- 0.105	(- 0.89)	
Executive-level controls	YES		YES		YES		
Firm-level controls	YES		YES		YES		
Firm FE	YES		YES		YES		
Year FE	YES		YES		YES		
N	82,407		27,071		55,336		
Adj. R^2	0.657		0.711		0.684		

Panel B: Option Vega	(1-2) 1996-2010		(1) 1996-2001		(2) 2002-2010		*p-Value* (1) → (2)
Constant	- 2.998	(- 10.34)	-2.766	(- 7.39)	-2.386	(- 6.90)	
Female	**- 0.179**	**(- 6.14)**	**- 0.317**	**(- 7.87)**	**- 0.160**	**(- 4.74)**	***
Female * % Female_Board	**0.357**	**(2.08)**	0.313	(1.18)	**0.419**	**(2.27)**	***
% Female_Board	0.127	(1.31)	0.300	(2.04)	- 0.077	(- 0.70)	
Executive-level controls	YES		YES		YES		
Firm-level controls	YES		YES		YES		
Firm FE	YES		YES		YES		
Year FE	YES		YES		YES		
N	82,407		27,071		55,336		
Adj. R^2	0.646		0.694		0.687		

Panel C: Portfolio Delta	(1-2) 1996-2010		(1) 1996-2001		(2) 2002-2010		*p-Value* (1) → (2)
Constant	2.445	(7.77)	3.652	(8.07)	2.974	(7.64)	
Female	**- 0.316**	**(- 7.90)**	**- 0.431**	**(- 8.21)**	**- 0.262**	**(- 5.83)**	***
Female * % Female_Board	**1.216**	**(4.09)**	**1.514**	**(3.52)**	**1.011**	**(3.25)**	***
% Female_Board	- 0.057	(- 0.61)	0.214	(1.44)	0.042	(0.40)	
Executive-level controls	YES		YES		YES		
Firm-level controls	YES		YES		YES		
Firm FE	YES		YES		YES		
Year FE	YES		YES		YES		
N	79,537		25,288		54,249		
Adj. R^2	0.687		0.727		0.703		

This table reports results from OLS estimation models that examine effect of female board representation on the gender differences in stock and option incentives. The sample period is between 1996 and 2010. All non-indicator variables are winsorized at the top and bottom one-percentiles. All models include firm and year fixed-effects. The *t*-values, reported in parentheses, are based on standard errors clustered at the executive level. The set of executive-level controls include: CEO_{ijt}, Non-CEO Corporate $Title_{ijt}$, Dividional Titles $Only_{ijt}$, $Tenure_{ijt}$, $Tenure^2_{ijt}$, Age_{it}, Age^2_{it},The set of firm-level controls include: $Ln(Sales)_{jt-1}$, Leverage $_{jt-1}$, ROA $_{jt-1}$, RET $_{jt-1}$, Firm Risk $_{jt-1}$, CAPEX $_{jt-1}$, RD $_{jt-1}$, MB_{t-1}. All variables are defined in the Appendix. The last column reports significance tests for the differences in the gender dummy coefficients across the two time windows (1993-2001) and (2002-2010). Coefficients in bold for the variables of interest indicates significance at p<.10 levels (two-tailed) or better. ***, **, * indicate whether the difference between the sub-periods is statistically significant at p<.01, p<0.5, p<.10 levels (two-tailed), respectively.

Appendix: Variable Definitions

Salary	= the salary executive *i* receives at firm *j* in year *t*
Short-Term Compensation	= the salary + annual bonus + cashed-in LTIPs executive *i* receives at firm *j* in year *t*
Total Flow Compensation	= Sum of the salary, bonus, cashed-in LTIPs, value of restricted stock, option grants and other compensation executive *i* receives at firm *j* in year *t*
Option Delta	= $ change in the executive *i*'s wealth for a 1% change in the stock price of firm *j* in year *t* (option grants only).
Option Vega	= $ change in the executive *i*'s wealth for a 1% change in the standard deviation of returns of firm *j* in year *t* (option grants only).
Portfolio Delta	= $ change in the executive *i*'s wealth for a 1% change in the stock price of firm *j* in year *t* (option + stock grants).
$Female_i$	= Indicator variable equal to one, if executive *i* is a female.
$Tenure_{ijt}$	= Executive *i*'s tenure at firm *j* in year *t* (Executive *i*'s tenure in a top-paid position at firm *j* in year *t* when the JOINED_CO field in Execucomp is missing).
CEO_{ijt}	= Indicator variable equal to one if executive *i*'s covers the "CEO" position at firm *j* in year *t.*
CFO_{ijt}	= Indicator variable equal to one if executive *i*'s covers the "CFO" position at firm *j* in year *t.*
COO_{ijt}	= Indicator variable equal to one if executive *i*'s covers the "COO" position at firm *j* in year *t.*
$Other\ Chief_{ijt}$	= Indicator variable equal to one if executive *i*'s covers another chief executive position (e.g., CAO, CMO) at firm *j* in year *t.*
$President_{ijt}$	= Indicator variable equal to one if executive *i*'s covers the "President" position at firm *j* in year *t.*
$Vice\text{-}President_{ijt}$	= Indicator variable equal to one if executive *i*'s covers the "Vice-President" position at firm *j* in year *t.*
$Chairman_{ijt}$	= Indicator variable equal to one if executive *i*'s covers the "Chairman" position at firm *j* in year *t.*
$Vice\text{-}Chairman_{ijt}$	= Indicator variable equal to one if executive *i*'s covers the "Vice-Chairman" position at firm *j* in year *t.*
$Divivional\ President_{ijt}$	= Indicator variable equal to one if executive *i*'s covers a "Divisional President" position at firm *j* in year *t.*
$Divisional\ Chairman_{ijt}$	= Indicator variable equal to one if executive *i*'s covers a "Divisional Chairman" position at firm *j* in year *t.*
$Diivisional\ Chief_{ijt}$	= Indicator variable equal to one if executive *i*'s covers a "Divisional Chief" position at firm *j* in year *t.*
$Any\ Corporate\ Title_{ijt}$	= Indicator variable equal to one if executive *i*'s covers at least one corporate role at firm *j* in year *t.*
$Non\text{-}CEO\ Corporate\ Titles_{ijt}$	= Indicator variable equal to one if executive *i*'s covers at least one non-CEO corporate role at firm *j* in year *t.*
$Divisional\ Titles\ Only_{ijt}$	= Indicator variable equal to one if executive *i*'s only covers divisional roles at firm *j* in year *t.*
$Other\ Titles\ Only_{ijt}$	= Indicator variable equal to one if executive *i*'s covers an "Other" position (e.g., treasurer, secretary) only at firm *j* in year *t.*
$\%\ Female\_Board_{it}$	= % female directors on the board at firm *j* in year *t.*
$\%\ Female\_Out\ Dir_{it}$	= % female outside directors on the board at firm *j* in year *t.*
$\%\ Female\_\ Comp\ Comm_{it}$	= % female directors in compensation committee.
$\%\ Female\_\ Gov\ Comm_{it}$	= % female directors in governance committee.

Appendix: Variable Definitions – cont'd

Firm Characteristics:

$Ln(Sales)_{it-1}$	= Natural log of sales (Compustat Data 'sale') for firm *j* in year *t-1*.
$Leverage_{it-1}$	= Long-Term + Current Liabilties / Assets (Compustat Data Items 'dltt + dlc'/ 'at') for firm *j* in year *t-1*.
ROA_{it-1}	= Return-on-assets (Compustat Data Item 18 / Compustat Data Item 6) for firm *j* in year *t-1*.
RET_{it-1}	= Buy and hold stock return for firm *j* over year t-1.
$Firm\ Risk_{jt-1}$	= Log(Variance of firm *j*'s daily stock returns over year t-1)
$CAPEX_{it-1}$	= Net Capital Expenditures / Assets (Compustat Data Items 'capx – sppe'/ 'at') for firm *j* in year *t-1*.
RD_{it-1}	= R&D Expenses / Assets (Compustat Data Items Max (0,'xrd') / 'at') for firm *j* in year *t-1*.
MB_{t-1}	= Market to book value of equity (Compustat Data Items 'at -lt + cscho * prcc_f' / 'at') for firm *j* in year *t-1*.
$YEAR_t$	= Year dummies.