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Are Shareholders Gender Neutral? Evidence from Say on Pay

Abstract

This study examines the relation between executive gender and shareholder voting (Say on Pay provision of the 2010 Dodd-Frank Act). Controlling for numerous factors including excess pay, firm performance and other firm characteristics, we find that gender is a determinant of shareholder voting behavior at the non-CEO executive level. We find that firms with non-CEO females receive a lower favorable vote than firms with an all-male non-CEO executive team, irrespective of the composition of pay. Our finding does not extend to the CEO level. Taken together our findings highlight a pay-varying and rank-contingent gender consideration in shareholding voting. Our results are robust to weighted sample and instrumental variable approaches.

Keywords: Gender; Say on Pay; Executive compensation; Shareholder voting.

JEL codes: G3; J33; M52.

'Say-on-pay has created a positive environment for dialogue between shareholders and the board about executive compensation. It's removed the difficulty of what to do if you don't like the way the board is handling compensation, but you don't want to use the extreme option of voting against directors. In companies that have adopted it, it's been proven to work very well.'[1]

'Stand by your woman: shareholders should demand more balanced boards'[2]

1. Introduction

Say on Pay (SoP) laws, introduced in January 2011 in the U.S., stands for the culmination of five years of political posturing in the U.S., with activist investors, including unions, supporting it and most corporations and their executives opposing it (White and Patrick (2007)). Even though the say-on-pay vote is officially non-binding, evidence suggests many parties; for example, politicians, corporations, and shareholder advocates, take the vote very seriously. Boards are adopting compensation packages that have a low probability of receiving a 'no' vote from shareholders, resulting in executive pay becoming more aligned with performance.[3]

Support for shareholders having a greater say on pay stems from the general argument that shareholders would be better off with enhanced control over corporate decisions. For example, Bebchuk (2005) argues that since shareholders have the 'correct' objective (value maximization), they can always opt to delegate the decision to management when they believe management will make a better decision. Thus, shareholders should have control over all major corporate decisions. Opponents to enabling shareholder power, however, argue that even if shareholders are fully informed,

[1] Kevin Thomas, director of shareholder engagement at the Shareholder Association for Research and Education (SHARE): http://calgaryherald.com/business/local-business/say-on-pay-votes-should-be-mandatory-advocates-say, 2017-07-15.
[2] *The Conversation* 21 October 2013 by Alice Klettner: https://theconversation.com/stand-by-your-woman-shareholders-should-demand-more-balanced-boards-18909.
[3] See, for example, Correa and Lel (2016) who find that countries adopting SoP laws have seen CEO pay for performance increase. Further examples include Conyon and Sadler (2010) and Cotter et al. (2013).

shareholders may want to use corporate resources to further a social, personal, or political, agenda at the expense of profits.[4] Further, Harris and Raviv (2010) show that shareholders can overestimate their ability to understand the issues, that is, shareholders may believe they have more information than they do, leading to bias. However, as Stout (2007) states, although the arguments are compelling on both sides, there is very little empirical evidence that increased shareholder control is beneficial to shareholders. Rather, he concludes that calls for greater shareholder control seem driven by sentiment and unspoken assumption that shareholder democracy must be good.

Since shareholders can now express approval or disapproval with compensation packages awarded to the firm's executive officers, their voting behavior can also reveal their preferences towards executive gender. If that is the case, do shareholders vote on the optimality of the pay packet irrespective of gender or do they exhibit a gender preference? To answer this question, we analyze shareholder voting data after the passage of SoP laws to investigate whether shareholders do have such a preference. In our paper, we do so by employing SoP which provides shareholders with a more direct say in how their executives are paid. Given there is no mechanism in financial markets to counter shareholder preference (for example, short-selling if a firm is overvalued), SoP votes are an ideal mechanism to test if shareholders do have a preference, while at the same time addressing the void that exists in the empirical literature highlighted by Stout (2007).

Recent research examining gender inequality mainly focuses on differences in the level of pay, but with conflicting results. Geiler and Renneboog (2015) and Bugeja et al. (2012) find that at the CEO level, female and male CEOs are equally rewarded. In contrast, Hill et al. (2015) find that female CEOs are, on average, paid 6 per cent more than male

[4] See, for example, Agrawal (2012), which provides evidence that some union pension funds vote differently in shareholder elections in firms that employ members of that union than they do in elections in firms that do not employ members.

CEOs. Further, Leslie et al. (2017) find that women '*who have the abilities needed to reach the upper echelons of organizations*' such as the status of CEO receive a pay premium with female executives in the S&P 1500 earning 110 per cent of what their male peers made. But at the executive level, females are paid less than male executives (Carter et al. (2017), Geiler and Renneboog (2015), Vieito and Khan (2012), Elkinawy and Stater (2011), Muñoz–Bullón (2010), Bell (2005) and Bertrand and Hallock (2001)), even though the gap appears to be narrowing (Geiler and Renneboog (2015) and Vieito and Khan (2012)). Overall, it appears that pay differences are still present but not necessarily uniformly across executive titles.

Given the significant political and social debate that gender inequality continues to generate,[5] we extend the investigation to an important but up until now relatively silent group, the shareholders. Since SoP is the only *direct* voting platform that occurs routinely offering shareholders an opportunity to provide feedback to a firm's (named) executives, we are provided with an opportunity to examine their preference. SoP laws signal a change in the direction of financial regulation for executive compensation and corporate governance. Prior literature mainly focuses on the relation between SoP votes and remuneration for CEOs (Ertimur et al. (2013), Balsam et al. (2016), Correa and Lel (2016) and Kimbro and Xu (2016)) as they are the most visible members of the executive team. We analyse all the named ('top five') executives reported in Execucomp because our focus is to determine if there are differences in SoP votes across executive positions. In addition, the Dodd-Frank Act stipulates that shareholders vote on the compensation packages of all 'named executives' collectively, not individually.[6]

[5] See http://fortune.com/2017/06/01/female-ceos-pay-gap/ as a recent example.
[6]See https://www.sec.gov/rules/final/2011/33-9178-secg.htm.

Earlier regulations mandated enhanced disclosure and independent boards of directors, (for example, Sarbanes-Oxley Act (SOX)).[7] In contrast, SoP laws allow shareholders a direct say on the compensation of the top five executives in the firm. Despite the continual interest in executive compensation with the popular press, government and academic research, little consensus has been achieved in the fundamental nature of the compensation setting process (Denis et al. (2017)). Thus, the introduction of SoP laws may be a further piece of the puzzle in understanding how executive compensation is viewed and determined.

The empowerment of shareholders by the SoP laws is shown to wield significant influence over firms. For example, Cuñat et al. (2016) show that adopting SoP leads to substantial increases in market value and long-term profitability, and Iliev and Vitanova (2015) document that a group of firms being exempted from SoP votes experience a negative market reaction. Kimbro and Xu (2016) report that '*shareholders effectively identify firms with excessive and abnormal levels of CEO pay and expressed their dissatisfaction through SOP*.' Further, practitioners have suggested that the SOP vote provides a mechanism for shareholders to provide communication to managers regarding their general level of satisfaction with managerial performance (Bew and Fields (2012), Burr (2012), and Chasan (2012)). Nevertheless, whether shareholder voting exhibits a preference towards female executives has thus far not been addressed in the literature and constitutes the aim of the current paper. Controlling for ISS recommendations, firm performance, optimal and excessive pay, governance variables, and other firm characteristics, we investigate how executive gender influences SoP votes. Our research represents a first step in examining whether shareholders consider gender when voting on the optimality of the pay package.

[7] See Bean (2004) for a discussion on the implications of SOX on executive compensation.

Using a large sample of the U.S. listed firms over the period 2011-2016, we find that female CEOs, on average, receive approximately $659,800 more pay than male CEOs, whereas female non-CEO executives, on average, receive $264,100 less pay than male non-CEO executives. Thus, it appears female CEOs are being paid a gender premium while female non-CEO executives are suffering a gender gap. Given the Dodd-Frank Act stipulates that shareholders vote on the compensation packages of all 'named executives' collectively, not individually we sum the top four paid non-CEO executives and calculate the sum of the pay slices of all female executives out of the top four paid non-CEO executives following Adhikari et al (2019). As the CEO is potentially the most visible executive and thus having the greatest influence on SoP voting outcomes, we control for CEO pay and CEO gender throughout. Motivated by Bebchuk, Cremers and Peyer (2011) the pay slice measures the power and influence of women in the top management team. We consistently find that firms having a female in the top four paid team are more likely to receive a lower SoP vote. The same cannot be said for CEOs, shareholders vote against higher CEO pay, consistent with the literature, irrespective of gender. Thus, providing shareholders with greater influence on compensation may have generated an unintended consequence.

Our results are robust to weighted sample design and instrumental variables approach as well as distinguishing optimal from excessive pay. We are the first to show that having '*the abilities needed to reach the upper echelons of organizations*' (Leslie et al. (2017)), highly paid female CEOs are no longer perceived by shareholders as being different from highly paid male CEOs. However, our results show that female non-CEO executives are less fortunate. Relative to firms hiring an all-male team, firms hiring female non-CEO executives are paid less on average and are more likely to receive a 'no' vote as her pay increases, even if considered optimal. We extend prior research by introducing

the voice of shareholders and in so doing shed light on the political and social debate on gender inequality for corporate executives. Specifically, our results indicate that it's not at the CEO level that females require political and social assistance but at the lower levels.

The remainder of this study is structured as follows: Section 2 discusses relevant prior literature; Section 3 describes the research method; Section 4 presents descriptive statistics and a discussion of the sample; Section 5 presents results, while Section 6 presents robustness checks. Section 7 concludes the study.

2. Related literature

The present paper contributes to the growing literature on SoP laws by identifying executive gender as a new and important determinant of shareholder SoP votes. It also adds to the literature on gender pay by investigating whether shareholder' voting behavior exhibits a gender preference, after controlling for executive pay (both optimal and excessive), firm performance, corporate governance, and other known factors that influence shareholder SoP votes. Shareholders can vote for a wide range of corporate issues, for example, choosing members of the board of directors, approving mergers and acquisitions, authorizing new equity issues, and amending the firm's articles of organization. Although certain benefits of strong shareholder voting rights appear apparent, some argue harmful side effects (Aghion and Tirole (1997), Burkart et al. (1997), and Karpoff and Rice (1989)). Shareholders lack specific information about the firm, and their voting decisions are likely to depart from superior choices that managers, with better information, might make on their own. Managers facing frequent shareholder votes might spend large amounts of time campaigning and pursuing short-term policies that cater to blocks of voters but compromise the firm's long-term interests.

A further push for shareholders to have a voice came with the corporate scandals and poor performance at major firms including Enron, WorldCom, and Fannie Mae, where

excessive executive pay, especially in poorly performing firms, was the subject of many shareholder protests.[8] SoP laws, through which shareholders have the right to vote on companies' executive remuneration has given a wider range of shareholders a direct route to express an opinion on executive pay. However, its introduction has increased the ongoing debate between efficient contracting (Hölmstrom (1979), Jensen and Murphy (1990)) which holds that extant compensation practices are the outcome of a competitive assignment of limited CEO talent among firms (Gabaix and Landier (2008), Edmans et al. (2009)), and managerial power theories which state that compensation practices represent rent extraction by entrenched CEOs, irrespective of gender (for example, Yermack (1997), Bertrand and Mullainathan (2001), Bebchuk and Fried (2004)).

According to the efficient contracting theory, gender pay differentials are optimal due to differences in gender attributes. The fact that only 8.0 per cent of executives in our sample dating 2006-2016 are female is inconsequential. Further, even though compensation contracts are incomplete, they nevertheless minimize the many contracting costs that shareholders and managers face in an asymmetric information market (Hölmstrom (1979), Edmans et al. (2009), Core and Guay (2010)). In this context, executive pay is optimally-determined with shareholders paying in accord with firm performance and not the gender of the executive, in other words, shareholders are gender neutral.

Managerial power theory (Bertrand and Mullainathan (2001), Bebchuk and Fried (2003)) states that gender pay differences do not reflect any performance relevant characteristic, but different degrees of managerial power between female and male

[8] Cumming et al. (2015) find that gender diversity leads to less corporate fraud. As such, providing shareholders with a voice may ensure a more gender-diverse board.

executives.[9] If executives can exercise significant bargaining strength over their boards and compensation committees leading to contracts that are not in the best interests of shareholders, then contracts are inappropriately designed and excessive executive pay may result (Bertrand and Mullainathan (2001) and Bebchuk and Fried (2004)). For example, Huang and Kisgen (2013) argue that if males are more confident than females, firms may grant more stock options to males, not to provide additional incentive, but to exploit the fact that incentive-intensive pay is cheaper when overconfidence is high.[10] Thus, shareholders are prepared to pay a premium for female executives. Empirically, gender attribute differences, such as risk aversion, can in part explain gender pay differences (Faccio et al. (2016)). However, efficient contracting fails to explain why, for example, female executives are more exposed to poor firm performance relative to males (Albanesi et al. (2015), Francis et al. (2013), and Kulich et al. (2011)).[11]

Empirically, SoP votes are shown to be influenced by excessive executive pay, firm performance and corporate governance (e.g., Collins et al. (2017), Conyon (2015), Gerner-Beuerle and Kirchmaier (2016), Schwartz-Ziv and Wermers (2016)). For example, Brunarski et al. (2016), provide evidence that directors of firms with low SoP support experience reductions in external directorships, compensation committee

[9] For example, Albanesi et al. (2015) find that female top executives are less likely to be entrenched due to their younger age and their relative difficulties in assessing informal networks.
[10] Kumar (2010) investigates the role of gender in the analyst industry. Female equity analysts are unlikely to be representative of the female population that is known to exhibit higher risk aversion and lower levels of competitiveness. As such, they are more likely to represent a special group of competitive women who choose to pursue a career in the male-dominated financial services industry. Due to a self-selection process, only women with above average abilities would choose the analyst profession and, consequently, on average, female analysts are likely to be more skilful than male analysts.
[11] Specifically, Albanesi et al. (2015) find that (i) a $1 million dollar increase in firm value generates a $17,150 increase in firm specific wealth for male executives and a $1,670 increase for females, and (ii) a 1% increase in firm value generates a 13% rise in firm specific wealth for female executives, and a 44% rise for male executives, while a 1% decline in firm value generates a 63% decline in firm specific wealth for female executives and only a 33% decline for male executives.

positions, and director compensation. Several studies provide evidence of changes in compensation following the adoption of SoP laws. Ferri and Maber (2013) find that their sample firms respond by removing overly generous severance contracts and by increasing pay-for-performance sensitivity. Correa and Lel (2016) use data from 39 countries and find that the introduction of SoP laws is followed by declines in compensation levels, higher pay-for-performance sensitivity, and falls in the share of total top management pay awarded to CEOs. These changes are concentrated in firms with high excess pay, long CEO tenure, and less independent boards.[12] Ertimur et al. (2013) examine firms for which proxy advisors recommend a negative SoP vote and find that the majority of such firms undertake compensation changes following the vote, again moving towards more performance-based pay.

The common thread in the empirical literature seems to be a move towards more performance-based pay after SoP laws came into effect. Thus, given the evidence finding female executive pay is less sensitive to firm performance (Albanesi et al. (2015), Francis et al. (2013), and Kulich et al. (2011)), have SoP laws levelled the playing field? Kulich et al. (2011) argue that pay-for-performance is stronger when the CEO has a 'perceived' greater impact on performance. That is, if compensation committees are susceptible to certain attributional biases, women are rewarded with less performance-sensitive pay. These attributional biases refer to the stereotypical associations of good leadership with masculine qualities such as influence and competence which may mean that perceptions of a male leader's impact on firm performance are more favorable than for females (Lee and James (2007)).[13] If shareholders' have a similar view, then shareholders' tendency to

[12] Their findings need to be interpreted with caution as not all countries have similar laws and institutional environments.

[13] Bordalo et al. (2016) present a model, showing that when decision makers assess a target group by overweighting its representative types, stereotypes arise and cause belief distortion.

vote favorably for executive pay may still be influenced by executive gender, even after controlling for other known determinants of SoP votes including excessive pay. On the other hand, if shareholders' perception of female executive abilities is unbiased, then shareholders' voting behavior would reflect firm performance and not on executive gender, that is, shareholders are gender-neutral. Since neither theory nor current empirical evidence helps us derive a formal prediction, we treat the association between shareholders and executive gender as an empirical issue and aim to provide the most rigorous evidence to date on this matter.

3. Research method

Our main analysis is performed employing the following model:

$$ln(FOR\_RATIO) = \beta_0 + \beta_1 NON\ CEO\ GENDER\ PAY\ SLICE + \beta_2 CEO[ln(TOTAL\_PAY)] + \beta_3\ FEMALE\ CEO + \beta_4\ FEMALE\ CEO \times CEO[ln(TOTAL\_PAY)] + \sum \beta_J\ CONTROLS + \epsilon_I \quad (1)$$

where NON CEO GENDER PAY SLICE[14] is the sum of all non-CEO females' pay slice, defined as the sum of the total compensation (Execucomp item TDC1) of all female non CEO females scaled by the total compensation of the top 4 paid executives. CEO ln(TOTAL_PAY) is the log transformation of CEO pay (Execucomp item TDC1), adjusted for inflation, FEMALE CEO equals one if the CEO is female, zero if male. We also include the interaction term. All variables are defined in the Appendix. Where appropriate, we also include firm, industry and year fixed effects to the models. We cluster standard errors by firm.

[14] Execucomp sometimes reports more or less executives by firm year. To ensure consistency we sum the total compensation of the top four paid named non-CEO executives and exclude any observations with less than four non-CEO executives. There are two observations of the latter.

3.1. Dependent variable

Following previous literature (Collins et al. (2017)), we measure favorable voting proportion as the ratio of favorable votes to the vote's base (specified by the firm, typically 'for' plus 'against,' or 'for' plus 'against' plus 'abstain'). We log-transform the proportion of favorable votes (FOR_RATIO) to improve the normality of the distribution of the error term, a consequence of the left skew of voting outcomes. Company shareholders vote at the annual meeting on the compensation package awarded during the most recent completed fiscal year. For simplicity, we consider the date of the fiscal year-end and the annual meeting immediately following to be year $t = 0$. Although the meeting technically occurs during fiscal year $t = 1$, voting relates only to executive compensation during fiscal year $t = 0$.

Following Brunarski et al. (2015) and Brunarski et al. (2016), we also define a 'for' vote as an indicator variable (FOR_RATIO_D) equal to one if the firm receives more than 70 per cent 'for' votes, and zero otherwise. The 70 per cent threshold represents a natural break-point because firms receiving less than 70 per cent support are added to watch lists at both Institutional Shareholder Services (ISS) and Glass Lewis, creating added attention. In addition, both the popular and academic press suggest that the 70 per cent threshold of shareholder approval is viewed as critical by directors, investors, and other market participants such as compensation consultants.[15]

[15] For example, Schwartz-Ziv and Wermers (2016) suggest that, according to ISS, shareholder support under 70% is 'viewed quite unfavourably by a typical company's management' and the *Wall Street Journal* notes, 'at annual meetings, 70 is the new 50'. See for example. https://blogs.wsj.com/cfo/2012/02/21/say-on-pay-changes-ways/ and https://www.bloomberg.com/graphics/2015-executive-pay-peer-groups/.

3.2. Control variables

Firm characteristics

We control for firm size as the log transformation of total assets, ln(AT), as shareholders appear to dissent at smaller firms more frequently than at larger firms (Ertimur et al. (2013)). We expect a correlation between voting behavior and profitability, as shareholders are more likely to approve of compensation packages during times of strong financial performance. Therefore, we control for profitability, where profitability is measured as operating income scaled by total assets (ROA). Similarly, we expect a correlation between voting behavior and actual stock return over the period. Therefore, we control for stock return over the twelve months prior to the vote (RET) (Kimbro and Xu (2016)). Following existing literature, we also include a proxy for growth opportunities (MB), leverage (DEBT/AT), and stock return volatility (VOL). All firm characteristics are measured in the year prior to the SoP vote.

Corporate governance characteristics

We control for institutional ownership (INST_OWN), using the Thompson Reuters Institutional (13f) Holdings Stock Ownership Summary and insider ownership (INS_OWN) measured as the ownership by firm's executives (sourced from Execucomp). We include executive age (AGE) and board independence (BOARD_INDEP). Following the literature to control for a powerful CEO, we include a dummy variable equal to 1 if the CEO is also the chairperson of the board, 0 otherwise (CEO-CHAIR). We also control for the percentage of female directors on the board (FEMALE_BOARD) given previous research shows that the number of males on the board is negatively related to the employment of female executives (Bugeja et al. (2012)). All governance variables are measured in the year prior to the SoP vote.

4. Sample, data and descriptive statistics

We obtain data on SoP votes from the ISS Voting Analytics. This data contains information about the dates when firms hold SoP and frequency votes, voting outcomes, ISS's voting recommendation and management recommendations. We merge this data with executive compensation data from Execucomp, firm financial data from Compustat and stock returns from CRSP. We obtain additional director information such as executive title from ISS. As is common in the literature, we exclude financial firms (with Standard Industrial Classification (SIC) codes 6000-6999) and public utility firms (with SIC codes 4900-4999). We also eliminate firm-year observations with missing or negative values for total assets (Compustat item AT), share price (Compustat item PRCC_F), and the number of shares outstanding (Compustat item CSHO). We retain those firm-year observations with non-missing values for all other variables used in the analysis. Finally, we restrict our sample to firms incorporated in the U.S. Our final sample contains at a maximum 8.044 firm-year observations for the period 2011-2016.

Table 1 reports voting data by gender and shows that among the 8,044 firm year observations, 5,339 have no females in the top 5 paid board members (includes the CEO), with only one firm having all are females. Amongst the CEO observations, 7,734 are male while 310 are female. Although some firms voluntarily conducted shareholder votes on their compensation packages, the bulk of the voting data begins after 2010. Dodd-Frank Act gave shareholders a mandatory, but advisory, vote on executive compensation. Table 1 also shows that shareholders generally endorse executive compensation plans. Given that shareholders vote on the compensation package of top five executives as one package, average FOR RATIO percentage votes are shown for both CEOs and non-CEOs. Shareholder opposition to executive pay is generally low but Table 1 also shows that in

general, FOR RATIOs are higher when the number of females is equal to zero. The same difference is not present at the CEO level.

[Insert Table 1 here]

Summary statistics are reported in Table 2. We report firm, CEO and non CEO characteristics. All our figures are similar to previous literature.

[Insert Table 2 here]

5. Multivariate tests of gender influence on SoP votes

We begin our main analysis by exploring the association between shareholder voting and gender while controlling for firm fundamentals and CEO status given the latter is most visible and therefore more likely to influence shareholder voting behavior. We employ Equation (1) described in Section 3, with the results reported in Table 3. We apply either industry (Column (1) or firm (Column (2)) fixed effects and year dummies and cluster standard errors by firm. We find that there is a strong negative association between ln*(*FOR_RATIO) and NON CEO GENDER PAY SLICE in both estimations, implying in the early stages that shareholders may have an issue with gender at the non CEO level. Consistent with previous literature (e.g., Correa and Lel (2016)), we report a significant negative association between ln*(*FOR_RATIO) and (CEO ln(TOTAL PAY)) in all our estimations, but not in relation to the gender of the CEO (FEMALE CEO). As expected ln(FOR RATIO) is strongly associated with ISS recommendations.

[Insert Table 3 here]

To assess the economic significance of our results, we consider observations with a FOR_RATIO around the 70 per cent threshold to determine what effect the presence of a female non-CEO executive would have on FOR_RATIO. Employing estimation 1 in

Table 3, we compute the hypothetical FOR_RATIO if firms did or did not have a female non-CEO executive. First, we examine firms with at least one female non-CEO executive and being in the range of 0.65≤FOR_RATIO≤0.7, of which there are 28 such firms. We then predict their FOR_RATIO assuming no female non-CEO executive. We find that 9 firms or 32 per cent would have a FOR_RATIO greater than 70 per cent. In other words, these firms would be better off with a male non-CEO executive. Next, we consider firms with no female non-CEO executive and being in the range of 0.7<FOR_RATIO≤0.75. We retain 104 such firms in our sample. We again predict their FOR_RATIO assuming a female non-CEO executive instead of a male non-CEO executive. We find that 43 firms or 41 per cent would fall below the 70 per cent threshold. This suggests that 41 per cent of firms would be worse off if they hired a female non-CEO executive instead. Though the sample sizes in these tests are small, the results are economically significant and reveal that the presence of female non-CEO executive is an important determinant for a firm to be added to the watch lists of ISS and Glass Lewis.

5.1 Entropy balancing[16]

Our baseline results in the previous section are subject to two concerns. First, there is a large disparity in numbers of male and female executive firm years, and second, prior literature has found that females have different characteristics to males.[17] To address these issues, we conduct our main analysis employing a weighted sample derived by entropy balancing (EB). We employ EB rather than propensity score matching (PSM)[18] given the concern raised by Shipman et al. (2016) that 'seemingly innocuous design

[16] Please see Hainmueller (2012) and Hainmueller and Xu (2013) for a thorough explanation on entropy balancing.
[17] For example, relative to males, Huang and Kisgen (2013) find females are less confident while Faccio et al. (2016) find females are more risk averse.
[18] Nonetheless, for robustness, we also perform PSM (see Section 5.3 (Robustness)).

choices greatly influence sample composition and estimates' of PSM treatment effects. Rather than assigning a weight of either one (matched) or zero (excluded) to each control observation based on the propensity score, EB solves a constrained optimization to identify *continuous* weights for the control sample while keeping weights as close as possible to equally-weighted. EB offers several benefits. First, focusing almost solely on setting a tolerance for convergence of the algorithm, EB permits less researcher discretion than PSM overcoming Shipman's et al. (2016) concern. Second, EB's use of continuous weights ensures that higher order moments (e.g., variance and skewness) of covariate distributions are similar across treated and control samples resulting in near perfect covariate balance, while PSM does not. Third, EB preserves statistical power and generalizability because all control firms, and not simply a subset, remain in the sample. Finally, EB should reduce idiosyncratic noise by assigning continuous weights to all control observations, rather than integer weights to observations matched via PSM.

Specifically, EB calculates weights for every control observation such that their first, second, and third moments equal those of the treated observations and effectively compares firms with at least one female executive (FEM $\geq$1 = 1) to firms with all male executives (FEM $\geq$1 = 0) weighted to have similar covariates. We balance FEM $\geq$1 = 1 (Treated) and FEM $\geq$1 = 0 (Control) on the mean, variance and skewness of all control variables employed in Table 3. We also include the percentage of females on the board (FEMALE_BOARD) given previous research shows that the number of males on the board is negatively related to the employment of female executives (Bugeja et al. (2012)).

Our results are reported in Table 4. Panel A reports the distribution of the control variables after EB, and shows that none of the standardized differences and variance ratios is outside of the vertical bands following the guidance in Rubin (2001) and Austin (2011). The weighted OLS regression reported in Panel B reports results that are virtually the

same as those of Table 3. Once we control for numerous factors suggested by the literature that affect gender, we find that although shareholders do not support higher pay, they are neutral to the gender of the CEO (the interaction term FEMALE CEO × CEO ln(TOTAL PAY) is insignificant), but not so for non CEO females. The association between ln(FOR RATIO) and NON CEO GENDER PAY SLICE continues to be significantly negative. Thus, even after controlling for a number of factors that the literature has suggested determine gender, our result of gender bias is robust to a weighted sample design.

[Insert Table 4 here]

5.1.2. Components of pay employing weighted EB sample

The literature on SoP has found that shareholders are more inclined to vote 'yes' if pay is more performance-based.[19] Thus, we substitute NON CEO GENDER PAY SLICE with DELTA_PAY_SLICE, VEGA_PAY_SLICE, EQ_PAY_SLICE and CASH_PAY_SLICE to determine whether the dissent vote for female non-CEO executives receiving high pay is due to a change in performance-based pay. We calculate all four pay slices in a similar manner to non CEO gender pay slice. The results are reported in Table 5. Taken together, the results show that female non-CEO executives receive lower votes irrespective of the form of pay. Consistent with Table 3, our results show that female non-CEO executives are more likely to receive lower SoP votes, but not so female CEOs, even when controlling for components of pay.

[Insert Table 5 here]

Another possibility is that given many firms disclose three years data in the summary of compensation table in the proxy statement, shareholders' vote may be

[19] See for example, Correa and Lel (2016), Conyon and Sadler (2010), and Cotter et al. (2013).

influenced by pay from prior years. To determine if this is the case, we perform two tests. First, following Ertimur et al. (2013), we include growth in total pay which is the percentage change in executive total pay (obtained from Execucomp) and second, we lag non-CEO gender pay slice for one and two periods to capture the three years data disclosed in the proxy statement. We then rerun the estimations of Table 3 controlling for first, growth in non-CEO executive pay and second, lagged non-CEO gender pay slice. In both cases, we find that it is the most recent year that shareholders are likely to vote against.[20] Thus, it appears that unfavorable votes against female non-CEO executives are not influenced by compensation received in prior years but is directed at the most current compensation package.[21]

5.1.3. Presence of compensation consultant employing weighted EB sample

Murphy and Sandino (2017) find that firms with compensation consultants have higher-paid CEOs and under certain conditions, SoP votes are more favorable for firms using compensation consultants. Thus, it is possible that highly paid female non-CEO executives are being discriminated against because the firm has not employed a compensation consultant. In other words, the compensation consultant can either compose a better contract for executives from the shareholders' perspective or certify that executive compensation is not excessive. To test this, we partition our EB weighted sample into firms employing a compensation consultant and those not. We employ our EB weighted

[20] For brevity, we do not report the results; however, they are available on request.

[21] A further possibility is that shareholders are showing dissent not so much for female non-CEO executives but for the lack of tournament compensation for females. To ensure this is not the case we regress CEO pay slice computed as in Bebchuk et al. (2011) on gender and employ all the controls in Table 3. We find no relation between the presence of a female non-CEO executive and CEO pay slice. This implies that gender does not seem to play a role in tournament compensation and thus we may rule out this possibility. We thank an anonymous referee for raising this point.

sample to address covariate imbalance, (that is, differences in observables on one or more distributional moments). We then re-run the same models as in Table 3. The results, reported in Table 6 show that irrespective of whether a compensation consultant is hired or not, shareholders continue to vote less favorably when non-CEOs are female but not so when the CEO is female. Thus, the results in Table 6 suggest that gender aversion in SoP votes is robust to the presence of compensation consultants.

[Insert Table 6 here]

5.1.4. Female executive dominated industries employing weighted EB sample

A further explanation for shareholder dissatisfaction with female non-CEO executives could be due to such females being in industries where there are numerous qualified females and hence the need to pay more is less justified. This is in contrast to female non-CEO executives being in industries where qualified females are scarce and are likely to merit higher compensation.[22] Our results could be due to an abundance of the former rather than the latter. To ensure our results are robust, we partition the weighted sample by above- and below-median female executive dominance in industries. Specifically, for a firm *i*'s executives, it is the ratio of female executives to all executives working in a given year in the same 4-digit SIC code industry, excluding the firm (IND_FEMALE_RATIO). We then code ABOVE-MEDIAN IND_FEMALE_RATIO equal to one and zero if below-median. We then re-estimate the models of Table 3 on the two subsamples. The results, reported in Table 7 show that irrespective of whether the female non-CEO executive is in a female dominated industry or not, shareholders show dissatisfaction with NON CEO GENDER PAY SLICE being significantly negative.

[22] We would like to thank an anonymous referee for this possibility.

[Insert Table 7 here]

It is also possible that the shareholder dissatisfaction we find is due to females having a particular title (for example, shareholders may accept females having the role of Chief Financial Officer (CFO) but not Vice President) or if females are ranked second after the CEO with respect to pay, irrespective of executive title. To check for this, we run the same models as in Table 3, controlling for executive title (namely, CFO, COO, Other Chief, President, Vice President, Chairman and Vice Chairman) and by pay rank.[23] In all cases, the results (not reported for brevity) show that executive tile and pay rank is not a determinant of how shareholders vote. Female non-CEO executives, in general, are shown to receive less favorable votes from shareholders.

5.1.5 Firm performance, size and educational background employing weighted EB sample

Prior literature has found that SoP votes are highly dependent on firm performance,[24] thus the possibility exists that shareholders are voting 'no' because firms with females exhibit lower performance than firms with males. Similarly, the possibility exists that shareholders are voting 'no' because relative to males, females are working in larger firms where pay is generally higher. To ensure our results are robust to both these explanations, we include an interaction term for firm performance (measured as ROA and RET) and size (measured as ln(AT)) with firms employing at least one female (FEM $\geq$ 1 (=1)). We re-estimate models from Table 3 including the interaction terms. The results are reported in Table 8. In all cases, our main variable NON CEO GENDER PAY SLICE

[23] Given we have the top 5 paid executives for each firm-year, there are 5 pay ranks in each firm-year observation with CEOs, in most cases, ranked number 1, that is, the most highly paid.
[24] See Cuñat et al. (2016) as an example.

continues to be significantly negative. Thus, shareholders are more likely to vote against highly-paid female non-CEO executives, irrespective of firm performance and firm size.[25]

[Insert Table 8 here]

A possible alternative explanation for our result could be due to differences in qualifications between female and male non-CEO executives. If females have less qualifications than males but are nonetheless employed because of their gender, then a lower Sop vote is justified. In an attempt to mitigate this concern, we perform additional analysis on a sub-sample of CFOs. We choose CFOs as the applicants should have a finance qualification and/or have an accounting background, thereby reducing differences in job skills. We obtain the following data from Thomson Reuters Eikon for a subsample of CFOs: whether the CFO attended an Ivey League University (IVEY_LEAGUE (=1)), how many degrees the individual has (TOTAL_QUAL.), whether the CFO has a Masters or greater qualification (QUAL≥MASTERS (=1)) and whether the CFO has an accounting qualification (ACC_QUAL (=1)).

We were able to collect data for 4,372 CFO-year observations of which 457 observations are identified as female. Prior to re-estimating the models of Table 3, we again perform EB to ensure covariate balance. We employ the same control variables as in Table 4, Panel A on the sub-sample of CFOs. We then run our main model on the weighted sample including the four variables on the CFOs qualifications. The results are reported in Table 9. Our results continue to support that highly paid female non-CEO executives are more likely to receive a lower vote even after controlling for executives' qualifications. All four qualification variables are insignificant.

[25] As another test, we bifurcate the sample into above- and below-median industry-adjusted ROA. We rerun the same models of Table 3. The results, not reported, are consistent with our main results.

[Insert Table 9 here]

6. Robustness checks

6.1 Optimal versus excess pay

Existing literature has found that SoP votes are lower when pay is excessive (Collins et al, 2017). To argue gender aversion we need to show that SoP votes are lower even when females are being paid optimally. A firm paying their executives excessively is expected to receive a lower vote, irrespective of gender, but not if the pay is justified. To check for this, we follow Core et al. (2008) and Brunarski et al. (2015) and measure excess pay as actual pay less expected or optimal pay. Following prior research[26], our benchmark model for expected pay is determined by regressing the natural logarithm of pay on proxies for economic determinants of executive pay, such as firm size, growth opportunities, stock return, accounting return, year dummies, and industry fixed effects using the 48-industry classification scheme of Fama and French (1997). Specifically, we estimate the following OLS regression models separately for all CEOs and non-CEO executive observations:

$$ln(\text{TOTAL\_PAY})_t = \beta_0 + \beta_1 ln(1 + CEO\ TENURE)_t + \beta_2 S\&P500\_RET_{t-1} + \beta_3 ln(SALES)_{t-1} + \beta_4 MB_{t-1} + \beta_5 ROA_t + \beta_6 ROA_{t-1} + \beta_7 RET_t + \beta_8 RET_{t-1} + \beta_9 ln(AGE)_{t-1} + \epsilon_t \quad (2)$$

Due to data unavailability, ln(1 + CEO TENURE) is included for CEOs but not for other executives. All variables are defined in the Appendix. We define *t* as the year compensation is paid. The regression residual measures the amount of the natural log of total pay in excess of that justified by firm characteristics and performance. The results of

[26] For example, Smith and Watts (1992), Core et al. (1999), and Murphy (1999).

the two regressions are presented in Table 10. Our results are fairly consistent with previous findings.

[Insert Table 10 here]

We next substitute NON CEO GENDER PAY SLICE with a dummy variable for the presence of a female (FEM ≥1) in the top four paid non-CEO executives and the sum of PRED[ln(TOTAL PAY)] and RES[ln(TOTAL PAY)] for the same top four paid non-CEO executives, respectively. We do the same for CEOs. The results, reported in Table 11 show that irrespective of CEO status, gender and controls from Table 3, shareholders are unlikely to favor the executive being paid excessively with both CEO RES[ln(TOTAL PAY)] and NON CEO RES[ln(TOTAL PAY)] being negative in all four estimations. But gender and CEO status are viewed differently by shareholders when comparing optimal pay. For non-CEOs, females tend to be voted against (FEM ≥1 × NON CEO PRED[ln(TOTAL PAY)] is negatively signed) while FEMALE CEO × CEO PRED[ln(TOTAL PAY)]) is insignificantly signed. Thus, our findings continue to show that firms hiring at least one female at the non-CEO level, and irrespective of whether it pays them optimally or not, shareholders are less likely to vote favorably.

[Insert Table 11 here]

6.2 Self-selection: Treatment effect model

Despite conducting a battery of tests there is still a possibility that alternate explanations of an unobserved change in discriminatory orientation of the firm still exist. For example, firms could seek out females if they believe females are more risk-averse which is consistent with prior literature (e.g., Faccio, Marchica and Mura, 2016). Shareholders may be voting in a manner that reflects the policy of lower risk-taking

rather than gender per se. The lack of a strong exogenous shock to female executive positions makes it impossible to establish that gender *per se* is causing the lower SoP vote. To rule this and alternate explanations, we conduct one additional set of tests using an instrumental variable approach. Following Adhikari et al (2019) we employ a self-selection via treatment effects model. To improve identification, our selection model includes an instrumental variable for the presence of female executives in the top four paid executives. To construct our instrument, we follow previous studies (see, e.g., Adams and Ferreira (2009), and Faccio, Marchica and Mura (2016)) and calculate the fraction of male directors on a firm's board who are on the boards of other firms that have females among their top four paid non-CEO executives (MALE EXEC. w/FEMALE EXEC LINK). The rationale behind this instrument is that male directors are likely more comfortable hiring women in top positions if they have experience working with women in senior executive positions in other firms on whose boards they serve. But given we are concerned with how non-CEO females are paid, we go one step further. We not only calculate MALE EXEC. w/FEMALE EXEC LINK but we then subdivide the sample into male executives having exposure to females who are over-MALE EXEC. w/OVER-PAID FEMALE EXEC LINK and for completeness, under-paid MALE EXEC. w/UNDER-PAID FEMALE EXEC LINK in these other firms. The expectation being that non-CEO females are more likely to be overpaid if their male counterparts have exposure to over-paid females in other firms. The results are reported in Table 12. In the first stage (selection) models the IV for over-paid, but not under-paid, females predicts positively non-CEO gender pay slice. But importantly is plausibly exogenous on how shareholders vote. The second stage model shows that non-CEO gender pay slice continues to be negative and significantly predicts a lower SoP vote only for the over-paid IV, as expected. Thus, our results suggest that our findings of a

negative relation between non-CEO gender pay slice and SoP voting behavior is not entirely driven by other policies.

[Insert Table 12 here]

7. Conclusion

In this study, we examine whether executive gender affects shareholder voting outcomes on SoP votes, as mandated by the Dodd-Frank Act. While most firms each year receive high shareholder support on their SoP advisory proposals, we find that relative to non-CEO male executives, firms hiring females at the non-CEO level are associated with less favorable voting outcomes. We obtain this result after controlling for firm performance, total and excessive pay and other firm and governance variables. Further, the less favorable voting outcome is realized even when the increase is due to performance-based pay. On the other hand, pay does not seem to be a determinant for females at the CEO level. Taken together, our findings suggest that gender affects shareholder voting but not at the '*upper echelons of organizations*'. One potential policy implication is that providing shareholders with greater influence of executive pay may have an unintended consequence, in that, SoP may in fact have the potential to exacerbate gender pay-disparities, at least at the non-CEO level.

Appendix

All control variables are measured prior to the SoP vote.

Variable	Definition
CEOs and Non-CEO executives	
CEO	CEO (Execucomp item CEO_ANN)
NON-CEO EXECUTIVE	Other named executives identified in Execucomp
TOTAL_PAY	Total compensation (Salary + Bonus + Other Annual + Restricted Stock Grants + LTIP Payouts + All Other + Value of Option Grants) (Execucomp item TDC1) adjusted for inflation using GDP deflator (in 1,000s of 2009 USD[27]) (measured at the executive level)
EQ/PAY	Fair value of options granted (Execucomp item OPTION_AWARDS_FV) and fair value of stock awarded (ExecuComp item STOCK_AWARDS_FV) over total compensation (measured at the executive level)
CASH/PAY	Salary (ExecuComp item SALARY), bonus (ExecuComp item BONUS), and non-equity incentives (Execucomp item NONEQ_INCENT) over total compensation (measured at the executive level)
AGE	Executive age (measured at the executive level)
CEO TENURE	CEO tenure (in years measured at the CEO level)
FEMALE	Equal to one if executive (including CEO) is female, otherwise zero (measured at the executive level)
IND_FEMALE_RATIO	For a firm *i*'s executives, it is a ratio of female executives to all executives working in a given year in the same 4-digit SIC code industry, excluding the firm *i* (measured at the firm level)
PREDICTED_FEMALE	Predicted value of FEMALE for the second stage of the 2SLS model (measured at the executive level)
IVEY_LEAGUE	Equal to one if the CFO attended an Ivey League University, zero otherwise.
TOTAL_QUAL.	The number of qualifications obtained by the CFO.
QUAL≥MASTERS	Equal to one if the CFO has a Masters degree or higher, zero otherwise.
ACC_QUAL.	Equal to one if the CFO has an accounting qualification, zero otherwise.
Firm characteristics	
ln(AT)	Natural logarithm of book value of assets (Compustat item AT)
ln(SALE)	Natural logarithm of sales (Compustat item SALE)
MB	Market value of assets (book value of assets – book value of equity (Compustat item CEQ) + market

[27] GDP deflator has been calculated using GDP chain-type price index (source: US Bureau of Economic Analysis; series ID: GDPCTPI).

	value of equity (common shares outstanding (Compustat item CSHO) × closing share price at the end of the fiscal year (Compustat item PRCC_F)) – deferred taxes (COMPUSTAT item TXDB)) over book value of assets
ROA	Net income (COMPUSTAT item NI) over book value of assets
RET	Stock return over the last fiscal year ((COMPUSTAT item PRCC_F/ COMPUSTAT item AJEX + COMPUSTAT item DVPSX_F/ COMPUSTAT item AJEX)/(lag(COMPUSTAT item PRCC_F)/lag(COMPUSTAT item AJEX))-1)
DEBT/AT	Long-term debt (Compustat item DLTT) + debt in current liabilities (Compustat item DLC) over assets
VOL	The annualized standard deviation of the past one year's monthly stock returns
S&P500_RET	The annual return on S&P 500 Index
Governance variables	
CEO-CHAIR	Equal to one if CEO is also the chair of the board, otherwise zero
FEMALE_BOARD	The percentage of female directors on the board
BOARD_INDEP	The number of independent directors (ISS item CLASSIFICATION = "I") divided by the board size
INST_OWN	Institutional ownership (sourced from Thompson Reuters)
INSID_OWN	Insider ownership, measured as the ownership by firm's executives (sourced from Execucomp)
ISS_REC	Equal to one if ISS recommendation is 'For', otherwise 0
ln(FOR_RATIO)	Natural logarithm of 1 + the number of 'for' votes (ISS item VOTEDFOR) over base
FOR_RATIO_D	Equal to one if FOR_RATIO is greater or equal to 0.7, otherwise 0
ln(IND_FOR_RATIO)	For a firm *i*, it is a natural logarithm of average FOR_RATIO in a given year in the same 2-digit SIC code industry, excluding the firm *i*
COMP_CONS	Equal to one if a firm hires a compensation consultant, otherwise zero

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Table 1 Distribution of female CEOs and executives

Number of non-CEO females	Frequency	Mean FOR RATIO
0	5,339	0.910
1	2,114	0.826
2	467	0.803
3	97	0.810
4	26	0.839
5	1	0.857
Female CEOs		
0	7,734	0.881
1	310	0.861

Table 2 Summary statistics

This table reports firm characteristics and pay characteristics by CEO and non-CEO executives. Executive refers to the top 4 paid officers (excluding the CEO) as given by Execucomp. All variables are defined in the Appendix.

	Mean	Std.	P25	Median	P75
Firm characteristics					
ln(FOR RATIO)	0.629	0.075	0.613	0.654	0.679
ISS_REC_D (=1)	0.915	0.278	1.00	1.00	1.00
ln(AT)	7.779	1.603	6.633	7.670	8.814
MB	1.982	1.145	1.232	1.637	2.312
ROA	0.046	0.099	0.021	0.054	0.090
RET	0.165	0.410	-0.070	0.129	0.342
DEBT/AT	0.239	0.196	0.075	0.221	0.350
VOL	0.334	0.172	0.218	0.296	0.407
FEMALE_BOARD	0.153	0.133	0.091	0.143	0.222
BOARD_INDEP	0.801	0.105	0.750	0.833	0.889
INST_OWN	0.666	0.276	0.595	0.739	0.848
INSID_OWN	0.026	0.054	0.003	0.007	0.020
CEO characteristics					
CEO-CHAIR	0.453	0.498	0.000	0.000	1.000
ln(TENURE)	2.09	0.65	1.59	2.08	2.55
ln(AGE)	4.02	0.13	3.95	4.03	4.11
ln(TOTAL PAY)	8.33	0.89	7.76	8.43	8.97
VEGA/PAY	0.020	0.023	0.002	0.013	0.028
DELTA/PAY	0.107	0.192	0.022	0.046	0.096
EQ/PAY	0.511	0.239	0.392	0.559	0.684
CASH/PAY	0.417	0.226	0.260	0.379	0.527
Non-CEO executive characteristics					
ln(AGE)	3.95	0.13	3.87	3.95	4.04
NON CEO GENDER PAY SLICE	0.029	0.071	0.000	0.000	0.059
ln(TOTAL PAY)	7.30	0.85	6.72	7.27	7.85
VEGA/PAY	0.013	0..017	0.001	0.008	0.019
DELTA/PAY	0.043	0.085	0.010	0.023	0.046
EQ/PAY	0.439	0.221	0.305	0.454	0.596
CASH/PAY	0.470	0.214	0.320	0.462	0.602

Table 3 Determinants of ln(FOR_RATIO)

This table presents our baseline results from OLS regressions where the dependent variable is ln(FOR_RATIO). All variables are defined in the Appendix. t-statistics based on standard errors robust to clustering by firm are reported in brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: ln(FOR RATIO)	
	(1)	(2)
NON CEO GENDER PAY SLICE	-0.225***	-0.170***
	[8.03]	[6.21]
CEO ln(TOTAL PAY)	-0.013***	-0.010***
	[6.83]	[4.29]
FEMALE CEO (=1)	0.051	0.025
	[1.11]	[0.30]
FEMALE CEO × CEO ln(TOTAL PAY)	-0.005	-0.001
	[1.01]	[0.06]
ISS_REC (=1)	0.165***	0.151***
	[31.31]	[29.29]
ln(AT)	0.002*	-0.010**
	[1.92]	[2.40]
MB	0.003***	0.002
	[2.87]	[1.23]
ROA	0.059***	0.043***
	[4.65]	[3.50]
RET	0.005**	0.005**
	[2.28]	[1.99]
DEBT/AT	0.005	0.006
	[0.87]	[0.58]
VOL	-0.029***	-0.030***
	[3.64]	[3.16]
INST_OWN	-0.009	-0.019**
	[1.46]	[2.14]
INSID_OWN	0.037*	0.048
	[1.68]	[1.23]
BOARD INDEP	-0.000	-0.030*
	[0.04]	[1.96]
CEO-CHAIR (=1)	-0.006***	-0.002
	[3.04]	[0.60]
ln(AGE)	-0.008	-0.023*
	[1.01]	[1.80]
Industry fixed effects	YES	NO
Firm fixed effects	NO	YES
Year fixed effects	YES	YES
Observations	5,717	5,646
R-squared	0.701	0.530
Adjusted R-squared	0.629	0.525

Table 4. Determinants of ln(FOR_RATIO) for the weighted sample determined by entropy balancing

Treated is a dummy variable = 1 when the firm has at least one female in the top 4 as given by Execucomp (FEM ≥1=1), 0 (FEM ≥1=0) otherwise. Panel A reports the distribution after entropy balancing (EB) of control variables including FEMALE_BOARD. Standardized differences (Std. Diff.) are calculated as the difference in means between treated and control samples divided by the standard deviation of the treated sample for each covariate. The standardized difference will approach zero when the distribution for a particular covariate is more similar between treated and control samples. Variance ratios (Var. Ratio) are calculated as the ratio of the variance of each covariate in the treatment sample scaled by variance for the control sample. None of the standardized differences and variance ratios are outside of the vertical bands following the guidance in Rubin (2001) and Austin (2011). Panel B reports results of the weighted ordinary least squares (Weighted OLS) regression using weights specified by the entropy balancing program used to achieve covariate balance. The dependent variable is ln(FOR_RATIO). Control variables include ln(AT), MB, ROA, RET, DEBT/AT, VOL, INST_OWN, INSID_OWN, AGE, BOARD_INDEP, and CEO-CHAIR. All variables are defined as in the Appendix. t-statistics based on standard errors robust to clustering by firm are reported in brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: After entropy balance	Treated (N = 1,835)			Control (N =3,435)			Std. Diff.	Var. Ratio
Covariate	Mean	Variance	Skewness	Mean	Variance	Skewness		
FEMALE_BOARD	0.172	0.015	1.195	0.172	0.015	1.239	0.000	1.000
ln(AT)	7.975	2.614	0.481	7.975	2.614	0.481	0.000	1.000
MB	1.963	0.992	1.760	1.963	0.992	1.760	0.000	1.000
ROA	0.059	0.006	-1.197	0.059	0.006	-1.198	0.000	1.000
RET	0.163	0.128	1.331	0.163	0.128	1.331	0.000	1.000
DEBT/AT	0.215	0.032	0.640	0.215	0.032	0.640	0.000	1.000
VOL	0.303	0.020	1.729	0.303	0.020	1.729	0.000	1.000
INST_OWN	0.692	0.067	-1.546	0.692	0.067	-1.546	0.000	1.000
INSID_OWN	0.021	0.002	4.606	0.021	0.002	4.606	0.000	1.000
AGE	4.022	0.015	-0.325	4.022	0.015	-0.324	0.000	1.000
BOARD_INDEP	0.812	0.009	-1.059	0.812	0.009	-1.059	0.000	1.000
CEO-CHAIR	0.449	0.248	0.205	0.449	0.248	0.205	0.000	1.000

Panel B: Weighted OLS regressions	
	Dependent variable: ln(FOR RATIO)
NON CEO GENDER PAY SLICE	-0.130***
	[5.30]
CEO ln(TOTAL PAY)	-0.014***
	[4.98]
FEMALE CEO (=1)	0.029
	[0.35]
FEMALE CEO × CEO ln(TOTAL PAY)	-0.001
	[0.09]
ISS_REC (=1)	0.153***
	[29.10]
Controls	YES
Firm fixed effects	YES
Year fixed effects	YES
Observations	5,220
R-squared	0.731

Table 5. Determinants of ln(FOR RATIO) controlling for the components of pay using the entropy balancing weighted sample

This table presents the results from OLS regressions where the dependent variable is ln(FOR_RATIO). Components of pay along with all other variables are defined in the Appendix. Weighted sample is determined by employing entropy balancing (refer Table xx). Control variables include ln(AT), MB, ROA, RET, DEBT/AT, VOL, INST_OWN, INSID_OWN, AGE, BOARD_INDEP, and CEO-CHAIR. t-statistics based on standard errors robust to clustering by firm are reported in brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: ln(FOR RATIO)			
	(1)	(2)	(3)	(4)
Independent variables				
EQ_PAY_SLICE	-0.030**	-0.033***		
	[2.45]	[2.67]		
CASH_PAY_SLICE	-0.180***	-0.161***		
	[13.67]	[10.25]		
VEGA_PAY_SLICE			-0.024***	-0.028***
			[3.18]	[2.83]
DELTA_PAY_SLICE			-0.110***	-0.073***
			[12.89]	[6.62]
CEO ln(TOTAL PAY)	-0.015***	-0.013***	-0.016***	-0.013***
	[8.66]	[4.56]	[8.74]	[4.67]
FEMALE CEO (=1)	0.049	0.056	0.045	0.035
	[1.24]	[0.72]	[1.01]	[0.44]
FEMALE CEO × CEO ln(TOTAL PAY)	-0.006	-0.006	-0.005	-0.003
	[1.17]	[0.66]	[0.96]	[0.29]
ISS_REC	0.168***	0.153***	0.167***	0.152***
	[31.66]	[29.49]	[31.00]	[29.48]
Controls	YES	YES	YES	YES
Firm fixed effects	NO	YES	NO	YES
Year fixed effects	YES	YES	YES	YES
Industry fixed effects	YES	NO	YES	NO
Observations	5,220	5,256	5,220	5,256
R-squared	0.614	0.753	0.570	0.736

Table 6. Determinants of ln(FOR RATIO) for the effect of compensation consultants using the entropy balancing weighted sample

This table presents the results from OLS regressions where the dependent variable is ln(FOR_RATIO). Weighted sample is determined by employing entropy balancing (refer Table 7). COMP_CONS is equal to one if a firm hires a compensation consultant, otherwise zero. Control variables include ln(AT), MB, ROA, RET, DEBT/AT, VOL, INST_OWN, INSID_OWN, AGE, BOARD_INDEP, and CEO-CHAIR. All variables are defined in the Appendix. t-statistics based on standard errors robust to clustering by firm are reported in brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: ln(FOR RATIO)			
	(1)	(2)	(3)	(4)
Independent variables	COMP_CONS = 1	COMP_CONS = 0	COMP_CONS = 1	COMP_CONS = 0
NON CEO GENDER PAY SLICE	-0.101***	-0.119***	-0.182***	-0.210***
	[2.72]	[3.35]	[5.48]	[12.26]
CEO ln(TOTAL PAY)	-0.017***	-0.013***	-0.011***	-0.016***
	[3.37]	[3.02]	[3.79]	[7.11]
FEMALE CEO (=1)	-0.080	0.187	-0.066	0.055
	[0.76]	[1.08]	[0.76]	[0.89]
FEMALE CEO × CEO ln(TOTAL PAY)	0.013	-0.021	0.008	-0.005
	[1.07]	[0.97]	[0.80]	[0.72]
ISS_REC (=1)	0.167***	0.140***	0.176***	0.160***
	[22.23]	[17.44]	[21.40]	[22.34]
Control variables	YES	YES	YES	YES
Firm fixed effects	YES	YES	NO	NO
Year fixed effects	YES	YES	YES	YES
Industry fixed effects	NO	NO	YES	YES
Observations	1,919	3,301	1,919	3,301
R-squared	0.817	0.723	0.618	0.505

Table 7. Determinants of ln(FOR RATIO) for the effect of female-dominated industries using the entropy balancing weighted sample

This table presents the results from OLS regressions where the dependent variable is ln(FOR_RATIO). The sample is matched using entropy balancing (see Table xx). ABOVE-MEDIAN IND_FEMALE_RATIO is equal to one if IND_FEMALE_RATIO is above-median for a given industry, zero otherwise. ISS_REC is equal to one if ISS recommendation is 'For', otherwise zero. Control variables include ln(AT), MB, ROA, RET, DEBT/AT, VOL, INST_OWN, INSID_OWN, AGE, BOARD_INDEP, and CEO-CHAIR. All variables are defined in the Appendix. t-statistics based on standard errors robust to clustering by firm are reported in brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: ln(FOR_RATIO)			
	(1)	(2)	(3)	(4)
Independent variables	ABOVE-MEDIAN IND_FEMALE_RATIO = 1	ABOVE-MEDIAN IND_FEMALE_RATIO = 0	ABOVE-MEDIAN IND_FEMALE_RATIO = 1	ABOVE-MEDIAN IND_FEMALE_RATIO = 0
NON CEO GENDER PAY SLICE	-0.056**	-0.359***	-0.144***	-0.483***
	[2.08]	[4.47]	[8.29]	[10.58]
CEO ln(TOTAL PAY)	-0.012***	-0.010**	-0.016***	-0.012***
	[2.86]	[2.00]	[6.71]	[4.62]
FEMALE CEO (=1)	0.024	0.156	0.023	0.128
	[0.22]	[0.80]	[0.40]	[1.48]
FEMALE CEO × CEO ln(TOTAL PAY)	0.000	-0.015	-0.001	-0.015
	[0.04]	[0.63]	[0.21]	[1.40]
ISS_REC (=1)	0.156***	0.158***	0.164***	0.171***
	[18.05]	[20.87]	[21.96]	[22.43]
Control variables	YES	YES	YES	YES
Firm fixed effects	YES	YES	NO	NO
Year fixed effects	YES	YES	YES	YES
Industry fixed effects	NO	NO	YES	YES
Observations	2,482	2,738	2,482	2,738
R-squared	0.768	0.770	0.552	0.580

Table 8. Determinants of ln(FOR RATIO) controlling for firm performance and size using entropy balancing weighted sample

This table presents the results from OLS regressions where the dependent variable is ln(FOR_RATIO). The sample is matched using entropy balancing (see Table 7). Control variables include ln(AT), MB, ROA, RET, DEBT/AT, VOL, INST_OWN, INSID_OWN , AGE, BOARD_INDEP, and CEO-CHAIR. All variables are defined in the Appendix. t-statistics based on standard errors robust to clustering by firm are reported in brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: ln(FOR RATIO)					
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
NON CEO GENDER PAY SLICE	-0.130***	-0.201***	-0.130***	-0.200***	-0.129***	-0.199***
	[5.29]	[10.92]	[5.30]	[10.91]	[5.24]	[10.73]
CEO ln(TOTAL PAY)	-0.014***	-0.015***	-0.014***	-0.015***	-0.014***	-0.014***
	[5.01]	[8.10]	[5.00]	[8.10]	[4.91]	[7.87]
FEMALE CEO (=1)	0.031	0.043	0.029	0.042	0.044	0.087
	[0.37]	[0.94]	[0.34]	[0.91]	[0.45]	[1.18]
FEMALE CEO × CEO ln(TOTAL PAY)	-0.001	-0.004	-0.001	-0.004	-0.007	-0.016
	[0.07]	[0.79]	[0.08]	[0.70]	[0.40]	[1.11]
ISS_REC (=1)	0.153***	0.167***	0.153***	0.167***	0.153***	0.167***
	[29.05]	[30.70]	[29.07]	[30.74]	[29.08]	[30.77]
FEM ≥ 1 (=1) × ROA	-0.056	0.040				
	[0.71]	[0.64]				
FEM ≥ 1 (=1) × RET			-0.002	-0.004		
			[0.18]	[0.27]		
FEM ≥ 1 (=1) × ln(AT)					0.005	0.007
					[0.57]	[1.09]
Control variables	YES	YES	YES	YES	YES	YES
Firm fixed effects	YES	NO	YES	NO	YES	NO
Year fixed effects	YES	YES	YES	YES	YES	YES
Industry fixed effects	NO	YES	NO	YES	NO	YES
Observations	5,220	5,220	5,220	5,220	5,220	5,220
R-squared	0.731	0.548	0.731	0.548	0.731	0.548

Table 9. Determinants of ln(FOR RATIO) on a subsample of Chief Financial Officers (CFOs) using entropy balancing weighted sample

This table presents the results from OLS regressions where the dependent variable is ln(FOR_RATIO). Control variables include ln(AT), MB, ROA, RET, DEBT/AT, VOL, INST_OWN, INSID_OWN, AGE, BOARD_INDEP, and CEO-CHAIR. All variables are defined in the Appendix. t-statistics based on standard errors robust to clustering by firm are reported in brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Independent variables	Dependent variable: ln(FOR_RATIO)
FEMALE CFO (=1)	0.088**
	[2.40]
PRED[ln(TOTAL_PAY)]	-0.011*
	[1.77]
FEMALE CFO × PRED[ln(TOTAL_PAY)]	-0.010**
	[2.21]
RES[ln(TOTAL_PAY)]	-0.002***
	[2.53]
FEMALE CFO × RES[ln(TOTAL_PAY)]	-0.012**
	[2.32]
ISS_REC (=1)	0.172***
	[19.94]
IVEY_LEAGUE(=1)	-0.006
	[0.87]
TOTAL_QUAL.	-0.003
	[0.44]
QUAL≥MASTERS (=1)	0.002
	[0.95]
ACC_QUAL.(=1)	-0.002
	[0.76]
Controls	YES
Firm fixed effects	YES
Year fixed effects	YES
Observations	4,372
R-squared	0.567

Table 10. OLS compensation regression.

We model optimal compensation, following Core et al. (2008) and Brunarski et al. (2015)for CEOs and non-CEO executives separately employing all observations in the sample period. The dependent variable in the OLS regressions is the natural log of total compensation (ln(TOTAL_PAY)). ln(SALE) is natural logarithm of sales (Compustat item SALE). MB is market-to-book ratio (market value of assets (book value of assets (Compustat item AT) – book value of equity (Compustat item CEQ) + market value of equity (common shares outstanding (Compustat item CSHO) × closing share price at the end of the fiscal year (Compustat item PRCC_F)) – deferred taxes (COMPUSTAT item TXDB)) over book value of assets). ROA is net income (COMPUSTAT item NI) over book value of assets. RET is stock return over the last fiscal year. CEO TENURE is CEO tenure (in years). S&P500_RET is the annual return on S&P 500 Index. t-statistics based on robust standard errors are reported in brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: ln(TOTAL PAY)	
	(1)	(2)
Independent variables	CEOs	NON_CEOs
$ln(SALES_{-1})$	0.401***	0.378***
	[81.09]	[170.75]
MB_{-1}	0.068***	0.093***
	[10.45]	[31.72]
ROA_{-1}	-0.276***	-0.256***
	[3.79]	[7.96]
ROA	-0.034	-0.071*
	[0.36]	[1.74]
RET_{-1}	0.002*	0.002***
	[1.83]	[3.45]
RET	0.180***	0.147***
	[9.49]	[17.35]
ln(1+CEO TENURE)	0.024**	
	[2.01]	
ln(AGE)	-0.015	0.064***
	[0.26]	[2.74]
S&P500_RET	-0.158	0.211***
	[1.38]	[4.07]
Industry fixed effects	YES	YES
Year fixed effects	YES	YES
Observations	8,501	37,863
R-squared	0.489	0.483
Adjusted R-squared	0.485	0.482

Table 11. Determinants of ln(FOR_RATIO) employing optimal and excess pay

This table presents OLS regressions where the dependent variable is ln(FOR_RATIO). FEM ≥1 (=1) if the firm has at least one female in the top 4 paid officers (excluding the CEO) as given by Execucomp. PRED[ln(TOTAL_PAY)] and RES[ln(TOTAL_PAY)] are both calculated following Core et al. (2008) and Brunarski et al. (2015); refer to Table 10. Control variables include ln(AT), MB, ROA, RET, DEBT/AT, VOL, INST_OWN, INSID_OWN, AGE, BOARD_INDEP, and CEO-CHAIR. All variables are defined in the Appendix. t-statistics based on standard errors robust to clustering by firm are reported in brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variable: ln(FOR_RATIO)			
	(1)	(2)	(3)	(4)
FEM ≥1 (=1)	-0.006*	-0.007*	-0.002	-0.002
	[1.74]	[1.89]	[0.47]	[0.55]
FEMALE CEO (=1)	-0.004	0.039	-0.038	-0.042
	[0.09]	[0.40]	[0.75]	[0.37]
CEO PRED[ln(TOTAL_PAY)]	-0.006	-0.005	-0.027***	-0.027**
	[1.18]	[0.46]	[3.64]	[2.25]
FEMALE CEO × CEO PRED[ln(TOTAL_PAY)]	-0.000	0.001	0.000	0.001
	[0.55]	[0.58]	[0.28]	[0.99]
CEO RES[ln(TOTAL_PAY)]	-0.010***	-0.010***	-0.010***	-0.009***
	[6.58]	[4.85]	[5.15]	[3.36]
FEMALE CEO × CEO RES[ln(TOTAL_PAY)]	-0.009	-0.012	-0.021*	-0.014
	[1.05]	[0.90]	[1.75]	[0.83]
NON CEO PRED[ln(TOTAL_PAY)]	0.001	-0.001	0.002	0.002
	[0.94]	[0.32]	[1.07]	[1.54]
FEM ≥1 × NON CEO PRED[ln(TOTAL_PAY)]	-0.002***	-0.002***	-0.002***	-0.002***
	[14.79]	[13.75]	[15.67]	[13.77]
NON CEO RES[ln(TOTAL_PAY)]	-0.001**	-0.001**	-0.002***	-0.002*
	[2.27]	[2.04]	[2.80]	[1.69]
FEM ≥1 × NON CEO RES[ln(TOTAL_PAY)]	-0.001	-0.002**	-0.000	-0.002*
	[0.85]	[2.26]	[0.40]	[1.65]
ISS_REC	0.161***	0.145***	0.165***	0.151***
	[34.34]	[32.03]	[31.45]	[29.22]
Controls	NO	NO	YES	YES

Firm fixed effects	NO	YES	NO	YES
Year fixed effects	YES	YES	YES	YES
Industry fixed effects	YES	NO	YES	NO
Observations	7,953	7,872	5,717	5,646
R-squared	0.554	0.700	0.597	0.727
Adjusted R-squared	0.550	0.633	0.592	0.661

Table 12. Determinants of ln(FOR_RATIO) in 2SLS setting

This table presents the results from a treatment effect model with selection bias using Tobit estimation. The instrumental variable for NON CEO GENDER PAY SLICE is the fraction of male directors on a firm's board who sit on boards of other firms that have women who are overpaid or underpaid among their non CEO executives (MALE EXEC. w/EXCESS. PAID FEMALE EXEC LINK). All models include year and industry effects. Control variables include ln(AT), MB, ROA, RET, DEBT/AT, VOL, INST_OWN, INSID_OWN, and AGE. All variables are defined in the Appendix. t-statistics based on standard errors robust to clustering by firm are reported in brackets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)		(2)	
	First stage	Second stage	First stage	Second stage
Independent variables	NON CEO GENDER PAY SLICE	ln(FOR_RATIO)	NON CEO GENDER PAY SLICE	ln(FOR_RATIO)
MALE EXEC. w/*EXCESS*. PAID FEMALE EXEC LINK	0.325***			
	[3.21]			
MALE EXEC. w/*UNDER* PAID FEMALE EXEC LINK			0.085	
			[1.04]	
NON CEO GENDER PAY SLICE		-0.017**		0.054
		[2.01]		[0.66]
CEO ln(TOTAL PAY)		-0.016***		-0.016***
		[4.71]		[4.70]
FEMALE CEO (=1)		0.142*		0.142*
		[1.92]		[1.92]
FEMALE CEO × CEO ln(TOTAL PAY)		0.068		-0.017*
		[1.34]		[1.88]
ISS_REC (=1)		0.172		0.172
		[17.06]		[17.05]
FEMALE BOARD	0.170***		0.177***	
	[4.06]		[4.00]	
Controls	YES		YES	
Industry fixed effects	YES		YES	
Year fixed effects	YES		YES	
Wald test	599.40***		623.44***	
Observations	4,705		4,614	