



# Do gender differences persist? An examination of gender diversity on firm performance, risk, and executive compensation



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## ABSTRACT

Women have made great strides in recent years in climbing the corporate ladder, yet the current corporate landscape suggests that obstacles still exist before true gender equity is achieved. We investigate the impact of gender diversity in top management teams (TMTs) on firm performance and firm risk, in conjunction with examining the moderating effect of gender diversity on executive compensation. We find that firms with greater gender diversity in TMTs show lower risk and deliver better performance. In turn, female executives were found to be paid less than their male colleagues, even at the TMT level. However, as gender diversity in the TMT increases, compensation differences between the genders decrease. As such, we highlight a failure in the employment market place and also point to continuing challenges faced by female executives in their search for parity in TMTs.

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In recent years there has been a resurgence of focus on women in management roles (Hillman, Shropshire, & Cannella, 2007; Jurkus, Park, & Woodard, 2011; Melero, 2011), perhaps due to the fact women have made considerable advances. For example, based on 2012 household data, women make up almost 39% of all individuals employed in management occupations (Bureau of Labor Statistics, 2013) and the number of *Fortune 500* companies with female CEOs has reached a record high of 21 (Catalyst, 2013). On the other hand, despite improvement in overall employment trends women still remain underrepresented as a whole as top managers and CEOs (Hillman et al., 2007), making gender a relevant topic of consideration for both researchers and practitioners.

We seek to add to current research by focusing on female top executive roles with regards to both firm and individual level outcomes. We begin by discussing the relevant research on gender diversity (hereafter defined as the proportion of female executives in the TMT) to ground our hypotheses in prior research. Specifically, we examine how increases in gender diversity for top executives may influence risk-taking behaviors by the firm, performance of the firm, and gender-based compensation differences at the executive level. The findings suggest, somewhat paradoxically, that increasing gender diversity in the TMT both reduces risk and increases performance. We also find that gender diversity in the TMT moderates the gender wage gap by showing

that the compensation gap between male and female executives decreases as the number of women in the top management team increase. These findings contribute to the literature as a whole by examining both macro and micro outcomes in a unified context rather than a piecemeal approach. Additionally, the analyses differ from prior research in terms of measurement, as the proportion of top female executives is used rather than concentrating on the gender of the CEOs only, which will focus the analyses on solely on a yes/no count. This subtle shift enables additional, broader insights into how female executives impact the business world. We conclude with the implications of these findings for both theory and practice.

## 1. Literature review & hypotheses

Work on gender often falls under the larger scope of diversity research. Diversity, broadly defined, is “any significant difference that distinguishes one individual from another” Kreitz (2008, p.102). Proponents of diversity maintain that different opinions from diverse groups make for better-quality decisions, with views from underrepresented groups thought to stimulate consideration of non-obvious alternatives (McLeod & Lobel, 1992) and be of particular value in making judgments in novel situations. Overall, heterogeneity in decision-making and problem-solving styles produces better decisions through the operation of a wider range of perspectives and a more thorough, critical analysis of issues. This is of particular importance, since upper echelons theory dictates that top managers are responsible for, and critically influence, a firm's strategic decisions, with prior research suggesting that the

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characteristics of those managers influence organizational functioning (Finkelstein & Hambrick, 1989). Demographic diversity, in this case with the focus being on gender, is associated with cognitive diversity – in that being female is associated with different perceptual views and potential solutions for problems (Dutton & Duncan, 1987). Thus increasing the number of female top managers is one means to broaden the range of cognitive perspectives at a firm's disposal to recognize strategic opportunities, find alternatives, and handle environmental changes (Wiersema & Bantel, 1992).

A sense-making approach also lends support to the need for gender diversity. Sense-making is an adaptive process through which organizations scan and interpret their environment and take action (Daft & Weick, 1984). Having top managers with varying outlooks and interpretations is critical to understanding complex environments, both within and outside the organization as the same reality can be perceived by diverse managers in different but complementary ways, while still acting effectively as a team without directly clarifying any interpretative ambiguity that may exist (Weick, 1995). Gender diversity thus may allow top managers to effectively reach common goals and decisions, regardless of whether they share the same meanings or views.

Upper echelon and sense-making lend support to the notion that the decisions of top managers influence firm outcomes, but do not explain how risk preferences, be they an aversion to or propensity for, shape those decisions. Risk taking is an important consideration in human behavior and equally important in a business context as many economic interactions involve some aspect of risk. One approach to theories of risk taking is to attempt to explain the differences between situations that promote risk-taking versus risk aversion. Prospect theory is a behaviorally driven theory that removes the assumption that individuals are universally rational, utility maximizing decision makers and instead focuses on how decisions are framed (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992). Under this theory, the framing of expected performance outcomes are such that individuals are presumed more risk averse when prospects are positive and risk seeking when prospects are negative. In a business context, this translates to high performance associated with risk aversion and poor performance with risk seeking, making for a negative risk–return relationship known as Bowman's paradox (Bowman, 1980, 1982). Bowman's original (1980) work suggested that this relationship could be the result of management that enables firms to better adapt to environmental conditions, which would suggest that better strategic fit equates to better performance outcomes.

In terms of how this relates to gender diversity, universal consensus regarding gender effects in strategic and competitive contexts does not exist. (García-Gallego, Georgantzis, & Jaramillo-Gutiérrez, 2012). Instead, there is pervasive, consistent evidence that there are gender differences in risk taking in other contexts (e.g., lotteries, drinking behavior, prisoner's dilemma, etc.) that has led to the underlying assumption that differences in strategic settings are due, at least in part, to gender differences in risk preferences and attitudes. The underlying assumption is that women are more risk averse than men (Charness & Gneezy, 2012; see Byrnes, Miller, & Schafer, 1999 for a meta-analysis). We do not seek to refute prior work, but instead further examine the role of women in a strategic setting and examine risk propensities in aggregate, as part of the TMT, rather than individually.

### 1.1. Firm risk and performance

Increased gender diversity in top management roles has been shown to enhance monitoring processes, and may be a viable substitute mechanism for stronger corporate governance control (Gul, Srinidhi, & Ng, 2011; Melero, 2011). Greater gender diversity in TMTs also may lead to broader and deeper considerations of strategic choices (Upadhyay & Zeng, 2014), along with more open, thoughtful consideration of divergent views and more complete information processing (Van Knippenberg, De Dreu, & Homan, 2004).

If top female executives, viewed in aggregate as part of TMTs, tend to pursue paths of more prudent risk, they are likely to voice these opinions and attempt to persuade other top executives to follow suite. Research indicates that in certain circumstances, pursuing less risky activities does not equate to sub-optimal performance choices (Khan & Veito, 2013). A study of US fund managers supports this view, with female managers achieving comparable performance as male managers despite adopting different risk strategies (Atkinson, Stanley, Baird, & Frye, 2003). Thus, even with more prudent risk attitudes performance is still likely to increase, but the increases are more likely to be steady and consistent. Research also has found gender diversity of senior managers to be associated with higher earnings quality and higher stock returns after the IPO process (Krishnan & Parsons, 2008) as well as higher firm profitability relative to the average for their sector (Erhardt, Werbel, & Shrader, 2003).

Given prior research, it is not suggested that increased gender representation in TMTs influences risk-taking via its effect on performance, but rather that women, on average, may be more risk averse than men, which influences TMT decision-making and firm risk-taking. Looking at firm risk and firm performance, the influence of increased gender diversity may indirectly result in firms having less large returns (i.e., taking less risk) while simultaneously having fewer huge losses (i.e., having more stable performance increases). From a theoretical standpoint, prospect theory can be extended to consider the role organizational conditions may play in influencing the perception of risk among decision-makers and their propensity to risk (March & Shapira, 1987), whereas Bowman's original 1980 work suggests strategic conduct as an explanation to the risk–return paradox.

Strategic conduct, however, can be viewed in relation to managerial decision-making or from a contingency perspective. From a contingency perspective, strategic conduct suggests that good management practices may prove beneficial. Stated more directly, the risk–return paradox may be the result of heterogeneity of strategic management capabilities (Anderson, Denrell, & Bettis, 2007). Based on the above discussion, we posit that increased gender diversity of TMT may be one such difference in capabilities that influence risk, which, in turn, influences performance. Stated formally, we hypothesize that:

**Hypothesis 1.** Firms with greater gender diversity in the TMT will display less risk than firms with lower levels of gender diversity.

**Hypothesis 2.** Firms with greater gender diversity in the TMT will display higher performance than firms with lower levels of gender diversity.

### 1.2. Compensation

The idea that females receive less compensation than males is not new, however the gap may be narrowing. The gender wage gap has been found to lessen when the firm is led by a female CEO (Bell, 2005) and recently Elkinawy and Stater (2011) found the gap to be diminishing at the CEO level. As the percentage of women in top management roles increases it is important to check if progress is being made with regard to compensation. Until equal status is reached in both representation and compensation, gender equality cannot exist in the business world.

One often cited factor for compensation differences is human capital, which is made up of task-related abilities and measured by factors such as educational achievement, prior work experience, and proven leadership ability (Blau & Kahn, 2000). As women have already succeeded in attaining top executive positions, an argument can be made that human capital should not be a determining factor in compensation differences. As such, other more socially based factors are offered to account for these potential differences.

Women make up a small percentage of top executives, those who advance to the top are more likely than not to be the lone female.

They may suffer from the lack, or total absence, of senior female mentors and role models to help guide career advancement, promotion decisions, negotiations, and other development opportunities (Scandura & Williams, 2001). Without traditional social capital and networking aspects of career advancement women must find different paths to attain executive positions, which may factor into their compensation.

Gender also may influence negotiations. Babcock and Laschever (2009) suggest that women tend to negotiate less than men. Barron (2003) notes that 85% of men feel it is up to them to make sure the company paid them “what they were worth” — in contrast to 17% of female respondents. This suggests that women may be more uncomfortable than men in declaring their own monetary worth, let alone directly stating they are worth more than others. Moreover, if women base salary expectations on knowledge of other women's salaries and not similar male salaries, their salary expectations may inadvertently be lower.

It is also relevant to consider the other side of the compensation equation, those making the hiring and compensation decisions. Price (2012) found that gender is a relevant factor managers rely on when evaluating payment schemes. More specifically, male managers were found to be 32% less likely to use competitive pay schemes for women with the same level of productivity as male candidates (Price, 2012). This, finding, however did not hold true when managers were not given any information about gender, which suggests that managers may have preconceived ideas about a worker's ability solely based on the candidate's gender.

In previous hypotheses, it was suggested that increasing gender diversity in the TMT benefits the firm as a whole. Here, we suggest that an additional benefit may accrue in the form of a more equitable distribution of compensation between genders. Specifically, increasing the proportion of females in the TMT may decrease wage disparity between genders at the executive level. This may occur for a variety of reasons. First, as gender diversity increases in TMTs so too should the availability of mentors and larger networks for female executives. Mentoring relationships and networking may be especially important for women as female mentors can aid other women in overcoming barriers to advancement such as stereotypes and suggestions of inappropriate male-female mentorship relationships. Prior research lends support to this notion as increases in the proportion of women in top management have even been linked to increases in female representation in lower-level managerial positions (Kurtulus & Tomaskovic-Devey, 2012).

An increase in gender diversity in TMTs also may help women re-frame personal ideas behind compensation, promotions, and raises along with improved negotiating skills via consultation with other women in positions of power. In women-led firms, compensation for female managers has been shown to increase while men's wages decreased leading to a smaller wage gap between the genders (Cardoso & Winter-Ebmer, 2010). Top female executives also are likely to disseminate information about qualified female candidates to other top executives (Kurtulus & Tomaskovic-Devey, 2012) and with the presence of female executives in top committees (i.e., compensation committees) pre-conceived notions about gender-based ability may be ameliorated. Thus, we expect gender diversity in the TMT to moderate male-female gender differences compensation among top executives. Formally stated:

**Hypothesis 3.** Gender diversity in the TMT will moderate the gender wage gap such that greater diversity will lead to smaller compensation differences between male and female top executives.

## 2. Research methodology

### 2.1. Data

ExecuComp, CRSP, and Compustat datasets were used for the analysis during 1992–2012. All firms were included with the exception of

financial and utilities firms, which are regulated industries. The data for firm performance was obtained from Compustat and ExecuComp and consists of 26,158 firm-year observations, which equates to 2566 firms. The data for firm risk was obtained from CRSP, Compustat, and ExecuComp and consists of 20,655 firm-year observations, which equates to 2454 firms. Lastly, data for compensation was obtained from Compustat and ExecuComp and consists of 130,839 observations of data for individual executives from 2564 firms.

### 2.2. Gender diversity

At this point in history, *Fortune 500* firms composed of entirely female top managers do not exist and thus are currently beyond testing. Arguments for increased diversity (regardless of factor) propose equal representation, which suggests maximization at 50% rather than 100%. Thus our forecasts referencing the proportion of female TMTs should not be interpreted as maximization to capacity, but instead an equal balance. Consistent with prior work, we define gender diversity as the degree of representation of female executives in the TMT as reported in ExecuComp (Baixauli-Soler, Belda-Ruiz, & Sanchez-Martin, 2015). In this study, the independent variable for gender diversity is labeled ‘Gender,’ defined as the number of female executives scaled by the total number of executives reported in ExecuComp for a given firm in a given year (Baixauli-Soler et al., 2015).

### 2.3. Firm risk

We evaluate Hypothesis 1 by using two well-established proxies for firm risk: beta and the standard deviation of daily returns (Stdret), (Amit & Livnat, 1988, Chandra Childs and Ro, 2002). Beta is the degree of congruence a firm's stock price displays with the price movement of the overall market, and measures the systematic risk of an individual firm. We use Stdret, measured as the standard deviation of daily returns as an alternative measure of risk.

We evaluate the impact of the presence of females in the TMT, on firm risk, by estimating the following model. The dependent variable, Risk<sub>it</sub> is a set with two variables, Beta<sub>it</sub> and Stdret<sub>it</sub>.

$$\text{Risk}_{it} = a_0 + a_1 * \text{Gender}_{it} + a_2 * \text{Size}_{it} + a_3 * \text{LnDBEQ}_{it} + a_4 * \text{Age}_{it} + a_5 * \text{StdEPS}_{it} + \text{industry and year dummies} + \varepsilon_{it} \quad (1)$$

Gender<sub>it</sub>, the label for the gender diversity measure, is the proportion of female executives in the TMT of firm *i* in year *t*. Size is the natural logarithm of total assets. LnDBEQ is the log of debt to equity ratio and Age is the natural logarithm of firm age, computed from the date that the firm first appeared in Compustat. Finally, StdEPS is the standard deviation of earnings over the previous three years. The control variables Size, LnDBEQ and StdEPS are adopted from Chandra et al. (2002). As firm size increases, the risk associated with such firms decrease. When debt as a proportion of total capital increases, the risk to the firm increases. Higher earnings variability (measured by stdEPS) is associated with greater firm risk. Finally, we include Age as a control variable since younger firms are associated with greater risk. Per Hypothesis 1, we expect *a*<sub>1</sub>, the coefficient of ‘Gender’ to be negative and significant.

### 2.4. Firm performance

We use Tobin's Q, measured as the ratio of the market value of a firm's assets (computed as the sum of the market value of its outstanding equity and debt) to the book value of the firm's assets (Tobin, 1969), as a proxy for firm performance to evaluate Hypothesis 2. Various studies (Brown & Caylor, 2006; Lang & Stulz, 1994; Yermack, 1996) have discussed the benefits of using Tobin's Q to evaluate firm performance. We use Eq. (2) to evaluate Hypothesis 2, which posits a positive impact of the proportion of female executives in the TMT on the performance of

the firm.

$$TQ_{it} = b_0 + b_1 * Gender_{it} + b_2 * Size_{it} + b_3 * Age_{it} + b_4 * Dividend_{it} + \text{industry and year dummies} + \varepsilon_{it} \quad (2)$$

TQ is Tobin's Q for a firm  $i$  in year  $t$ . We compute TQ according to Brown and Caylor (2006) as [Total Assets + Market Value of Equity – Total Common Equity – Deferred Taxes] scaled by Total Assets. Per Hypothesis 2, we expect that  $b_1$ , the coefficient of  $Gender_{it}$  to be positive and significant. We use Size, Age (Brown & Caylor, 2006) and Dividend (Servaes, 1996) as control variables. We expect a negative coefficient for size since larger firms have relatively lower Tobin's Q compared to smaller firms (Lang & Stulz, 1994). Younger firms experience faster growth and have more intangible assets; hence we expect a negative sign for age. The dividend dummy variable denotes access to capital (Servaes, 1996).

### 2.5. Compensation

Hypothesis 3 tests the effect of gender diversity on the relationship between executive gender and compensation. We use 'Comp<sub>eit</sub>', the log of total compensation (Salary, Bonus and Stock Options) of executive  $e$ , from firm  $i$ , in year  $t$ , as our dependent variable. 'DGender<sub>eit</sub>' is a dummy variable equal to 1 if the executive is a female and 'Gender<sub>it</sub>' is the proportion of female executives in the TMT in a given firm. We use an interaction variable to evaluate the moderating effect of gender diversity on executive compensation (Dawson, 2014). Therefore, the variable of interest is DGender \* Gender. As per Hypothesis 3, we expect  $c_3$ , the interaction variable to be positive and significant.

We use 'Size' (log of total assets), 'ROA' (return on assets) and 'RET' (percentage increase in stock price) to proxy for firm size and firm performance respectively (Balsam, Fernando, & Tripathy, 2011). We control for future growth opportunities (Gaver & Gaver, 1993; Smith & Watts, 1992) by including market-to-book ratio 'MTB' as a control variable. We use two variables to capture the executive's experience; 'ExAge' represents the age of the executive and 'Tenure' represents the executive's experience at the current firm. Lastly, 'Curr\_CEO' is a dummy variable that equals 1 if the executive is the current CEO and 0 otherwise, included to control for the significantly greater compensation received by CEOs compared to other executives. Thus we estimate model [3] below to evaluate our third hypothesis.

$$\begin{aligned} \text{Comp}_{eit} = & c_0 + c_1 \text{DGender}_{eit} + c_2 \text{Gender}_{it} + c_3 \text{DGender}_{eit} * \text{Gender}_{it} \\ & + c_4 \text{Size}_{it} + c_5 \text{ROA}_{it} + c_6 \text{RET}_{it} + c_7 \text{MTB}_{it} + c_8 \text{ExAge}_{it} \\ & + c_9 \text{Tenure}_{it} + c_{10} * \text{Curr\_CEO}_{it} \\ & + \text{industry and year dummies} + \varepsilon_{it} \end{aligned} \quad (3)$$

### 3. Results

Means and standard deviations are presented in Table 1. Since we estimate three different analyses using three different data samples, we present the descriptive statistics for each sample separately. The descriptive statistics for the sample used to evaluate firm risk is tabulated in Table 1, Panel A. This sample contains 20,655 firm-year observations. An average firm in this sample has a market value of equity of \$7121.84 million and sales revenue of \$5546.18 million. The average ROA of this sample is 4.01% with a Beta of 1.042 and female TMT representation at 4.80%. The descriptive statistics for the sample used to evaluate firm performance is tabulated in Table 1, Panel B. This sample contains 26,158 firm-year observations. An average firm in this sample has a market value of equity of \$6251.74 million and generates sales revenue of \$4927.91 million. The mean ROA is 3.09% with a Tobin's Q of 1.98, and 5.11% of the TMT is female.

Table 1, Panel C shows the descriptive statistics used to evaluate compensation. This sample contains 130,839 firm-year observations. The average ROA is 2.80%, the average total compensation per executive is \$2,194,810, and 4.81% of top executives are female. Although these samples are different in the number of observations, the firms are similar in nature.

We use OLS regression to estimate all models. When estimating the models, we adjust the standard errors to correct for auto-correlation by clustering by firm and year as per Petersen (2009). We include year dummies and industry dummies to control for possible time and industry specific effects not captured by the explanatory variables. Industries are classified based on the Fama–French 12-industry classification (Fama & French, 1997). Finally, multicollinearity was examined using variance inflation factors (VIF) and found to be within acceptable limits as per Tabachnick and Fidell (2001).

Table 2 shows the results of the test of Hypothesis 1, with Panel A displaying the results where the proxy for risk is Beta and Panel B where the proxy for risk is Stdret. In Panel A, the coefficient of Gender is negative and significant (Coeff. = −0.0824; t-stat = −2.59) indicating that the presence of female executives in the TMT lowers the firm's Beta. The results of Panel B show that when the dependent variable is the standard deviation of daily returns, the coefficient of Gender is again negative and significant (Coeff. = −0.0011; t-stat = −1.55). The results show that the presence of a female in the TMT lowers the Stdret, indicating a reduction in the risk faced by the firm. Overall, these results imply that the increased presence of females in the TMT reduces the overall riskiness of the firm.

Next we test Hypothesis 2 by examining the impact of female executives in the TMT on firm performance by estimating Eq. (2). Table 3 presents the results of the regression where the dependent variable is firm performance (Tobin's Q) and the independent variable of interest is 'Gender', the proportion of female executives in the TMT. The coefficient of 'Gender' is positive and significant (Coeff. = 0.4499; t-stat = 5.60). The results indicate that the greater the number of females in the TMT, the better the performance of the firm. Overall, the results confirm the second hypothesis, which states that as gender diversity increases so too will firm performance.

Finally, we test the third hypothesis by evaluating the moderating effect of gender diversity in the TMT on executive compensation by estimating model [3]. Table 4 shows the results of the regression model [3]. The dependent variable is 'Comp', and the independent variables of interest are 'DGender' and the moderator 'DGender \* Gender'. First, we estimate model [4] without the interaction term to evaluate the compensation of female executives in the TMT compared to their male counterparts. The results tabulated in Panel A show that the coefficient of DGender is negative and significant (Coeff. = −0.0664; t-stat = −5.69), indicating that if the executive is female, her compensation is significantly lower than that of the other executives. Next, we estimate model [3] to evaluate the effect of gender diversity on the compensation of female executives in the TMT. The results tabulated in Panel B show that the coefficient of DGender is negative and significant (Coeff. = −0.2612; t-stat = −9.78) and the coefficient of the interaction variable 'DGender \* Gender' is positive and significant (Coeff. = 0.5062; t-stat = 4.93). The coefficient of 'Gender', the gender diversity variable, is also positive and significant (Coeff. = 0.3209; t-stat = 7.53). Similar to the results in Panel A, these results indicate that female executives in the TMT are paid less than other executives. Further, the moderation effect of gender diversity is suggested in Fig. 1, which shows that as gender diversity increases in the TMT, the difference between male and female executive compensation lessens. Taken together, these results suggest that increases in gender diversity have a positive effect on total compensation and an even greater positive effect on the compensation of female executives in the TMT, thus contributing to the decrease in the compensation difference between male and female executives in the TMT. These results support Hypothesis 3.

**Table 1**  
Descriptive statistics.

| Variable                                                        | Mean                                                                                                                                     | Median  | Std. Dev  | Quartile 1 | Quartile 3 |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------|------------|------------|
| <i>Panel A — sample to evaluate risk</i>                        |                                                                                                                                          |         |           |            |            |
| MVE (\$MM)                                                      | 7121.84                                                                                                                                  | 1371.39 | 22,849.67 | 518.547    | 4259.11    |
| Sales (\$MM)                                                    | 5546.18                                                                                                                                  | 1356.84 | 17,162.82 | 518.804    | 4066.79    |
| ROA                                                             | 0.0401                                                                                                                                   | 0.0519  | 0.1184    | 0.0191     | 0.0854     |
| RET                                                             | −0.2125                                                                                                                                  | 0.0274  | 8.6759    | −0.2754    | 0.2231     |
| BETA                                                            | 1.0424                                                                                                                                   | 0.9772  | 0.5416    | 0.6667     | 1.3415     |
| StdRet                                                          | 0.0277                                                                                                                                   | 0.0247  | 0.0128    | 0.0185     | 0.0338     |
| Size                                                            | 7.3456                                                                                                                                   | 7.2027  | 1.5434    | 6.2647     | 8.3268     |
| LnDBEQ                                                          | −1.0678                                                                                                                                  | −0.6874 | 1.773     | −1.5958    | −0.0759    |
| Age                                                             | 10.87                                                                                                                                    | 10      | 5.3       | 6          | 15         |
| stdEPS                                                          | 7.6847                                                                                                                                   | 1.2384  | 239.8525  | 0.776      | 2.1125     |
| Gender                                                          | 0.0478                                                                                                                                   | 0       | 0.0974    | 0          | 0          |
| N                                                               |                                                                                                                                          |         |           |            | 20,655     |
| <i>Panel B — sample to evaluate performance</i>                 |                                                                                                                                          |         |           |            |            |
| TQ                                                              | 1.9789                                                                                                                                   | 1.5725  | 1.2732    | 1.1923     | 2.2758     |
| MVE (\$MM)                                                      | 6251.74                                                                                                                                  | 1182.70 | 21,497.84 | 446.81     | 3713.59    |
| Sales (\$MM)                                                    | 4927.91                                                                                                                                  | 1137.81 | 16,118.70 | 426.12     | 3713.59    |
| ROA                                                             | 0.0309                                                                                                                                   | 0.0515  | 0.1744    | 0.0149     | 0.0891     |
| RET                                                             | −0.3369                                                                                                                                  | 0.0201  | 8.0517    | −0.3036    | 0.2273     |
| Size                                                            | 7.1545                                                                                                                                   | 7.012   | 1.5959    | 6.0269     | 8.1561     |
| Age                                                             | 2.2434                                                                                                                                   | 2.3026  | 0.5682    | 1.7918     | 2.7081     |
| Dividend                                                        | 0.487                                                                                                                                    | 0       | 0.4998    | 0          | 1          |
| Gender                                                          | 0.0511                                                                                                                                   | 0       | 0.1023    | 0          | 0          |
| N                                                               |                                                                                                                                          |         |           |            | 26,158     |
| <i>Panel C — sample used to evaluate executive compensation</i> |                                                                                                                                          |         |           |            |            |
| Total Comp (\$ '000)                                            | 2194.81                                                                                                                                  | 985.44  | 5747.11   | 449.89     | 2192.47    |
| Salary (\$ '000)                                                | 403.65                                                                                                                                   | 329.15  | 294.11    | 225        | 500.05     |
| logComp                                                         | 6.9218                                                                                                                                   | 6.8931  | 1.2158    | 6.109      | 7.6928     |
| Size                                                            | 7.1074                                                                                                                                   | 6.9634  | 1.6359    | 5.947      | 8.133      |
| ROA                                                             | 0.028                                                                                                                                    | 0.0517  | 0.5095    | 0.0149     | 0.09       |
| RET                                                             | −0.3716                                                                                                                                  | 0.0264  | 8.5185    | −0.306     | 0.2385     |
| MTB                                                             | 1.5875                                                                                                                                   | 1.941   | 2.0001    | 0.6363     | 1.8928     |
| ExAge                                                           | 57.7774                                                                                                                                  | 57      | 9.5339    | 51         | 64         |
| Tenure                                                          | 4.728                                                                                                                                    | 4       | 3.6339    | 2          | 6          |
| Curr_CEO                                                        | 0.1997                                                                                                                                   | 0       | 0.3998    | 0          | 0          |
| Gender                                                          | 0.0519                                                                                                                                   | 0       | 0.1022    | 0          | 0          |
| DGender                                                         | 0.0481                                                                                                                                   | 0       | 0.2139    | 0          | 0          |
| N                                                               |                                                                                                                                          |         |           |            | 130,839    |
| Data definitions                                                |                                                                                                                                          |         |           |            |            |
| BETA                                                            | Measures the systematic risk of an individual firm. Computed as per model [1]                                                            |         |           |            |            |
| StdRet                                                          | Measure of total risk — standard deviation of daily returns over a calendar year.                                                        |         |           |            |            |
| TQ                                                              | Tobin's Q, defined as the ratio of the market value of assets to their book value                                                        |         |           |            |            |
| Total Comp (\$ '000)                                            | Total compensation (salary + bonus + stock options) received by the executive.                                                           |         |           |            |            |
| Salary (\$ '000)                                                | Salary component of compensation                                                                                                         |         |           |            |            |
| logComp                                                         | Natural logarithm of total compensation                                                                                                  |         |           |            |            |
| Gender                                                          | The proportion of female executives in the TMT                                                                                           |         |           |            |            |
| DGender                                                         | Dummy variable equal to 1 if the executive is a female                                                                                   |         |           |            |            |
| MVE (\$MM)                                                      | Market value of equity                                                                                                                   |         |           |            |            |
| Sales (\$MM)                                                    | Net sales revenue                                                                                                                        |         |           |            |            |
| ROA                                                             | Return on assets — net income scaled by total assets                                                                                     |         |           |            |            |
| RET                                                             | Annual percentage increase in stock price                                                                                                |         |           |            |            |
| Size                                                            | The natural logarithm of total assets                                                                                                    |         |           |            |            |
| LnDBEQ                                                          | Natural log of debt to equity ratio                                                                                                      |         |           |            |            |
| Age                                                             | Natural log of firm age, computed from the date that the firm first appeared in Compustat                                                |         |           |            |            |
| stdEPS                                                          | Standard deviation of earnings over the previous three years                                                                             |         |           |            |            |
| Dividend                                                        | Dummy variable equal to 1 if dividends were paid in the current year and zero otherwise.                                                 |         |           |            |            |
| MTB                                                             | Market-to-book ratio. Proxies for growth opportunities                                                                                   |         |           |            |            |
| ExAge                                                           | Age of the executive, from the ExecComp database                                                                                         |         |           |            |            |
| Tenure                                                          | Length of service at a particular firm; computed from when the executive first appeared under a particular firm in the ExecComp database |         |           |            |            |
| Curr_CEO                                                        | Dummy variable equal to 1 if the executive is the current CEO and 0 otherwise                                                            |         |           |            |            |

### 3.1. Sensitivity analysis

We use several sensitivity analyses to evaluate the robustness of our results. First, we re-estimated our models [1], [2] and [3] using a matched pair sample, where we matched firms that had at least one female in the TMT with firms that had no females in the TMT by year, industry, and firm size. The results of the estimations were qualitatively similar to our main results. Second, to evaluate the robustness of our results related to gender diversity and risk, we re-estimated model [2]

using leverage as an alternative proxy for firm risk. Leverage is a widely accepted measure of financial risk (Amit & Livnat, 1988; Miller & Bromiley, 1990) and also forms a component of the Altman Z-score measure of bankruptcy. The results remained qualitatively similar to our main results on risk tabulated in Table 3. Third, we use  $\text{Irisk}_{it}$  in place of Beta. Beta measures systematic risk whereas total risk of a firm is the systematic risk plus the unsystematic (or idiosyncratic) risk. Hence, to supplement our findings for Beta and get an idea of the impact of gender diversity in the TMT on the unsystematic risk of a

**Table 2**

The impact of gender diversity on firm risk.  $Risk_{it} = a_0 + a_1 * Gender_{it} + a_2 * Size_{it} + a_3 * LnDBEQ_{it} + a_4 * Age_{it} + a_5 * StdEPS_{it}$ , [1].  
+ industry and year dummies +  $\varepsilon_{it}$

| Panel A – dependent variable – risk |               |             | Panel B – dependent variable – Stdret |                                    |            |
|-------------------------------------|---------------|-------------|---------------------------------------|------------------------------------|------------|
|                                     | Expected Sign | Coefficient | t-stat                                |                                    |            |
| Intercept                           |               | 1.2159***   | 20.89                                 | Intercept                          | 0.0512***  |
| Gender                              | –             | –0.0824***  | –2.59                                 | Gender                             | –0.0011*   |
| Size                                |               | –0.0055**   | –2.29                                 | Size                               | –0.0031*** |
| LnDBEQ                              |               | –0.0161***  | –7.36                                 | LnDBEQ                             | 0.0004***  |
| Age                                 |               | –0.0221**   | –1.87                                 | Age                                | –0.0023*** |
| StdEPS                              |               | 0.0001***   | 3.78                                  | StdEPS                             | 0.0000***  |
| Industry and year dummies included  |               |             |                                       | Industry and year dummies included |            |
| N                                   |               |             | 20,587                                | N                                  | 20,655     |
| R-squared                           |               |             | 0.2434                                | R-squared                          | 0.4717     |

Refer Table 1 for data definitions.

\*\*\* Indicate significance at 1%.

\*\* Indicate significance at 5%.

\* Indicate significance at 10%.

firm, we ran regression model [2] with  $Irisk_{it}$  (idiosyncratic risk, computed as the standard deviation of the errors of the market model {i.e. regression model [1]}) as the dependent variable. The results show that our independent variable  $Gender_{it}$  is negative and marginally significant, further lending support to our first hypothesis.

#### 4. Discussion

Are women different than men? Yes, but not in ways that are easily or always evident. We do not suggest that women are universally or unambiguously more risk averse than men, have more stable performance outcomes, or are paid less. Instead, we suggest that research should work towards understanding the boundaries of the differences between men and women and how that affects firm, group, and individual level outcomes with regard to gender diversity. This study in particular makes contributions to the discussion by looking at the age-old question of “are men and women different” in the context of gender diversity’s relationship to risk, performance, and gender wage gap, in a single study using the theoretical lens of prospect theory along with Bowman’s risk–return paradox. Prospect theory, a behavioral driven theory, removes the assumption of universal rationality and utility maximization and instead focuses on decision framing such that individuals are presumed to base decisions on perceived gains rather than perceived losses. Bowman’s risk–return paradox works with this view and elaborates on the idea that strategic conduct both influences performance outcomes and shapes risk. The results suggest that a paradox does exist in that firms with greater gender diversity in their leadership teams were found to take less risk and have greater firm performance. Acknowledging that a relationship is paradoxical may not be, in and of itself, a sufficient explanation, but it can serve as a basis for further

examining firms’ ability to respond to changing conditions – in this case increasing gender diversity, with a focus on women in top leadership roles. When expanding the performance-risk relationship to include a discussion of compensation, women when compared to men, exclusive of a firm’s gender diversity in its top leadership team, typically are paid less. However, when a firm’s gender diversity is considered, top females executives receive higher compensation in more gender-diversified firms, thus suggesting that increases in gender diversity also play a role in reducing the wage gap between men and women at the executive level.

As a result, the findings of the present paper have implications for management theory building in general. In particular, the results documented here have ties to some of the current theories of leadership dealing with the topics of compensation, gender diversity, and overall TMT composition (particularly those rooted in agency theory) as they show that a particular social group, in this case female top managers, still receive significantly different treatments. Beginning with compensation, according to agency theory, an optimal compensation package is one that links managerial pay to some measures of firm performance to mitigate agency costs (Devers, Cannella, Reilly, & Yoder, 2007; Murphy, 1999). Accordingly, agency theory implies that if female managers are not perceived to be agents who are instrumental in delivering desired corporate outcomes they will be less likely to receive performance-sensitive compensation. The results here suggest that female managers can, in fact, be particularly instrumental in shaping risk and firm performance and should be compensated as such.

In terms of gender diversity and TMT composition, gender diversity has been identified as a needed innovation (Carpenter, Geletkanycz, & Sanders, 2004). This paper elaborates on some of the benefits of increased gender diversity in TMTs, particularly that firms with increased

**Table 3**

The impact of gender diversity on firm performance.  $TQ_{it} = b_0 + b_1 * Gender_{it} + b_2 * Size_{it} + b_3 * Age_{it} + b_4 * Dividend_{it}$ , [2].  
+ industry and year dummies +  $\varepsilon_{it}$

| Dependent variable – Tobin’s Q     |               |             |        |
|------------------------------------|---------------|-------------|--------|
|                                    | Expected sign | Coefficient | t-stat |
| Intercept                          |               | 3.3825***   | 22.17  |
| Gender                             | +             | 0.4499***   | 5.60   |
| Size                               |               | –0.0788***  | –13.64 |
| Age                                |               | –0.4966***  | –15.81 |
| Dividend                           |               | 0.1325***   | 7.98   |
| Industry and year dummies included |               |             |        |
| N                                  |               |             | 26,158 |
| R-squared                          |               |             | 0.1331 |

Refer Table 1 for data definitions.

\*\*\* Indicate significance at 1%.

\*\* Indicate significance at 5%.

**Table 4**

Gender diversity and compensation differences.

$$\text{Comp}_{\text{eit}} = c_0 + c_1 \text{DGender}_{\text{eit}} + c_2 \text{Gender}_{\text{it}} + c_3 \text{DGender}_{\text{eit}} * \text{Gender}_{\text{it}} + c_4 \text{Size}_{\text{it}} + c_5 \text{ROA}_{\text{it}} + c_6 \text{RET}_{\text{it}} + c_7 \text{MTB}_{\text{it}} + c_8 \text{ExAge}_{\text{it}} + c_9 \text{Tenure}_{\text{it}} + c_{10} * \text{Curr\_CEO}_{\text{it}} + \text{industry and year dummies} + \varepsilon_{\text{it}} \quad [3].$$

| Panel A: dependent variable – total compensation |               |             |         |
|--------------------------------------------------|---------------|-------------|---------|
|                                                  | Expected sign | Coefficient | t-stat  |
| Intercept                                        |               | 3.6875***   | 54.81   |
| DGender                                          | –             | –0.0664***  | –5.69   |
| Size                                             |               | 0.3707***   | 116.60  |
| ROA                                              |               | 0.0046      | 0.84    |
| RET                                              |               | 0.0014      | 1.09    |
| MTB                                              |               | 0.0613***   | 5.51    |
| ExAge                                            |               | 0.0049***   | 11.96   |
| Tenure                                           |               | 0.0467***   | 36.00   |
| Curr_CEO                                         |               | 0.9342***   | 155.06  |
| Industry and year dummies included               |               |             |         |
| N                                                |               |             | 130,839 |
| R-Squared                                        |               |             | 0.4417  |
| Panel B: dependent variable – total compensation |               |             |         |
|                                                  | Expected sign | Coefficient | t-stat  |
| Intercept                                        |               | 3.6737***   | 54.48   |
| DGender                                          | –             | –0.2612***  | –9.78   |
| Gender                                           |               | 0.3209***   | 7.53    |
| DGender * gender                                 |               | 0.5062***   | 4.93    |
| Size                                             |               | 0.3719***   | 117.70  |
| ROA                                              |               | 0.0038      | 0.68    |
| RET                                              |               | 0.0014      | 1.09    |
| MTB                                              |               | 0.0607***   | 5.50    |
| ExAge                                            |               | 0.0050***   | 12.05   |
| Tenure                                           |               | 0.0368***   | 36.16   |
| Curr_CEO                                         |               | 0.9307***   | 154.82  |
| Industry and year dummies included               |               |             |         |
| N                                                |               |             | 130,839 |
| R-Squared                                        |               |             | 0.4426  |

Refer Table 1 for data definitions.

\*\*\* Indicate significance at 1%.

\*\* Indicate significance at 5%.

gender diversity take on less risk and show greater firm performance. That withstanding, a lack of risk-seeking behavior should not necessarily be treated as a stable trait for women, but instead part of a process that varies across context and situations (Dwyer, Gilkeson, & List, 2002). As theory continues to evolve, more work needs to focus on questions of how this process works. For instance, are women still

conforming to prescriptive stereotypes or actively seeking ways to be viewed as distinct yet equal (or even the same as males).

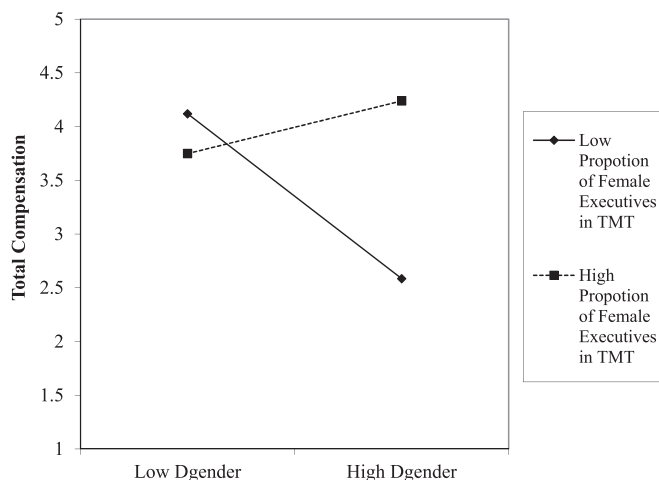
#### 4.1. Practical implications

Practically, these results present a conundrum. On the surface it shows that gender diversity in regard to females in top leadership roles is beneficial to firms despite being equally financially beneficial to female leadership. This suggests that top female executives, in aggregate, can be viewed as a valuable resource to firms. The data shows that there are fewer women than men in these roles. Economic arguments suggest that scarce resources carry a price premium rather than a discount. However, without other females in top leadership roles female executives command lower wages than their male counterparts.

#### 4.2. Limitations and future research

All studies have limitations and this one is no exception. The most noteworthy for this study is the continuing progress in increased gender diversity of firms. The data and subsequent results reflect the average state of affairs over the sample period. As changes occur, and gender diversity in TMTs (hopefully) continues to improve, the topics of risk, performance, and compensation should be revisited in order to assess changes, reduce equivocality, and establish boundaries. Likewise, this study focuses on data from firms traded on US stock markets, and therefore reflects Western based culture and social changes. These assessments may vary greatly in other cultures.

Additionally, more nuanced findings are likely at a finer grained level of analysis. For example, educational and functional area background may influence choice. In turn, decision-making may be more



Note: Dgender is a dummy variable, which equals to 1 if the executive is a female

**Fig. 1.** The influence of gender diversity in TMTs on executive compensation. Note: Dgender is a dummy variable, which equals to 1 if the executive is a female.

fully understood as a simultaneously cognitive and emotional process. Being able to obtain or proxy the measurement of how senior leaders feel about their options, the group decision-making process itself, and the final choice may show differences unseen in cognitive evaluations. Furthermore, this study has examined total compensation. However, the compensation mix may play a role in altering risk preferences and, in turn, performance outcomes. These areas also serve to provide opportunities for future research.

Lastly, many economic decisions are made in group, rather than individual, contexts, where the choices of a single individual (the group leader) shapes the outcomes of the entire group, as well as those outside the group. Taking on the responsibility of deciding on behalf of others who are socially tied in a stakeholder relationship to those in leadership roles can be a voluntary choice or a necessary evil of entering a senior leadership position. As women take on more leadership roles in TMTs, future research should examine how female leadership, for example on boards and board sub-committees, may affect risk and performance outcomes.

## 5. Conclusion

In closing, the results are consistent with recent research that has signaled the shortcomings of a “one size fits all” approach to corporate governance, (e.g. Hambrick, 2007; Wowak & Hambrick, 2010). When gender is considered, universal truths may not exist as individual exceptions to every rule may always be found. However, understanding the boundaries of the differences between men and women in aggregate, as conceptualized by concept of gender diversity, can help shed some light on the equivocal findings of prior research. Our findings suggest that increases in gender diversity not only reduce firm risk and improve firm performance, but also play a role in reducing the wage gap at the top executive level. Thus, further efforts by companies to improve the representation of top female executives is seen as both societally necessary and beneficial to the firm as a whole.

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