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Top Management Team Diversity, Equality, and Innovation: A Multilevel Investigation of the Health Care Industry

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Abstract

The role of women on top management teams (TMTs) is an increasingly important topic for both academics and practitioners. Despite increased attention to gender diversity on TMTs, there remains limited understanding of how gender diversity influences important outcomes of the firm, such as innovation. To this end, I investigate the relationships between two dimensions of TMT diversity—TMT gender diversity and TMT compensation equality—and firm innovation, and consider how TMT size influences these relationships. Using a unique, multilevel, longitudinal sample of publicly-traded firms in the US healthcare industry, I find TMT size to be a key driver in the TMT diversity and firm innovation relationship.

Keywords: Diversity, Healthcare, Innovation, Multilevel Analysis, Top Management Teams

Top Management Team Diversity, Equality, and Innovation:

A Multilevel Investigation of the Healthcare Industry

The conversation is growing on the role of women on top management teams (TMTs). This is especially true in industries that are historically male-dominated, where pioneers such as Marry Barra (CEO of General Motors Company), Lynn Good (President and CEO of Duke Energy), and Emma Walmsley (CEO of GlaxoSmithKline) actively change what diversity looks like on TMTs. As pioneers, these women potentially point to a shift of not just female inclusion on TMTs, but as occupying shared status and standing with their male counterparts. Despite the increased attention of gender diversity on TMTs (Auh & Menguc, 2005; Roberson, Holmes, & Perry, 2017), there remains limited understanding of how gender diversity influences important outcomes of the firm, such as performance, change, and firm innovation (Triana, Miller, & Trzebiatowski, 2013).

Women bring different social and human capital to TMTs (Adler & Kwon, 2002; Miller & Triana, 2009; Robinson & Dechant, 1997); however, much of the focus has been on how this influences firm performance, with less attention paid to how TMT diversity influences other important firm outcomes. To complicate matters, the existing literature points to mixed results, where some studies indicate a positive relationship between TMT gender diversity and firm outcomes, while others indicate a negative or even non-significant relationship (Miller & Triana, 2009; Roberson et al., 2017). These mixed findings perhaps imply that TMT gender diversity does not critically or systematically influence important outcomes for the firm.

I argue that TMT diversity does matter, but perhaps not for all firm outcomes. That is, female TMT members bring unique social and human capital to the firms in which they serve as executives and this value may be pronounced in industries that are typically male-dominated. In

the industries, females must perceive themselves to be equal in status and standing to their male counterparts to positively impact firm outcomes. Of interest is the relationship between TMT gender diversity and equality and firm innovation. This particular firm outcome is of interest for two reasons. First, innovation is a key factor underlying a firm's ability to attain and sustain a competitive advantage (Brown & Eisenhardt, 1995; Tang, Li, & Yang, 2015), and has been identified as a potential mediator between the diversity and performance relationship (Miller & Triana, 2009). Second, when executives are appropriately rewarded via compensation for their skills and contributions to the firm, they are better able to identify and exploit more innovative opportunities (Frydman & Papanikolaou, 2018).

In this study, I examine the relationship between TMT diversity and firm innovation by examining two distinct ways in which firms value diversity: through the presence of women on the TMT but also the compensation of female TMT members relative to the male counterparts. Following previous diversity research (Auh & Menguc, 2005), TMT size is considered an important moderator to the TMT diversity and innovation relationship. I test these relationships using multilevel modeling (MLM) of longitudinal data from 73 publicly-traded firms in the US healthcare industry. Although TMT diversity is significantly related to firm innovation, the findings indicate that TMT size plays an important role in this relationship. Larger TMTs seem to be less able to leverage the benefits of diversity for innovation.

This study provides implications for research on TMT diversity in three ways. First, TMT size plays a critical role in TMT diversity issues including gender diversity and compensation equality. I extend existing research on the ideal size of TMTs as well as the ideal number of females on TMTs (Lyngsie & Foss, 2016) to suggest that TMT size does matter for at least two dimensions of diversity—gender diversity and compensation equality. Alone, these dimensions

of diversity do not seem to significantly influence the innovation of the firm. However, when considered with TMT size, both dimensions of diversity are important drivers in the firm's innovation. Second, I contribute to the existing literature on gender diversity of TMTs and boards and its relationship to firm innovation. Whereas previous literature tends to focus on the relationship between boards and innovation (Miller & Triana, 2009), the focus of this study is on the TMT. TMT members make the strategic decisions for the firm and are more closely linked to identifying and creating innovative opportunities. I augment this stream of research to also consider equality in terms of TMT compensation. Using an organizational justice lens, I demonstrate the importance of not just having female TMT members for innovation, but that these individuals must perceive themselves to be of equal status and standing to their male counterparts. Third, I point to the importance of multilevel theorizing and analysis for uncovering the nuances of TMT diversity related to important firm outcomes, such as innovation. Multilevel theorizing and analysis can provide insights to this literature, where previous research finds mixed results (Miller & del Carmen Triana, 2009; Roberson et al., 2017). By providing more accurate specifications of the relationships of interest at various levels of analysis (Hoffman, 2015), both within-firm and between-firm effects of TMT diversity and innovation are considered.

Relevant Literature

Diversity in TMTs

Upper echelons theory (Hambrick, 2007; Hambrick & Mason, 1984) views the firm as a reflection of its TMT. Thus, the firm's efforts to innovate, change, or take on new strategic initiatives are reflective of the strategic decisions of the TMT (Auh & Menguc, 2005; Jeong & Harrison, 2017), or the "the relatively small group of influential executives at the apex of an

organization—usually the CEO (or general manager) and those who report directly to him or her" (Finkelstein, Hambrick, & Cannella, 2009, p. 10).

Diversity in TMTs is a key facet of TMT composition research because diversity is related to a host of positive outcomes such as improved firm knowledge, performance, and innovation (Haleblian & Finkelstein, 1993; Hambrick, Cho, & Chen, 1996; Ling & Kellermanns, 2010). Diversity can encompass a multitude of ways in which there is variety among TMT members. This variety can include dimensions such as "gender, age, ethnicity, nationality, educational background, industrial experience and organisational membership, among others" (Campbell & Mínguez-Vera, 2008, p. 437). Of importance here is gender diversity and specifically female representation on the TMT. Hillman, Cannella, & Harris (2002) propose gender to be a useful proxy for the variety of perspectives individuals bring to groups or organizations, such as TMTs, and they found demographic indicators, such as gender, to be significantly related to strategic decision-making in firms.

Female representation on TMTs is important for at least two reasons. First, it helps the TMT avoid systematic biases by expanding the collective knowledge of the group (human capital). Second, it offers additional, distinctive social networks and cultural expertise to challenge the assumptions held by males (social capital) (Milliken & Martins, 1996). I explore each of these facets of female representation below.

Human capital. When the TMT is more homogenous in terms of knowledge and experiences, there is a limited array of options that may be considered by the group. Because females have different experiences than males, they bring to groups and organizations diversity in terms of human capital that includes attitudes, cognitive functions, and beliefs (Miller & Triana, 2009; Robinson & Dechant, 1997) This enables females to bring unique perspectives to

the TMT that can be used to better resolve conflict, complexity, and uncertainty in a firm's strategy (Furst & Reeves, 2008; Hillman et al., 2002).

Social capital. Social capital describes the resources rooted in social relationships that produce benefits such as information access and resource exchange (Adler & Kwon, 2002; Miller & Triana, 2009). Females tend to have different and more diverse social networks than their male counterparts (Ibarra, 1997). This is due to several reasons. First, women tend to create and maintain multiple, sometimes independent, social networks to obtain professional and personal resources (Ibarra, 1993, 1997). For example, a female professional may maintain multiple professional networks, from those that are specific to her career, such as an IT networking group, but also networks specific to females (Women in IT networking group). Additionally, the same individual may also maintain multiple personal networks, such as belonging to a parent-teacher organization or a moms group. From the diversity of these networks, the female has a broad range of contacts to share ideas, engage in discussions, and even acquire resources or information that can be of potential value when used in TMT discussions and strategic decision-making (Miller & Triana, 2009).

Because the human and social capital of female TMT members tends to differ from that of their male counterparts, female representation on TMTs increases the diversity of the firm's resource portfolio (Jeong & Harrison, 2017). A diverse resource portfolio can be a source of competitive advantage for a firm when the resources differ from those of competitors and the firm deploys those resources (Sirmon, Hitt, Ireland, & Gilbert, 2011). That is, the human and social capital of the female TMT member must be leveraged in order to shape strategic decision-making and positively impact firm outcomes.

Gender Equality in TMTs

Though it is important for firms to have female members on the TMT for human and social capital, these individuals must believe that they are valued members of the team. This echoes previous literature on tokenism in which individuals occupy particular spaces—such as a member of a TMT—as "representatives of their category, as symbols rather than individuals" (Kanter, 1977, p. 966). An organizational justice perspective (Greenberg, 1987, 1990) can be integrated with upper echelons theory to explore how female TMT members may feel not as tokens but rather as valued members of the executive team.

Organizational justice implies that individuals' attitudes and behaviors are influenced by their perceptions of fairness within the organization (Cropanzano, Byrne, Bobocel, & Rupp, 2001; Rupp, Ganapathi, Aguilera, & Williams, 2006). Fairness perceptions are important because they shape how the individual senses they will be treated. This can include the individual's perceptions of whether they will be legitimate, non-biased members of the organization because they have responsibility for the organization's future, that they will be more behaviorally integrated into the TMT, and that they will be respected by the organization (Rupp et al., 2006). I expand on each of these elements below.

It is important for TMT members to believe that their presence and contributions to the group will influence the future of the firm. Firms that are more just enable individuals to predict with some certainty the firm's processes and the control they have over the firm's actions (Rupp et al., 2006). In addition to believing they have control over the firm's future, female TMT members may also be concerned of the degree to which they are behaviorally integrated in the group. In opposition of the tokenism argument, in just firms, female TMT members perceive they are of equivalent status and standing to their male counterparts, and are respected members of the group and the firm (Hayward, Tropp, Hornsey, & Barlow, 2017; Rupp et al., 2006). Thus,

they may exhibit more collaborative attitudes and behaviors that positively affect not only the group, but the firm (Rupp, 2011). Finally, organizational justice is important because it influences the degree to which female TMT members believe they are respected by the firm. This is related to how the firm interacts with society in general, and specifically, its interactions with and treatment of women. In firms that are more just, female TMT members believe that the firm respects women in general and interacts with them in ethically appropriate or morally just ways (Rupp et al., 2006).

Hypothesis Development

TMT Diversity and Firm Innovation

Based on the review, both human and social capital are important factors that might influence a firm's innovation (Auh & Menguc, 2005). Because Caucasian males represent the majority in many TMTs (Jones, 2017), homogeneity is magnified due to demographic similarities. When a female member is introduced, it increases the TMT's diversity in terms of both human and social capital, which can create more cognitive conflict. This cognitive conflict results from the combination of different matrices of information (Amason, 1996) that allow the group to discover or identify new opportunities (Alvarez & Barney, 2007). Some of the opportunities identified or discovered are novel or point to new avenues to pursue, increasing the innovativeness of the firm (Amason, 1996; Hillman et al., 2002; Miller & del Carmen Triana, 2009). Additionally, the diverse ties of female members can increase the firm's ability to access and use diverse knowledge that can positively impact innovation (Miller & del Carmen Triana, 2009; Rodan & Galunic, 2004).

The human and social capital that female members bring to the TMT can help the group better identify opportunities for innovation. Homogeneous groups might hamper innovation due

to the lack of cognitive conflict, increased risk of systematic bias, and general higher levels of cohesion. As a corollary, more heterogeneous groups—or those TMTs with female representation—may produce more ideas. When more ideas are produced, the likelihood that the TMT will consider, and potentially implement, innovative ideas for the firm increases (Milliken & Vollrath, 1991).

I anticipate that more TMT gender diversity will be positively related to firm innovation, and that this is true for both within-firm and between-firm effects. That is, in years in which the firm has a more gender diverse TMT, it will experience more diversity in terms of human and social capital and consider and potentially implement more innovative activities. Similarly, firms with more gender diverse TMTs relative to other firms will benefit more from diversity in social and human capital, which can be leveraged to positively influence firm innovation.

In sum, it is expected that gender diversity in TMTs increases the diversity of the human and social capital of the group and the firm (Auh & Menguc, 2005; Hambrick, 2007; Hambrick & Mason, 1984). Thus, I propose that firms are more innovative when the TMT has female representation:

> Hypothesis 1a: Within-firm TMT gender diversity is positively related to the firm's innovation.
>
> Hypothesis 1b: Between-firm TMT gender diversity is positively related to the firm's innovation.

TMT Equality and Firm Innovation

As stated above, attitudes and behaviors of individuals can influence group dynamics such as strategic decision-making related to firm innovation (Hood & Koberg, 1994). When individuals work for just firms, they may perceive that the strategic decision-making process is

fairer and collaborate more effectively with other group members (Chan & Mauborgne, 1998; Rupp et al., 2006). Effective collaboration and cooperation among TMT members can facilitate more creative initiatives and spontaneous action among members, both of which can underscore more innovation (Chan & Mauborgne, 1998).

Organizational justice appears to be a critical contingency for innovation. Although there may be many indicators of organizational justice, one relevant indicator—especially for executives—may be executive compensation. Executive compensation is connected to the structure of the organization (Balkin & Gomez-Mejia, 1990; Hambrick, 2007). In more just firms, compensation of TMT members should reflect the shared status and standing among members (Rupp et al., 2006).

In firms with more equality in executive compensation, female TMT members believe they have responsibility for the organization's future, that they are more behaviorally integrated into the TMT, and that they are respected by the firm (Rupp et al., 2006). This influences the behaviors and attitudes of these female TMT members such that they perceive their contributions to be valuable to the team and the firm, and as such may be more participative and collaborative with other members of the group. In doing so, the group may be better able to create or identify new opportunities, engage in creative initiatives, pursue spontaneous actions, and positively influence the firm's innovation.

These arguments apply to both the within-firm and between-firm levels. That is, in years in which TMT compensation is more equal, female TMT members may believe they share similar status and standing with other members of the TMT and be more participative and collaborative, positively influencing firm innovation. Also, firms with greater TMT

compensation equality relative to other firms may facilitate a more just environment for TMT

members and experience higher levels of firm innovation.

In sum, it is expected that more just firms have greater equality in TMT compensation,

and this equal treatment positively influences the attitudes and behaviors of the entire TMT,

especially female members. The result of this equal treatment is a more innovative firm, and thus

I suggest:

> Hypothesis 2a: Within-firm TMT compensation equality is positively related to the firm's
>
> innovation.

> Hypothesis 2b: Between-firm TMT compensation equality is positively related to the
>
> firm's innovation.

TMT Size as a Moderator

I follow previous research on TMT composition to consider the size of the TMT as

potentially influencing the relationships previously discussed. Size "parsimoniously represents a

team's structural and compositional context" (Godoy et al., 2007, p. 32). Size can indicate not

just the exclusivity of the TMT as leaders of the firm (Finkelstein & Hambrick, 1996) but also

the diversity of individuals that are members of this exclusive group. From a diversity

perspective, larger TMTs have the potential to entertain more diverse opinions and experiences

(Wiersema & Bantel, 1992). However, larger teams often experience more difficulties related to

effective collaboration and conflict resolution (Simsek, Veiga, Lubatkin, & Dino, 2005).

Despite the challenges with larger teams, it is expected that team size will positively

moderate the relationship between TMT diversity and innovation for several reasons. First, larger

TMTs have more opportunities for female members to join simply because there are more seats

available at the table. This follows previous research that suggests that TMT size is positively

related to TMT heterogeneity, and subsequently innovation (Bantel & Jackson, 1989). This positive effect is anticipated to occur at both the within-firm and between-firm levels. That is, in years in which the firm has a larger TMT, the relationship between TMT diversity and innovation will be more positive. Additionally, firms that have a larger TMT relative to other firms have more opportunities for diversity on the TMT, and subsequently have greater innovation. Thus, I propose:

Hypothesis 3a: Within-firm TMT size positively moderates the within-firm TMT diversity and firm innovation relationship. When within-firm TMT size is larger, the relationship is more positive.

Hypothesis 3b: Between-firm TMT size positively moderates between-firm TMT diversity and firm innovation relationship. When between-firm TMT size is larger, the relationship is more positive.

TMT size is also believed to moderate the relationship between TMT compensation equality and firm innovation. Because larger TMTs have more opportunities for females to join or be appointed to the TMT, there is the potential for decreased wage disparity between male and female TMT members (Perryman, Fernando, & Tripathy, 2016). When females are compensated more equally in relation to their male counterparts, they may perceive their contributions to be equally as valuable, and positively influence the innovation of the firm. Larger TMTs afford more opportunities for equity, and when there is more equity among group members, there is more collaboration and participation, which is positively related to firm innovation.

Similar to the previous set of hypotheses, this positive effect is anticipated to occur at both the within-firm and between-firm levels. More formally, in years in which the firm has a larger TMT, the relationship between TMT compensation equality and innovation is expected to

be more positive. Also, relative to other firms, in firms with a larger TMT, the relationship

between TMT compensation equality and firm innovation will be more positive. Therefore:

> Hypothesis 4a: Within-firm TMT size positively moderates the within-firm TMT
>
> compensation equality and firm innovation relationship. When within-firm TMT size is
>
> larger, the relationship is more positive.
>
> Hypothesis 4b: Between-firm TMT size positively moderates the between-firm TMT
>
> compensation equality and firm innovation relationship. When between-firm TMT size is
>
> larger, the relationship is more positive.

Methods

Sample

Both diversity and innovation have received increased attention in the healthcare

industry. Many healthcare firms are investing in innovation centers, moving from traditional

commercialization models to human-centered and co-creation models of innovation (Bhatti, del

Castillo, Olson, & Darzi, 2018). Additionally, diversity is a hot topic in this industry because of

gender imbalance in healthcare leadership despite roughly equal numbers of males and females

graduating from medical schools (Rotenstein, 2018). Thus, the primary sample for this study

consists of firm-level data from 2013-2017 for 73 publicly-traded firms operating in US health

services (SIC 80–). These years were selected because they correspond with recent trends in both

innovation and diversity in this industry. Firms in this industry provide medical, surgical, and

health services to individuals and range from health facilities to laboratories to health centers. To

investigate the relationships in this study, I used the DirectEdgar and Compustat databases to

collect relevant data on TMT diversity, compensation, size, and the firm's R&D expenditure.

Both databases contain information from SEC filings for publicly traded firms.

Methodological Approach

This study used multilevel models (MLM) for analyses, which allows for quantification and prediction of variance at multiple levels of a dataset and permits the use of both fixed and random effects (Raudenbush & Bryk, 2002). MLM appropriately accounts for the dependency across units within clusters (Raudenbush, Yang, & Yosef, 2000). Given the longitudinal data used in this study, dependency is accounted for such that years are nested within firms. All the hypotheses were tested using SAS PROC GLIMMIX estimated in maximum likelihood using the Laplace approximation, which serves to approximate likelihoods and correct bias in models that include nested random effects (Breslow & Lin, 1995; Raudenbush et al., 2000).

Dependent Variable

Firm innovation. Following previous literature, innovation is measured as the firm's research and development (R&D) expenditure. This dependent variable is continuous and time-varying. This measure is consistent with previous literature and has been used in studies of both TMTs and healthcare (Chen & Miller, 2007; Lim, 2015; Schramm & Hu, 2013). As a proxy for innovation, it captures firm spending on R&D, with higher R&D expenditure indicating that the firm dedicates more financial resources to R&D and invests more heavily in innovation-related activities.

Independent Variables

TMT gender diversity (within-firm and between-firm). This is a continuous, time-varying variable that captures the representativeness of females on the TMT. This was measured using Blau's (1977) index of heterogeneity $1 - \sum p_i^2$, where i is the proportion of group members in each of the various categories, here, female and male. Blau's index is a common

measure of diversity (Harrison & Klein, 2007; Triana et al., 2013) that ranges from 0 (when there

is only one gender represented) to 0.50 (when there are equal numbers of males and females).

To calculate within-firm TMT gender diversity, each firm's mean TMT gender diversity

across the years in the study was subtracted from the firm's TMT gender diversity for each year:

$$\overline{TMT\ Gender\ Diversity_{\text{Firmt}}} - \overline{TMT\ Gender\ Diversity_{\text{Firm}}}.$$

To calculate between-firm TMT gender diversity, the firm's mean TMT gender diversity

across the years in the study was subtracted from the mean TMT gender diversity across all firms

in the sample:

$$\overline{TMT\ Gender\ Diversity_{\text{Firm}}} - \overline{TMT\ Gender\ Diversity}.$$

TMT compensation equality. This continuous, time-varying variable is calculated as the

ratio of the average compensation for female members on the TMT to the average compensation

of male members on the TMT. This variable takes into account total compensation for all TMT

members (salary, bonus, and stock options) as reported to the SEC (Perryman et al., 2016). For

firms with years that have no female members, the numerator is calculated as 0. For firms with

years that have one female member, the compensation for that female member is the numerator.

Smaller numbers indicate less equality; larger numbers indicate greater equality.

To calculate within-firm TMT compensation equality, each firm's mean TMT

compensation equality across the years in the study was subtracted from the firm's TMT

compensation equality for each year:

$$\overline{TMT\ Compensation\ Equality_{\text{Firmt}}} - \overline{TMT\ Compensation\ Equality_{\text{Firm}}}.$$

To calculate between-firm TMT gender diversity, the firm's mean TMT gender diversity across the years in the study was subtracted from the mean TMT gender diversity across all firms in the sample:

$$\overline{TMT\ Compensation\ Equality}_{\text{Firm}} - \overline{TMT\ Compensation\ Equality}\ .$$

TMT size. This continuous, time-varying variable indicates the reported number of TMT membes. To calculate within-firm TMT size, each firm's mean TMT size across the years in the study was subtracted from the firm's TMT size for each year:

$$TMT\ Size_{\text{Firmt}} - \overline{TMT\ Size}_{\text{Firm}}\ .$$

To calculate between-firm TMT size, the firm's mean TMT size across the years in the study was subtracted from the mean TMT size across all firms in the sample:

$$\overline{TMT\ Size}_{\text{Firm}} - \overline{TMT\ Size}\ .$$

Control Variables

A variety of firm-level factors that could influence the relationships of interest in this study were included as controls. Following previous research on TMTs, diversity, and innovation (Auh & Menguc, 2005), *firm size* (calculated as total number of employees), *sales* (calculated as total revenues), and *performance* (calculated as the firm's return on assets (ROA)) were included as controls. I followed previous literature on TMT heterogeneity and use ROA as a measure for performance given that it captures both scale and scope of firm performance, but also that it demonstrates similar results to other performance measures, such as return on equity (ROE) and Tobin's Q (Cannella, Park, & Lee, 2008; Carpenter, 2002). Also controlled for was the four-digit *SIC* code for each firm given that some services (such as laboratories, SIC 8071) may have higher R&D expenditures than firms that provide other services (such as intermediate care

facilities, SIC 8052). Firm sales, size, and performance are all continuous, time-varying variables, thus, these variables were determined at the within-firm and between-firm levels in the same way the independent variables were calculated as described above.

Results

Descriptive Statistics and Correlations

Tables 1 and 2 provide the means, standard deviations, and correlations of the variables by level of analysis. As noted in Table 1, R&D expenditures in this sample have a mean of $2,588. The average TMT gender diversity index is 0.19, with some firms having no female TMT members (TMT gender diversity index = 0.00) and other firms having equality among genders (TMT gender diversity index = 0.50). The mean TMT compensation equality for the sample is 0.38, indicating that the average compensation for female TMT members is $0.38 for every $1.00 average compensation for male TMT members. Finally, the mean TMT size for the sample is 6.55 members, with the smallest TMT consisting of 1 member and the largest TMT consisting of 22 members.

Table 2 reports the within-firm and between-firm correlations. In terms of the Level 1 (within-firm) correlations for the variables of interest, there is a significant, positive relationship between within-firm TMT gender diversity and within-firm TMT compensation equality. There are also significant, positive relationships between within-firm sales and within-firm TMT gender diversity and within-firm TMT compensation equality. In terms of the Level 2 (between-firm) correlations for the variables of interest, there is a significant negative relationship between between-firm TMT gender diversity and R&D expenditure. However, there is a significant positive relationship among between-firm TMT compensation equality and between-firm TMT gender diversity. There is also a significant negative relationship among between-firm TMT size

and R&D expenditure, yet significant positive relationships among between-firm TMT size and between-firm TMT gender diversity and between-firm TMT compensation equality.

Insert Tables 1 and 2 About Here

Unconditional Models

To evaluate the degree of the dependency in the data, an empty means MLM was used to evaluate sources of variation in the dependent variable, R&D expenditure. The baseline model was an unconditional model without predictors and only residual variance. To test for potential dependency in the data due to firm mean differences (i.e., some firms systematically have higher R&D expenditure than others), a random intercept for firm was included. Model fit improved ($-2\Delta LL = 85.38$, $p < 0.001$) confirming that during the five years of observation, firm mean differences were a significant source of dependency in the data. Thus, a random effect for firm was included in the estimations for the conditional models.

Given that the data include both within-firm and between-firm effects, an empty model (no predictor) intraclass correlation (ICC) was calculated—an estimate of the proportion of outcome variance due to between-firm differences in the intercept. The corresponding empty model ICC indicated that between-firm mean differences accounted for 87% of the variance in R&D expenditure. The ICCs for the three independent variables shows that significant variance exists both within-firms and between-firms: between-firm mean differences were the source of 75% of the variance in TMT gender diversity; between-firm mean differences were the source of 71% of the variance in TMT compensation equality; and between-firm mean differences were the source of 32% of the variance in TMT size.
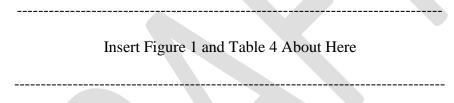
Conditional Models

Control variables. Results of the conditional models (with predictors) are presented in Table 3. Model A includes only the control variables. Results show that both within-firm (b = 0.00, p < 0.001) and between-firm (b = 0.00, p < 0.001) sales are significantly related to R&D expenditure.

Hypotheses 1 and 2. Model B includes within-firm and between-firm TMT gender diversity and TMT compensation equality. The results do not support hypothesis 1a or 1b. Surprisingly, though not significant, the within-firm effect of TMT gender diversity shows a negative relationship with R&D expenditure, thus there is a negative relationship between TMT diversity and innovation. The results also do not support hypothesis 2a or 2b. Both effects show a negative relationship, however neither effect is significant.

Insert Table 3 About Here

Hypothesis 3. Model C includes the full model with the interaction effect of TMT size on the relationships between both TMT gender diversity and TMT compensation equality and R&D expenditure. Hypothesis 3a proposed that within-firm TMT size would positively influence the relationship between within-firm TMT gender diversity and innovation. Hypothesis 3a is not supported. However, hypothesis 3b proposed that between-firm TMT size would positively influence the between-firm TMT gender diversity and innovation relationship. The interaction effect is significant, but in the opposite direction of what was hypothesized (b = -288.40, p < 0.01), indicating that although the TMT gender diversity and innovation relationship is positive, the relationship is less positive in firms that have larger TMTs relative to others.

Hypothesis 4. Hypothesis 4a proposed that within-firm TMT size would positively influence the within-firm TMT compensation equality and innovation relationship. Similar to hypothesis 3a, hypothesis 4a is not supported. Finally, hypothesis 4b proposed that between-firm TMT size would positively influence the between-firm TMT compensation equality and innovation relationship. Hypothesis 4b is supported as shown by the positive and significant interaction effect ($b = 186.39$, $p < 0.01$), indicating that the TMT compensation equality and innovation relationship is negative, the relationship is more negative in firms that have larger TMTs relative to other firms. Figure 1 provides a graphical depiction of the results tested in this study. Also included is Table 4, a summary table of the results.

Insert Figure 1 and Table 4 About Here

Discussion

This paper examines how TMT diversity is related to firm innovation using two separate dimensions of diversity: gender diversity and compensation equality. Integrating an upper echelons perspective with the organizational justice literature, more diverse TMTs—whether diversity is indicated by gender diversity or compensation equality—will positively influence the innovation of the firm. However, TMT size was introduced as a potential contingency to this relationship. Although some of the relationships are contrary to what was proposed, the multilevel analysis does indicate the importance of TMT size to the effectiveness of TMT diversity as related to innovation. Much of the discussion is centered on the TMT size as related to diversity issues in the upper echelons of the firm.

Implications for Research

The study offers three implications for research. First, the multilevel analysis uncovers the importance of TMT size for the relationship between TMT diversity and innovation. Alone, neither dimension of TMT diversity (gender diversity nor compensation equality) seem to significantly influence the innovation of the firm. However, when TMT size is considered, both influence the innovation of the firm. More specifically, the larger the TMT, the less positive the relationship between gender diversity and firm innovation. This relationship may occur for two reasons. First, in larger TMTs, strategic decision-making may be more diffuse and cohesiveness and coordination may be problematic (Certo, Lester, Dalton, & Dalton, 2006). Thus, strategic-decision making may fall in the hands of a few individuals, creating either formal or informal committees responsible for specific firm outcomes. Second, in larger TMTs, it may be difficult to capitalize on the factors that enable gender diversity to be leveraged for important firm outcomes. That is, the human and social capital that female TMT members bring to the table may be more difficult to leverage in larger teams where responsibility and decision-making is more diffuse. Additionally, TMT size amplifies the negative TMT compensation equality—firm innovation relationship. When TMTs are larger, female TMT members may have more male counterparts to benchmark against in terms of both standing and status, and have more opportunities to find inequality in the TMT. As a result, these female TMT members may be less willing to collaborate, negatively influencing the innovation of the firm.

Second, this study contributes to the existing literature on gender diversity of TMTs and boards and its relationship to firm innovation. Previous research in this area has focused on the role of boards in influencing firm innovation (Miller & del Carmen Triana, 2009). These efforts are complemented to examine the influence of TMTs on innovation, anchoring the arguments in the benefits that diverse TMTs can have on this important firm outcome. Whereas boards

oversee and monitor the strategy of the organization, TMTs are reflections of the organization (Hambrick & Mason, 1984) and play a critical role in strategic-decision making. Furthermore, I augment this research on the relationship between diversity of boards and TMTs and firm innovation to consider diversity in two ways—gender diversity and compensation equality. By incorporating compensation equality into the research on TMT diversity and firm innovation, this study introduces implications from the organizational justice literature and points to compensation equality as a key driver in enabling equality of both standing and status among TMT members.

Third, the use of multilevel analysis uncovers interesting insights in terms of the levels of analysis that matter for TMT diversity and firm innovation. On one hand, within-firm TMT diversity does not seem to make a significant difference in firm innovation. That is, in years in which the firm has more (or less) diversity, the innovation of the firm does not seem to change. On the other hand, between-firm TMT does matter for firm innovation. Thus, the findings imply that multilevel theorizing and analysis is critical for understanding the dynamics of TMT diversity and important firm outcomes, such as innovation. Upper echelons studies inherently lend themselves to multilevel theorizing (Hitt, Beamish, Jackson, & Mathieu, 2007). This study echoes this argument to suggest that additional insights can be uncovered when multilevel analysis is incorporated. To this end, the mixed results are actually an outcome of more accurate measurement of the variables of interest. That is, by appropriately including the within-firm and between-firm effects for the variables of interest, how TMT diversity is related to innovation is more accurately specified.

Implications for Practice

The research points to at least two implications for practice. The first managerial implication from the research is that TMT size matters. Previous research has examined the relationship between TMT size and important firm outcomes (Amason & Sapienza, 1997; Haleblian & Finkelstein, 1993). Here, size matters because it influences how TMT diversity is leveraged and influences firm innovation. Larger TMTs negatively impact the relationships between TMT gender diversity, TMT compensation equality, and innovation. Thus, smaller TMTs may be better for harnessing the positive effects of diversity, and size should be benchmarked against competitors or other firms in the industry.

On a similar note, the multilevel analysis suggests that benchmarking against other firms is a key driver in terms of the TMT diversity—firm innovation relationship. Thus, rather than focusing on the firm's past in terms of TMT gender diversity or compensation equality, what matters is how the firm stacks up against competitors on these two important diversity dimensions. While benchmarking R&D expenditure against competitors may be tempting for firms, especially in the healthcare industry given the newness of human-centered innovation (Bhatti et al., 2018), benchmarking TMT diversity and size may be important as they drive firm innovation.

Limitations and Future Directions

Although this study uncovers unique insights related to TMT diversity and innovation, it has limitations that could be addressed by future research. This study uses a unique sample comprised of data from multiple databases that incorporates both TMT-level and firm-level longitudinal data. The difficulty in attaining these data, in addition to their multilevel nature, gives rise to a smaller sample size. Further, the data focus on a specific context—the US healthcare industry—that potentially limits the sample size and generalizability of the study.

Thus, future research should test the relationships of interest using a dataset of firms across a variety of industries or with more longitudinal data. Doing so will add to understanding the relationships in this study, potentially incorporating lagged variables or an additional level of analysis related to industry.

Related to the previous suggestion, an additional limitation is that this study only incorporates two levels of analysis—the TMT and the firm. Though these two levels provide unique insights related to how within-firm and between-firm TMT diversity influences firm innovation, future research could extend these insights to incorporate additional levels of analysis. As mentioned above, future research could include multiple industries and use industry as a third level of analysis. Alternatively, more focus could be placed on the individuals that comprise each TMT, introducing individual-level analysis to this research. Incorporating additional levels of analysis might uncover more nuanced insights similar to the within-firm and between-firm insights discovered in this study.

Conclusion

As issues related to gender on executive teams continue to permeate both the academic literature and the popular press, understanding how diversity shapes strategic decision-making and strategy becomes increasingly important. For firms in which innovation is a key driver of success, such as those in the healthcare industry, understanding the link between TMT diversity and firm innovation is needed. The study contributes to the literature by uncovering the nuanced relationship between TMT diversity and innovation. By investigating both TMT gender diversity and compensation equality at multiple levels of analysis, TMT size as an important factor influencing this relationship is considered. TMT size influences how the human and social capital of female TMT members is leveraged for innovation, as well as how female TMT

members collaborate and contribute to innovation based on perceptions of equality in terms of standing and status with male counterparts. The study provides unique insights that contribute to the growing discussion on the role of women on TMTs.

References

Adler, P. S., & Kwon, S.-W. (2002). Social capital: Prospects for a new concept. *Academy of Management Review*, *27*(1), 17–40.

Alvarez, S. A., & Barney, J. B. (2007). Discovery and creation: Alternative theories of entrepreneurial action. *Strategic Entrepreneurship Journal*, *1*(1-2), 11–26.

Amason, A. C. (1996). Distinguishing the effects of functional and dysfunctional conflict on strategic decision making: Resolving a paradox for top management teams. *Academy of Management Journal*, *39*(1), 123–148.

Amason, A. C., & Sapienza, H. J. (1997). The effects of top management team size and interaction norms on cognitive and affective conflict. *Journal of Management*, *23*(4), 495–516.

Auh, S., & Menguc, B. (2005). Top management team diversity and innovativeness: The moderating role of interfunctional coordination. *Industrial Marketing Management*, *34*(3), 249–261.

Balkin, D. B., & Gomez-Mejia, L. R. (1990). Matching compensation and organizational strategies. *Strategic Management Journal*, *11*(2), 153–169.

Bantel, K. A., & Jackson, S. E. (1989). Top management and innovations in banking: Does the composition of the top team make a difference? *Strategic Management Journal*, *10*(S1), 107–124.

Bhatti, Y., del Castillo, J., Olson, K., & Darzi, A. (2018, March). Putting humans at the center of health care innovation. *Harvard Business Review*.

Blau, P. M. (1977). *Inequality and heterogeneity: A primitive theory of social structure* (Vol. 7). New York: Free Press.

Breslow, N. E., & Lin, X. (1995). Bias correction in generalised linear mixed models with a single component of dispersion. *Biometrika*, *82*(1), 81–91.

Brown, S. L., & Eisenhardt, K. M. (1995). Product development: Past research, present findings, and future directions. *Academy of Management Review*, *20*(2), 343–378.

Campbell, K., & Mínguez-Vera, A. (2008). Gender diversity in the boardroom and firm financial performance. *Journal of Business Ethics*, *83*(3), 435–451.

Cannella, A. A., Park, J.-H., & Lee, H.-U. (2008). Top management team functional background diversity and firm performance: Examining the roles of team member colocation and environmental uncertainty. *Academy of Management Journal*, *51*(4), 768–784.

Carpenter, M. A. (2002). The implications of strategy and social context for the relationship between top management team heterogeneity and firm performance. *Strategic Management Journal*, *23*(3), 275–284.

Certo, S. T., Lester, R. H., Dalton, C. M., & Dalton, D. R. (2006). Top management teams, strategy and financial performance: A meta-analytic examination. *Journal of Management*

Studies, *43*(4), 813–839.

Chan, K. W., & Mauborgne, R. (1998). Procedural justice, strategic decision making, and the knowledge economy. *Strategic Management Journal*, *19*(4), 323–338.

Chen, W., & Miller, K. D. (2007). Situational and institutional determinants of firms' R&D search intensity. *Strategic Management Journal*, *28*(4), 369–381.

Cropanzano, R., Byrne, Z. S., Bobocel, D. R., & Rupp, D. E. (2001). Moral virtues, fairness heuristics, social entities, and other denizens of organizational justice. *Journal of Vocational Behavior*, *58*(2), 164–209.

Finkelstein, S., & Hambrick, D. (1996). *Strategic leadership: Top executives and their effects on organizations*. Minneapolis/St. Paul: West Pub. Co.

Finkelstein, S., Hambrick, D. C., & Cannella, A. A. (2009). *Strategic leadership: Theory and research on executives, top management teams, and boards*. Oxford University Press.

Frydman, C., & Papanikolaou, D. (2018). In search of ideas: Technological innovation and executive pay inequality. *Journal of Financial Economics*, *130*(1), 1–24.

Furst, S. A., & Reeves, M. (2008). Queens of the hill: Creative destruction and the emergence of executive leadership of women. *The Leadership Quarterly*, *19*(3), 372–384.

Godoy, R., Reyes-García, V., Huanca, T., Leonard, W. R., McDade, T., Tanner, S., … Seyfried, C. (2007). Signaling by consumption in a native Amazonian society. *Evolution and Human Behavior*, *28*(2), 124–134.

Greenberg, J. (1987). A taxonomy of organizational justice theories. *Academy of Management Review*, *12*(1), 9–22.

Greenberg, J. (1990). Organizational justice: Yesterday, today, and tomorrow. *Journal of Management*, *16*(2), 399–432.

Haleblian, J., & Finkelstein, S. (1993). Top management team size, CEO dominance, and firm performance: The moderating roles of environmental turbulence and discretion. *Academy of Management Journal*, *36*(4), 844–863.

Hambrick, D. C. (2007). Upper echelons theory: An update. *Academy of Management Review*, *32*, 334–343.

Hambrick, D. C., Cho, T. S., & Chen, M.-J. (1996). The influence of top management team heterogeneity on firms' competitive moves. *Administrative Science Quarterly*, 659–684.

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, *9*(2), 193–206.

Harrison, D. A., & Klein, K. J. (2007). What's the difference? Diversity constructs as separation, variety, or disparity in organizations. *Academy of Management Review*, *32*(4), 1199–1228.

Hayward, L. E., Tropp, L. R., Hornsey, M. J., & Barlow, F. K. (2017). Toward a comprehensive understanding of intergroup contact: Descriptions and mediators of positive and negative contact among majority and minority groups. *Personality and Social Psychology Bulletin*,

43(3), 347–364.

Hillman, A. J., Cannella, A. A., & Harris, I. C. (2002). Women and racial minorities in the boardroom: How do directors differ? *Journal of Management*, *28*(6), 747–763.

Hitt, M. A., Beamish, P. W., Jackson, S. E., & Mathieu, J. E. (2007). Building theoretical and empirical bridges across levels: Multilevel research in management. *Academy of Management Journal*, *50*(6), 1385–1399.

Hoffman, L. (2015). Longitudinal analysis: Modeling within-person fluctuation and change. Routledge.

Hood, J. N., & Koberg, C. S. (1994). Patterns of differential assimilation and acculturation for women in business organizations. *Human Relations*, *47*(2), 159–181.

Ibarra, H. (1993). Personal networks of women and minorities in management: A conceptual framework. *Academy of Management Review*, *18*(1), 56–87.

Ibarra, H. (1997). Paving an alternative route: Gender differences in managerial networks. *Social Psychology Quarterly*, 91–102.

Jeong, S.-H., & Harrison, D. A. (2017). Glass breaking, strategy making, and value creating: Meta-analytic outcomes of women as CEOs and TMT members. *Academy of Management Journal*, *60*(4), 1219–1252.

Jones, S. (2017, June 9). White Men Account for 72% of Corporate Leadership at 16 of the Fortune 500 Companies. *Fortune*. Retrieved from http://fortune.com/2017/06/09/white-men-senior-executives-fortune-500-companies-diversity-data/.

Kanter, R. M. (1977). Some effects of proportions on group life: Skewed sex ratios and responses to token women. *American Journal of Sociology*, *82*(5), 965–990.

Lim, E. N. K. (2015). The role of reference point in CEO restricted stock and its impact on R&D intensity in high-technology firms. *Strategic Management Journal*, *36*(6), 872–889.

Ling, Y., & Kellermanns, F. W. (2010). The effects of family firm specific sources of TMT diversity: The moderating role of information exchange frequency. *Journal of Management Studies*, *47*(2), 322–344.

Lyngsie, J., & Foss, N. J. (2016). The more, the merrier? Women in top-management teams and entrepreneurship in established firms. *Strategic Management Journal*, *38*(3), 487–505.

Miller, T., & Triana, M. (2009). Demographic diversity in the boardroom: Mediators of the board diversity–firm performance relationship. *Journal of Management Studies*, *46*(5), 755–786.

Milliken, F. J., & Martins, L. L. (1996). Searching for common threads: Understanding the multiple effects of diversity in organizational groups. *Academy of Management Review*, *21*(2), 402–433.

Milliken, F. J., & Vollrath, D. A. (1991). Strategic decision-making tasks and group effectiveness: Insights from theory and research on small group performance. *Human Relations*, *44*(12), 1229–1253.

Perryman, A. A., Fernando, G. D., & Tripathy, A. (2016). Do gender differences persist? An examination of gender diversity on firm performance, risk, and executive compensation. *Journal of Business Research*, *69*(2), 579–586.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (Vol. 2nd). Thousand Oaks, CA: Sage.

Raudenbush, S. W., Yang, M.-L. M.-L., & Yosef, M. (2000). Maximum likelihood for generalized linear models with nested random effects via high-order, multivariate Laplace approximation. *Journal of Computational and Graphical Statistics*, *9*(1), 141–157.

Roberson, Q., Holmes, O., & Perry, J. L. (2017). Transforming research on diversity and firm performance: A dynamic capabilities perspective. *Academy of Management Annals*, *11*(1), 189–216.

Robinson, G., & Dechant, K. (1997). Building a business case for diversity. *Academy of Management Perspectives*, *11*(3), 21–31.

Rodan, S., & Galunic, C. (2004). More than network structure: How knowledge heterogeneity influences managerial performance and innovativeness. *Strategic Management Journal*, *25*(6), 541–562.

Rotenstein, L. S. (2018, October). Fixing the gender imbalance in health care leadership. *Harvard Business Review*.

Rupp, D. E. (2011). An employee-centered model of organizational justice and social responsibility. *Organizational Psychology Review*, *1*(1), 72–94.

Rupp, D. E., Ganapathi, J., Aguilera, R. V, & Williams, C. A. (2006). Employee reactions to corporate social responsibility: An organizational justice framework. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, *27*(4), 537–543.

Schramm, M. E., & Hu, M. Y. (2013). Perspective: The evolution of R&D conduct in the pharmaceutical industry. *Journal of Product Innovation Management*, *30*, 203–213.

Simsek, Z., Veiga, J. F., Lubatkin, M. H., & Dino, R. N. (2005). Modeling the multilevel determinants of top management team behavioral integration. *Academy of Management Journal*, *48*(1), 69–84.

Sirmon, D. G., Hitt, M. A., Ireland, R. D., & Gilbert, B. A. (2011). Resource orchestration to create competitive advantage: Breadth, depth, and life cycle effects. *Journal of Management*, *37*(5), 1390–1412.

Tang, Y., Li, J., & Yang, H. (2015). What I see, what I do: How executive hubris affects firm innovation. *Journal of Management*, *41*(6), 1698–1723.

Triana, M., Miller, T. L., & Trzebiatowski, T. M. (2013). The double-edged nature of board gender diversity: Diversity, firm performance, and the power of women directors as predictors of strategic change. *Organization Science*, *25*(2), 609–632.

Wiersema, M. F., & Bantel, K. A. (1992). Top management team demography and corporate

strategic change. *Academy of Management Journal*, *35*(1), 91–121.

Table 1: Descriptive Statistics

Variable	n	Mean	Standard Deviation
Firms	404	-	-
SIC Codes	111	-	-
R&D Expenditure	79	$2,588	$8,400
TMT Gender Diversity	404	0.19	0.19
TMT Compensation Equality	404	0.38	0.05
TMT Size	404	6.55	3.73
Performance (ROA)	110	-18.70	83.23
Sales	110	$2,558,050	$2,822,970
Size (Employees)	103	18,473	21,302
Level-1 (Within-firm) Variables (Group Mean Centered)			
Within-firm TMT Diversity Index	404	0.01	0.10
Within-firm TMT Compensation Equality	404	0.02	0.22
Within-firm TMT Size	404	-0.94	2.88
Within-firm Sales	110	$-9,023.67	$597.88
Within-firm Performance (ROA)	110	2.02	39.82
Within-firm Size (Employees)	103	-7.67	4,871
Level-2 (Between-firm) Variables (Group Mean Centered)			
Between-firm TMT Diversity Index	404	0.03	0.17
Between-firm TMT Compensation Equality	404	0.08	0.43
Between-firm TMT Size	404	-0.88	2.98
Between-firm Sales	113	$-449,083.24	$2,764.07
Between-firm Performance (ROA)	113	-1.77	82.22
Between-firm Size (Employees)	113	-3,889.09	20,556.48

Table 2: Correlations

Level-1 (Within-firm) Correlations

Variable	n	1.	2.	3.	4.	5.	6.	7.
1. R&D Expenditure	79	1.00						
2. Within-firm TMT Gender Diversity	404	-0.07	1.00					
3. Within-firm TMT Compensation Equality	404	-0.02	0.56***	1.00				
4. Within-firm TMT Size	404	0.05	0.00	0.01	1.00			
5. Within-firm Sales	110	0.05	0.24**	0.19*	0.01	1.00		
6. Within-firm Size (Employees)	103	0.07	0.09	0.08	0.08	0.80***	1.00	
7. Within-firm Performance (ROA)	110	-0.06	-0.02	-0.02	-0.10	-0.01	-0.01	1.00

Level-2 (Between-firm) Correlations

Variable	n	1.	2.	3.	4.	5.	6.	7.	8.
1. R&D Expenditure	79	1.00							
2. Between-firm TMT Gender Diversity	404	-0.22*	1.00						
3. Between-firm TMT Compensation Equality	404	-0.22	0.80***	1.00					
4. Between-firm TMT Size	404	-0.43***	0.28***	0.10*	1.00				
5. Between-firm Sales	113	-0.23*	0.14	-0.05	0.56***	1.00			
6. Between-firm Size (Employees)	109	-0.16	-0.01	-0.09	0.46***	0.85***	1.00		
7. Between-firm Performance (ROA)	113	-0.10	0.29**	0.26**	0.27**	0.28**	0.26**	1.00	
8. SIC Code	111	-0.17	0.19*	0.20*	0.48***	0.28**	0.20*	0.34***	1.00

$* \ p < 0.05$
$** \ p < 0.01$
$*** \ p < 0.001$

Table 3:
Multilevel Analysis Results for the Effects of TMT Gender Diversity, TMT Compensation Equality, and TMT Size on R&D Expenditure

	Model A		Model B		Model C	
	b	Standard Error	b	Standard Error	b	Standard Error
Intercept	13.89	10.92	5.01	8.76	-10.20	9.38
Level-1 (Within-firm) Main Effects						
TMT Gender Diversity			-11.41	27.27	1.55	32.89
TMT Compensation Equality			1.56	15.45	-0.35	16.95
TMT Size					-0.15	0.24
Level-2 (Between-MNE) Main Effects						
TMT Gender Diversity			-4.14	25.36	174.42**	67.39
TMT Compensation Equality			-6.50	11.91	-92.94**	34.39
TMT Size					5.65	3.57
Level-1 (Within-firm) Interaction Effects						
TMT Gender Diversity * TMT Size					1.82	14.87
TMT Compensation Equality * TMT Size					0.42	7.06
Level-2 (Between-firm) Interaction Effects						
TMT Gender Diversity * TMT Size					-288.40**	107.96
TMT Compensation Equality * TMT Size					186.39**	69.12
Covariates						
Level-1 (Within-firm) Main Effects						
Sales	0.00***	0.00	0.00***	0.00	0.00***	0.00
Size (Employees)	0.13	0.13	0.14	0.21	0.10	0.19
Performance (ROA)	-0.01	0.01	-0.01	0.01	-0.01	0.01

	Model A		Model B		Model C	
	b	Standard Error	b	Standard Error	b	Standard Error
Level-2 (Between-firm) Main Effects						
Sales	0.00***	0.00	0.00***	0.00	0.00***	0.00
Size (Employees)	0.04	0.18	0.04	0.13	0.00	0.12
Performance (ROA)	0.01	0.02	0.02	0.02	-0.01	0.02
SIC Code	0.00***	0.00	0.00***	0.00	0.00***	0.00
Variance Components						
Level-2 (Between-firm) Random						
Intercept Variance	67.52	25.87	28.12	8.62	4.42	1.06
Level-1 (Within-firm) Residual Variance	12.29	2.28	32.32	0.00	9.58	0.74
Pseudo-R^2	-		24.23		76.85	
-2LL	438.35		460.14		450.74	

All models are based on 73 observations nested within 19 groups (firms). Pseudo-R2 for Model B is compared to Model A. Pseudo-R^2 for Model C is compared to Model B. Similar results were found when TMT gender diversity and TMT compensation equality were tested in separate models.

Table 4: Summary of Results

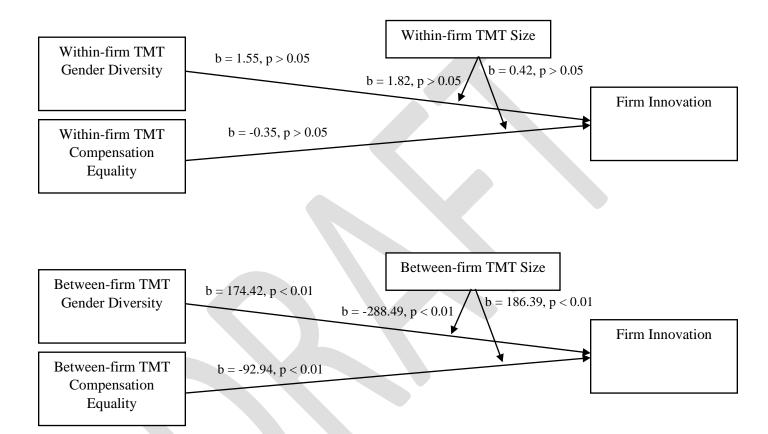| Hypothesis	Proposed Relationship	Supported
1a	Within-firm TMT gender diversity is positively related to the firm's innovation.	Not significant
1b	Between-firm TMT gender diversity is positively related to the firm's innovation.	Not significant
2a	Within-firm TMT compensation equality is positively related to the firm's innovation.	Not significant
2b	Between-firm TMT compensation equality is positively related to the firm's innovation.	Not significant
3a	Within-firm TMT size positively moderates the within-firm TMT diversity and firm innovation relationship. When within-firm TMT size is larger, the relationship is more positive.	Not significant
3b	Between-firm TMT size positively moderates between-firm TMT diversity and firm innovation relationship. When between-firm TMT size is larger, the relationship is more positive.	Significant, but in opposite direction of hypothesis
4a	Within-firm TMT size positively moderates the within-firm TMT compensation equality and firm innovation relationship. When within-firm TMT size is larger, the relationship is more positive.	Not significant
4b	Between-firm TMT size positively moderates the between-firm TMT compensation equality and firm innovation relationship. When between-firm TMT size is larger, the relationship is more positive.	Significant, in support of hypothesis

Figure 1: Within-firm and Between-firm Results Based on the Full Model

Within-firm TMT Size

Within-firm TMT Gender Diversity

b = 1.55, p > 0.05

b = 1.82, p > 0.05

b = 0.42, p > 0.05

Firm Innovation

Within-firm TMT Compensation Equality

b = -0.35, p > 0.05

Between-firm TMT Size

Between-firm TMT Gender Diversity

b = 174.42, p < 0.01

b = -288.49, p < 0.01

b = 186.39, p < 0.01

Firm Innovation

Between-firm TMT Compensation Equality

b = -92.94, p < 0.01