UNDERSTANDING WHEN CEO GENDER DRIVES FIRM STRATEGIC DECISIONS: THE ROLE OF BOTTOM-UP DRIVERS IN ATTENUATING CEO'S GENDER-SPECIFIC TOP-DOWN ATTENTION BOUNDARIES

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ABSTRACT

Across the two studies in my dissertation, I investigated the responsiveness of female CEOs to bottom-up attentional factors and their impact on two strategic outcomes – CSR and innovation. I hypothesized that female CEOs would be more responsive to evaluators' guidance, resulting in greater variations in strategic outcomes in female-led firms than male-led firms. Specifically, I focused on how evaluators would affect CEOs' risk propensity, temporal orientation, and stakeholder orientation, which tend to be gender-specific and associated with CSR and innovation. I asserted that examining these theoretical arguments would more effectively explain gender's effect on CSR and innovation. As hypothesized, I found that female CEOs showed higher responsiveness to bottom-up factors than male CEOs. However, they were responsive to different factors across CSR and innovation. In the CSR chapter, female CEOs showed higher sensitivity to media stakeholder focus. On the other hand, the innovation chapter demonstrated female CEOs' higher responsiveness toward stock options and analysts' adverse ratings. These findings suggest that executives, especially female executives, tend to respond differently to bottom-up factors according to the context they are situated in. The degree to which a strategic action is tightly related to a firm's financial performance is likely to determine whether female executives respond to their previously overlooked bottom-up factors.

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INTRODUCTION

Upper echelons research has highlighted the role of executive attributes in shaping the strategic choices of firms (Hambrick & Mason, 1984). Among these attributes, gender is a key demographic characteristic that has received considerable interest. While an individual's attentional structure is formed through distinctive social and career experiences (Shepherd et al., 2017), gender is one of the factors that distinguishes attentional structures among executives. The differences in socialization processes and career trajectories between men and women (Cruz et al., 2019; Hillman et al., 2002; Major & Konar, 1984) lead executives of different genders to develop distinctive attentional structures by acquiring unique knowledge and cognitive schemas (Dezso & Ross, 2012). This process results in systematic behavioral differences between male and female executives (Cruz et al., 2019).

Prior studies have demonstrated how stereotypical female-specific attributes, such as stakeholder orientation and risk aversion (Eagly & Karau, 2002; Glass & Cook, 2018) are reflected in female executives' pursuit of relevant strategic actions. Beyond the executive-level, research has also found that women are more willing to sacrifice immediate rewards for future benefits (Silverman, 2003), which indicates their long-term orientation. Particularly, female-led firms have been shown to invest more in socially responsible activities, which exemplifies their stakeholder orientation, risk propensity, and temporal orientation (Cook & Glass, 2016; Manner, 2010). Such activities are most effectively promoted by individuals who prioritize stakeholders and long-term outcomes (Mallin et al., 2013; Flammer & Bansal, 2017) as well as those who strive to reduce firm risk (Goss & Roberts, 2011; Husted et al., 2016).

However, some studies have shown that female executives do not always lead firms to engage in actions consistent with stereotypical female-specific attributes. For instance, in some

studies, female leaders had no impact on a firm's socially responsible internal policies (Cook & Glass, 2016; Glass & Cook, 2018; Tocher & Rutherford, 2009). In others, female-led firms resulted in pursuing fewer socially responsible actions when the firm had a gender diverse board (Glass & Cook, 2018). Additionally, Wang and colleagues (2018) found no association between CEO gender and risk-taking behavior. The lack of conclusive evidence on the impact of CEO gender underscores the need to illuminate the possible theoretical mechanisms that determine when and how CEO gender has a significant influence on a firm's strategic actions.

In this dissertation, I leverage the attention-based view (ABV) to argue that CEO gender is likely to influence a firm's strategic choices through distinct attentional structures, with male and female CEOs having salient boundaries in the areas they pay attention to. Nonetheless, I also argue that the attentional boundaries of a CEO are subject to change with contextual factors, particularly the pressures and guidance they perceive from evaluators. Depending on how CEOs respond to evaluators, the attentional boundaries across gender may become more salient or less distinctive. CEOs may be induced to better attend to their blind spots or be directed to focus on their pre-existing attentional fields, which may lead the attentional vision of male and female CEOs to become more similar or dissimilar.

I argue that male and female CEOs have distinct social and career experiences that create different top-down attentional processes. These processes are the mental templates used to notice, interpret, and respond to environmental stimuli, thus guiding leaders' strategic actions (Shepherd et al., 2017; Cruz et al., 2019). However, CEOs do not operate in a vacuum when making strategic choices. Rather, they are subject to various pressures and guidance from a diverse set of stakeholders who continuously evaluate both CEOs and their firms. Consequently, these external forces may impact a CEO's attentional scope, leading them to either broaden their

focus to encompass previously overlooked informational elements or reinforce their pre-existing attentional scope. Thus, evaluators serve as bottom-up attentional factors (Ocasio, 2011; Rerup, 2009; Shepherd et al., 2017) who can either soften or solidify gender-specific attentional boundaries. Overall, the attentional structure of individuals is formed by the interaction of top-down and bottom-up attentional processing. It has been suggested that these dynamic changes depending on how individuals "relax their top-down processing" and "involve more bottom-up processing" (Shepherd et al., 2017). Therefore, considering both top-down and bottom-up processing would more effectively explain how executive gender affects a firm's strategic action and performance consequences.

Further, I suggest that the influence of relevant bottom-up processes is likely to be stronger for female CEOs than male CEOs and lead to greater changes in the attentional structures of female CEOs. Female CEOs face more scrutiny due to being a minority group and are often judged more harshly than their male counterparts. As a result, they receive unfavorable evaluations of their abilities and competencies (Dixon-fowler et al., 2013; Eagly & Karau, 2002; Gupta et al., 2018; Gupta et al., 2020; Lee & James, 2007; Ryan & Haslam, 2007; Ryan et al., 2016). The increased skepticism, scrutiny, and adverse evaluations experienced by female leaders are likely to make female CEOs more responsive to contextual factors. As such, I argue that evaluator pressures tend to exert greater influence on the attention of female CEOs.

To investigate how internal and external evaluators change the degree to which CEO gender influences a firm's strategic outcomes, I examine two fundamental strategic actions: corporate social responsibilities (CSR) and innovation. These actions differ in their degree of gender-specificity. CSR is closely linked to executives' stakeholder orientation, long-term orientation, and risk aversion, all of which are key communal attributes (Glass & Cook, 2018;

Silverman, 2013). As a result, CSR has been a primary behavioral outcome examined by scholars of leader gender (Glass & Cook, 2018; Harjoto et al., 2015; Rao & Tilt, 2016; Shaukat et al., 2016). In contrast, innovation benefits from both male and female-specific stereotypical attributes. For example, innovation is facilitated by risk-taking behavior (Almor et al., 2019; Chen et al., 2016; Mao & Zhang, 2018), which is usually associated with men. However, it is also enhanced by stereotypical female-specific attributes, such as high stakeholder orientation and long-term orientation (Flammer & Kacperczyk, 2016; Griffin et al., 2021).

Although there are differences in the gender specificity levels of CSR and innovation, existing research has produced mixed results regarding the relationship between gender and these two strategic actions. While there are discrepancies in the results, most studies have demonstrated a gender effect on CSR, whereas findings on how gender influences innovation have been more mixed (Mah et al., 2023). However, varying degrees of mixed effects for CSR and innovation align well with the universality of the theorized gender effect on both. By examining these strategic outcomes, I identified how contextual factors can impact the degree to which female CEOs and male CEOs exert influence, regardless of how gender-specific a particular strategic action is.

With this dissertation, I make five primary contributions. First, gender research has been inconclusive regarding whether an executive gender effect exists on a firm's strategic actions and those outcomes. Scholars have utilized gender categorization of executives to explain executives' strategic actions. However, they have largely overlooked how environmental factors may blur or solidify executives' gender-specific attentional boundaries. As external stimuli are likely to influence executive attention, these external factors have the potential to affect the degree to which CEO gender systematically influences firm actions. By drawing on the ABV, I argue that

complementing top-down attentional processes with bottom-up attentional processing helps build a more detailed understanding of how executive gender explains a firm's strategic actions and performance outcomes.

Second, I argue that CEOs may respond differently to bottom-up factors depending on the primary strategic action. When a strategic action serves to accumulate the firm's financial wealth, CEOs are likely to be better attuned to bottom-up factors that are in their blind spots. However, if a focal action's primary aim does not directly benefit a firm's financial standing, CEOs tend to rely on their existing attentional fields and reinforce their baseline behavioral tendencies. Therefore, while a bottom-up factor may prompt a CEO to shift from their pre-existing attentional structure in one context, the same factor may reinforce their baseline behaviors in another context. This highlights the dangers of assuming that a particular contextual factor will consistently prompt a CEO to act in a specific manner without considering the type of strategic action involved.

Lastly, scholars tend to leverage the argument that men and women exhibit distinctive attributes when explaining the actions taken by male and female executives. However, I argue that adopting a more dynamic perspective on how executive attributes, such as stakeholder orientation, temporal orientation, and risk propensity, vary based on external drivers may more effectively explain when executive gender effects are more likely to be evident in a firm's strategic actions. In particular, the contributing factors for CSR and innovation, such as stakeholder orientation, temporal orientation, and the risk propensity of executives, have been shown to vary depending on context. Thus, overlooking contextual factors may have contributed to the mixed findings regarding the gender effect on CSR and innovation.

CHAPTER 1. LITERATURE REVIEW ON EXPERIENCES AND ACTIONS OF FEMALE EXECUTIVES AND FEMALE-LED FIRMS

INTRODUCTION

Traditionally, society has expected leaders to be assertive, self-confident, controlling, and dominant. While men have been perceived and expected to possess these agentic qualities, women are expected to possess communal attributes (Eagly et al., 2000). Role congruity theory explains how the alignment between gender attributes and certain roles, such as leadership roles, determines the level of bias against individuals. This theory outlines the difficulties women face in achieving leadership positions (Eagly & Karau, 2002) as their communal attributes do not fit the traditional image of a leader, resulting in unfavorable evaluations from society. This bias against female leaders is also reflected in the corporate world where men predominantly hold positions in the upper echelon. While the number of female CEOs in S&P 500 companies has grown from 2% to 6.4% over the last two decades, women nonetheless remain a small minority among corporate executives.

In the following section, I first review studies on how gender biases and stereotypes affect female leaders and female-led firms across different phases, from appointment processes to their tenure as executives. I then discuss contextual factors that facilitate or mitigate negative consequences for female executives and their firms. Finally, I discuss actions taken by female executives toward other individuals and groups, as well as the firm-level and performance consequences for the firm. Each section will be summarized with a short conclusion.

HOW GENDER BIASES AND STEREOTYPES AFFECT FEMALE EXECUTIVES

Female executives' appointments. Women aspiring to executive positions face numerous challenges when climbing the corporate ladder due to pervasive gender-based discrimination in

leadership roles. Specifically, society expects women to possess communal attributes, while leaders are typically associated with agentic characteristics. This creates a role incongruence that undermines the legitimacy of female leaders. Gender-based discrimination is evident from the appointment stage, where female candidates are often overlooked in favor of their male counterparts. Research has demonstrated that employers and executive-search firms are more likely to select and interview male candidates for executive positions. Additionally, female candidates face greater penalties than their male counterparts, as demonstrated by the higher human capital requirements for women to reach the same leadership positions as men (Dreher, Lee, & Clerkin, 2011; Fernandez-Mateo & Fernandez, 2016; Jung et al., 2017; Wang et al., 2018).

Furthermore, studies have indicated a negative spillover effect whereby having a woman in a top management role reduces the likelihood of further women being appointed to the team (Dezso et al., 2016). Similarly, Bonet and colleagues (2020) found that the presence of other female executives also slows down the advancement of women to executive positions. These studies suggest that firms with female top executives may perceive less societal pressure to improve gender diversity at the top with their current set of female executives, which may limit the representation of women in executive roles. Additionally, Elvira and Cohen (2001) considered the gender effect when examining female executive turnover. The proportion of current female executives had little influence on the likelihood of female executives' exit, which suggests that having female peers may not change the degree to which female executives remain committed to their firms. Thus, it continues to be unclear whether female executives are opposed to inviting more female executives to their positions.

However, studies have found that the gender composition of other levels within a firm can positively influence the appointment of female executives. For example, bottom-up effects suggest that female executives' appointment chances increase with a greater representation of women in lower-level management positions (Dreher, 2003) and non-management positions (Ali et al., 2021). However, Ali and colleagues (2021) found that female representation in lower through middle management positions did not meaningfully impact female executives' appointment. Conversely, the top-down effect delineates how gender diversity at higher organizational levels will likely trickle down and increase lower-level gender diversity (Cohen, Broschak, & Haveman, 1998; Hillman, Shropshire, & Cannella, 2007). Following this logic, scholars have examined how board-level gender diversity spills over to female executive appointments. Wang and Kelan (2013) and Gould and colleagues (2018) found that having a critical mass of female directors (at least three) increased the likelihood that firms would appoint female CEOs and top executives. Specifically, Wang and Kelan (2013) found that the probability of appointing female CEOs was higher in firms with stronger boards, as measured by the percentage of independent directors and highly qualified directors. Ironically, Gould and colleagues (2018) found this effect weakened after institutional pressures for gender diversity increased, suggesting that institutional pressure at one level may have indirect negative effects at another level. Additionally, Oliver and colleagues (2018) concluded that a board chair's collaborative orientation facilitated the appointment of a female CEO. While the orientation still exhibited bias in that female CEOs are likely subjected to benevolent sexism by corporate directors, this subtle bias and the board chair's collaborative orientation were attenuated under higher female representation in the boardroom. While the strength of the trickle-down effect seems to vary across different contexts, more research examining the relative effect would offer

additional insight on its efficacy. Specifically, it might assess whether the institution or the focal firm and its members are responsible for preventing firms from appointing more female executives once they have achieved heightened board gender diversity.

Furthermore, prior research has examined how female candidates receive biased treatment from their internal peers, which limits their advancement toward executive positions by inhibiting their capabilities and social capital accumulation. Women were more likely to face hostility from their peers, and they were assigned fewer developmental assignments and geographic mobility opportunities. They also had fewer chances to engage in social and informal networks with coworkers, resulting in smaller informal networks (Lyness & Thompson, 2000). More broadly, when a firm exhibits a masculine organizational culture, female representation at the executive level is also less likely (Loughlin & Arnold, 2007; Wang et al., 2018).

Other firm-level attributes have been found to limit female executives' representation as well. Wang and colleagues (2018), in a meta-analysis of the literature, found that firms with high prestige, as measured by firm size, age, and performance, were less likely to appoint female CEOs. Similar to their findings, Nelson and Levesque (2007) hypothesized that Fortune 500 firms would appoint fewer female executives than entrepreneurial firms. As entrepreneurial firms tend to be highly dynamic and less institutionalized, these firms were argued to exhibit less gender bias. However, they ultimately found the opposite in that entrepreneurial firms were less likely to appoint female executives relative to Fortune 500 companies.

While research has determined how female executives are adversely affected by internal members and their firm's attributes (Lyness & Thompson, 2000; Loughlin & Arnold, 2007; Nelson & Levesque, 2007; Wang et al., 2018), other studies have found opposing, affirmative, organizational practices and cultures that benefit female executives' appointments. For example,

human resource practices related to work-life balance and career encouragement have elevated female executives' representation (Dreher, 2003; Tharenou, 2001). Therefore, while research demonstrates how female candidates confront multiple hurdles for advancement toward the upper echelon, making the advancement more challenging for women and resulting in fewer female executives, internal practices exist that enhance opportunities for female executives.

Furthermore, other attributes exist at the firm-level that benefit female executives' representation. Leveraging the glass-cliff phenomenon, which suggests that minorities are more likely to assume leadership positions during organizational crises (Ryan & Haslam, 2007), Cook and Glass (2014) found women are more likely to be appointed to CEO positions in poorly performing firms relative to those that are performing well. As female candidates are typically offered fewer opportunities to assume leadership roles, they may be more willing to take on challenging positions. Moreover, as firms perceive a need to shift the competencies required of a leader during difficult situations, they may be more attracted to female candidates, who often possess strong relationship-building skills and are better equipped to navigate such challenges.

Finally, external factors have also negatively impacted the employment of female executives. Gao and colleagues (2016) examined how gender discrimination prevalent in the geographical environment affects the appointment of female executives. They found that regional gender bias, evident from the male-to-female ratio at birth, was associated with fewer female executives in the region. Studies have also examined the consequences of gender diversity pressures that may permeate firms nationwide. Wang and Kelan (2013) found that institutional pressure for gender diversity was effective in Norway where the regulatory requirement for board gender diversity resulted in more frequent appointments of female CEOs. However, while the Australian Securities Exchange Corporate Governance Council also

suggested (non-governmental) institutional pressures to enhance gender diversity, it reduced the likelihood of female directors positively influencing female CEO appointments (Gould et al., 2018). Thus, whether external regulatory policy engenders its intended impact of heightening gender diversity in the upper echelon remains unclear.

Despite the finding that there is a significant disadvantage for women in terms of appointments, studies have also identified positive experiences for female candidates in their employment phase, such as faster advancement speed. For example, female executives in the Fortune 100 advanced to executive positions 3.2 years earlier than male executives, with the effect being stronger for female executives with longer firm tenures (Bonet et al., 2020). Furthermore, scholars have also elaborated on circumstances that tend to lower the hurdles for female executives in reaching the upper echelon.

First, the type of position appears to matter in female executive appointments. Jung and colleagues (2017) determined that biases against women varied depending on the specific role being considered. Female founders, for example, were less likely to be considered for CEO positions but more likely to be considered for chief marketing positions, which are generally perceived as more gender congruent. This finding suggests that selection bias may be contingent on whether the position aligns well with gender role expectations.

Second, research has elucidated ways in which female candidates can proactively contribute to greater representation at the executive level. Some studies have claimed that female candidates often opt-out of the executive candidate pool (Brands & Fernandez-Mateo, 2017; Fernandez-Mateo & Fernandez, 2016), suggesting that their decision to opt-in can enhance female executives' composition in the upper echelon. However, these women's tendency to opt-out was stronger when they had previously been rejected from recruitment but weaker when they

perceived a high level of procedural justice during the hiring process (Brands & Fernandez-Mateo, 2017). This demonstrates how female candidates' prior experience influences their decision to apply for executive positions. Moreover, women who take ownership of their trajectories (Athanasopoulou, Moss-Cowan, Smets, & Morris, 2018), have a positive performance history, and build effective networks (Lyness & Thompson, 2000) raise their chances of reaching executive positions. Furthermore, Athanasopoulou and colleagues (2018) found that maintaining a balance between masculine and feminine leadership skills may help women advance toward assuming executive roles. When women displayed stereotypically masculine behaviors in an authentic way, harmonious with gender, they were more likely to be employed as CEOs.

Thus, although scholars have largely focused on the challenges female candidates confront when reaching the upper echelons, the field has not reached a conclusion as to whether female candidates always face biased treatment. Some drivers have generated both positive and negative effects on female executives' appointments. As seen in several circumstances, female candidates sometimes benefit from the appointment process more than their male counterparts. Likewise, female candidates can proactively take action to navigate challenges while reaching executive positions. With this in mind, examining contextual factors may partly explain the mixed findings concerning female executives' appointments.

Experience of female executives and their firms. Despite overcoming numerous obstacles to reach executive positions, female executives continue to face ongoing negative consequences, and their firms are also subject to adverse assessments by external stakeholders, including investors.

First, internal members contributed to female executives' negative experiences, particularly due to male counterparts' gender biases and discrimination. Male colleagues often treated and assessed female CEOs unfairly, and female CEOs who received ingratiation from white male managers were more likely to be resented by those same managers. Moreover, when those male managers communicated with journalists, the resentment was often translated into negative comments about the female CEO's leadership capabilities (Keeves et al., 2017). Keeves and Westphal (2021) also found that male executives perceive female counterparts to be under-reciprocating when women have advanced toward a higher corporate status. However, female benefactors were less likely to go through the same process of perceiving under-reciprocation from executives who attained high-status corporate leadership positions. Interestingly, McDonald and colleagues (2018) determined that white male top managers exhibited bias toward newly appointed female CEOs, leading the men to experience lower levels of organizational identification and provide less assistance to their executive-level colleagues, especially women. More broadly, female managers were often excluded from informal networks (Inci et al., 2017; Lyness & Thompson, 2000).

Gender bias and discrimination have also been found to exist in the boardroom in terms of directors setting executives' compensation and career-related outcomes. First, studies have pointed to female executives receiving less pay relative to their male counterparts, indicating skepticism towards female leadership skills. Specifically, some research suggests that female CEOs earned less base compensation, total compensation, and long-term pay than male peers (Wang et al., 2018; Wang, Markoczy, Sun, & Peng, 2019). Female executives also received lower pay in terms of cash, equity incentives, and total compensation than their male counterparts (Carter, Franco, & Gine, 2017; Dreher et al., 2011). Furthermore, Newton and

Simutin (2015) examined that female executives were awarded lower pay and smaller pay increases under male CEOs, and the effect was notably stronger under older male CEOs. Similarly, Malhotra and colleagues (2021) found that female CEOs were compensated less for their external directorships. Ironically, this particular effect was stronger when the female CEO's firm had a greater representation of female directors in the boardroom itself and the compensation committee. However, the effect was attenuated when female directors assumed powerful positions, such as chairing a larger proportion of powerful board committees.

Nonetheless, Klein and colleagues (2021) demonstrate that newly appointed female CEOs received higher value severance packages than new male CEOs, likely due to women's greater perception of vulnerability regarding their potential termination compared to men. This effect was amplified in cases where the CEO felt more vulnerable, such as when the firm was underperforming or when the previous CEO was dismissed early. However, the effect was weakened in firms with a high proportion of female directors and or where there was a greater number of female CEOs in the industry.

On a more positive note, scholars have identified certain circumstances where female executives receive more favorable treatment in terms of pay relative to their male counterparts. Hill and colleagues (2015) found that female CEOs received higher compensation than male peers. Other studies have explored specific contexts and reached similar conclusions. For example, when a female CEO replaced a male CEO, female executives received higher compensation (Newton & Simutin, 2015). Similarly, when female CEOs displayed agentic behaviors and took risks, their signaling of greater suitability for leadership roles resulted in a smaller gender pay gap (Wang et al., 2019). Other studies have also identified contexts in which the gender pay gap narrows and women are both less prone to experiencing bias and better

appreciated for their communal skills. Scholars have found that firms with greater board gender diversity (Carter et al., 2017), such as a female compensation committee chair (Cook, Ingersoll, & Glass, 2019), or those in female-dominated industries (Wang et al., 2019) mitigated the pay disparity between male and female executives. However, Cook and colleagues (2019) noted that the mere number of female directors or female directors on the compensation committee did not influence the top management team (TMT) gender pay gap. While their findings contradict those of Carter and colleagues (2017), a key takeaway may be that it is not merely the presence of female directors but the level of power held by female directors that matters in improving the experiences of female executives within firms.

Continuing at the board-level, research has shown that female executives face discrimination in their career-related outcomes, in addition to their pay levels. A few studies have found that female CEOs were more likely to be dismissed than male CEOs (Gupta, Mortal, Silveri, et al., 2020; Zhang & Qu, 2016). They were also less likely to become board chairs and have shorter tenures (Wang et al., 2018), with even shorter tenures for women operating in countries with greater uncertainty avoidance. However, other studies have found evidence that boards do not discriminate against female executives based on gender. For instance, female CEOs (Hill et al., 2015) and CFOs (Huang & Kisgen, 2013) were less likely to exit their positions. Furthermore, female executives were less likely to experience turnover along with greater support and organizational standing, evidenced by firms with a larger proportion of female directors and executives or with insider status (Zhang & Qu, 2016). Additionally, Gupta and colleagues (2020) confirmed that CEO gender was less likely to be a significant factor in examining dismissals under poor performance (Gupta, Mortal, Silveri et al., 2020), and Huang and Kisgen (2013) found that CEO gender had no effect on early exits from a position.

As such, there is a lack of consensus regarding whether female executives receive biased treatments from different internal groups within a firm. However, considering both the positive and negative experiences female executives undergo, further research should delve into additional contextual factors to more effectively explain the level of bias that internal members and groups may hold towards female executives.

Furthermore, although still reflecting mixed findings, gender biases and discriminatory actions have also been identified from external members and groups of firms, such as in the financial market and media outlets. First, Ryan and colleagues (2011) found that observers associated stereotypical agentic masculine attributes with successful firms and stereotypical communal feminine attributes with unsuccessful firms, based on the "think-manager-think-male" perspective (TMTM). Successful managers were described with stereotypical masculine attributes, which alludes to gender bias.

Second, Park and Westphal (2013) found that peer executives appeared to offer less support toward female CEOs, suggesting that male CEOs offer less support to their female counterparts than to male counterparts whose firms experience a similar level of downward performance. The male CEOs attributed the struggles of female-led firms to internal factors whereas the struggles of male-led firms were attributed to external factors when the male CEOs were communicating with journalists.

Third, the financial market suggests bias and skepticism towards female CEOs. From a narrow perspective, investors responded negatively to certain major organizational events. Scholars found that investors reacted negatively at the time of female CEOs' appointments (Jeong & Harrison, 2017; Lee & James, 2007). More specifically, Lee and James (2007) found that the adverse reaction became stronger when the newly appointed CEO was an external hire.

In the context of IPO firms, Bigelow and colleagues (2014) found that investors negatively evaluated firms led by women during a firm's IPO compared to those led by men. From a broader perspective, female-led firms (Wang et al., 2018) and firms with high TMT gender diversity under high gender pay disparity (Yanadori et al., 2021) received a negative market assessment.

Lastly, studies have identified gender bias in media coverage. Journalists highlighted gender and family issues when describing incoming female CEOs whereas male CEOs were primarily depicted with words related to their positions (Lee & James, 2007). Similarly, Dixon-Fowler and colleagues (2013) found that female CEOs were perceived as an entity by the media, with reports of female CEO appointments tending to refer to female executives as a collective group. They also found a negative spillover effect, with the appointment of a female CEO at one firm resulting in negative market reactions for other related female-led firms. Likewise, Park and Westphal (2013) found that media members were more influenced by critical peer CEO assessments of female CEOs relative to male counterparts.

However, as with other studies, external evaluation of female executives has been mixed. Unlike the TMTM perspective where female executives receive biased and adverse assessments (Ryan et al., 2011), other scholars have highlighted the "think-crisis-think-female" perspective (TCTF), examining circumstances where female executives are viewed more positively in times of crisis. Ryan and colleagues (2011) found respondents claimed that feminine characteristics are desired by managers of unsuccessful companies. They also noted that observers considered those feminine attributes to be beneficial in times of crisis and poor performance, which supports the TCTF association. Moreover, Rosette and Tost (2010) offered additional insight into situations in which observers viewed female leaders positively. Respondents viewed female CEOs as more

effective than male CEOs when successful performance was attributed to internal causes, and the effect was mediated by perceptions of double standards of competence and perceptions of feminized management skills.

Along the lines of inquiry regarding female leaders' ability to navigate complex and challenging circumstances, several studies have shown that female CEOs are better equipped to handle certain situations. First, Huang and Kisgen (2013) and Zhu and colleagues (2020) found that investors responded more favorably to acquisitions led by female CEOs, suggesting that they were seen as more capable of managing the uncertain and complex process of an acquisition. Second, in the context of activism, Francis and colleagues (2021) found that female CEOs were more effective at navigating challenges posed by activist investors than male CEOs. These results suggest that stakeholders respond well to female CEOs under complex situations and crises. Third, female CEOs were better able to respond to stakeholders when their products failed. Cowen and Montgomery (2020) showed that female CEOs were able to overcome consumer skepticism after a product failure by offering apologies for the failure.

Thus, while women face biases, skepticism, and less support from others, some research nonetheless delineates circumstances in which female CEOs' leadership is appreciated, especially in challenging situations. The reaction to female leadership seems to be contingent on the nature of the context, with less favorable stakeholder reactions when firms face positive growth-oriented situations and more favorable reactions when situations are perceived as risky or threatening.

Additionally, above and beyond circumstances of crisis, research also shows that the market does not always exhibit bias against female leaders. While Bigelow and colleagues (2014) found bias against female CEOs under an IPO, this bias did not exist towards other

female top executives under the same event. MBA students in their study found no significant differences between female-dominated TMTs and male and gender-balanced TMTs. This could indicate that, for younger professionals, CEO gender is more influential than TMT gender in assessments of firm quality.

Some scholars have examined how the market positively assesses female leaders in the long-term. Firms led by female CEOs (Jeong & Harrison, 2017; Nekhili, Chakroun, & Chtioui, 2018) and with greater female TMT representation (Dezso & Ross, 2012; Francoeur, Labelle, & Sinclair-Desgagne, 2008; Jeong & Harrison, 2017) received better long-term market assessments. In this case, the effect was greater for female-led firms under increased CEO managerial discretion (Jeong & Harrison, 2017) and non-family firms (Nekhili et al., 2018). For firms with high TMT gender diversity, the positive long-term market assessment was stronger in complex environments (Francoeur et al., 2008), innovation-oriented industries (Dezsö & Ross, 2012), and firms with autonomous structures (Jeong & Harrison, 2017). However, the field cannot conclude that female leaders engender better long-term market performance. Other studies continue to find no significant relationship between TMT gender diversity and a firm's market value (Hoobler, Masterson, Nkomo, & Michel, 2018; Yanadori, Kulik, & Gould, 2021).

While research has examined the degree to which women receive favorable or adverse assessments from others, several studies have shown how women can take actions to receive better treatment. More specifically, scholars have focused on how female executives can display certain behaviors to attenuate the biases and challenges they face. For example, Byrne and colleagues (2021) found that female CEO successors in family businesses displayed both masculine (entrepreneurial, authoritarian, and paternalistic) and feminine (relational, maternal, and individualized femininity) identities. Their results also demonstrated that those CEOs drew

on their masculine identities to prove their legitimacy to stakeholders and feminine identities to garner support and alliances for change initiative implementation. Moreover, Baker and Kelan (2019) found that, although female executives, in general, face biased treatment and limited access to opportunities, some nonetheless uphold long-standing beliefs that perseverance pays off regardless of gender. These women engaged in two intertwined processes: the division of undesirable and unfair elements of the workplace and blaming other women for their own failures. These approaches allowed female executives to handle cognitive dissonance stemming from threats to the neoliberal ideal that attributes gender inequalities to the natural consequences of individual actions rather than to societal or organizational structures.

ACTIONS PURSUED BY FEMALE EXECUTIVES

I will now turn to studies that examine how female executives influence other individuals, groups, or firm-level actions and performance.

Influence on other women. Prior research has examined how female executives influence the representation of women in various positions. For example, they facilitated the appointment of additional women to the boardroom, with the effect being more prominent under younger boards (Guldiken, Mallon, Fainshmidt, Judge, & Clark, 2019). However, female executives also affected lower-level gender composition, with a mixed set of results. Ali and colleagues (2021) showed that female executives positively predicted the presence of women in non-management positions and in lower and middle management jobs in female-dominated and gender-balanced industries. However, Elvira and Cohen (2001) found that female top executives led to a higher turnover for female employees in low-ranking positions.

At the external level, the work of Lee and colleagues (2019) supported the homophily effect in the context of firm's external partner choice. More specifically, they found that the

effect varies according to the position held by the female executive. When a firm had a female CFO or gender-diverse TMT, the focal firm was more likely to choose a female lead audit partner. However, CEO gender did not have an impact on the gender of the lead audit partner.

Moving beyond whether female executives invite same-gender individuals to the firm, Dezso and colleagues (2022) examined how female CEOs also impact the level of compensation female top managers receive. Specifically, they found that female top managers receive less compensation under a female CEO relative to when men lead the firm. When a woman assumes a CEO position, they argue, the diversity benefits that additional female top managers bring into the firm may wane, leading to lesser compensation benefits for female top executives.

Together, these mixed findings suggest that the degree to which female executives engender better opportunities for other women, specifically in terms of their representation and compensation, would benefit from further scholarly attention. First, the field has not yet reached a conclusion regarding whether female executive representation elicits a homophily effect. This speaks to the greater need for delving into contingencies that influence the impact of female executives on the ability to recruit, hire, and retain female executives and employees as well as on their external network. Second, the lack of research on how female leaders affect other female top executives' career-related outcomes requires further investigation before reaching a conclusion. Dezso and colleagues (2022) found that female top executives' contribution to enhancing gender diversity becomes redundant under a female CEO, resulting in female top executives receiving less compensation compared to working under a male CEO. Future research may explore whether female top executives experience other adverse effects with a female CEO.

Influence on male counterparts. While many studies have examined gender bias penalties faced by female executives from their male peers, it is also important to consider the role that female

executives may play in influencing the experiences of their male counterparts. In the one study I found on this topic, Newton and Simutin (2015) found that female CEOs negatively impacted the pay of male officers, likely due to out-group biases. However, further research is needed to explore the extent to which female executives may exhibit bias toward men, the outcomes associated with such potential bias, and the underlying mechanisms and contingencies that may influence female executives' biases toward male colleagues.

STRATEGIC ACTIONS OF FEMALE EXECUTIVES

Scholars have delineated how gender-specific attributes lead female executives to enact strategic actions and generate different levels of performance than from their male counterparts. The section below discusses the relevant attributes of female executives and subsequent firm consequences.

Risk-aversion. Several studies have examined the risk-taking behavior of leaders of different genders and found that female CEOs generally exhibit lower levels of risk-taking than male CEOs (Brenner, 2015; Ingersoll et al., 2019; Jeong & Harrison, 2017). Additionally, firms with higher TMT gender diversity were associated with reduced firm risk-taking (Richard et al., 2019). As evidenced by Brenner (2015), female CEOs' greater risk aversion was observed in their disparate incentive compensation and option-exercising decisions.

More studies have found firm-level consequences of female leaders' risk-aversion. First, firms with female CEOs had more conservative balance sheets (Palvia et al., 2015), lower borrowing costs (Luo, Huang, Li, & Lin, 2018), and undertook fewer acquisitions than male-led firms (Huang & Kisgen, 2013). Similarly, firms with high TMT gender diversity undertook lower levels of strategic changes (Richard et al., 2019), engaged in less risky investments (Adhikari et al., 2019; Jeong & Harrison, 2017), and had lower borrowing costs when led by

female CFOs (Luo et al., 2018). Palvia and colleagues (2015) concluded that female CEOs' conservatism is especially beneficial in helping smaller organizations weather a business-related storm in the context of bank failure.

Although risk-aversion has long been considered a female-specific attribute (Byrnes et al., 1999), scholars have found that environmental conditions may influence female executives to deviate from their baseline tendencies and either become more risk-seeking than normally expected or strengthen their risk-aversion. For example, Luo and colleagues (2018) found that, in China, the degree to which banks rated firms led by female CEOs as low-risk was greater when the focal firm was not owned by the state, did not have political connections, and was in a non-crisis period. Moreover, Jeong and Harrison (2017) found that the relationship between female TMT membership and lower risk-taking was stronger when the focal firm's structure was autonomous, or when the firm was operating in countries with high managerial discretion. However, Richard and colleagues (2019) found that female executives' risk-aversion was less evident when firms operated in dynamic industries. Thus, although several studies suggest a difference in risk propensity across male and female executives, other studies indicate how contextual factors may weaken female executives' risk aversion or even strengthen the degree to which they are averse to risky actions. These findings highlight the importance of examining further contextual factors that may influence female executives' risk-taking behavior.

Ethicality. Scholars have generally demonstrated the greater ethicality of female leaders both in individual beliefs and firm actions. Valentine and Rittenburg (2007) showed that female executives had higher intentions to act ethically and made more ethical judgments than their male peers. They found that female executives more often considered fairness and justness when making decisions than male executives. Scholars have found the ethicality of women mostly in

accounting and financial practices, such that their higher ethical intentions were portrayed through the pursuit of more conservative accounting practices (Ho, Li, Tam, & Zhang, 2015; Valentine & Rittenburg, 2007). Ho and colleagues (2015) specifically found that the effect was stronger when firms had high litigation and takeover risks.

Additionally, some scholars have hypothesized that female leaders' ethicality is found in accounting and financial practices. For instance, having a female CEO was associated with better earnings quality, such that firms with gender-diverse TMTs reported earnings that accurately reflected the firm's underlying performance (Krishnan & Parsons, 2008). Similarly, having a female CFO has been tied to a lower likelihood of financial misreporting with a stronger effect under low investor monitoring (Gupta, Mortal, Chakrabarty, Guo, & Turban, 2020). Moreover, while CEO narcissism leads to more aggressive accounting practices, CEO gender moderated the relationship: a weaker effect was found for female CEOs (Ingersoll et al., 2019).

Taking a more nuanced view, Zalata and colleagues (2019) examined whether accounting practice differences between male and female CEOs reflected risk aversion or ethicality. Considering accounting aggressiveness, they found female CEOs were more likely to engage in earnings management than male CEOs prior to the passing of the Sarbanes-Oxley Act (SOX). However, after the adoption of the SOX, female-led firms engaged in less earnings management. This led the authors to conclude that differences in accounting behavior between male and female CEOs were primarily driven by gender differences in risk propensity and not ethicality.

However, Das (2005) found no statistically significant differences between male and female executives in terms of the ethical principles they value or the ordering of those principles. Thus, evidence suggests that male and female executives use similar criteria in evaluating the ethicality of actions. Ultimately, while scholars have shown that gender-based differences exist

in the degree of ethical behavior, several studies have also suggested that female executives may not differ from male executives in their level of ethicality, as has typically been hypothesized in the literature.

Stakeholder-orientation. Women are often considered to have better interrelationships skills (Cook & Glass, 2014; Eagly & Karau, 2002), and researchers have suggested that male and female executives may differ in their attention to internal and external stakeholders. Specifically, female executives are hypothesized to be more attentive to stakeholders and exhibit more care towards them.

First, studies have found that female executives tend to prioritize the experiences of internal stakeholders by promoting socially oriented practices. For example, female CEOs were more likely to advance gender and gender-identity equity (Cook & Glass, 2016), diversity policies (Glass & Cook, 2018), and corporate social performance (Manner, 2010). Female-led firms were also more likely to provide domestic partner benefits, employ gender identity non-discrimination policies (Cook & Glass, 2016), and implement diversity initiatives that recognize and promote women and minorities (Glass & Cook, 2018). Additionally, Bader and colleagues (2019) found that older female executives with higher education levels and socially oriented vocational backgrounds tended to champion the adoption of diversity perspectives in their firms. Moreover, Shi and colleagues (2018) found a positive relationship between the proportion of female TMT members and the likelihood of having a Chief Diversity Officer, a role designed to enhance diversity and equity within firms.

Second, female-led firms also appeared to be more attentive and responsive to external stakeholders, both investor and non-investor stakeholders. They engaged in greater charitable giving and educational support as well as offering high-quality and socially beneficial products

(Glass & Cook, 2018). Female leaders also tended to cooperate more with activist shareholders (Francis et al., 2021). Studies have also shown that firms with higher TMT gender diversity are associated with lower internal and external stakeholder-related concerns (Adhikari et al., 2019).

However, some scholars have yet to find evidence to support the hypothesis that female leaders enhance stakeholder experiences. For example, Tocher and Rutherford (2009) found no effect of CEO gender on human resource management problems that owners of small to medium-sized entrepreneurial firms perceive as critical to their firms' survival and performance. Moreover, other studies have found that CEO gender did not affect sexual orientation non-discrimination policies, firms' corporate equality indices, or corporate governance strengths (Cook & Glass, 2016; Glass & Cook, 2018). More unexpectedly, Glass and Cook (2018) found that female leaders' positive influence on product strengths was attenuated under high board gender diversity. The effect became negative when examining their impact towards corporate governance strengths.

Thus, the field's findings regarding female leaders' stakeholder orientation are mixed. Some studies have shown that female executives benefit stakeholders, but others have not identified gender differences in stakeholder orientation. Moreover, some studies suggest that the positive influence of female CEOs on stakeholders may wane or even become a negative relationship under certain conditions, such as high board gender diversity. These mixed findings indicate that female executives may not always show greater attention toward stakeholders relative to male executives. Delving into a more fine-grained mechanism of when the attentional boundaries of female executives toward stakeholders widen or narrow would significantly advance the understanding of female executives' stakeholder orientation.

While scholars have primarily focused on female executives' stakeholder orientation as the driver of CSR performance, other gender-specific dispositional factors may also contribute to female executives' attention to stakeholder-related issues. For example, female CEOs who are more long-term oriented may prioritize CSR as it elevates a firm's long-term competitive advantages (Porter & Kramer, 2002). Furthermore, as CSR lowers firm risk (Goss & Roberts, 2011; Husted et al., 2016), female CEOs who are more risk-averse may increasingly engage with CSR. However, the degree to which female CEOs prioritize CSR may decrease if they are motivated to focus primarily on shareholder interests, have shorter-term orientations, or take greater risks. Therefore, further research is imperative to more fully comprehend the circumstances and mechanisms that underlie female leaders' contribution to CSR while also considering other gender-specific attributes that vary according to contextual factors.

Innovation. In the innovation literature, scholars have identified both male and female-specific attributes that contribute to innovation. For instance, risk-taking, which is prototypically higher for male executives (Brenner, 2015; Huang & Kisgen, 2013), has been shown to facilitate innovation (Almor et al., 2019). Conversely, female leaders' democratic and participative leadership style has been argued to promote greater employee engagement and contribute to innovation through information diversity (Bantel & Jackson, 1989; Yap et al., 2005; Dai et al., 2019). Moreover, innovation success is typically a long-term process (Flammer & Kacperczyk, 2016; Griffin et al., 2021). As prior research has shown, women tend to have a long-term orientation relative to men (Silverman, 2003), making them more likely to persevere through the delayed pay-offs inherent in innovation.

In the executive gender literature, research on whether gender affects innovation has been limited, and the few studies in this area have yielded mixed conclusions. Prior studies have

largely highlighted the importance of information diversity (Bantel & Jackson, 1989; Miller & Triana, 2009; Yap et al, 2005). Building on this argument, firms with a higher proportion of female top managers were found to be more innovative due to the diverse discussions brought by female executives to the top management team (Lyngsie & Foss, 2017). However, this effect weakened when the firm had a higher proportion of lower-level female employees, which the authors speculated could be due to female employees feeling antagonized by female executives. Furthermore, Ruiz-Jimenez and colleagues (2016) found no direct effect of female TMT membership on innovation performance. Nonetheless, they evidenced that female top executives were better able to combine diverse sources of knowledge, thereby strengthening the positive relationship between knowledge combination capability and innovation performance. Although not directly capturing the gender effect on innovation, Dezso and Ross (2012) found that female executives performed better in innovation-oriented firms, engendering more effective accounting and market performance primarily for firms in innovative industries.

Given this limited set of studies with inconsistent findings, it remains challenging to draw definitive conclusions about whether and how executive gender impacts innovation. Further research is needed to examine gender-specific attributes that may benefit innovation and the contextual factors that can influence the level of these attributes. For example, research has shown that innovation is facilitated by individuals with a higher risk tolerance (Chang et al., 2015; Mao & Zhang, 2018; Sauermann, 2018) and those who are willing to withstand delayed remuneration (Flammer & Bansal, 2017). While female executives may exhibit risk-aversion (Brenner, 2015; Huang & Kisgen, 2013), their long-term orientation (Silverman, 2003) may provide a foundation for their contributions to innovation. Furthermore, female executives' higher stakeholder orientation (Glass & Cook, 2018) and democratic and participative leadership

style (Dai et al., 2019) may enable firms to draw upon a richer pool of knowledge from employees, thereby enhancing innovation. A broader array of gender-specific attributes relevant to innovation might help broaden our understanding of when and how female executives can facilitate firm innovation.

PERFORMANCE CONSEQUENCES OF FEMALE EXECUTIVES

Findings have largely been inconclusive of whether CEO gender significantly influences firm performance. From a financial perspective, studies have concluded CEO gender does not significantly impact accounting performance (Amore et al., 2014; Jeong & Harrison, 2017; Wang et al., 2018) or performance measures combining both market and accounting performance (Hoobler et al., 2018). However, studies have shown that women in key governance roles or other support structures that provide female CEOs with greater latitude to implement strategic aims and effectively manage stakeholders can contribute to more effective accounting performance in female-led firms. For example, female CEOs engendered better accounting performance under a diverse board (Amore et al., 2014) or when they were insiders and had a prior CEO's support and mentorship (Dwivedi et al., 2018). While Zhang and Qu (2016) found that female-led firms exhibited worse accounting performance, they showed how the negative effect waned under high TMT, board gender diversity, or when the female CEO was an insider. Firms led by female CEOs also produced higher accounting performance after facing an activism campaign (Francis et al., 2021), possibly due to the greater responsiveness of female CEOs to stakeholder actions.

At a broader level, Hoobler and colleagues (2018) found that gender egalitarianism affects the degree to which female CEOs generate firm performance. Female CEOs demonstrated better performance, in the form of combined market and accounting performance,

in settings where gender egalitarianism was high. Thus, female CEOs may perform better with a stronger support system. Future research could delve into further environmental contexts that may support the decisions of female executives and help them engender more effective firm performance.

Regarding TMT gender diversity findings, research suggests mixed effects for accounting performance. Two primary studies found no relationship between TMT gender diversity and firm accounting performance (Van Knippenberg, Dawson, West, & Homan, 2011; Yanadori et al., 2021). However, Yanadori and colleagues (2021) showed that TMT gender diversity negatively influences accounting performance under high gender pay disparity. Conversely, Jeong and Harrison (2017) concluded that firms with higher female TMT membership had better accounting performance, especially when the firm had an autonomous structure. Considering a specific role, Wiengarten, Lo, and Lam (2017) found that having a female Chief Sustainability Officer was associated with higher accounting performance.

These fundamentally mixed findings suggest that the degree to which female executives can elicit better firm accounting performance is dependent upon contextual factors. Specifically, when a firm tends to appreciate communal leadership, female executives are inclined to perform better. However, the opposite occurs when they receive unfair treatment, such as less compensation.

Apart from financial performance implications, scholars have also examined how leader gender affects other performance measures. Female CEOs were better capable of recovering from scandals than male CEOs. More specifically, female CEOs' apologies following a product failure were more effective than that of male CEOs. Consumers exhibited higher perceptions of interactional fairness and willingness to purchase their firms' products (Cowen & Montgomery,

2020). At the TMT level, firms where a woman assumed a non-stereotypical position, such as CFO, were more likely to attract female job seekers as they tend to view such firms as more socially just (Iseke & Pull, 2019). Van Knippenberg and colleagues (2011) also found positive firm consequences of female top executives, such as TMT gender diversity enhancing firm productivity. However, this effect became negative when it aligned with functional diversity that created faultlines within the TMT.

CONCLUSION

Previous research shows that female executives face greater obstacles in reaching upper-level positions compared to their male counterparts, despite some studies suggesting that female executives possess unique capabilities that can lead to positive outcomes. Female executives also tend to receive harsher evaluations from internal and external stakeholders, although some research portrays mixed findings on this issue. Therefore, further research is needed to better understand when and how executive gender affects outcomes of interest. One reason for the mixed findings in leader gender research may be the failure to consider contextual factors. Thus, it is important to examine the impact of surrounding evaluators on female executives' influence on a firm's strategic outcomes to gain a broader understanding of executive gender.

In the next two chapters, I emphasize the importance of considering contextual factors, particularly the role of internal and external evaluators, when investigating the gender effect on a firm’s strategic outcomes. Female leaders tend to experience greater skepticism than male leaders, which leads women to face adverse evaluations despite having the same capabilities. Consequently, female executives are more likely to follow guidance and respond to pressures from surrounding evaluating entities than male executives. Drawing upon the ABV, I argue that female executives are more likely to incorporate bottom-up attentional factors into their

attentional structure. Specifically, I examine female executives' responsiveness in the context of CSR and innovation. Although CSR has been largely found to be influenced by CEO gender, this hypothesized relationship has not been universally supported. For innovation, findings concerning the gender effect have been fundamentally mixed. Therefore, I aim to demonstrate how the impact of top-down attentional processing on strategic actions varies by investigating the influence of bottom-up factors on individuals' attentional structure. A particular context may induce an individual to focus on areas that he or she has been overlooking or to allocate even greater attention to one's pre-existing attentional fields. Furthermore, depending on how an individual is sensitive to the surrounding entities' guidance, pressures, and evaluations, these contextual factors would impact individuals' attentional structure differently. Thus, examining the role of bottom-up drivers would help delineate the mechanisms through which gender has an impact on firm's strategic actions.

CHAPTER 2. UNTANGLING THE CEO GENDER AND CSR DEBATE: THE IMPACT OF EVALUATORS AND THE RESPONSIVE NATURE OF FEMALE CEOS

INTRODUCTION

Following growing societal interest in corporate social responsibility (CSR) (Wang et al., 2020), firms have increasingly acted to demonstrate support for their communities, such as elevating social and environmental awareness and reducing relevant concerns (Flammer, 2013; McWilliams & Siegel, 2001). Despite going beyond their fiduciary aims and interests (Matten & Moon, 2008; McWilliams & Siegel, 2001), firms still voluntarily commit to social and environmental concerns and practices to further social good (Bansal et al., 2015; Cheng et al., 2014; McWilliams & Siegel, 2001). The upper echelons literature suggests that executives' heterogeneous dispositional characteristics, experiences, and values are injected into their strategic decisions (Chin & Hambrick, 2013; Hambrick & Mason, 1984; Hambrick, 2007). As CSR is a value-loaded voluntary action (Petrenko et al., 2016), executives who are personally attracted to elevating social good may endeavor to facilitate CSR (Manner, 2010).

Gender is considered to be a leader characteristic that highly impacts CSR initiatives (Cook & Glass, 2016; Glass & Cook, 2018; Tocher & Rutherford, 2009). Specifically, female leaders' stakeholder orientation has been argued to further CSR (Flammer, 2015; McWilliams & Siegel, 2001; Wang et al., 2020). However, other gender-specific dispositional factors, such as temporal orientation and risk propensity, are also likely to play a role in female leaders' tendency to pursue CSR initiatives. Female leaders tend to have a long-term perspective (Silverman, 2003) and be less tolerant of risk (Brenner, 2013; Huang & Kisgen, 2013). As such, they are more attracted to CSR because of its contribution towards building a firm's long-term competitive advantage (Porter & Kramer, 2002) and risk management (Goss & Roberts, 2011; Husted et al.,

2016). These factors, in addition to stakeholder orientation, serve as bases for female executives to facilitate CSR. While most studies have found that female leaders tend to pursue higher levels of CSR (Glass & Cook, 2018; Shi et al., 2018; Tocher & Rutherford, 2009; Manner, 2010), several others have concluded that there was little evidence of this relationship (Bader et al., 2019; Cook & Glass, 2016). This disparity raises questions about whether female leaders' influence on CSR may be contingent on some unmeasured factors.

The attention-based view (ABV) sheds light on how leader gender affects CSR through a CEO's stakeholder orientation, temporal orientation, and risk propensity, which ultimately shapes their attentional structure. While prior research has hypothesized that women contribute more to CSR as their attentional structure aligns well with it, external drivers that lead decision makers to attend to additional decision factors have been overlooked (Joseph & Wilson, 2018; Rerup, 2009). This study seeks to fill this gap in the literature by investigating the role of evaluators in changing female CEOs' attentional structure and the subsequent impact on CSR.

Specifically, I argue that female CEOs are more likely to be influenced by contextual factors, especially the pressures and guidance of evaluating entities. Due to greater skepticism of and gender bias against female leaders, they tend to receive more adverse evaluations compared to male leaders (Eagly et al., 1992). Thus, with male and female leaders facing differing levels of scrutiny and evaluations, I contend that female CEOs are more likely to adjust their attentional structure by allocating their attention to evaluators than male CEOs to better meet their expectations. As female CEOs tend to be more responsive to evaluators, I argue that female-led firms' pursuit of CSR is likely to differ under evaluators' oversight. By examining the impact of these evaluating entities, such as board of directors, financial analysts, and journalists, this study

aims to offer a potential explanation for the inconsistent findings in prior research regarding the leader gender effect on CSR.

I largely elaborate how external drivers may differentially influence the attentional structures of male and female CEOs. Given that attentional structures are shaped by prior experiences (Ocasio, 1997), the greater skepticism and bias towards female leaders likely contributes to women attending more to surrounding evaluating entities than men. In other words, female executives' attentional structure may be more influenced by the evaluators' guidance and pressure. Thus, it is imperative for studies to consider contextual factors especially when delving into the gender effect on a firm's strategic decision-making. While previous research has suggested a gender effect on specific strategic actions, male and female executives' respective impact on those actions may vary depending on the degree to which external factors influence them.

THEORY AND HYPOTHESES

I begin my theorizing by reviewing the drivers for CSR from prior research. I then examine how gender specifically has been associated with relevant action and performance consequences. Next, I leverage the ABV to explain how male and female leaders exhibit different patterns of actions and behaviors to facilitate CSR. However, by incorporating contextual factors when theorizing each leaders' attention to CSR, this challenges the dominant logic where scholars have generally argued for a universal gender effect on CSR. I propose that gender-specific attentional boundaries may change according to environmental factors, considering female CEOs' heightened responsiveness. This may result in female-led firms' pursuit of CSR deviating from the level that has generally been expected.

CSR and Gender

Following Aguinis' (2011) definition, firms engage in CSR as a voluntary response to meeting stakeholders' expectations to improve economic, social, and environmental performance. In addition to a firm's pursuit of CSR for such instrumental motivations (Tenbrunsel et al., 2000), firms further pursue CSR for normative reasons. When the CSR value fits well with the firm's or its executives' attentional structures, firms tend to pursue CSR. In this section, I briefly review the executive-level factors that have been considered to facilitate CSR.

Scholars have argued that CSR may depend on executives' qualities or priorities. Regarding a leader's psychological attributes, research has shown that CEO greed (Sajko et al., 2021) and hubris (Tang et al., 2015; Tang et al., 2018) have a negative impact on CSR, while CEO narcissism has a positive effect (Tang et al., 2018). Moreover, CEOs' values and demographic background, such as their political orientation (Chin et al., 2013; Gupta et al., 2021) and foreign background (Bertrand et al., 2021), may influence a firm's CSR. Research has indicated that liberal CEOs are more attentive to addressing societal needs and thus advance a firm's CSR (Chin et al., 2013). Furthermore, Bertrand and colleagues (2021) found that foreign CEOs exerted extra effort toward improving their local community due to local stakeholders' biases against them. Finally, prior experiences of CEOs, such as early traumatic life experiences, generally trigger their attention toward socially responsible actions (O'Sullivan et al., 2021).

While several executive attributes have been examined, gender has been studied more frequently than any other leader demographic factor as a driver of CSR. Prior research has found that executive (Adhikari et al., 2019; Cook & Glass, 2016; Glass & Cook, 2018; Manner, 2010; Francis et al., 2021) and director gender (Beji et al., 2021; Cook & Glass, 2018; Cruz et al.,

2019; Harjoto et al., 2015; Hafsi & Turgut, 2013; Shaukat et al., 2016) further CSR, theorizing women's communal orientation as the primary driver.

However, a few studies have, surprisingly, found no gender effect. For example, CEO gender did not significantly influence sexual orientation non-discrimination policies and corporate equality indices (Cook & Glass, 2016), and the gender of an owner did not explain firms perceiving human resource problems as important (Tocher & Rutherford, 2009). Furthermore, while Glass and Cook (2018) concluded that having a female CEO did not affect the level of the firm's corporate governance strengths, they ironically found a negative effect under a gender-diverse board.

Despite the vast amount of literature arguing for and identifying a leader gender effect on CSR, the field would still benefit from further research examining when the executive gender effect on CSR is more or less evident. Although women's communal attentional structures induce them to devote more attention to CSR, it is crucial to examine the circumstances under which they are induced to pay attention to elements that were often overlooked, which leads to female leaders impacting CSR less, or strengthen their attention to their pre-existing attentional fields, such that female leaders would exert a stronger influence on CSR.

Attention-Based View

According to the ABV, boundedly rational individuals have a limited attention span that leads them to attend to specific informational sources and lack a comprehensive view of their surroundings (Ocasio, 1997). This complements March and Simon (1993)'s argument that ideas are only selected if they match a decision maker's frame of reference (Manner, 2010). Thus, top executives' unique attentional or knowledge structures induce each individual to subjectively comprehend their environment, focus on specific strategic actions, and forgo opportunities that

do not overlap with their attentional map (Shepherd et al., 2017). A knowledge structure is a "mental model that individuals superimpose on an information environment to organize and make sense of it" (Walsh, 1995: 281). Such a structure offers top managers a foundation for constructing a subjective understanding of the environment, which can then be utilized to devise strategic initiatives (Dutton and Jackson, 1987; Starbuck and Milliken, 1988). Scholars refer to this as top-down attentional processing, which involves "schema-based attentional processes whereby the cognitive representation of managers induce the actions" (Joseph & Wilson, 2018: 1784). It generally refers to a collection of knowledge structures that allow top managers to systematically engage with their environment, perceive and comprehend novel stimuli, and make informed decisions (Bogner and Barr, 2000; Walsh, 1995).

This top-down attentional processing is generally dependent upon executives' prior experiences (Ocasio, 1997). Among several factors determining executives' top-down attentional structure, executive gender is one of the contributors to explain the structural differences across executives. Compared to male executives, research has indicated significant disadvantages and adverse experience female executives go through (Cruz et al., 2019). Women are generally expected to hold stronger capabilities to assume top positions at firms (Wang et al., 2018). When a woman was appointed as a CEO, market responded more negatively compared to a male CEO's appointment (Lee & James, 2007). After assuming the position, the downward performance of female-led firms was often attributed to internal reasons, rather than external causes (Park & Westphal, 2013). These would be described by the role congruity theory, which suggests that roles expected of a woman are misaligned with those of a leader (Eagly & Karau, 2002). For example, women are expected to be caring and affectionate whereas leaders are generally assumed to be aggressive and dominant (Eagly & Karau, 2002). Overall, this

distinctive experience female executives go through would lead the attentional structures of male and female executives to overlap less than for executives of the same gender (Cruz et al., 2019; Hillman et al., 2002; Major & Konar, 1984).

This distinctiveness has been demonstrated in the strategic actions each gender pursues. For instance, scholars have examined that male and female executives tend to engage in disparate actions according to their risk propensity (Brenner, 2015), temporal orientation (Silverman, 2003), and stakeholder orientation (Glass & Cook, 2018). Male executives' greater risk-seeking tends to lead their firms to engage in larger and frequent acquisitions (Huang & Kisgen, 2013). Female executives' long-term and stakeholder orientation were implied from their greater engagement of CSR (Deng et al., 2013; Glass & Cook, 2018).

However, the distinctiveness across male and female executives' attentional structure tends to be affected by contextual factors as the structure is composed of not only top-down attentional processing but also bottom-up attentional processing. Specifically, individuals allocate their attention to both top-down and bottom-up attentional processes, with the latter highlighting how executives may attend to areas that have been often overlooked by their top-down attentional processes (Shepherd et al., 2007, Shepherd et al., 2017). Changes occurring in the environment may not always be captured by an individual's top-down attentional structure. However, allocating one's attention to bottom-up processes may more effectively capture such changes. Thus, by considering both top-down and bottom-up processing, it is possible to gain a more comprehensive understanding of how executives respond to a set of opportunities. This includes an awareness of their expected patterns of behaviors and actions as well as those that deviate from their established attentional paths (Joseph & Wilson, 2018).

Taking a step further, I argue that bottom-up factors exert differential influence on executives' overall attentional structure according to their gender. While executives are scrutinized and monitored on an ongoing basis due to their significant impact on firm's performance (Berns & Klarner, 2017; Zhang & Rajagopalan, 2004), female executives are subject to even greater monitoring and evaluation (Dixon-fowler et al., 2013, Gupta et al., 2018; Gupta et al., 2020; Ryan & Haslam, 2007; Ryan et al., 2016). For example, the glass cliff phenomenon demonstrates that female leaders are more frequently criticized and evaluated than their male counterparts, even when performing the same leadership roles (Ryan & Haslam, 2007).

Due to the pervasiveness of skepticism and heightened scrutiny received by female leaders, I posit that these tend to induce women to strive to meet the expectations and desires of audiences to reduce unfavorable outcomes. As a result, I argue that they are more likely to be responsive to surrounding evaluating entities, making female CEOs more attentive to bottom-up drivers, such as evaluators' guidance. Thus, I complement the ABV with a gender perspective, proposing that female leaders' attentional structures are more likely to be influenced by bottom-up attentional processing compared to male leaders.

Executives' Attentional Structures for CSR

It is axiomatic that executives who are more attentive to stakeholders are more likely to attend to and promote CSR. In addition to their stakeholder orientation, I argue that other attentional factors also contribute to a firm's CSR engagement.

First, executives who are more attentive to long-term strategic actions and find the relevant actions more attractive may further CSR. In other words, executives who are willing to withstand short-term financial losses for better future remuneration are more likely to promote

CSR. As Porter and Kramer (2002) argued, CSR builds a firm's long-term competitive advantage rather than engendering immediate financial profits. Thus, executives who appreciate the value of long-term strategic actions (e.g., executives with long-term orientation) would pursue CSR more than short-term oriented executives.

Furthermore, executives who attend to the risk elements of strategic actions, being less tolerant of and more sensitive to risk, may find CSR more attractive as it tends to reduce firm risk. For example, Goss and Roberts (2011) examined how banks view firms with high CSR scores related to environmental, social, or governance issues as less risky and offer them lower bank loan costs. Similarly, other scholars found that CSR reduces both equity (Husted et al., 2016) and financing costs (El Ghoul et al., 2011; Sharfman & Fernando, 2008). Moreover, socially responsible firms were less likely to face reputational and litigation risks (Hong & Kacperczyk, 2009). In particular, Husted and colleagues (2016) argued that firms' CSR engagement alleviates investors' risk perception of the firm. As firms engage in more CSR, they tend to reassure investors with a greater amount of information disclosure as firms endeavor to publicize their CSR efforts.

Although executives may differ in their attentional structures regarding stakeholder orientation, temporal orientation, and risk propensity, executive gender is a primary factor that distinguishes them in these dimensions. Scholars have found that women attend to stakeholder issues (Glass & Cook, 2018), long-term actions (Silverman, 2003), and attend to and are wary of actions involving high risk due to their greater risk aversion (Eagly & Karau, 2002) to a greater degree than men. Furthermore, these female-specific attentional factors are reflected in a firm's strategic direction (Glass & Cook, 2018; Huang & Kisgen, 2013).

Stakeholder orientation. Prior research has demonstrated that women tend to pay greater attention to stakeholders than men (Eagly & Karau, 2002; Glass & Cook, 2018). As women are more likely to exhibit caring for others (Eagly & Karau, 2002), such behavior extends to their greater engagement of firms' strategic actions that enhance the experiences of stakeholders. For example, female-led firms had higher corporate social performance (Manner, 2010) and were more likely to offer domestic-partner benefits and gender identity non-discrimination policies (Cook & Glass, 2016). Additionally, these firms possessed higher diversity and community strengths (Glass & Cook, 2018). These findings support the view that female executives may pay greater attention to a variety of stakeholders than male executives.

Temporal orientation. Scholars from diverse fields have proposed that women are more likely to engage in actions where value materializes in the long term. From a biological standpoint, men's high testosterone levels are associated with short-term goal prioritization (Archer, 2006). Furthermore, women tend to sacrifice short-term gains and delay immediate returns for greater future benefits (Silverman, 2003). This gender difference in temporal orientation was also evident in research by Bacon and colleagues (2018) who found that women scored higher on goal-driven persistence and lower on impulsivity. Specifically, high persistence in goal-orientation indicates women's willingness to work toward long-term goals without immediate rewards. Moreover, their low impulsivity induces women to engage less in rapid actions to capture a reward (Dolatyar & Walker, 2020). Thus, prior studies' examination of gender difference in temporal orientation serves as a foundation to an argument for female CEOs being more open toward actions where success typically materializes in the long run.

Risk propensity. Prior research has demonstrated that female leaders are more likely to pursue actions that involve less risk. For example, female-led firms tend to have lower levels of

financial leverage and capital expenditures (Jeong & Harrison, 2017), and firms with higher proportions of female top executives showed lower R&D spending (Adhikari et al., 2019) where R&D expenditure has generally been utilized to capture firms' risk taking (Devers et al., 2008; Miller & Bromiley, 1990). In addition, since acquisitions typically entail a relatively high level of risk due to their high failure rates (Krug et al., 2014), female executives' risk aversion (Brenner, 2013) is evident in their firms pursuing fewer and smaller-sized acquisition deals compared to male-led firms (Huang & Kisgen, 2013). Therefore, these studies establish a foundation for female CEOs' preference for reducing a firm's risk.

Thus, female executives' attentional structure seems to align with the structure that would promote CSR. As CSR enhances stakeholder experiences, requires a long gestation period for action to be fruitful, and contributes to firm risk management, female CEOs—who are generally more attentive to stakeholders, more likely to engage in long-term actions, and tend to avoid risky decisions—would be more likely to pursue CSR than their male counterparts.

Hypothesis 1: CEO gender is positively associated with CSR, such that female led firms evidence higher levels of CSR.

While prior research has found executive gender to explain firms' CSR, results have been mixed to a certain extent. However, the aforementioned attributes, such as stakeholder orientation, temporal orientation, and risk propensity, that affect CSR have been found to change within an individual according to different contexts (DesJardine & Shi, 2021, Flammer & Kacperczyk, 2016; March & Shapira, 1987; Souder & Bromiley, 2012). Thus, examining when an individual's orientation changes on these dimensions may partly identify when gender is more or less likely to explain a firm's CSR. In this study, I argue that external conditions will serve as bottom-up attentional drivers that would attenuate the degree to which female CEOs support

CSR. Specifically, I examine how the guidance of internal evaluators, such as board of directors, and external evaluators, such as financial analysts and journalists, change the attentional structure of female CEOs and may lead them to change their impact on CSR.

Board of Directors and Incentive Compensation

Stakeholder orientation. Among various types of executive compensation, certain compensation forms are associated with specific stakeholder groups (Coombs & Gilley, 2005; Pandher & Currie, 2013). For example, equity-based compensation is intended for executives to focus on maximizing the financial wealth of shareholders (Chauvin & Shenoy, 2001; Martin et al., 2013). Thus, this type of compensation, stock options, affects the degree to which executives focus on actions that align with the interests of shareholders. As individuals have limited attention spans (Ocasio, 1997) that would result in trade-offs when allocating attention among diverse stakeholders, greater focus on shareholders is likely to lead to a reduction in the level of attention towards non-financial stakeholders.

While equity-based pay affects executives' attention towards shareholders and, consequently, stakeholders as well, I propose that the degree to which stock options induce attentional changes of executives differ by gender. Because of greater skepticism and adverse evaluation toward female leaders, female CEOs would endeavor more than their male peers to follow the guidance of their evaluative entities. Thus, female CEOs' attentional structure would be more susceptible to bottom-up attentional processing, such as stock options endowed by board of directors. Therefore, as female CEOs with greater amount of stock options allocate more attention to shareholders, they would consequently deprioritize non-financial stakeholders compared to when they had less stock options. Thus, while CSR is promoted more effectively

with leaders' attention towards non-financial stakeholders, higher stock options will attenuate the degree to which female CEOs undertake greater CSR.

Risk propensity. Equity-based compensation also induces executives to exhibit greater risk propensity. While shareholders can diversify their investments, executives are at a disadvantage when it comes to protecting their financial assets as they are unable to diversify their employment (Eisenhardt, 1989). This serves as a basis for executives' greater risk aversion relative to shareholders. Thus, the board incentivizes executives through equity-based compensation to align the risk preferences of shareholders and executives, endeavoring to reduce executives' risk-aversion (Jensen & Meckling, 1976; Sanders & Hambrick, 2007).

Stock options have an asymmetric risk profile in that they provide executives with unlimited financial gains and a floor to avoid losses (Sanders & Hambrick, 2007; Martin et al., 2013). As such, executives tend to pursue high-risk actions, which generally entail high returns, to generate greater financial benefits from their stock options. Specifically, prior research has examined how endowing executives with equity-based compensation changes the degree to which firms pursue risky strategic actions. Sanders and Hambrick (2007) argued and found that CEOs endowed with stock options invest more in uncertain and risky actions, such as higher expenditures on R&D and acquisitions. Additionally, executives with a greater number of stock options pursued more (Sanders, 2001) and riskier (Wright et al., 2002) acquisitions.

While it is reasonable to suspect that equity-based compensation induces executives to be attracted to higher risk actions in the pursuit of higher returns, I argue that male and female executives respond differently to this compensation. Equity-based compensation is expected to have a greater impact on female CEOs compared to their male counterparts as female CEOs tend to be more susceptible to evaluators' influence and exhibit greater flexibility in changing their

attentional structure. Although female CEOs are generally more attentive to actions that reduce risks (Huang & Kisgen, 2013), granting stock options will heighten female CEOs' risk-seeking behavior more than that of male CEOs. Consequently, female CEOs would find CSR less attractive as it is generally pursued by individuals who prefer to lower firm risk (Goss & Roberts, 2011; Husted et al., 2016).

Temporal orientation. Finally, equity-based compensation also affects the temporal attentional field of executives. The short-termism of executives has been identified as another agency problem (Martin et al., 2016). Executives tend to sacrifice long-term profits for those that can be earned in the short-term (Walsh & Seward, 1990) as they are more likely to be interested in a firm's performance during their tenure rather than longevity of the firm. Thus, executives are likely to be self-serving and short-term oriented, which may reduce a firm's long-term value.

As executives "must wait several years before receiving the value from restricted stock or until the stock options become exercisable" (Souder & Bromiley, 2012: 555), stock options are offered to executives to allow them to engage in actions that may increase the firm value over time (DeFusco et al., 1991; Souder & Bromiley, 2012; Wu & Tu, 2007). Therefore, stock options tend to lead executives to focus on the long-term value of their firm, thus enhancing the firm's long-term stock price (Chauvin & Shenoy, 2001).

Equity-based pay would incentivize both male and female CEOs to be more long-term oriented, but female CEOs are more likely to be affected to have greater interest in pursuing long-term actions than male CEOs as they are more likely to be sensitive to bottom-up factors. As CSR is a long-term strategic action (Porter & Kramer, 2002), the degree to which female CEOs promote CSR may be stronger under higher equity-based compensation from the perspective of temporal orientation.

Temporal orientation demonstrates how the positive influence of female CEOs on CSR may become stronger as equity-based compensation induces them to pay more attention to long-term actions. However, the compensation's stakeholder and risk elements suggest the opposite. With equity-based pay inducing female CEOs to pay more attention to shareholders, rather than stakeholders, and actions that entail high risk, the relevant pay is likely to exert more negative influence for female CEOs' CSR engagement. Therefore, the positive effect female CEOs generally have on CSR would be attenuated under greater amounts of equity-based pay endowed to CEOs.

Hypothesis 2: CEO equity-based compensation attenuates the positive relationship between CEO gender and CSR.

Financial Analysts and Their Evaluations

Financial analysts garner information from multiple sources to evaluate the firms they cover and set earnings forecasts or stock recommendations to investors (He & Tian, 2013). Nonetheless, their attention is largely geared towards a firm's strategic actions that elevate performance in the short term (Qian et al., 2019). With analysts' rewards being dependent upon the accuracy of their short-term earnings target, analysts tend to focus more on firm's short-term performance (Washburn & Bromiley, 2014). Graham and colleagues (2005) support the notion of analysts' short-term orientation. They utilized a survey aimed at CFOs wherein the CFOs observed that "youthful equity analysts" are less experienced in terms of having a clear sense of the full business cycle, which leads them to overreact to firms missing short-term earnings targets.

More importantly, scholars examined how analysts induce managerial myopia by pressuring executives to meet their short-term goals. As analysts substantively influence

investors and the stock price (Frankel et al., 2006), managers are pressured to reach the short-term quarterly earnings target set by analysts to protect the share price from a downfall (Chen et al., 2016; He & Tian, 2013; Porter, 1992; Zhang & Gimeno, 2016). Specific to this current study, Qian and colleagues (2019) found that when analysts placed greater emphasis on firms meeting short-term performance targets, firms were more likely to neglect CSR as its benefits often take longer to materialize. In other words, analysts tend to lead executives to pay less attention to strategic actions that require a long gestation period for success. Instead, analysts may induce executives to pay attention to and pursue actions that generate short-term immediate profits. Especially, I argue that analysts' adverse evaluations of the firm would trigger executives to better meet the expectations of analysts to prevent further harsh ratings toward the firm. This would result in executives focusing more on short-term profitable actions when they receive adverse ratings from the analysts.

In particular, male and female executives may respond differently to financial analysts' poor ratings, which entails pressure to prioritize short-term goals. As female executives are likely more sensitive and susceptible to bottom-up attentional processing, especially the pressures and guidance from evaluators, they would be more affected by financial analysts. With female CEOs' top-down temporal orientation, they are likely to promote CSR as they tend to pay greater attention to actions where the value materializes in the long run. However, financial analysts' focus on short-term gains is likely to lead female CEOs to prioritize short-term actions. Therefore, as CSR is generally pursued with executives' greater attention for long-term actions, financial analysts' adverse evaluations toward the firm are likely to exert a negative influence on female CEOs' pursuit of CSR.

Hypothesis 3: Financial analysts' adverse evaluations attenuate the positive relationship between CEO gender and CSR.

Journalists and Their Stakeholder Focus

As media plays a crucial role in directing public attention (Carroll & McCombs, 2003), CEOs are often motivated to monitor articles covering their focal firm (Bednar, 2012; Deephouse, 2000; Westphal et al., 2012) and change their behaviors and strategic attention accordingly. The reciprocal effects model (Kepplinger, 2007, 2008) suggests a two-way relationship between the media and its subjects. While the actions and behaviors of the subjects stimulate the media, it reciprocally triggers and changes subjects' "cognitions, appraisals, emotions, and behaviors" (Kepplinger & Glaab, 2007: 338). Thus, this model supports the view that CEOs are aware and responsive to the media's evaluations. For example, prior research found that CEOs socially distanced themselves from journalists who negatively described them (Shani & Westphal, 2016), and changed the degree to which they put in effort for subsequent acquisitions when their focal acquisition was negatively assessed by the media (Gamache & McNamara, 2019).

In addition to CEOs responding to media tone, I argue that CEOs may also respond to the content in each article and change their level of attention to relevant issues. The reciprocal effects model also argues that the media indirectly influences media subjects (Kepplinger, 2007). As media influences stakeholders, stakeholders relevant to the media may in turn influence the media subjects. Thus, when certain stakeholder groups are discussed in articles directed at the focal firm, the CEO may heighten their attention toward these stakeholders as they are likely to exert influence on the firm.

Furthermore, I contend that the impact of media articles leveraging stakeholder topics on individuals' responses varies. First, I posit that female CEOs are more likely to pay attention to journalists compared to their male counterparts due to their heightened sensitivity to bottom-up attentional processing. As female CEOs tend to be more wary of the evaluations directed at them because of the prevalent skepticism towards their leadership capability, they are more likely to pay attention to evaluators, such as journalists. More specifically, I argue that female CEOs may be more responsive to the articles that discuss stakeholder topics. Female CEOs' top-down attentional structure induces them to be attracted to articles discussing stakeholders as they tend to pay attention to stakeholders by default (Glass & Cook, 2018). In contrast, male CEOs are more likely to overlook articles that discuss stakeholders, as such topics tend to fall outside their top-down attentional structure.

In summary, female CEOs typically pay more attention to journalists and their articles on stakeholders compared to male CEOs. This means that media articles leveraging stakeholder topics are likely to have a greater impact on heightening female CEOs' attention towards stakeholders than on male CEOs. Consequently, leveraging stakeholder topics in media articles would further reinforce female CEOs' pursuit of CSR, given that attention towards stakeholders is critical for promoting CSR.

Hypothesis 4: Media stakeholder focus strengthens the positive relationship between CEO gender and CSR.

METHODS

As the rarity of female CEOs would result in a highly unbalanced sample in this study, I utilized a matched sample design for firms in S&P 1500 from 2011 to 2019. Following prior studies, firms in highly regulated industries, such as financial (SIC codes from 6022 to 6200),

insurance (SIC codes from 6312 to 6400), and utilities (SIC codes from 4911 to 4941), will be excluded as the discretion of CEOs in these industries are likely to be limited over CSR (Petrenko et al., 2016). Firm-level information is retrieved from *Compustat*, and CEO-related information, including the equity-based compensation of the CEO, is obtained from *Execucomp*. For CSR performance, the *MSCI* database is employed. Last, *Factiva*[1] was utilized to examine the media stakeholder focus through the media articles retrieved from the source. Information on financial analysts is taken from *IBES*.

Independent and moderating variables. CEO gender is a dummy variable of 1 if a CEO is woman and 0 for a male CEO. Following Sanders and Hambrick (2007), I measured CEO's equity-based compensation by the value of *stock options* granted during a focal year (Sanders, 2001)[2]. The option granted value calculates the present value of all options awarded during the year based upon the grant date. For *analysts' adverse ratings*, I utilized the *IBES* dataset and retrieved the recommendation scores given to the firm each quarter and averaged those to a yearly level. As the recommendation score of 1 indicates a "Strong buy" and 5 indicates a "Strong sell", higher value would indicate worse evaluations from analysts.

For *media stakeholder focus*, I follow Crilly and Ioannou (2017)'s dictionary of stakeholders and captured the diverse stakeholder topics being captured in each article. They isolated stakeholder-related items of vocabulary from the 1,200 most frequent words across all letters to shareholders. This led to 34 words in total, which were assigned to 7 different categories using Post, Preston, and Sachs (2002) as a guide: Employees, Customers, Communities, Natural environment, Government, Shareholders, and Suppliers. With this

[1] Articles will be pulled from the sources of New York Times, Washington Post, Los Angeles Times, USA Today, Wall Street Journal, Barron's, Fortune, Forbes, and Associated Press Newswires.

[2] Controlling for the value of unexercised exercisable options and unexercised exercisable options did not change the results.

stakeholder dictionary (Table 1.1), I use the *Linguistic Inquiry and Word Count (LIWC)* software to count the number of words associated with each dictionary within a media article. I averaged the scores for each dictionary on a yearly basis.

Following Crilly and Sloan (2014), the Simpson index (Simpson, 1949) captures the degree to which executives concentrate on different stakeholder groups. The Simpson index measures concentration as follows:

$$\lambda = \sum_{i=1}^{R} p_i^2,$$

where p indicates the level of focus each media article has toward a single stakeholder category and R represents stakeholder categories in the focal article. A higher λ indicates media's being less divided in the degree to which each article discusses distinct stakeholder categories. Thus, lower λ would imply greater media stakeholder topic breadth. For easier interpretation, I subtracted the index from 1, such that the higher value would indicate greater media stakeholder topic breadth.

TABLE 1.1. Stakeholder Dictionary

Stakeholders	Employees	Customers	Communities	Natural environment	Government	Shareholders	Suppliers
Words	Colleague* Employee* People Union* Worker* Workforce	Consumer* Customer* Patient*	Citizen* Climate Communit* Neighbor*	Conservation Emission* Environment* Footprint Greenhouse Nature Renewable* Waste	Authority Authorities Government* Legislation Legislator* Regulation Regulator*	Investor* Shareholder* Shareowner* Stockholder*	Contractor* Manufacturer* Partner*

Dependent variables. Following prior studies, I leveraged five categories in the *KLD* measures that represent the primary stakeholder groups: employee relations, diversity issues, product

issues, community relations, and environmental issues (Hillman & Keim, 2001). Then, I summed up the relevant strengths scores for each category to capture a firm's *CSR performance*[3].

Control variables. To more effectively examine the distinctive CEO gender effect towards CSR performance changes, a number of control variables that influence a firm's CSR performance are used (Flammer, 2013), including the *prior CSR* performance. *Firm size* is measured by the natural logarithm of sales, *firm years* as the natural logarithm of the number of years since a company appeared in Compustat, *firm performance* as the return on assets, *tobin's q* as measured by the book value of debt plus market value of equity divided by total assets in the prior year, and *leverage* as total debt divided by the sum of debt and the market value of equity in the prior year. Additionally, in order to capture the gender effect from the CEO-level, I controlled for the *CEO age*, *tenure*, and *insider* status. Also, the number of female top executives who appear in the five most paid top executive members from Execucomp is controlled (*female TMT*), along with the number of top executives in total (*TMT size*). At the industry-level, *industry dynamism* and *munificence* are controlled. Last, the yearly number of articles for the focal firm for each year within a CEO's appointment are controlled to better capture the impact of each article to the CEO and the firm (*yearly media volume*). All independent, moderating, and control variables are lagged for a year.

Estimation Technique

To compensate for the proportional rarity of female CEOs relative to male CEOs, I utilized a one-to-one propensity score matching to balance the features of female and male-led firms through minimizing the differences captured in observed covariates and limited the sample from S&P 1500 firms. The female and male-led firms were balanced throughout considering the

[3] The results were consistent when utilizing all CSR categories generated by KLD to capture CSR performance strengths.

CEO's age, insider status, tenure, firm's size and its performance, tobin's q, leverage, and institutional ownership of the firm. This allows the two groups (female and male CEO observations) to have a balanced distribution as in a randomized study, which minimizes the effects of confounds (Hasan, Kobeissi, & Wang, 2011). Through this process, the PSM sample included 496 female-led firm-year observations and 496 male-led firm-year observations. Utilizing this list of firms, I retrieved media articles from *Factiva* to measure media stakeholder focus. These led to the final sample being 194 female-led firm-year observations and 267 male-led firm-year observations. Finally, I standardized independent and control variables to minimize the potential for multicollinearity and ran ordinary least squares regression with robust standard errors. None of the variance inflation factors exceeded 3.59 which further reduces multicollinearity concerns (Cohen, Cohen, West, & Aiken, 2003).

RESULTS

Table 1.2 presents the descriptive statistics and correlations across variables, and Table 1.3 represents the results of the regression analyses.

TABLE 1.2. Descriptive Statistics and Correlation Matrix

Variable	Mean	Std. Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) CSR	2.629	2.963	1.000									
(2) CEO gender	.421	.494	0.116	1.000								
(3) Stock options	1122.888	1536.706	0.262	0.006	1.000							
(4) Analysts' adverse ratings	.683	.64	0.310	0.099	0.154	1.000						
(5) Media stakeholder focus	.562	.211	0.295	0.044	0.183	0.153	1.000					
(6) Prior CSR	2.707	3.111	0.850	0.116	0.175	0.317	0.294	1.000				
(7) Yearly media volume	47.002	86.778	0.517	0.159	0.155	0.142	0.288	0.464	1.000			
(8) Female TMT	.64	.868	0.020	0.045	-0.141	0.023	-0.044	0.005	-0.028	1.000		
(9) TMT size	5.527	.905	0.088	-0.001	-0.013	-0.048	0.094	0.058	0.063	0.212	1.000	

TABLE 1.2. (cont'd)

Variable	Mean	Std Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(10) Firm years	19.484	6.484	0.289	-0.048	0.005	0.296	0.063	0.315	0.128	0.033	-0.001	1.000
(11) Firm size	8.112	1.629	0.672	0.060	0.319	0.506	0.301	0.646	0.509	0.019	-0.018	0.380
(12) Firm performance	.067	.106	0.084	-0.001	0.071	0.147	-0.048	0.032	-0.008	0.027	-0.101	-0.019
(13) Leverage	.182	.165	0.107	0.070	-0.034	0.032	0.174	0.149	0.174	-0.033	0.160	0.065
(14) Tobin's Q	1.846	1.316	0.008	0.054	0.136	0.031	-0.054	-0.023	-0.104	-0.018	0.038	-0.103
(15) Industry dynamism	.027	.028	0.021	-0.048	0.028	-0.106	-0.002	-0.007	-0.022	-0.052	0.023	-0.047
(16) Industry munificence	.028	.085	-0.050	0.048	0.038	0.034	0.077	-0.049	-0.008	-0.030	-0.183	-0.124
(17) CEO age	56.859	4.97	0.045	-0.051	-0.032	0.072	0.044	0.049	0.076	-0.049	0.026	0.143
(18) CEO tenure	2369.729	2608.022	0.031	-0.108	-0.012	-0.003	0.036	0.035	-0.065	-0.102	-0.070	0.101
(19) CEO insider	.885	.319	0.072	0.142	0.120	0.116	0.069	0.106	0.008	-0.150	-0.196	0.057

Variable	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(11) Firm size	1.000								
(12) Firm performance	0.092	1.000							
(13) Leverage	0.189	-0.214	1.000						
(14) Tobin's Q	-0.117	0.379	-0.442	1.000					
(15) Industry dynamism	-0.013	-0.083	0.121	-0.147	1.000				
(16) Industry munificence	-0.015	0.075	-0.144	0.071	0.030	1.000			
(17) CEO age	0.124	-0.047	0.028	-0.090	0.019	-0.010	1.000		
(18) CEO tenure	0.025	0.066	-0.030	0.054	0.020	-0.020	0.046	1.000	
(19) CEO insider	0.119	0.211	-0.030	0.049	0.016	0.120	0.030	0.164	1.000

Note: N=461, Correlation values that are greater than an absolute value of 0.0993 are significant at p=0.05.

TABLE 1.3. Regression Results of CEO Gender Effect on CSR Considering the Role of Stock Options, Analysts, and Media

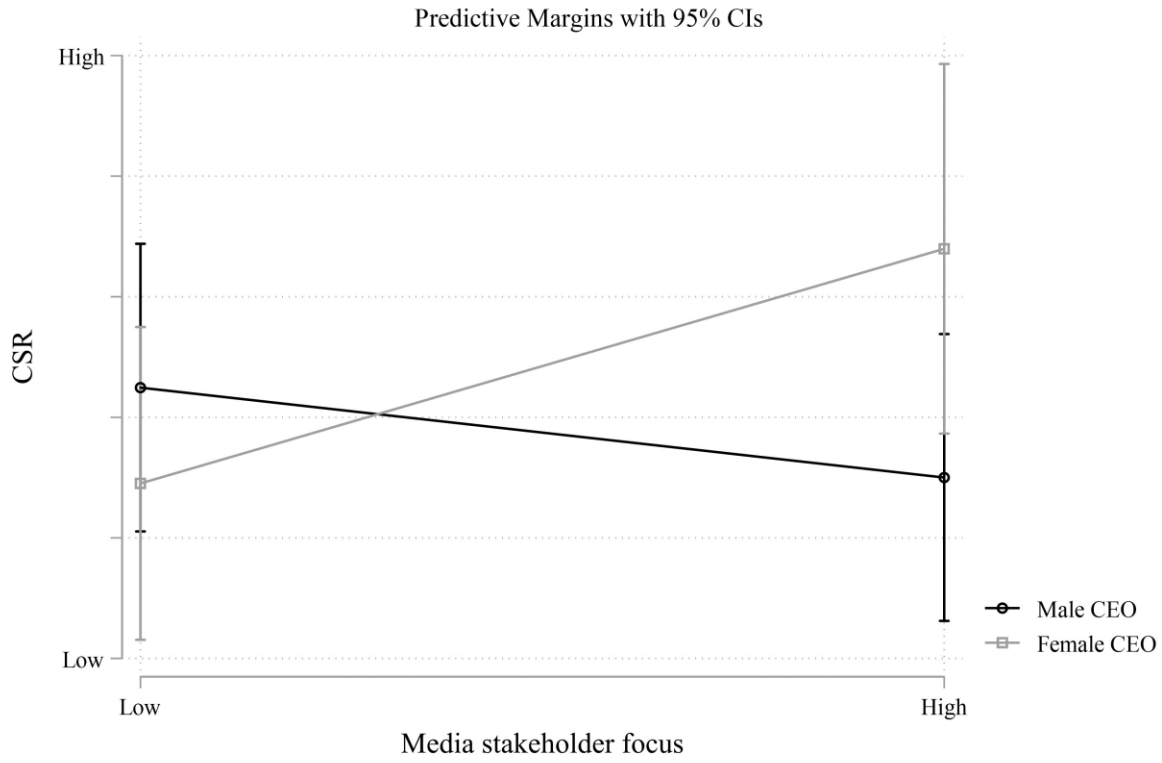
	Model 1	Model 2	Model 3	Model 4
Prior CSR	.649***	.647***	.650***	.640***
	(.039)	(.039)	(.038)	(.039)
Yearly media volume	.153**	.150**	.144*	.147**
	(.058)	(.058)	(.057)	(.055)
Female TMT	.007	.004	.033	.032
	(.061)	(.063)	(.063)	(.062)
TMT size	.154*	.155*	.141*	.14*
	(.069)	(.069)	(.068)	(.068)
Firm years	-.005	-.002	.030	.006
	(.072)	(.072)	(.071)	(.074)

TABLE 1.3. (cont'd)

Firm size	.553***	.556***	.483***	.489***
	(.108)	(.108)	(.117)	(.119)
Firm performance	.109*	.111*	.127**	.121*
	(.044)	(.043)	(.044)	(.048)
Leverage	-.136	-.141	-.135	-.143†
	(.085)	(.086)	(.084)	(.085)
Tobin's Q	.082	.076	.041	.039
	(.080)	(.082)	(.081)	(.08)
Industry dynamism	.122†	.124†	.111†	.127*
	(.067)	(.066)	(.060)	(.062)
Industry munificence	-.042	-.043	-.046	-.056
	(.059)	(.059)	(.057)	(.061)
CEO age	-.052	-.050	-.035	-.026
	(.065)	(.065)	(.065)	(.065)
CEO tenure	.038	.044	.050	.044
	(.075)	(.077)	(.076)	(.077)
CEO insider	-.235	-.263	-.320	-.329
	(.207)	(.209)	(.207)	(.207)
CEO gender		.101	.127	.151
		(.150)	(.149)	(.145)
Stock options			.207*	.312**
			(.092)	(.113)
Analysts' adverse ratings			-.047	-.044
			(.100)	(.126)
Media stakeholder focus			.033	-.068
			(.053)	(.072)
CEO gender X Stock options				-.249
				(.182)
CEO gender X Analysts' adverse ratings				.018
				(.170)
CEO gender X Media stakeholder focus				.246*
				(.117)
Constant	.858***	.844***	.882***	.898***
	(.203)	(.205)	(.204)	(.205)
N	461	461	461	461
F	63.63	59.35	55.64	46.91
R-squared	.767	.767	.772	.774

Note: Robust standard errors are in parentheses
**** p<.001, ** p<.01, * p<.05, † p<0.1*

FIGURE 1.1. Interaction Effects of CEO Gender and Media Stakeholder Focus on CSR



Hypothesis 1 stated that female-led firms would engender greater CSR performance than male-led firms. However, I did not find a significant relationship between CEO's gender and CSR performance – see Model 2. Hypotheses 2 to 4 examined whether bottom-up factors influence how CEO gender affects CSR performance. While the hypotheses related to stock options and financial analysts' adverse ratings were not supported, I found support for Hypothesis 4. I found that female CEOs were more responsive to articles that leveraged diverse stakeholder topics, resulting in greater positive changes in CSR performance (b=0.246, p=0.036). The simple slope test further examined female-led firms' positive slope (dy/dx=0.178, p=0.048), whereas no meaningful changes were found for male-led firms (dy/dx=-0.068, p=0.347).

In sum, CEO gender did not drive CSR performance changes from the prior year. However, I examined that when firms are exposed to media that discusses diverse stakeholder

topics, female-led firms were more likely to respond to the relevant factor and engender greater positive CSR performance changes, whereas male-led firms relatively remained silent.

SUPPLEMENTAL ANALYSES

Taking a step further, I investigated whether the media's descriptive tone of the firm affects CEOs' CSR engagement. Given that CSR is often considered a voluntary and intrinsically motivated act than other strategic actions (Chen, Ioannou, & Serafeim, 2014; Ioannou & Serafeim, 2015), journalists' negative evaluations of the firm would discourage CEOs' effort towards CSR. As firms are generally expected to prioritize their financial wealth over upholding stakeholders' experiences, the negative evaluations would lead CEOs to orient their attention more on actions that would directly benefit firm's financials but less on nonfinancial ones. Moreover, I anticipate that female CEOs, who are subject to prevalent gender bias and skepticism towards their leadership capability, are more likely to curtail their attention towards CSR in response to negative evaluations by the media.

As predicted, I found that negative media tone marginally led female-led firms to decrease their efforts toward building a strong CSR score (b=-0.523, p=0.058). While the simple slope test showed that the slope for female-led firms was negative and significant (b=-0.575, p=0.022), it was non-significant for male-led firms (b=-0.053, p=0.685).

Interestingly, female CEOs were only responsive to journalists' adverse evaluations, not to those of financial analysts. This implies that CEOs are more responsive to evaluative entities whose attentional structures are similar to their own. When investigating the type of audience each evaluative group serves, both male and female CEOs would be attentive to analysts' guidance since they mainly serve shareholders. However, as financial analysts tend to induce managerial myopia (Qian et al., 2019), the generally long-term oriented female CEOs would be

less inclined to follow the guidance offered by the short-term focused financial analysts. Moreover, compared to male CEOs, female CEOs are more likely to be more attuned to journalists who convey news to a much wider public that includes diverse stakeholders. Thus, in line with this argument, the results from this analysis suggest that journalists' statements and guidance impact female CEOs' direction more than those offered by financial analysts. Broadly, I conclude that CEOs are generally more responsive to factors where they see attentional fit and, among the CEOs, women tend to be more responsive to those factors than male CEOs.

DISCUSSION

This study investigated the role of contextual factors in the relationship between CEO gender and CSR. Specifically, I examined how the attentional structures of male and female CEOs are affected by bottom-up drivers, and how these drivers attenuate or strengthen the degree to which CEO gender impacts a firm's CSR. Contradictory to my hypothesis, I did not find a gender effect on CSR. However, as my argument bases upon how CEOs change their effort towards CSR with the influence of evaluators, where I control for prior CSR performance level, it is not surprising that gender explains the level of changes in CSR.[4] Furthermore, I examined that female CEOs were more responsive to the media leveraging diverse stakeholder topics, resulting in greater positive changes on CSR from the female-led firms compared to firms led by men. This study adds nuances to the literature on the relationship between gender and CSR, ABV, and corporate governance.

The first contribution is to the literature on gender and CSR. While majority of the CSR studies have found a gender effect on CSR, such that women tend to proceed CSR more than men, few studies still found results deviating from the main findings. Previous studies exhibited

[4] Without controlling for prior CSR, I find a gender main effect such that female CEOs pursue CSR more than male CEOs.

a static view of CEO gender behavior and maintained that male and female CEOs are inclined to reside in their baseline tendency without considering when they would deviate from or strengthen their pre-existing behavioral tendencies. I argue that overlooking these contextual factors would have contributed to the mixed findings in the relationship between gender and CSR. While I did not find CEO gender to explain the level of CSR performance changes, I examined gender difference in terms of its response to surrounding factors. Specifically, female CEOs responded acutely to the media's leveraging various stakeholder topics that potentially led them to solidify their baseline attentional structure on stakeholders, resulting in better CSR. On the other hand, no meaningful changes were made from male-led firms. Therefore, understanding how each male and female CEOs respond to their surroundings could partially explain the reasons behind the inconclusive relationship between gender and CSR.

Relatedly, I contribute to the ABV literature by claiming that individuals' attentional structure is malleable to bottom-up factors based upon the individuals' responsiveness and the primary strategic action. Specifically, I found that only female CEOs were responsive, and they were responsive to the evaluating entities that fit with their attentional structure. Following my argument that female leaders suffer more from the prevalent gender bias, resulting in their higher responsiveness to the pressures and guidance offered by evaluative entities, I conjecture that women's attentional structure would be more likely to be impacted. Furthermore, I argue that the type of strategic action also matters on how individuals respond to the bottom-up factors.

Through this study, I found that female CEOs responded greater than their male counterparts to a bottom-up factor that tends to their attentional structure, but there was no difference in terms of how female CEOs respond to their blind spots to male CEOs' responsiveness. I conjecture that this may be due to the particular context this study leverages.

CEO's primary aim has been suggested to enhance economic returns for the firm's shareholders, such that CEOs are evaluated upon firm's financial performance (Hubard et al., 2017; Quigley & Hambrick, 2015) and may even be dismissed under adverse financial circumstances (Finkelstein et al., 2009; Hubbard et al., 2017). Thus, CEOs would avidly protect their employment by carefully attending to factors that go beyond their baseline attentional fields when a strategic action is tightly related to firm's financial performance. However, CSR has been examined to show mixed relationship with firm's financial wealth (Petrenko et al., 2016). Therefore, I argue that female CEOs, in particular, would be less inclined to shift their attention from their baseline attentional fields and respond to their blind spots when a strategic action is less likely to guarantee firm's financial success. In sum, I highlight the importance of investigating how a strategic action serves firms' primary aim when analyzing female executives' responsiveness to bottom-up factors. The less tightly related a strategic action is to fulfill a firm's financial needs, the less likely female executives are likely to be driven by their surrounding factors that are beyond their baseline attentional structure.

From a practical standpoint, I argue that governance institutions should be aware of the responsiveness or malleability of executives' attentional structures before devising their incentive plans. For example, the boardroom pressurizes executives to act on behalf of shareholders and pay greater attention to a firm's long-term value to resolve agency concerns. While I found that CEOs in general responded to stock options in this context of CSR, it is unsurprising to find no gender difference in CEOs' response to the pay. While female CEOs would be more responsive in general, the fact that stock options reside in their blind spots may have led male and female CEOs to show similar responses to stock options here. However, in other contexts where the primary strategic action brings firm tangible benefits more directly,

where CEOs are likely to pay attention to their blind spots, female CEOs may shift their attention towards stock options and incur greater behavioral changes than male CEOs. Thus, when devising incentive plans, the board should consider whether the executive would respond acutely to the offerings by inspecting their baseline attentional structures and the strategic action. Executives may eventually receive either excessive or too few incentives to align with the board's intended direction.

CHAPTER 3. UNTANGLING THE CEO GENDER AND INNOVATION DEBATE: THE IMPACT OF EVALUATORS AND THE RESPONSIVE NATURE OF FEMALE CEOS

INTRODUCTION

Firms often strive to engage in innovation as it serves as a foundation for their competitive advantage (An et al., 2021; Barker III & Mueller, 2002; Hall et al., 2005). However, despite the benefits of innovation, executives may differ in the degree to which they engage in innovation due to its inherent risk, uncertainty, and delayed success (Chen et al., 2016; Flammer & Bansal, 2017; Mukarram et al., 2018). Executives' values and dispositions are expressed through their strategic decisions (Chin et al., 2013; Hambrick & Mason, 1984; Hambrick, 2007), so those who are willing to take on the risk associated with innovation and have the patience to wait for its benefits are more likely to pursue it (Chen et al., 2016; Flammer & Bansal, 2017; Mukarram et al., 2018). Conversely, executives who perceive misalignment with innovation would seek it less.

The different degrees of attention executives place on innovation can be explained by the attention-based view (ABV). This view suggests that executives' attentional structures differ based upon their prior experiences (Ocasio, 2011). Gender, specifically, is one of the most salient attributes that distinguishes executives in terms of their individual paths. Due to the misalignment between expectations held towards women and leaders, female executives tend to receive greater skepticism and unfavorable evaluations of their leadership capability (Eagly & Karau, 2002; Lee & James, 2007). The "glass cliff" phenomenon demonstrates that female leaders are more frequently criticized and evaluated less favorably than their male peers, even when performing the same leadership roles (Ryan & Haslam, 2007). Furthermore, the status of women as a distinctive minority tends to induce greater scrutiny (Dixon-Fowler et al., 2013).

These factors contribute to forming the attentional structures of female CEOs. Consequently, I argue that the prevalent skepticism towards female leaders result in female CEOs' attentional structures being more malleable and susceptible to their surroundings. Specifically, I assert that they are more likely to pay attention to the evaluations geared toward themselves and their firms.

While previous research has explored the distinctive baseline attentional structures held by male and female executives, the relationship between executive gender and innovation remains inconclusive (Almor et al., 2019; Biga-Diambeidou et al., 2021; Cady & Valentine, 1999; Pearsall et al., 2008; Proudfoot et al., 2015; Tang et al., 2021). To shed light on this relationship, I delved into when the gender-specific attributes that benefit innovation, such as risk-taking (Almor et al., 2019; Proudfoot et al., 2015), long-term orientation (Flammer & Kacperczyk, 2016), and stakeholder orientation (Flammer & Kacperczyk, 2016; Griffin et al., 2021), changes by accounting the role of evaluators. I predicted that the attentional structures of female CEOs would change more than those of male CEOs, incurring greater changes in innovation under diverse evaluating entities. I explored this dynamic hoping to offer a better understanding of when gender plays a significant role in explaining a firm's degree of innovation. As I'll discuss later, the results revealed that female CEOs were responsive to bottom-up factors that tend to reside in their blind spots when it comes to investing in R&D.

Additionally, prior studies have approached innovation in a piecemeal manner, focusing on one or two dimensions of innovation. Some scholars have examined how leader gender affect innovation inputs (Almor et al., 2019; Chen et al., 2016; Saggese et al., 2021; Mukarram et al., 2018). Others have considered the influence of gender on innovation outputs. These include quantitative output measures, such as the number of patents (Griffin et al., 2021), and qualitative output measures, such as the degree to which an innovation is explorative (e.g., patents that

leverage prior patents less (An et al., 2021) or impactful (e.g., patents that are highly cited by future patents (Hoisl & Mariani, 2017)). However, I believe it is valuable to comprehensively examine how the executive attributes of stakeholder orientation, temporal orientation, and risk propensity affect various dimensions of innovation since certain gender-specific executive attentional factors may only benefit particular dimensions of innovation.

In addition to approaching innovation comprehensively, it is crucial to examine how executive gender affects different forms of innovation in a causal manner, considering not only how male and female executives differ their level of innovation input and output but also how executive gender affects innovation productivity, which is the translation of innovation input into outputs. As women are comprehensive information processors (Meyers-Levy & Maheswaran, 1991), female leaders may utilize resources more effectively and comprehensively than male counterparts to generate realized outcomes. As such, I argue that industry environmental conditions may change female leaders' information processing capabilities and propose a three-way interaction effect toward innovation productivity.

Through this study, I make several contributions to management research in innovation, gender, and ABV. First, I extend our understanding of the link between CEO gender and innovation. Because innovation requires attributes that are specific to both men and women, delving into contextual factors that influence each CEO's attentional structure helps to identify when male and female CEOs would exert greater influence on innovation. Specifically, I found that female CEOs responded more acutely to bottom-up factors, especially those that reside outside their baseline attentional fields. However, male CEOs remained relatively unresponsive to bottom-up factors regardless of where those are located – within or beyond their general attentional structure. Examining bottom-up factors that tend to reside in male or female CEOs'

attentional fields, which would often be overlooked by the other gender, helped determine under which particular evaluators female CEOs showed meaningful responses to, thereby explaining when female CEOs would incur greater changes on innovation.

Relatedly, the different responsiveness to bottom-up factors by CEO gender indicates that incentives should be allocated accordingly to male and female CEOs. As I find that female executives react more strongly to evaluators, the level of guidance or pressure from evaluators should be different from those offered to male executives. In order to elicit similar behavioral responses from male and female executives, weaker guidance or lower pressure for female executives may achieve the same behavioral response as stronger guidance or pressure for male counterparts. Offering identical levels of incentives to male and female executives may result in inefficient resource allocation, leading to either excessive or deficient levels of incentives for them to act in a way desired by evaluative groups.

Third, I contribute to existing research on the relationship between resources and creativity, which has produced mixed results. Some studies suggest that resources can enhance creativity, while others suggest the opposite (Mehta & Zhu, 2016; Scopelliti et al., 2014; Shalley & Gilson, 2004). Through this study, I found that the findings may have differed due to the operationalization of creativity. Greater R&D expenditure led to a higher number of innovations and highly impactful innovations but had an adverse effect on the degree of exploratiVeness. Firms with higher R&D spending generated innovations that relied more on previous patents, indicating exploitative innovations.

THEORY AND HYPOTHESES

In this section, I begin by reviewing prior literature that discusses predictors of innovation and delineate how gender scholars have associated gender with innovation. I then use

the ABV to theorize how male and female leaders exhibit different attentional structures and emphasize how this distinctiveness has contributed to mixed findings in gender and innovation. To gain a better understanding of when the gender effect on innovation becomes evident, I elaborate upon how internal and external evaluators may either reduce or solidify the distinction between genders. In addition to approaching innovation separately, I also discuss how gender can impact the degree to which firms translate innovation input into outputs using the selectivity model (Meyers-Levy & Maheswaran, 1991) and consider how industry factors affect such translation. As such, I contribute to knowledge of the link between gender and innovation of various forms.

Innovation and Gender

First, I discuss individual and group level predictors that have been identified as enhancing or inhibiting innovation. Following the discussion of the general innovation predictors, I subsequently review prior gender studies that have identified similar mechanisms associated with innovation.

One key factor that greatly benefits innovation is information diversity. Scholars have found that diverse sources of information facilitate innovation. For example, functional and educational diversity in managerial teams fosters creativity and innovation as firms can gather diverse knowledge and expertise from individuals of different backgrounds (Bantel & Jackson, 1989; Yap et al, 2005). Additionally, demographic diversity has also been found to enhance innovation. Miller and Triana (2009) examined how racial and gender diversity in the boardroom enable firms to accumulate unique human and social capital, which facilitates the identification of new innovative opportunities.

To elaborate on the role of gender diversity, it is notable that women have been found to facilitate new ideas and perspectives, which prompts firm's innovation through enriching the information pool and enhancing decision comprehensiveness (Chen et al., 2021; Diaz-Garcia et al., 2013; Miller & Triana, 2009; Ruiz-Jimenez et al., 2016; Saggese et al., 2021; Xie et al., 2020). Scholars have claimed that female directors (Chen et al., 2021), top executives (Ruiz-Jimenez et al., 2016), and team members (Diaz-Garcia et al., 2013) leverage different knowledge sets relative to their male counterparts to promote innovation. Furthermore, Ruiz-Jimenez and colleagues (2016) concluded that female members are more adept at combining different sources of knowledge, which serves as another mechanism through which women enhance innovation.

Additionally, female members are not only active contributors to innovation, but also create a flexible, democratic, and participatory environment that elicits greater employee participation and benefits innovation (Chen et al., 2021; Dai et al., 2019; Ostergaard et al., 2011; Xie et al., 2020). Thus, both the diverse sources of knowledge exhibited by women and their capabilities in eliciting and combining diverse knowledge from their employees strengthens innovation.

However, scholars have also contended that diverse information originating from multiple individuals may inhibit innovation. When a group consists of diverse demographic characteristics, internal conflict (Pelled et al., 1999) as well as a lack of idea exchange (van Knippenberg et al., 2004) can inhibit innovation. Diversity can also disrupt decision-making processes and performance outcomes (Tajfel & Turner, 1986), which would adversely impact innovation. In the context of gender specifically, Pearsall and colleagues (2008) also found that gender diversity of a team stifles innovation as it prevents open interactions and the sharing of everyone's unique experiences and perspectives.

Prior research has also explored how other individual attributes impact innovation. Related to the argument that informational diversity benefits innovation, stakeholder-oriented individuals were found to be more adept at gathering information from diverse stakeholders, thus creating more opportunities for innovation (Flammer & Kacperczyk, 2016; Jiang et al., 2020). Other psychological attributes have also been associated with innovation. Given the high uncertainty and risk inherent in innovation, individuals who are long-term oriented (Flammer & Bansal, 2017; He & Tian, 2013) and risk-seeking (Mao & Zhang, 2018; Mukarram et al., 2018; Sauermann, 2018) tend to be more open to innovation. Furthermore, CEOs with high overconfidence (Galasso & Simcoe, 2011) and hubris (Tang et al., 2015) are more likely to underestimate the probability of failures, which leads to more innovation.

Scholars have also examined how gender differences in individual attributes influence innovation. Generally, Proudfoot and colleagues (2015) found that men tend to be more creative than women due to masculine-agentic qualities, such as risk-seeking, competitiveness, and adventurousness. However, in terms of risk aversion, female directors (Chen et al., 2016) and female members in R&D teams (Xie et al., 2020) have been found to balance the risk-seeking behavior of male-dominated groups leading to improved R&D efficiency. Conversely, while Almor and colleagues (2019) found that female directors' risk aversion reduces innovation in the form of lower R&D expenditure, the relationship becomes positive when they receive greater equity-based compensation. Furthermore, Mukarram and colleagues (2018) suggested that female leaders may not be as risk averse as is generally assumed by prior literature. Rather, they exhibit different levels of risk-aversion depending on their industry and ownership level. For example, while female directors in technology firms increased R&D expenditures, family ownership of the firm attenuated the relationship.

Lastly, studies have determined that monitoring affects innovation. Shareholders (Keum, 2021; Lin et al., 2021) and financial analysts (He & Tian, 2013) often prioritize generating greater short-term performance, and this can lead executives to put less effort into innovation where success prevails in the long term. However, from a gender perspective, Chen and colleagues (2021) found that intensive monitoring of female directors can improve a firm's innovation as they tend to reduce R&D-related agency problems.

Overall, prior research has produced mixed results regarding the impact of individual attributes, including gender-related factors, on innovation. As a result, I propose a null gender main effect and instead examine contextual factors that are likely to lead female CEOs to incur greater changes on innovation compared to male CEOs.

Attention-Based View: Top-Down Attention and Bottom-Up Drivers

The ABV proposes that the limited attention span of an individual leads them to follow and keep track of informational cues that align with their attention and knowledge structure while dismissing information that is beyond their baseline attentional boundaries (Shepherd et al., 2017). Executives are unable to comprehensively attend to their surrounding environment but instead tend to focus on specific informational sources. This individual attentional structure represents their top-down attention, which Joseph and Wilson (2018) describe as "schema-based attentional processes whereby the cognitive representation of mangers induce the actions."

Individuals' top-down attentional structures are formed via their prior paths (Ocasio, 1997), with executive gender being one of the main contributors to structural differences across individuals. As male and female executives follow distinctive societal and career trajectories (Cruz et al., 2019), they tend to exhibit unique top-down attentional structures and rely on different sources of information. Female CEOs face additional challenges and intensified

scrutiny as they work toward, and even after assuming, the top position in organizations. For example, women are expected to possess stronger capabilities to reach the top (Wang et al., 2018), receive less favorable reactions to their appointment as CEO relative to men (Lee & James, 2007), and their poor performance is more commonly attributed to internal, rather than external, causes (Park & Westphal, 2013). As Hill et al. (2015:1116) stated, "stereotypes of leadership positions result in biases against groups of individuals that have traditionally not occupied leadership positions," leading female CEOs to receive greater skepticism regarding their leadership competences and capabilities than male CEOs. Role congruity theory suggests that expectations held toward women are inconsistent with those of leaders: women are seen as caring and affectionate while leaders are expected to be aggressive and dominant (Eagly & Karau, 2002). However, even when female leaders adopt a masculine leadership style, they are viewed as ineffective (Eagly et al., 1992). Thus, the distinctively different experiences of male and female leaders would contribute to the non-overlapping attentional structures demonstrated in the strategic actions they pursue.

For example, scholars have primarily investigated gender differences in risk propensity (Brenner, 2015), temporal orientation (Silverman, 2003), and stakeholder orientation (Glass & Cook, 2018). This focus has led scholars to hypothesize and identify different strategic actions each executive gender would engage in. On the one hand, male executives' greater risk-seeking has been argued based on their larger and frequent acquisitions (Huang & Kisgen, 2013). On the other hand, female executives' greater engagement in CSR (Glass & Cook, 2018) may reflect their long-term and stakeholder orientation (Deng et al., 2013).

While male and female executives tend to be distinctive in their areas of attention and the actions they pursue, I argue that bottom-up drivers may change the degree of distinctiveness

across their overall attentional structures. Scholars have claimed that an individual's attentional structure is malleable to contextual factors (Ocasio, 1997; Joseph & Wilson, 2018), a dynamic referred to as "bottom-up" processing. They have highlighted that bottom-up and externally-driven attentional processing induces executives to deviate from their baseline attentional structure. Changes in the external environment may encourage executives to relax their pre-existing attentional boundaries and incorporate bottom-up processing more into their attentional structure. As such, bottom-up factors can induce individuals to direct their attention to topics that would otherwise be overlooked (Shepherd et al., 2007; 2017). Or, bottom-up processing may lead the individual to allocate more attention towards their pre-existing attentional fields. Thus, I argue that contextual factors may cause male and female executives to loosen their attentional boundaries and become attuned to areas that the other gender is generally more attentive to. Alternatively, the boundaries may become more distinct and cause executives of one gender to behave more differently than executives of the other gender.

Executives, and CEOs in particular, acknowledge the importance of how they are perceived and evaluated (Meister et al., 2017). However, this likely matters more to female CEOs than male CEOs. As mentioned above, the distinctive experience of male and female CEOs, I argue, leads each gender to behave differently when exposed to the evaluations of their surrounding entities. I contend that the intense scrutiny and evaluation received by female leaders induces female CEOs to more acutely respond to evaluators' oversight. In other words, the bottom-up processing that influences individuals' attentional structure is likely to be stronger for female CEOs than male CEOs because the former feels the need to prevent further skepticism and adverse evaluations. Following my argument that female CEOs are more reactive to the guidance and pressures of evaluators, I hypothesize that the direction and magnitude of

differences in innovation efforts between male and female-led firms are likely to be contingent on the actions of entities that evaluate the firm and its leaders.

Board of Directors and Incentive Compensation

Executives tend to be risk-averse in comparison to shareholders. Executives generally opt for investments that "pose minimal threats to their future compensation and employment" (Steinbach et al., 2017: 1702), whereas shareholders are less conservative and more willing to take risks as they can diversify their financial wealth. To align the risk preferences of executives with those of shareholders, boards of directors provide executives with incentive compensation (Jensen & Meckling, 2019).

Increases in the stock price lead executives with stock-based incentive plans to enjoy greater financial returns. When endowed with these incentives, executives are likely to pay attention to actions of greater risk, most commonly with stock options (Chauvin & Shenoy, 2001; Martin et al., 2013). As the nature of this form of compensation provides executives with the potential for unlimited upside value while being insured with a downward floor for losses (Sanders & Hambrick, 2007; Martin et al., 2013), executives are induced to engage in risky strategic actions (Bodolica & Spraggon, 2009).

In this study, I posit that while male and female CEOs tend to have distinctive top-down attentional boundaries, female CEOs' overall attentional structures are more susceptible to bottom-up factors, such as the influence of incentive compensation by board of directors in terms of altering their risk propensity. In a broad sense, the granting of stock options is a clear indicator of a board's attempt to align risk preferences across executives and shareholders and thus foster greater risk taking by CEO (Sanders, 2001; Sanders & Hambrick, 2007). Given that risk-seeking behavior has a positive impact on various forms of innovation, whether in terms of quantity or

quality (Almor et al., 2019; Chen et al., 2016, 2021; Mao & Zhang, 2018), greater use of stock options is likely to have a positive effect on firm innovation.

In innovation literature, scholars have argued that risk-seeking may benefit innovation. A CEO's risk-seeking may increase the amount of input executives allocate to innovation, quantitative innovation outcome (e.g., the number of patents), and the degree to which innovations are exploratory (Almor et al., 2019; Chen et al., 2016; Chen et al., 2021; Mao & Zhang, 2018; Proudfood et al., 2015). The amount allocated to innovation expenditures is the first step towards innovation. Because innovation entails high risk, executives willing to take risks may pursue innovation to a greater extent than risk-averse executives (Chang et al., 2015). Thus, risk-taking would facilitate greater expenditure on innovation. Furthermore, executives who are willing to take greater levels of risk are more prone to generate realized innovative outcomes despite the uncertainty of success (Sauermann, 2018). Finally, explorative innovation entails greater possibilities of failure, and thus indicates higher risk (Chen et al., 2019). As such, executives whose risk tolerance is higher are more likely to pursue innovation that is distinct from pre-existing innovations, which is known as explorative innovation (Mao & Zhang, 2018). Executives whose attention is geared towards risk-seeking actions are therefore likely to exert positive influence on the aforementioned forms of innovation – innovation input, quantitative and qualitative innovation.

However, I contend that heightened risk-taking through greater equity pay is expected to exert a negative influence on the degree to which a focal innovation is impactful, or the degree to which a patent is cited by future patents (Valentini, 2012). It is important to examine whether risk-seeking universally benefits innovation. While the relevant risk propensity may encourage highly novel and exploratory innovation, it may not result in a highly impactful innovation.

Scholars have argued that extremely original and novel ideas can lack usefulness (Simonton, 2018; Souto, 2021), and, similarly, creative processes are bound to result in novel ideas, without usefulness being guaranteed (Dewett, 2004). Therefore, greater risk-taking behavior is anticipated to lead executives to engender innovations of greater volume and novelty. However, a particular risk propensity is likely to elicit innovation that future innovators may not find useful and thus cite less. Therefore, I argue that while additional equity-based pay facilitates executives' risk-taking behavior, thus encouraging more innovation input and quantity as well as, explorative innovation, it is predisposed to adversely affect how future innovations utilize these focal innovations.

However, I expect these aforementioned effects of stock options facilitating executives' risk-taking behavior to be stronger for female CEOs. As a result of heightened skepticism towards female leaders (Gupta et al., 2018; Gupta et al., 2020; Ryan & Haslam, 2007; Ryan et al., 2016), female CEOs assume more precarious positions than male CEOs. For example, female-led firm's poor performance is more likely to be attributed to internal reasons than one led by a male CEO (Park & Westphal, 2013). Additionally, women are more prone to be dismissed regardless of performance (Gupta et al., 2020). Thus, female CEOs would arduously strive to follow the guidance by board of directors to enhance the security of their employment. Because directors grant stock options to alleviate executives' risk aversion, female CEOs are likely to respond more to such guidance and increase their risk propensity to a greater degree than male CEOs. In other words, the degree to which female CEOs allocate their attention to risky actions is probable to be greater than male CEOs when endowed with stock options.

Thus, as greater risk-taking induces more innovation inputs, quantitative outputs, and explorative innovation, increased incentive compensation is likely to lead female CEOs to

engender greater positive changes in innovation for such forms relative to men. This is because their risk propensity is more likely to be shifted. However, female CEOs are expected to engender more, negative, changes in innovation under high incentive compensation for innovation impact.

H1: The level of equity-based pay a CEO receives will moderate the relationship between CEO gender and firm innovation inputs, with higher levels of equity-based pay resulting in a relatively larger increase in innovation input for firms led by female CEOs compared to firms led by male CEOs.

H2a: The level of equity-based pay a CEO receives will moderate the relationship between CEO gender and firm innovation outputs, with higher levels of equity-based pay resulting in a relatively larger increase in number of patents for firms led by female CEOs compared to firms led by male CEOs.

H2b: The level of equity-based pay a CEO receives will moderate the relationship between CEO gender and firm innovation output types, with higher levels of equity-based pay resulting in a relatively larger increase in explorative innovation for firms led by female CEOs compared to firms led by male CEOs.

H2c: The level of equity-based pay a CEO receives will moderate the relationship between CEO gender and firm innovation output impact, with higher levels of equity-based pay resulting in a relatively larger decrease in innovation impact for firms led by female CEOs compared to firms led by male CEOs.

Financial Analysts and Their Evaluations

Financial analysts play a significant role in informing the financial market about the investment worthiness of a firm. They provide recommendations, set quarterly earnings targets,

and are remunerated based on the accuracy of their predictions (Washburn & Bromiley, 2014). As such analysts focus on short-term quarterly results, they tend to pay more attention to actions that deliver immediate results (Qian et al., 2019). Executives are aware of this short-term orientation of financial analysts, as demonstrated in a survey conducted among CFOs (Graham et al., 2005). The CFOs responded that financial analysts overreact to firms that miss their short-term earnings targets, which they attribute to analysts' lack of experience and understanding of the long-term business cycle. Scholars have also shown how executives are pressured to adopt a short-term focus due to the influence of financial analysts. As investors rely on the information provided by these analysts, their short-term recommendations and targets have a significant impact on the perception of a firm by investors (Chen et al., 2015). Therefore, executives strive to meet the short-term performance expectations set by these analysts (Qian et al., 2019) to avoid negative evaluations that can lead to a decline in the firm's stock price (Bartov et al., 2002).

However, financial analysts' emphasis on short-term profit-making actions can hinder innovation, which is best fostered through a long-term perspective (Yadav et al., 2007). Scholars have found that executives with a long-term orientation are more likely to contribute to greater innovation input, quantity, and quality (Barker III & Mueller, 2002; Miller & Xu, 2020; Flammer & Bansal, 2017; Valentini, 2012). Given the negativity bias, wherein negative evaluations receive greater attention than positive ones (Rozin & Royzman, 2001), I focus on the role of financial analysts' negative ratings in leading CEOs to become more short-sighted and eventually harming innovation.

Following prior findings that the seemingly stable temporal orientation (DesJardine & Shi, 2021) is subject to change with contextual factors (Gibson & Earley, 2007; Souder & Bromiley, 2012; Thoms & Greenberger, 1995), I argue that CEOs are prone to change the degree

to which they remain in their pre-existing temporal attentional field under analysts' pressure. Research has evidenced a seemingly stable difference in terms of temporality between men and women, suggesting that women tend to be more long-term oriented (Silverman, 2003). High testosterone is associated with prioritizing short-term goals (Archer, 2006), and men tend to score lower on goal-driver persistence and higher in impulsivity (Bacon et al., 2018). These distinctions indicate men's relatively lower focus on future events. However, their temporal attentional structure may change in response to bottom-up attentional processing, such as financial analysts' negative evaluations.

In light of evidence suggesting skepticism towards the leadership capabilities of female CEOs (Eagly & Karau, 2002; Jeong & Harrison, 2017; Lee & James, 2007), I argue that they are more likely to be wary of and susceptible to bottom-up attentional processing as a result of analyst' evaluations. In particular, these CEOs may focus on analysts' downward negative ratings in order to appease their concerns more than male CEOs. As such, the degree to which a female CEO changes and shortens her temporal attentional field in response to negative evaluations is likely to be greater than male CEOs, resulting in greater downward innovation performance for female-led firms compared to firms led by men.

H3: The analysts' rating will moderate the relationship between CEO gender and firm innovation inputs, with more negative analysts' ratings resulting in a relatively larger decrease in innovation input for firms led by female CEOs compared to firms led by male CEOs.

H4a: The analysts' rating will moderate the relationship between CEO gender and firm innovation outputs, with more negative analysts' ratings resulting in a relatively larger decrease in the number of patents for firms led by female CEOs compared to firms led by male CEOs.

H4b: The analysts' rating will moderate the relationship between CEO gender and firm innovation types, with more negative analysts' ratings resulting in a relatively larger decrease in explorative innovation for firms led by female CEOs compared to firms led by male CEOs.

H4c: The analysts' rating will moderate the relationship between CEO gender and firm innovation impact, with more negative analysts' ratings resulting in a relatively larger decrease in innovation impact for firms led by female CEOs compared to firms led by male CEOs.

Journalists and Their Stakeholder Focus

Journalists exert significant influence on executives' behaviors and actions as well as firms' strategic directions. Following the reciprocal effects model (Kepplinger, 2007; 2008), which explains how media and its subjects engage in a two-way process, journalists, executives, and their firms are likely to engage in relevant procedures. While subjects' actions stimulate journalists to cover them, media coverage reciprocally triggers subjects' behaviors and affects their future behavioral paths (Kepplinger & Glaab, 2007). The model further elaborates upon how the characteristics of media coverage, such as its tone, topic, and source, incurs reciprocal effects between the subject and the media.

For example, scholars have studied how media tone plays a significant role in influencing CEOs' behaviors and firms' pursuit of actions. CEOs reshaped their subsequent acquisition activities according to the market reaction toward a focal acquisition announcement in the media (Gamache & McNamara, 2019). Specifically, a negative market reaction towards an acquisition announcement led to a decrease in the CEOs' level of acquisitions moving forward. Additionally, CEOs have been shown to change their behaviors after receiving negative media coverage. Shani and Westphal (2016) found that CEOs socially distanced themselves from journalists who negatively described their leadership. As such, prior studies have empirically

demonstrated that CEOs alter their strategic actions and behaviors as a response to the media – especially its tone (Bednar, 2012; Deephouse, 2000; Gamache & McNamara, 2019; Shani & Westphal, 2016).

This study extends the reciprocal effects model by arguing that media topics, particularly media stakeholder focus, also impact CEOs' responses and firm's strategic outcomes. For instance, when journalists leverage stakeholder topics in an article that covers the focal firm, the CEO may become more attentive to stakeholders. Regardless of the pre-existing attention level towards stakeholders, executives may enhance their attentiveness to stakeholder issues. As greater attention to stakeholders engenders greater innovative outcomes (Flammer & Kacperczyk, 2017), I argue that journalists' usage of stakeholder topics, specifically media stakeholder focus, is likely to lead the firm to increase innovative performance.

Studies have found that executives' stakeholder orientation is beneficial for innovation. First, greater stakeholder orientation facilitates more opportunities and idea generation. However, with more ideas being generated, increased innovation resources are required to implement them (Flammer & Kacperczyk, 2016; Griffin et al., 2021). Thus, greater CEO stakeholder orientation is bound to trigger more resource allocation for innovation to support the number of innovative ideas. Second, greater attention to stakeholders leads executives to build a psychologically safe environment for employees. As employees feel protected by the firm, they are more likely to engage in experimentation, trial-and-error, and innovation that has a higher probability of failure (Flammer & Kacperczyk, 2016). Thus, strengthened stakeholder orientation would facilitate employees to experiment more, which is likely to result in greater number of innovative outputs and more explorative innovation. Last, when employees perceive higher job

security, they tend to engender innovations that are more impactful, or innovations that are cited more by future innovations (Azoulay et al., 2011; Flammer & Kacperczyk, 2016).

While the reciprocal effects model does not distinguish between subjects in terms of their level of responsiveness, I advance its application and argue that the degree to which individuals' overall attentional structure is likely to be malleable differs across individuals. Specifically, it depends on how they are sensitive to bottom-up attention processing in general. Further, I propose that individuals respond to media articles directed at themselves and their firms to varying degrees depending upon the topics leveraged in the articles.

First, as female leaders generally receive greater scrutiny than male counterparts (Gupta et al., 2018; Gupta et al., 2020; Ryan & Haslam, 2007; Ryan et al., 2016), female CEOs are apt to react to evaluators. Thus, they may incur greater changes in their attentional field in response to journalists' media articles. Second, from a narrower perspective, CEOs may vary in the degree to which they pay attention to media depending on the topics leveraged in an article. Topics of higher relevance to an individual will capture their attention more, while topics outside their attentional boundaries will elicit a weaker response. As individuals are only able to allocate their attention towards those elements that align with their attentional structure (Ocasio, 1997), the topics of higher relevance to them are likely to hold their attention.

Therefore, along with my expectation of female leaders' greater responsiveness to evaluators and increased attention towards stakeholders (Glass & Cook, 2018), I argue that female CEOs are more prone to be affected by bottom-up attentional factors, which include the stakeholder topics leveraged by journalists' media articles. Thus, female CEOs are likely to pay more attention to internal and/or external stakeholders after exposures to stakeholder issues in the media. Overall, as greater attention to stakeholders tends to promote innovation (Azoulay et

al., 2011; Flammer & Kacperczyk, 2016; Griffin et al., 2021), female CEOs who are more prone to be affected by media's stakeholder focus, are more likely to advance innovation compared to male CEOs when the media highlights stakeholder issues.

H5: Media stakeholder focus will moderate the relationship between CEO gender and firm innovation inputs, with higher levels of media stakeholder focus resulting in a relatively larger increase in innovation input for firms led by female CEOs compared to firms led by male CEOs.

H6a: Media stakeholder focus will moderate the relationship between CEO gender and firm innovation outputs, with higher levels of media stakeholder focus resulting in a relatively larger increase in the number of patents for firms led by female CEOs compared to firms led by male CEOs.

H6b: Media stakeholder focus will moderate the relationship between CEO gender and firm innovation output types, with higher levels of media stakeholder focus resulting in a relatively larger increase in explorative innovations for firms led by female CEOs compared to firms led by male CEOs.

H6c: Media stakeholder focus will moderate the relationship between CEO gender and firm innovation impact, with higher levels of media stakeholder focus resulting in a relatively larger increase in innovation impact for firms led by female CEOs compared to firms led by male CEOs.

Innovation Productivity

Furthermore, I argue that female CEOs are more adept at converting innovation input into realized outputs. Meyers-Levy and Maheswaran (1991)'s selectivity model suggests that women excel at processing a wide array of information relative to men. For example, women tend to be better at processing diverse sources of information, such as being attentive to subtle cues,

whereas men are more likely to rely on heuristics and overlook subtle cues. Additionally, women have been found to be more capable of combining diverse sources of knowledge (Ruiz-Jimenez et al., 2016). Information processing and resource combination capabilities enhance experimentation and facilitate the discovery of valuable combination portfolios (Yang et al., 2021; Wiklund & Shepherd, 2009). Consequently, I contend that the positive association between innovation input and output (Ahuja & Katila, 2004; Katila & Ahuja, 2002) will be stronger under female CEOs who are more capable of processing and combining diverse sources of information. In other words, I argue that female CEOs are likely to strengthen the degree to which innovation input translates to outputs.

H7: Innovation input is positively associated with innovation outputs (H7a. the number of patents, H7b. explorative innovation, and H7c. innovation impact).

H8: Female CEOs strengthen the positive relationship between innovation input and outputs (H8a. the number of patents, H8b. explorative innovation, and H8c. innovation impact).

Furthermore, industry factors are apt to change the degree to which CEOs can effectively convert resources to outputs. In a complex and munificent industry, a focal firm is surrounded by heterogeneous stakeholders and slack resources with active resource flows (Bourgeois III, 1981; Malhotra & Harrison, 2022). Thus, CEOs with high information processing capabilities – female CEOs – are likely to benefit more from industry complexity and munificence as they are more capable of handling and leveraging diverse resources (Malhotra & Harrison, 2022; Snowden & Boone, 2007). Specifically, they seem to translate allocated resources to realized outcomes more effectively than male counterparts.

However, while high information processors are likely to flourish under diverse and active resource flows, I anticipate finding the opposite under dynamic industry conditions, which

reflect industry instability (Dess & Beard, 1984). Under high industry dynamism, high information processors are more prone to struggle as they endeavor to match their decision-making speed to the speed requirements of dynamic markets. With new technologies and business models consistently emerging in a dynamic industry, faster managerial decisions are required. As executives who are adept at processing diverse sources of information and combining resources benefit from additional time (Dean & Sharfman, 1996; Fredrickson, 1984; Malhotra & Harrison, 2022), their capabilities are less likely to be utilized under dynamic industry conditions. Thus, female CEOs' positive influence on converting innovation input to output would be attenuated under high industry dynamism.

H9: The degree to which female CEOs positively moderate innovation productivity (innovation input – H9a. the number of patents, H9b. explorative innovation, H9c. innovation impact) is dependent upon industry factors, such that industry complexity would strengthen the relationship.

H10: The degree to which female CEOs positively moderate innovation productivity (innovation input – H10a. the number of patents, H10b. explorative innovation, H10c. innovation impact) is dependent upon industry factors, such that industry munificence would strengthen the relationship.

H11: The degree to which female CEOs positively moderate innovation productivity (innovation input – H11a. the number of patents, H11b. explorative innovation, H11c. innovation impact) is dependent upon industry factors, such that industry dynamism would attenuate the relationship.

METHODS

I utilized firms in S&P 1500 where firms have applied for patents from 2011 to 2019. Firm-level information was retrieved from *Compustat*, and CEO-related information, including

the equity-based compensation of the CEO, was obtained from *Execucomp*. For innovation related information, such as the number of patents, the degree to which a patent leverages prior innovation, and the number of citations a focal patent receives was retrieved from *USPTO* and *US Patents by WRDS*. To measure media stakeholder focus, I utilized Factiva to pull media articles covering each firm using the following sources: *New York Times, Washington Post, Los Angeles Times, USA Today, Wall Street Journal, Barron's, Fortune, Forbes,* and *Associated Press Newswires.*

Variables

Mediating and dependent variables. Innovation input is captured by the expenditures spent on research and development (R&D) following prior literature (Mukarram et al., 2018; Shen & Zhang, 2018). Similarly, I used *R&D expenditure* at t+1 (Keum, 2020; Shen & Zhang, 2018; Lin et al., 2021). Because the expenditure can be immediately adjusted, I used a shorter lag compared to the other innovation output variables (Keum, 2020). For R&D expenditures in particular, scholars have pointed out this ongoing issue of missing R&D expenditure information on *Compustat*. Following Flammer & Kacperczyk (2016), I replaced the missing R&D expenditures to zero. Quantitative innovation output is measured as the *number of patents* generated by the firm. Among the qualitative innovation outputs, explorative innovation is the degree to which a focal patent leverages prior patents (Kong et al., 2022; Chemmanur et al., 2019). The less (more) a focal patent relies upon prior patents, the more (less) likely a patent is to be explorative. Thus, the count of backward citations would represent *exploitative innovation*, with the lower value indicating explorative innovation. Last, *innovation impact* is measured through the number of citations a focal patent receives from following patents (Valentini, 2012). Quantitative and qualitative innovation outputs are aggregated at a yearly-level, and they are

constructed based on years when patents' applications were filed instead of when they were granted. This is because application year more closely captures when firms initiate their innovation activities (Chen et al., 2021). Additionally, the innovation output variables are measured with 3-year time lags (Chen et al., 2021; Keum, 2021) as innovation requires certain time lags to be generated. Moreover, it is necessary to account for time effects that may influence the degree to which innovation is cited and leverages previous citations, known as the truncation bias (Ganco, 2013; Hall, Jaffe, & Trajtenberg, 2001; Keum, 2021; Seru, 2014). Therefore, I follow prior research and adopt a normalization approach where the firm's patent-related outcome is captured in relation to the output average for the focal year. Thus, innovation outputs for each firm year is divided by the mean innovation outputs of all firms for the particular year with log transformation, with the year being the one from the patent's application filing date: ln $(1 + \frac{\text{Firm innovation outputs}}{\text{Mean innovation outputs}})$.

Independent and moderating variables. CEO gender is a dummy variable with female CEOs being 1 and male CEOs being 0. Equity-based compensation of CEOs is the value of *stock options* granted during a focal year where the value is calculated as the present value of all options awarded during the year based upon the granted date (Sanders & Hambrick, 2007)[5]. Financial analysts' ratings are measured on a five-point scale and are aggregated at the yearly level by averaging the quarterly ratings. As 1 indicates "Strong Buy" and 5 being a "Sell", higher value would indicate *analysts' adverse ratings.*

For media stakeholder focus, I utilized the stakeholder dictionary created by Crilly and Ioannou (2017). They have categorized stakeholder-related items of vocabulary from the 1,200

[5] Controlling for the value of unexercised exercisable options and unexercised exercisable options did not change the results.

most frequent words that appeared in all letters to shareholders. This led to 34 words in total, which were assigned to 7 different categories using Post, Preston, and Sachs (2002) as a guide: Employees, Customers, Communities, Natural environment, Government, Shareholders, and Suppliers. With this stakeholder dictionary (Table 2.1), I used the *Linguistic Inquiry and Word Count (LIWC)* software to count the frequency of words appearing from each dictionary for each media article. I averaged the score for each dictionary on a yearly basis.

Following Crilly and Sloan (2014), the Simpson index (Simpson, 1949) captures the degree to which executives attend to diverse stakeholders. The Simpson index measures concentration as follows:

$$\lambda = \sum_{i=1}^{R} p_i^2,$$

where p indicates the level of focus each media article has toward a single stakeholder category and R represents stakeholder categories in the focal article. A higher λ indicates media's being less divided in the degree to which each article discusses distinct stakeholder categories, which demonstrates high concentration on particular stakeholder groups. Thus, lower λ would imply greater media stakeholder topic breadth. For easier interpretation, I subtracted the index from 1, such that the higher value would indicate greater media stakeholder topic breadth.

TABLE 2.1. Stakeholder Dictionary

Stakeholders	**Employees**	**Customers**	**Communities**	**Natural environment**	**Government**	**Shareholders**	**Suppliers**
Words	Colleague* Employee* People Union* Worker* Workforce	Consumer* Customer* Patient*	Citizen* Climate Communit* Neighbor*	Conservation Emission* Environment* Footprint Greenhouse Nature Renewable* Waste	Authority Authorities Government* Legislation Legislator* Regulation Regulator*	Investor* Shareholder* Shareowner* Stockholder*	Contractor* Manufacturer* Partner*

Control variables. To more effectively examine the distinctive CEO gender effect on innovation changes, I first controlled for the prior innovation forms. Thus, R&D expenditures in the previous year, and innovation quantity and quality measures with a three-year time lag are controlled. Additionally, several control variables are used following prior literature (Flammer & Kacperczyk, 2016).

To control other leadership attributes, I included a number of CEO and TMT characteristics (Flammer & Kacperczyk, 2016). At the executive level, I controlled for *CEO age*, *tenure,* insider status (*CEO insider*), and whether it was a newly appointed CEO as *first-time CEO*. I also controlled for the number of female top executives who appear in the five most paid top management team (TMT) members, *Female TMT*, and the size of the TMT, *TMT size*. At the firm level, I controlled for the following: *Firm size* measured by the natural logarithm of sales, *firm performance* as the return on assets, measured by the ratio of net income to total assets, *firm years*, *R&D expenditures*, *tobin's q*, and *leverage* measured through the ratio of the sum of long-term debt and debt in current liabilities divided by the book value of total assets.

I also controlled two media related variables. First, I controlled the media tone, media *positive and negative tone,* as studies have examined how the tone of the media articles can affect executives' behaviors and actions (Gamache & McNamara, 2019; Shani & Westphal, 2016). Next, as media stakeholder focus would have different levels of impact to the firm depending on the article volume, the number of articles at a yearly level has been controlled as well – *yearly media volume*.

Estimation Technique

I used a Generalized Estimating Equation (GEE) model with a panel dataset (Liang & Zeger, 1986), utilizing the xtgee function from STATA. This GEE model controls for the

unobserved firm heteroskedasticity, specifies within-group correlation (Mahmood et al., 2011; Pan et al., 2019), and accommodates non-independent observations (Hambrick et al., 2015). For these features, GEE estimates have advantages over fixed or random models (Ndofor et al., 2011).

In addition, to seek whether the gender effect on innovation outcomes holds in a moderated mediation mechanism, I utilized structural equation modelling estimation technique. The model captures the indirect effect of how CEO gender affects innovation output through innovation input, the R&D expenditures, considering the role of stock options, analysts' ratings, and media's stakeholder focus.

RESULTS

The descriptive statistics and correlations are presented in Table 2.2. In addition, the variables have been standardized to reduce multicollinearity concerns. Furthermore, I ran a variance inflation factor (VIF) test and found that the highest mean VIF value across all regressions was 1.74 and all VIF values were below 6.77, which further reduces concerns related to multicollinearity (Cohen, Cohen, West, & Aiken, 2003). Table 2.3 presents the results of the regression analyses of H1 through H6, and Table 2.4 demonstrates the results of H7 through H11.

TABLE 2.2. Descriptive Statistics and Correlation Matrix

Variable	Mean	Std. Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) CEO gender	.04	.187	1.000											
(2) R&D expenditure	224.87	873.01	0.057	1.000										
(3) Prior R&D expenditure	213.77	833.24	0.057	0.980	1.000									
(4) Number of patents	.24	.38	0.103	0.570	0.579	1.000								
(5) Prior number of patents	.25	.39	0.114	0.599	0.604	0.963	1.000							
(6) Exploitative innovation	.26	.42	0.059	0.453	0.466	0.786	0.749	1.000						
(7) Prior exploitative innovation	.27	.43	0.075	0.498	0.504	0.757	0.792	0.912	1.000					
(8) Innovation impact	.20	.38	0.068	0.495	0.504	0.817	0.769	0.793	0.733	1.000				
(9) Prior innovation impact	.22	.40	0.078	0.548	0.550	0.809	0.829	0.781	0.809	0.900	1.000			

TABLE 2.2. (cont'd)

Variable	Mean	Std. Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(10) Stock options	1219.92	1586.35	-0.005	0.187	0.187	0.195	0.196	0.220	0.226	0.163	0.164	1.000		
(11) Analysts' adverse ratings	.41	.46	0.044	0.178	0.183	0.226	0.237	0.173	0.198	0.157	0.171	0.183	1.000	
(12) Media stakeholder focus	.57	.21	0.061	0.122	0.122	0.177	0.180	0.136	0.146	0.146	0.144	0.145	0.084	1.000
(13) Industry complexity	.72	.22	-0.074	0.033	0.034	0.008	0.003	0.005	0.004	0.021	0.018	0.026	-0.107	0.003
(14) Industry munificence	.05	.08	0.011	0.011	0.014	0.030	0.016	0.007	-0.010	0.029	0.011	0.025	-0.021	-0.020
(15) Industry dynamism	.03	.03	0.012	-0.057	-0.063	-0.026	-0.030	-0.057	-0.060	-0.037	-0.045	-0.038	-0.003	0.011
(16) Media positive tone	2.86	.86	-0.071	-0.099	-0.099	-0.113	-0.122	-0.076	-0.087	-0.082	-0.105	-0.033	-0.043	-0.095
(17) Media negative tone	.88	.47	0.025	0.081	0.089	0.056	0.056	0.039	0.040	0.058	0.059	0.033	-0.005	0.168
(18) Yearly media volume	34.79	69.18	0.193	0.484	0.482	0.359	0.365	0.255	0.264	0.301	0.297	0.176	0.120	0.238
(19) Firm size	7.59	1.56	0.104	0.321	0.333	0.300	0.312	0.218	0.239	0.222	0.232	0.307	0.432	0.294
(20) Firm performance	.05	.14	-0.001	0.057	0.050	0.061	0.056	0.079	0.073	0.078	0.081	0.061	0.165	0.013
(21) Leverage	.18	.18	0.040	-0.049	-0.044	-0.071	-0.063	-0.080	-0.066	-0.092	-0.086	-0.043	0.008	0.072
(22) Tobin's Q	1.68	1.23	-0.014	0.035	0.028	0.048	0.043	0.109	0.096	0.115	0.122	0.105	-0.007	-0.048
(23) Firm years	17.26	5.39	-0.007	0.109	0.111	0.112	0.133	0.063	0.093	0.052	0.085	0.014	0.242	0.039
(24) Female TMT	.41	.65	0.128	0.017	0.017	-0.055	-0.053	-0.031	-0.026	-0.040	-0.035	0.021	-0.020	0.030
(25) TMT size	5.65	1.13	-0.002	0.004	0.004	-0.038	-0.040	-0.028	-0.035	-0.030	-0.031	0.054	-0.055	0.042
(26) First-time CEO	.10	.30	-0.033	-0.026	-0.028	-0.027	-0.020	-0.029	-0.025	-0.027	-0.015	-0.002	-0.017	0.015
(27) CEO age	55.16	7.72	-0.030	0.047	0.048	0.007	0.013	-0.000	0.006	0.005	0.011	-0.021	0.114	0.016
(28) CEO tenure	3407.85	3241.30	-0.063	-0.015	-0.015	0.008	0.005	0.039	0.035	0.052	0.047	-0.050	0.045	-0.013
(29) CEO insider	.78	.42	0.025	0.036	0.036	0.058	0.050	0.042	0.036	0.060	0.038	0.049	0.129	0.010

Variables	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)
(13) Industry complexity	1.000															
(14) Industry munificence	0.062	1.000														
(15) Industry dynamism	-0.212	-0.038	1.000													
(16) Positive emotion	0.051	0.078	-0.029	1.000												
(17) Negative emotion	-0.001	-0.042	-0.007	-0.082	1.000											
(18) Yearly media volume	-0.037	0.032	-0.037	-0.102	0.121	1.000										
(19) Firm size	-0.128	-0.049	-0.010	-0.125	0.103	0.378	1.000									
(20) Firm performance	-0.023	0.009	-0.007	0.038	-0.096	0.035	0.140	1.000								
(21) Leverage	-0.037	-0.084	0.042	-0.079	0.091	0.066	0.313	-0.244	1.000							
(22) Tobin's Q	0.106	0.074	-0.092	0.071	-0.125	-0.061	-0.224	0.261	-0.408	1.000						
(23) Firm years	-0.135	-0.125	0.040	-0.123	0.042	0.046	0.301	0.044	0.126	-0.129	1.000					
(24) Female TMT	-0.041	-0.026	-0.033	-0.040	0.020	0.076	0.032	0.008	-0.003	-0.007	-0.035	1.000				
(25) TMT size	-0.032	0.010	-0.048	-0.024	0.024	0.076	0.056	-0.056	0.091	-0.067	0.011	0.216	1.000			
(26) First-time CEO	-0.008	-0.017	-0.018	-0.008	-0.024	-0.015	0.007	-0.013	0.042	-0.005	0.041	0.022	0.034	1.000		
(27) CEO age	-0.077	-0.039	0.097	-0.011	0.018	0.007	0.147	0.039	0.116	-0.094	0.175	-0.042	-0.087	0.097	1.000	
(28) CEO tenure	-0.000	0.028	-0.004	0.023	-0.013	-0.044	-0.014	0.070	-0.103	0.067	0.140	-0.072	-0.076	0.011	0.288	1.000
(29) CEO insider	0.009	0.022	0.045	0.031	-0.022	-0.011	0.082	0.136	-0.081	0.091	0.047	-0.085	-0.178	-0.351	-0.010	0.165

N=4,109; Correlation values that are equal to or greater than an absolute value of 0.0313 are significant at p=0.05.

Although I did not hypothesize for the main effects, I found that female CEOs spent less on R&D and generated fewer number of patents – Model 1 and Model 3 from Table 2.3. For Hypothesis 1, I predicted that equity-based compensation would moderate the relationship between CEO gender and R&D expenditures, such that female CEOs would engender a larger increase in innovation input with greater stock options compared to male CEOs. As hypothesized, I found that female CEOs responded more acutely to stock options and they spent more on R&D expenditures with the relevant pay, whereas male-led firms did not alter their level of R&D expense upon receiving greater stock options – Model 2 from Table 2.3. As shown in Figure 1, female-led firms exhibited a significant incline (dy/dx= 0.075, p=0.000), while the slope for male-led firms was negligible (dy/dx=0.002, p=0.471). However, stock options did not affect the gender effect on innovation outputs, not supporting Hypotheses 2a through 2c.

Hypotheses 3 through 4c elaborated the role of financial analysts' evaluations on CEO gender effect on innovation inputs and outputs. Supporting Hypothesis 3, I found that female CEOs displayed more responsiveness to analysts than male CEOs and female-led firms spent less on R&D upon receiving adverse analysts' evaluations – Model 2 in Table 2.3. As shown from Figure 2, female CEOs showed a negative slope under analysts' adverse ratings (dy/dx=-0.017, p=0.015), but the slope for male CEOs was not significantly different than zero (dy/dx=-0 001, p=0.765). While Hypotheses 4a and 4b, which examined the role of analysts' adverse ratings on the number of patents and explorative innovation, were not supported, analysts affected how gender influences innovation impact. While Hypothesis 4c indicated that female-led organizations generate innovations that have lesser impact under analysts' adverse ratings, I found the opposite; Female CEOs generated innovations of greater impact when they received poor evaluations from analysts – Model 8 in Table 2.3. As seen from Figure 3, female CEOs

showed acute positive slope towards innovation impact under adverse evaluations from analysts (*dy/dx*=0.017, *p*=0.043), whereas no significant changes were found from male counterparts (*dy/dx*=-0.003, *p*=0.411).

Hypothesis 5 through Hypothesis 6c posited that media stakeholder focus would cause female-led firms to increase innovations of multiple forms. However, they were not supported.

TABLE 2.3. GEE Results of CEO Gender Effect on Innovation Considering the Role of Stock Options, Analysts, and Media

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
	R&D expenditure	R&D expenditure	Number of patents	Number of patents	Exploitative innovation	Exploitative innovation	Innovation impact	Innovation impact
Female CEO	-.031**	-.016	-.018*	-.018†	-.024†	-.024	-.014	-.021
	(.01)	(.014)	(.009)	(.01)	(.014)	(.015)	(.014)	(.015)
Stock options	.005*	.002	.001	.001	.003	.004	.002	.003
	(.002)	(.002)	(.002)	(.002)	(.003)	(.003)	(.003)	(.003)
Analysts' adverse rating	-.001	-.001	.000	-.001	-.004	-.005	.000	-.003
	(.002)	(.002)	(.002)	(.002)	(.003)	(.003)	(.003)	(.003)
Media stakeholder focus	.000	.000	.001	.001	.000	.000	.004	.003
	(.003)	(.003)	(.002)	(.002)	(.003)	(.003)	(.003)	(.003)
Industry complexity	.001	.002	.001	.001	-.002	-.003	.000	.000
	(.002)	(.002)	(.002)	(.002)	(.003)	(.003)	(.003)	(.003)
Industry munificence	-.001	-.002	.005**	.004**	.004	.004	.005†	.005†
	(.002)	(.002)	(.002)	(.002)	(.003)	(.003)	(.003)	(.003)
Industry dynamism	.004†	.004†	.002	.002	.000	.000	.002	.002
	(.002)	(.002)	(.002)	(.002)	(.003)	(.003)	(.003)	(.003)
Positive emotion	-.001	.000	.001	.001	.000	.000	.006	.006
	(.004)	(.004)	(.002)	(.002)	(.004)	(.004)	(.004)	(.004)
Negative emotion	-.004	-.004	.002	.001	.003	.003	.001	.001
	(.003)	(.003)	(.002)	(.002)	(.003)	(.003)	(.003)	(.003)
Yearly media volume	.008***	.008**	.003†	.003†	.005*	.005*	.010***	.010***
	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)
Firm size	-.012***	-.012***	.002	.002	.004	.004	.005	.006
	(.003)	(.003)	(.002)	(.002)	(.004)	(.004)	(.004)	(.004)
Firm performance	.005	.004	.002	.002	.003	.003	-.001	-.001
	(.003)	(.003)	(.002)	(.002)	(.003)	(.003)	(.003)	(.003)
Leverage	-.001	.000	-.003	-.003	-.005	-.005	-.006†	-.006†
	(.003)	(.003)	(.002)	(.002)	(.003)	(.003)	(.003)	(.003)
Tobin's Q	.004†	.005*	.000	.000	.006*	.006*	.000	.000
	(.002)	(.002)	(.002)	(.002)	(.003)	(.003)	(.003)	(.003)

TABLE 2.3. (cont'd)

Firm years	.002 (.002)	.003 (.002)	-.006** (.002)	-.006** (.002)	-.009** (.003)	-.009** (.003)	-.010*** (.003)	-.010*** (.003)
Female TMT	.000 (.002)	.000 (.002)	-.002 (.002)	-.002 (.002)	-.003 (.003)	-.003 (.003)	-.003 (.003)	-.003 (.003)
TMT size	.003 (.002)	.003 (.002)	.001 (.002)	.001 (.002)	.003 (.003)	.003 (.003)	.001 (.003)	.001 (.003)
First-time CEO	.013 (.010)	.016 (.010)	-.006 (.006)	-.006 (.006)	-.004 (.010)	-.004 (.010)	-.004 (.009)	-.004 (.009)
Analysts' adverse rating	-.001 (.002)	-.001 (.002)	.000 (.002)	-.001 (.002)	-.004 (.003)	-.005 (.003)	.000 (.003)	-.003 (.003)
Media stakeholder focus	.000 (.003)	.000 (.003)	.001 (.002)	.001 (.002)	.000 (.003)	.000 (.003)	.004 (.003)	.003 (.003)
Industry complexity	.001 (.002)	.002 (.002)	.001 (.002)	.001 (.002)	-.002 (.003)	-.003 (.003)	.000 (.003)	.000 (.003)
Industry munificence	-.001 (.002)	-.002 (.002)	.005** (.002)	.004** (.002)	.004 (.003)	.004 (.003)	.005† (.003)	.005† (.003)
Industry dynamism	.004† (.002)	.004† (.002)	.002 (.002)	.002 (.002)	.000 (.003)	.000 (.003)	.002 (.003)	.002 (.003)
Positive emotion	-.001 (.004)	.000 (.004)	.001 (.002)	.001 (.002)	.000 (.004)	.000 (.004)	.006 (.004)	.006 (.004)
Negative emotion	-.004 (.003)	-.004 (.003)	.002 (.002)	.001 (.002)	.003 (.003)	.003 (.003)	.001 (.003)	.001 (.003)
Yearly media volume	.008*** (.002)	.008** (.002)	.003† (.002)	.003† (.002)	.005* (.002)	.005* (.002)	.010*** (.002)	.010*** (.002)
Firm size	-.012*** (.003)	-.012*** (.003)	.002 (.002)	.002 (.002)	.004 (.004)	.004 (.004)	.005 (.004)	.006 (.004)
Firm performance	.005 (.003)	.004 (.003)	.002 (.002)	.002 (.002)	.003 (.003)	.003 (.003)	-.001 (.003)	-.001 (.003)
Leverage	-.001 (.003)	.000 (.003)	-.003 (.002)	-.003 (.002)	-.005 (.003)	-.005 (.003)	-.006† (.003)	-.006† (.003)
Tobin's Q	.004† (.002)	.005* (.002)	.000 (.002)	.000 (.002)	.006* (.003)	.006* (.003)	.000 (.003)	.000 (.003)
Firm years	.002 (.002)	.003 (.002)	-.006** (.002)	-.006** (.002)	-.009** (.003)	-.009** (.003)	-.010*** (.003)	-.010*** (.003)
Female TMT	.000 (.002)	.000 (.002)	-.002 (.002)	-.002 (.002)	-.003 (.003)	-.003 (.003)	-.003 (.003)	-.003 (.003)
TMT size	.003 (.002)	.003 (.002)	.001 (.002)	.001 (.002)	.003 (.003)	.003 (.003)	.001 (.003)	.001 (.003)
First-time CEO	.013 (.010)	.016 (.010)	-.006 (.006)	-.006 (.006)	-.004 (.010)	-.004 (.010)	-.004 (.009)	-.004 (.009)

TABLE 2.3. (cont'd)

CEO age	.003 (.002)	.003 (.002)	-.002 (.002)	-.002 (.002)	.000 (.003)	.000 (.003)	-.001 (.003)	-.001 (.003)
CEO tenure	-.005** (.002)	-.005** (.002)	.002 (.002)	.002 (.002)	.003 (.003)	.004 (.003)	.004 (.003)	.004 (.003)
CEO insider	.011† (.006)	.013* (.006)	.006 (.004)	.006 (.004)	.005 (.007)	.005 (.007)	.020** (.007)	.020** (.007)
CEO gender X Stock options		.073*** (.012)		.004 (.009)		-.004 (.014)		-.014 (.014)
CEO gender X Analysts' adverse ratings		-.017* (.007)		.004 (.006)		.011 (.009)		.020* (.009)
CEO gender X Media stakeholder focus		-.019 (.017)		-.003 (.011)		-.006 (.018)		.009 (.017)
Prior R&D expenditure	.991*** (.002)	.996*** (.002)						
Prior number of patents			.933*** (.005)	.932*** (.005)				
Prior exploitative innovation					.889*** (.006)	.888*** (.006)		
Prior innovation impact							.863*** (.007)	.859*** (.007)
Constant	-.009 (.006)	-.010† (.006)	.005 (.004)	.005 (.004)	.015* (.007)	.015* (.007)	-.006 (.007)	-.005 (.007)
Wald Chi Square	472,919	730,288	54,555	54,644	24,842	24,766	20,766	20,662

Notes: N=4,109; Standard errors are in parentheses
**** p<.001, ** p<.01, * p<.05, † p<0.1*

FIGURE 2.1. Interaction Effects of CEO Gender and Stock Options on R&D Expenditures

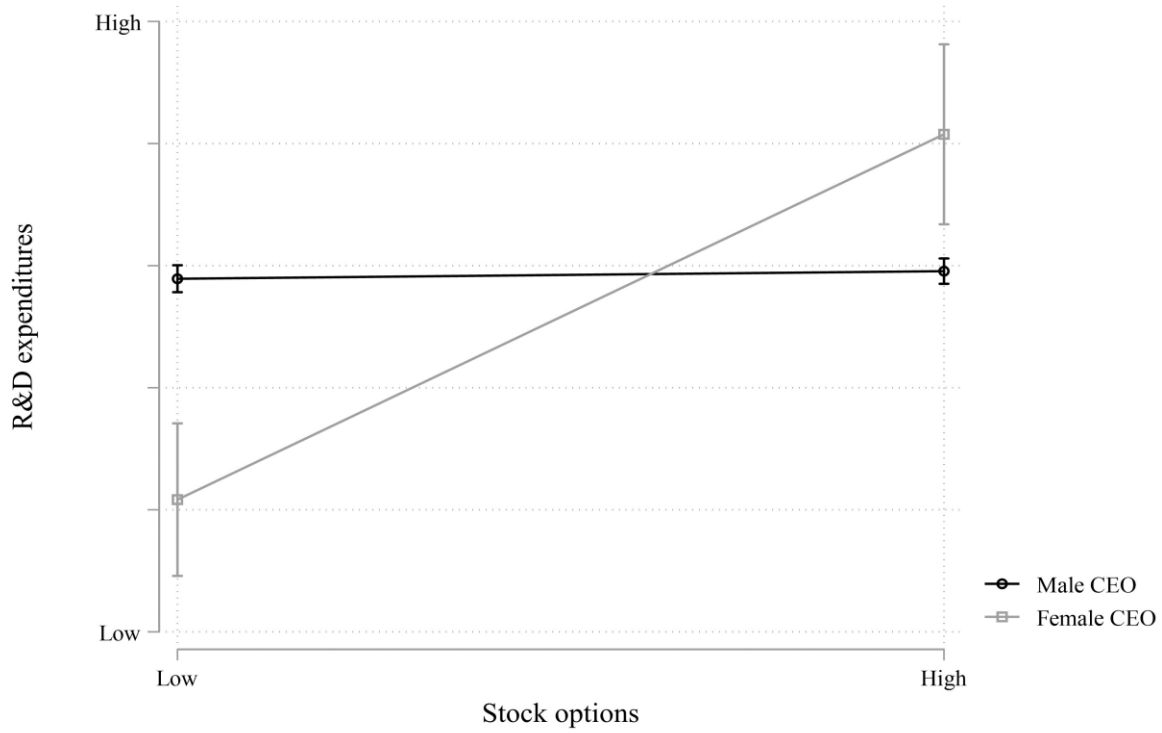


FIGURE 2.2. Interaction Effects of CEO Gender and Analysts' Adverse Ratings on R&D Expenditures

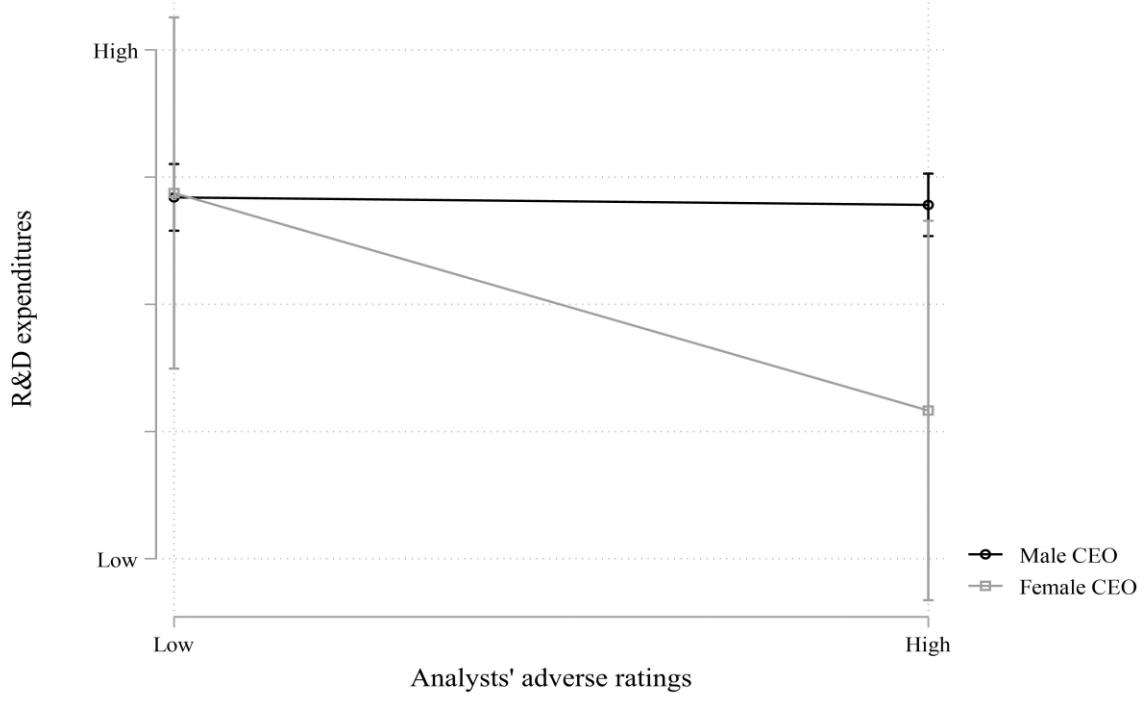


FIGURE 2.3. Interaction Effects of CEO Gender and Analysts' Adverse Ratings on Innovation Impact

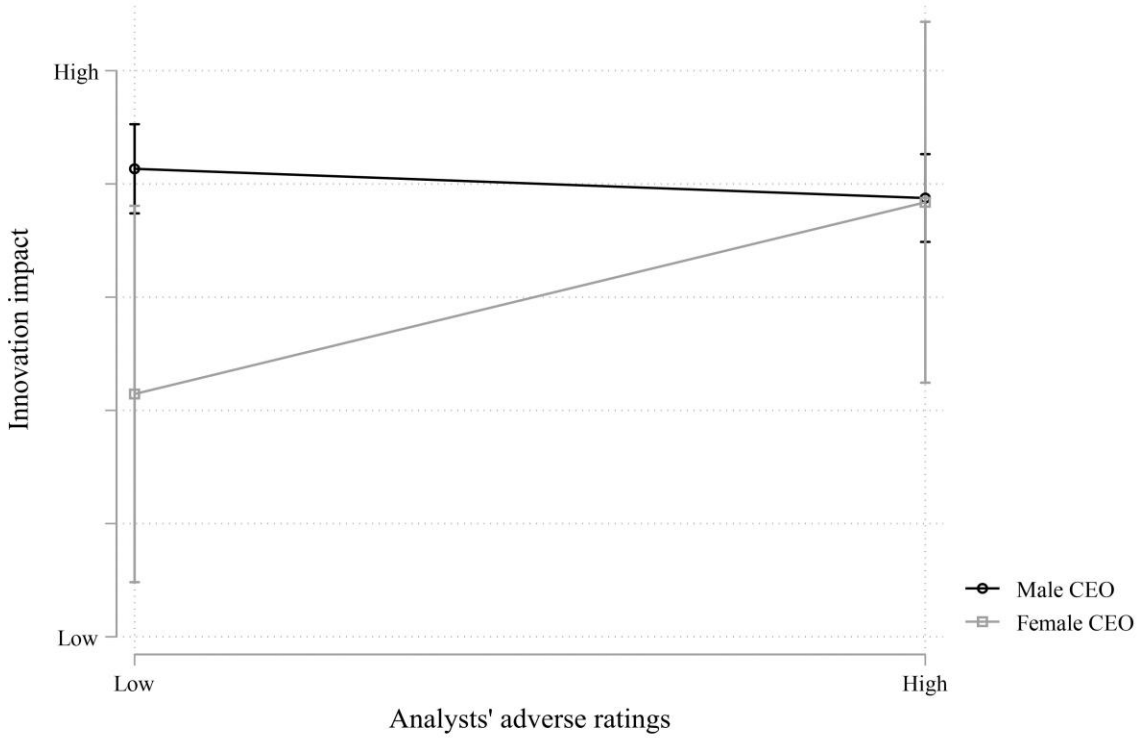


TABLE 2.4. GEE Results of R&D Expenditures on Innovation Outputs Considering the Role of CEO Gender and Industry Factors

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
	Number of patents	Exploitative innovation	Innovation impact	Number of patents	Exploitative innovation	Innovation impact	Number of patents	Exploitative innovation	Innovation impact
Stock options	.007* (.003)	.012** (.004)	.006 (.004)	.007* (.003)	.012*** (.004)	.006 (.004)	.004 (.003)	.009* (.004)	.004 (.004)
Analysts' adverse ratings	.010* (.004)	-.009† (.005)	.000 (.006)	.010* (.004)	-.009† (.005)	-.001 (.006)	.009* (.004)	-.010† (.005)	-.001 (.006)
Media stakeholder focus	.004 (.002)	.004 (.003)	.005 (.003)	.004 (.002)	.003 (.003)	.005 (.003)	.004 (.002)	.003 (.003)	.006† (.003)
Positive emotion	-.002 (.004)	-.008 (.005)	-.009† (.005)	-.002 (.004)	-.007 (.005)	-.009† (.005)	.000 (.004)	-.006 (.005)	-.007 (.005)
Negative emotion	.001 (.003)	.002 (.003)	.005 (.004)	.001 (.003)	.002 (.003)	.005 (.004)	.000 (.002)	.001 (.003)	.004 (.003)
Yearly media volume	.012*** (.003)	.010** (.004)	.022*** (.004)	.013*** (.003)	.012** (.004)	.023*** (.004)	.011*** (.003)	.008* (.004)	.014*** (.004)
Firm size	.049*** (.007)	.053*** (.009)	.039*** (.009)	.048*** (.007)	.052*** (.009)	.038*** (.009)	.043*** (.007)	.046*** (.009)	.034*** (.009)
Firm performance	-.004 (.003)	-.003 (.003)	-.006† (.004)	-.004 (.003)	-.003 (.003)	-.006† (.004)	-.004 (.002)	-.003 (.003)	-.006† (.003)
Leverage	-.023*** (.004)	-.031*** (.005)	-.034*** (.006)	-.023*** (.004)	-.031*** (.005)	-.034*** (.006)	-.022*** (.004)	-.029*** (.005)	-.031*** (.006)

TABLE 2.4. (cont'd)

Tobin's Q	.007* (.003)	.009* (.004)	.018*** (.005)	.007* (.003)	.009* (.004)	.018*** (.005)	.006† (.003)	.007† (.004)	.017*** (.005)
Firm years	-.011* (.005)	-.026*** (.006)	-.026*** (.007)	-.010† (.005)	-.025*** (.006)	-.026*** (.007)	-.004 (.005)	-.018** (.006)	-.020** (.006)
Female TMT	.003 (.003)	.000 (.004)	-.001 (.005)	.004 (.003)	.000 (.004)	.000 (.005)	.002 (.003)	-.001 (.004)	.000 (.004)
TMT size	-.006* (.003)	-.003 (.003)	-.009* (.004)	-.006* (.003)	-.004 (.003)	-.010* (.004)	-.007** (.003)	-.005 (.003)	-.012*** (.004)
First-time CEO	-.004 (.007)	-.015† (.009)	-.002 (.010)	-.004 (.007)	-.015† (.009)	-.002 (.01)	-.008 (.007)	-.020* (.009)	-.006 (.010)
CEO age	.001 (.003)	.006 (.004)	.004 (.005)	.001 (.003)	.006 (.004)	.004 (.005)	.001 (.003)	.006 (.004)	.004 (.005)
CEO tenure	-.008* (.004)	.001 (.005)	.006 (.005)	-.008† (.004)	.001 (.005)	.006 (.005)	-.006 (.004)	.004 (.005)	.008 (.005)
CEO insider	.014* (.006)	-.004 (.008)	.011 (.009)	.013* (.006)	-.005 (.008)	.010 (.009)	.013* (.006)	-.005 (.008)	.010 (.009)
R&D expenditures	.063*** (.008)	.042*** (.010)	.074*** (.010)	.060*** (.008)	.039*** (.010)	.072*** (.010)	.099*** (.009)	.087*** (.011)	.101*** (.011)
CEO gender	.010 (.023)	.037 (.029)	.032 (.031)	-.003 (.023)	.026 (.029)	.021 (.031)	.007 (.023)	.040 (.029)	.024 (.030)
CEO gender X R&D expenditure				.036* (.014)	.034† (.018)	.037† (.020)	.002 (.022)	-.031 (.027)	-.018 (.028)
Industry complexity	.004 (.007)	.013 (.008)	.008 (.008)	.004 (.007)	.013 (.008)	.008 (.008)	.002 (.006)	.011 (.008)	.010 (.008)
R&D expenditure X Industry complexity							-.015† (.009)	-.025* (.011)	.021* (.010)
CEO gender X Industry Complexity							-.015 (.024)	-.062* (.03)	-.070* (.031)
CEO gender X R&D expenditure X Industry complexity							.053† (.029)	.093* (.036)	.017 (.037)
Industry munificence	.010*** (.002)	.004 (.003)	.011** (.003)	.010*** (.002)	.004 (.003)	.011** (.003)	.020*** (.002)	.016*** (.003)	.022*** (.003)
R&D expenditure X Industry munificence							.081*** (.005)	.099*** (.006)	.100*** (.007)
CEO gender X Industry munificence							.019 (.013)	.034* (.017)	.009 (.019)
CEO gender X R&D expenditure X Industry munificence							-.021 (.025)	-.030 (.031)	.001 (.035)
Industry dynamism	.003 (.003)	-.010** (.004)	-.002 (.004)	.003 (.003)	-.010** (.004)	-.002 (.004)	-.002 (.003)	-.015*** (.004)	-.001 (.004)
R&D expenditure X Industry dynamism							-.022*** (.006)	-.022** (.008)	.032*** (.008)
CEO gender X Industry dynamism							-.019 (.013)	-.025 (.017)	.000 (.019)

TABLE 2.4. (cont'd)

CEO gender X R&D expenditure X Industry dynamism							.011 (.017)	.004 (.021)	-.059* (.024)
Constant	.194*** (.012)	.214*** (.014)	.156*** (.013)	.194*** (.012)	.215*** (.014)	.156*** (.013)	.194*** (.012)	.215*** (.014)	.157*** (.013)
Wald-Chi Squared	274.77	165.50	269.32	283.44	170.17	274.70	584.38	445.32	564.26

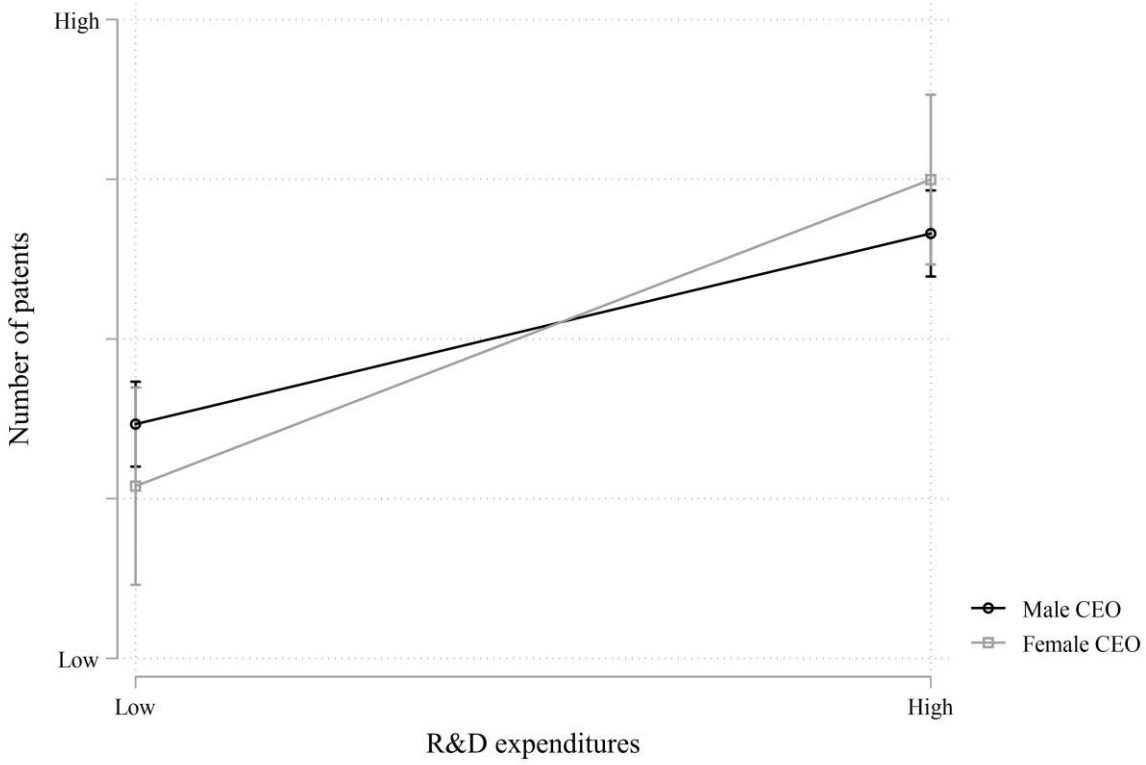
Notes: N=4,109; Standard errors are in parentheses
**** p<.001, ** p<.01, * p<.05, † p<0.1*

I further examined whether increased R&D expenditures lead to higher level of innovation outputs in Hypothesis 7. As shown in Table 2.4, greater R&D expenditures led to more patents (Model 1) and more impactful patents (Model 3), confirming Hypotheses 7a and 7c. However, I found the opposite for Hypothesis 7b. Greater R&D expenditures caused firms to focus more on innovations that relied on prior patents, indicating more (less) exploitative (explorative) innovation (Model 2).

Moreover, Hypothesis 8 predicted that female CEOs would be more adept at translating innovation input into outputs. Among the three hypotheses that examined the gender interaction effect toward innovation outputs, Hypothesis 8a was supported at p=0.010 and Hypothesis 8c were marginally supported (p=0.057) as predicted. To be specific, female CEOs were more effective at translating innovation input into greater number of patents (Model 4 in Table 2.4 and Figure 2.4) and patents of higher impact (Model 6 in Table 2.4). To elaborate more on the findings from testing Hypothesis 8c, female CEOs showed steeper positive slope (dy/dx=0.109) than male CEOs (dy/dx=0.072) toward innovation impact with greater R&D expenditures. Opposite to Hypothesis 8b, there was marginal support for female CEOs generating more (less) exploitative (explorative) innovation with R&D expense compared to male CEOs (p=0.053). The simple slope test examined that female CEOs showed greater positive incline towards exploitative innovation (dy/dx=0.074) than male CEOs (dy/dx=0.039) when their firms invested

more on R&D. In sum, female CEOs were found to leverage R&D expense toward generating greater number of patents and those of greater impact, but those that are less explorative or more exploitative.

FIGURE 2.4. Interaction Effects of R&D Expenditures and CEO Gender on the Number of Patents



Finally, I examined industry factors that may affect the extent to which female CEOs influence innovation productivity–the three-way interaction effects were tested in Hypotheses 9 through 11. Hypothesis 9 predicted that industry complexity would strengthen the positive effect female CEOs have on innovation productivity. For Hypothesis 9a, there was marginal support (p=0.068). Female CEOs were more likely to generate greater number of patents under high industry complexity. However, the focal industry factor did not moderate female CEOs' innovation productivity as hypothesized in Hypothesis 9b. I found that under low industry

complexity, female CEOs generated innovations that were more exploitative with limited R&D expenditures (Model 8 and Figure 2.5). However, they engendered more explorative innovation under high industry complexity when they had limited R&D investments to utilize. For hypotheses examining the role of industry munificence (Hypotheses 10a through 10c), I did not find any support. Lastly, I examined female CEOs' innovation productivity under a dynamic industry environment in Hypotheses 11. As predicted, I found support for its influence on innovation impact, confirming Hypothesis 11c. Female-led firms showed poor innovation productivity in terms of innovation impact with R&D expenditures under high industry dynamism (Model 9 and Figure 2.6). However, within female CEOs, the level of dynamism did not influence their innovation productivity in terms of the degree to which the patent is impactful.

FIGURE 2.5. Three-way Interaction Effects of R&D Expenditures, CEO Gender, and Industry Complexity on Exploitative Innovation

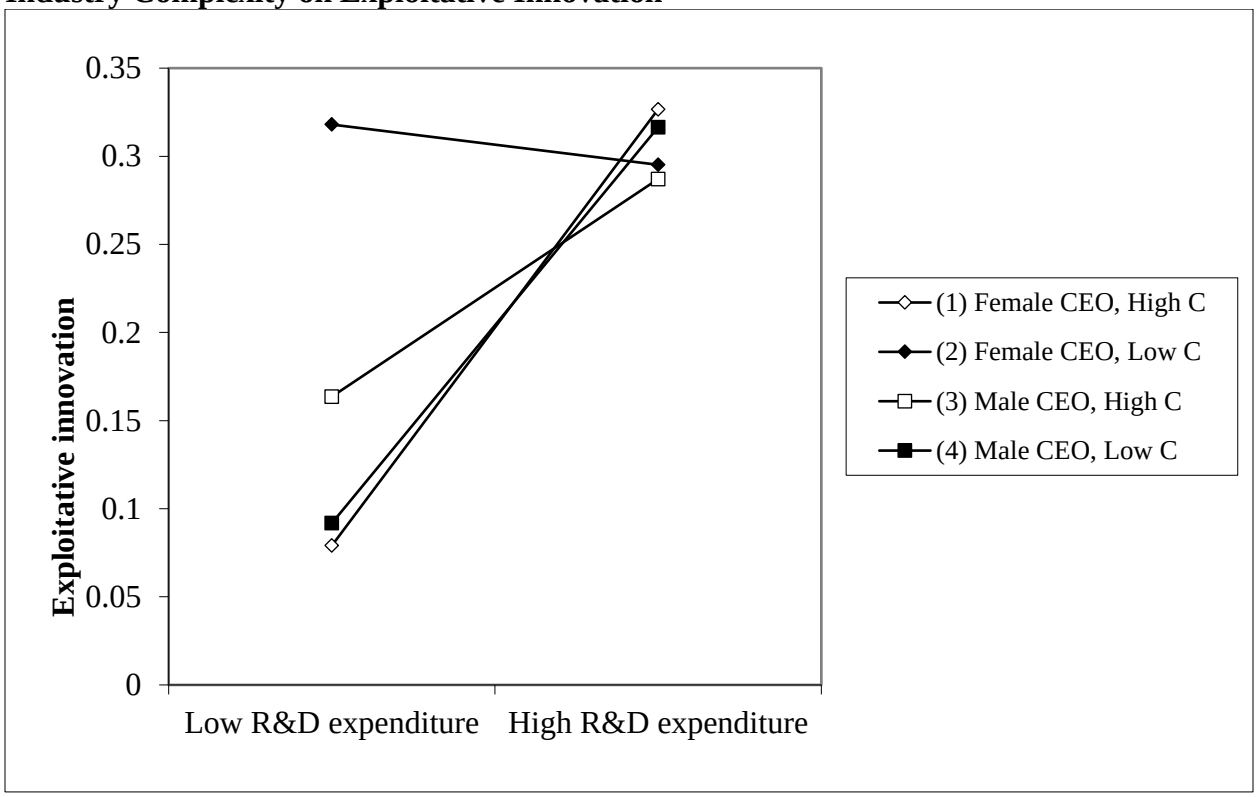
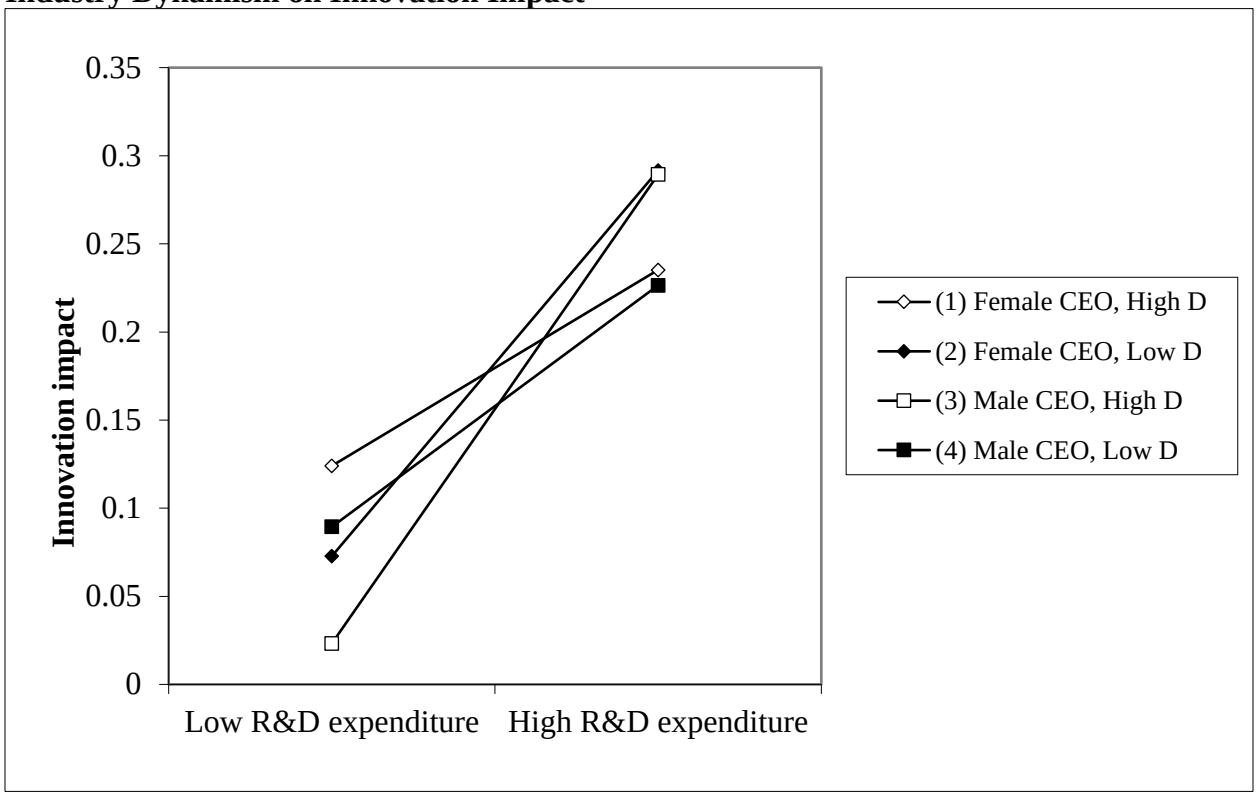


FIGURE 2.6. Three-way Interaction Effects of R&D Expenditures, CEO Gender, and Industry Dynamism on Innovation Impact



Additionally, a structural equation modeling (SEM) analysis with a bootstrapping procedure with 5,000 iterations was performed with STATA. This bootstrapping approach randomly samples "5,000 bootstrapped cases from the original data to derive a bias-corrected and accelerated 95% confidence interval (CI) that reflects the mediation effect" (Owens & Hekman, 2016: 1096). This allows an examination of a moderated mediation effect where CEO gender is the independent variable, innovation outputs (number of patents, backward citations, forward citations) are dependent variables. The control variables are equivalent to the ones included in the GEE models, except for prior R&D expenditure. Instead, I have changes in R&D expenditure as a mediator. This analysis examined how the CEO gender effect on innovation is explained through R&D expenditures.

However, the SEM path analysis results in Table 2.5 show that the indirect effect of CEO gender on innovation outputs through R&D expenditures was not significant, including zero within the 95% confidence intervals, for both the main gender effect and the interaction effects of gender and stock options, analysts' adverse ratings, and media stakeholder focus on innovation outputs.

TABLE 2.5. Indirect Effects of CEO Gender on Innovation Input and Outputs Through R&D Expenditures

Mediator	IV	DV	Moderators	Estimate	Bootstrap *SE*	95% CI Bootstrap lower limit	95% CI Bootstrap upper limit
R&D expenditures	CEO gender	Number of patents	.	0.000	0.001	-0.002	0.003
		Exploitative innovation	.	0.001	0.002	-0.003	0.004
		Innovation impact	.	0.001	0.002	-0.003	0.004
		Number of patents	Stock options	0.000	0.000	-0.000	0.000
			Analysts' adverse ratings	0.018	0.033	-0.046	0.082
			Media stakeholder focus	-0.006	0.048	-0.101	0.088
		Exploitative innovation	Stock options	-0.000	0.000	-0.000	0.000
			Analysts' adverse ratings	0.001	0.003	-0.005	0.007
			Media stakeholder focus	0.004	0.006	-0.008	0.016
		Innovation impact	Stock options	-0.000	0.000	-0.000	0.000
			Analysts' adverse ratings	0.001	0.003	-0.005	0.007
			Media stakeholder focus	0.004	0.006	-0.008	0.016

DISCUSSION

This study investigated mechanisms by which CEO gender impacts a firm's innovation activities. I argued that the prevalent gender bias would lead female CEOs to be more responsive to bottom-up factors, incurring greater changes in innovation. Additionally, I expected female CEOs to be more adept at translating innovation resources into outputs than male CEOs. Furthermore, I hypothesized that female CEOs' innovation productivity would be contingent upon industry factors.

In this study, female CEOs were more responsive to evaluative groups than male CEOs. However, their greater responsiveness was only shown through their impact on innovation input, the R&D expenditures. As hypothesized, female CEOs were able to translate R&D expenditures to a greater number of patents and higher level of innovation impact. However, greater expense on R&D was converted into more exploitative, less explorative, innovations by female CEOs. This could be explained by female CEOs' baseline behaviors as they tend to refrain from engaging in risky actions (Brenner, 2015; Glass & Cook, 2018; Huang & Kisgen, 2013). Thus, it is probable that they may engage in more of those innovations that entail less risk when endowed with resources to pursue innovation. Moreover, I found that female CEOs were less likely to translate innovation resources into high-impact innovations in dynamic industry environments.

First of all, I contribute to the ABV literature by pointing out that individuals differ in their level of responsiveness to bottom-up factors. Due to the prevalent gender bias and role incongruity issues, women are often not perceived as legitimate for leadership roles. Through my research, I have argued that female CEOs would pay greater attention to their evaluators and be more responsive due to their perceived legitimacy deficiency for their positions. As predicted, I found that female CEOs were more likely to be responsive to their evaluators and incur greater behavioral changes. As such, when examining how individuals' attentional structure is impacted, it is crucial to consider each individuals' different degrees of responsiveness to bottom-up factors. While I focused on gender bias and stereotypes that led female leaders to be more attentive, future research may delve into other executive attributes or prior experiences of executives that would induce each executive to pay more attention to their surrounding environment.

In addition, I found that executives tend to be more responsive when bottom-up factors point to issues outside their baseline attentional structure. In this study, female CEOs demonstrated greater responsiveness to stock options and analysts, but not towards media articles that leverage diverse stakeholder topics. Although female CEOs tend to exhibit greater interest in stakeholders in general, the media stakeholder focus did not affect female CEOs' attentional fields. However, stock options and analysts' guidance, which tend to misalign with female CEOs' baseline attentional structure, were impactful in changing the attentional focus of female CEOs. As innovation is a pivotal strategic action for a firm's viability that helps firms accumulate competitive advantages (An et al., 2021; Barker III & Mueller, 2002; Hall et al., 2005), executives may be greatly pressured to comprehensively gauge their surroundings that would induce them to attend to areas that would have otherwise been overlooked.

Finally, this study has practical implications from a corporate governance perspective. Governance scholars have overlooked how executives respond differently to incentives. For example, the boardroom offers stock options to executives to encourage them to behave in the interest of shareholders. However, this study finds that executives respond to incentives differently. Depending on the focal strategic action, I argue that executives may respond acutely or remain insensitive to the incentive. In order to better allocate incentives, I posit that the governing institutions should motivate executives, considering their baseline attentional structure and whether the incentives have elements within or beyond the structure. If the firm is pursuing a focal strategic action directly related to its vitality, executives would be more responsive to factors in their blind spots. Considering these aspects would help the governing institutions understand whether the incentives would effectively guide the executives in the direction originally intended, with effective incentive allocation across diverse members.

INTEGRATED DISCUSSION

Across the two studies in my dissertation, I investigated the responsiveness of female CEOs to bottom-up attentional factors and their impact on two strategic outcomes – CSR and innovation. I hypothesized that female CEOs would be more responsive to evaluators' guidance, resulting in greater variations in strategic outcomes in female-led firms than male-led firms. Specifically, I focused on how evaluators would affect CEOs' risk propensity, temporal orientation, and stakeholder orientation, which tend to be gender-specific and associated with CSR and innovation. I asserted that examining these theoretical arguments would more effectively explain gender's effect on CSR and innovation.

As hypothesized, I found that female CEOs showed higher responsiveness to bottom-up factors than male CEOs. However, they were responsive to different factors across CSR and innovation. In the CSR chapter, female CEOs showed higher sensitivity to media stakeholder focus. On the other hand, the innovation chapter demonstrated female CEOs' higher responsiveness toward stock options and analysts' adverse ratings.

These findings suggest that executives may respond differently according to the context they are situated in. The most salient difference between CSR and innovation seems to be whether the action is tightly related to the firm's financial performance. Previous findings have demonstrated inconsistent results in the relationship between CSR and financial performance, finding positive, negative, and nonsignificant results (Ghanbarpour & Gustafsson, 2022; Wang, Dou, & Jia, 2016). In contrast, research on innovation has consistently confirmed that a firm's innovativeness positively influences its financial performance (Ghanbarpour & Gustafsson, 2022; Leung & Sharma, 2021, Rubera & Kirca, 2012, Simeth & Cincera, 2016; Sood & Tellis, 2009). In the CSR study, I found that female CEOs largely responded to media's stakeholder

focus, which tends to be in their baseline attentional field. However, they were generally responsive to factors outside their baseline attentional structure – stock options and analysts' ratings – in the context of innovation. These findings imply that executives respond to bottom-up factors in their blind spots when the strategic action being pursued has high potential to enhance the firm's financial performance. However, executives tend to pay greater attention to factors that reside in their baseline attentional field and overlook factors outside the field when the strategic action has a weaker chance of impacting firm's financial wealth.

Thus, I theorize that the malleability of executives' baseline attentional structure is based on two factors: (1) how tightly related the strategic action is to the firm's financial performance and (2) where the bottom-up factor resides – within or outside one's baseline attentional structure. When the action (1) highly guarantees a firm's financial growth, executives are likely to attend to (2) factors that they have been overlooking. Executives would be vigilant of their surroundings, which would enable them to attend to factors that they would have otherwise missed. However, when (1) a strategic action has a lower probability of bringing the firm financial benefits, executives are likely to solidify their baseline attentional structure by responding to (2) factors that they have been previously attending to.

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