

Marquette University

e-Publications@Marquette

Management Faculty Research and
Publications

Management, Department of

4-2021

The Role of Female Directors in the Boardroom: Examining Their Impact on Competitive Dynamics

Kalin Kolev

Marquette University, kalin.kolev@marquette.edu

Margaret Hughes-Morgan

Marquette University, margaret.hughes-morgan@marquette.edu

Kathleen Rehbein

Marquette University, kathleen.rehbein@marquette.edu

Follow this and additional works at: https://epublications.marquette.edu/mgmt_fac



Part of the [Business Commons](#)

Recommended Citation

Kolev, Kalin; Hughes-Morgan, Margaret; and Rehbein, Kathleen, "The Role of Female Directors in the Boardroom: Examining Their Impact on Competitive Dynamics" (2021). *Management Faculty Research and Publications*. 361.

https://epublications.marquette.edu/mgmt_fac/361

Marquette University

e-Publications@Marquette

Management Faculty Research and Publications/College of Business Administration

This paper is NOT THE PUBLISHED VERSION.

Access the published version via the link in the citation below.

Business & Society, Vol. 60, No. 4 (April 1, 2021): 811-843. [DOI](#). This article is © SAGE Publications and permission has been granted for this version to appear in [e-Publications@Marquette](#). SAGE Publications does not grant permission for this article to be further copied/distributed or hosted elsewhere without express permission from SAGE Publications.

Role of Female Directors in the Boardroom: Examining Their Impact on Competitive Dynamics

Kalin D. Kolev

College of Business Administration, Marquette University, Milwaukee, WI

Margaret Hughes-Morgan

College of Business Administration, Marquette University, Milwaukee, WI

Kathleen Rehbein

College of Business Administration, Marquette University, Milwaukee, WI

Abstract

This study contributes simultaneously to research on women board members and competitive dynamics by investigating two unresolved research questions: What is the effect of female directors on the firm's competitive repertoire? Under what conditions is this effect more pronounced? Leveraging the "Awareness-Motivation-Capability" (AMC) framework, we predict that having women on the board of directors should impact the complexity, heterogeneity, and volume of the firm's competitive moves. Relying upon a sample of U.S. pharmaceutical firms for the years 2000 to 2017, we find that adding

female directors on the board positively affects the complexity and volume of a firm's competitive moves, but negatively impacts the heterogeneity of competitive actions. In addition, the presence of a female CEO moderates these effects, leading to more complex competitive actions and increased volume. Thus, our study lends a greater understanding of how female board members influence competitive dynamics and shape the strategic direction of the firm.

Keywords

CEO gender, competitive dynamics, female directors

Female board members accounted for 40% of new board appointees in S&P 500 firms during 2018 but the overall percentage of female board members remains relatively low, reaching only 24% in 2018 of total board seats (SpencerStuart, 2018). As a result, a myriad of constituencies—advocacy groups, institutional investors, and governmental officials—have intensified their efforts to increase gender diversity in the boardroom (Cook & Glass, 2014). Shareholder activists, such as large institutional investors State Street Global Advisors, New York Pension Funds, and BlackRock, have made it a priority to increase the number of women on corporate boards by filing shareholder resolutions, engaging in letter writing campaigns, joining global campaigns, and exercising their voting rights against members of underrepresented boards (Grosvold, 2011; Marquardt & Wiedman, 2016; Ross-Sorkin, 2018). There is evidence that these strong actions are leading to more disclosure and transparency about board members in terms of gender and ethnicity, and an increase in the number of female and minority directors (de la Merced, 2018).

In addition to this growing societal pressure on corporations, an increasing number of practitioners and scholars continue to investigate the business case for female representation on corporate boards (Galbreath, 2018; Hoobler, Masterson, Nkomo, & Michel, 2016; Post & Byron, 2015). Strong arguments have been made about the strategic benefits of having more female board members, who through their unique experiences, knowledge, and backgrounds, may improve board decision making (Geletkanycz, Clark, & Gabaldon, 2018). However, attempts to quantify these benefits by examining a firm's financial performance have produced mixed and inconclusive results, with some studies reporting a positive relationship between female directors and firm financial performance (Campbell & Minguez-Vera, 2010; Cook & Glass, 2014; Galbreath, 2018; Hoobler et al., 2016; Post & Byron, 2015), other studies demonstrating a negative relationship (Ahern & Dittmar, 2012; Bøhren & Strøm, 2010; Darmadi, 2011; Mínguez-Vera & Martin, 2011), and yet others showing no impact (Carter, D'Souza, Simkins, & Simpson, 2010; Rose, 2007; Shrader, Blackburn, & Iles, 1997).

These conflicting results have prompted scholars to shift the focus from analyzing the direct relationship between female directors and performance to identifying the specific actions through which female board members affect firm outcomes (Andrevski, Richard, Shaw, & Ferrier, 2014; Galbreath, 2018; Hoobler et al., 2016; Miller & Triana, 2009). In particular, Cook and Glass (2014) argue that a better understanding is needed about the entire range of effects that female board members may have on corporate policies and procedures.

We address this challenge by analyzing how female directors affect the competitive strategy and behavior of firms. An increasing number of studies demonstrate the key role that boards play in strategic decision making, in strategy initiation (Haunschild, 1993), and in strategy development (Cook

& Glass, 2014; Haynes & Hillman, 2010; Hillman, Shropshire, & Cannella, 2007; Johnson, Daily, & Ellstrand, 1996; Triana, Miller, & Trzebiatowski, 2013). However, there has been little focus on how corporate boards, and more specifically female board members, shape a firm's "competitive repertoire" which encompasses the pattern of competitive actions carried out in a given time period (Ferrier, Smith, & Grimm, 1999). Analyzing competitive actions provides an opportunity to examine how female board members influence the observable and longitudinal strategic actions that firms undertake (Chen & Miller, 2012).

Our study makes three research contributions. First, we integrate two research streams—female board representation and competitive dynamics (CD)—to address how female directors influence the firm's pattern of competitive actions. We extend recent research on the strategic implications of women in the boardroom (Chen, Crossland, & Huang, 2016; Triana et al., 2013) by analyzing how female board representation affects three critical dimensions of the firm's competitive repertoire: competitive complexity (the range of actions the firm engages in), competitive heterogeneity (the difference in actions compared with industry competitors), and competitive volume (the number of actions; Andrevski et al., 2014; M. J. Chen & Miller, 1994; Chen, Su, & Tsai, 2007; Ferrier, 2001; Ferrier et al., 1999; Hughes-Morgan & Ferrier, 2014; Miller & Chen, 1996a, 1996b). Focusing on these dimensions of the competitive repertoire, we shed more light on the general debate whether female directors facilitate strategic actions by generating more ideas, viewpoints, and a more thorough analysis of strategic alternatives (Miller & Triana, 2009) or hinder strategic decision-making processes by generating interpersonal conflict and reducing board cooperation (Chen et al., 2016; Triana et al., 2013).

Second, we contribute to CD research by identifying underexplored drivers of competitive actions. Although past research has examined various firm and managerial antecedents of competitive actions, it has overlooked the role of board gender composition on these actions. Thus, our study responds to calls for investigation of how gender within the board of directors influences the competitive repertoire of firms (Hughes-Morgan, Kolev, & McNamara, 2018). Employing the "Awareness-Motivation-Capability (AMC)" model that has been widely used in CD analysis (Chen et al., 2007; Hughes-Morgan et al., 2018; Uhlenbruck, Hughes-Morgan, Hitt, Ferrier, & Brymer, 2017), we examine how female board members influence (a) the board's awareness of competitive actions, (b) the board's motivation to engage in competitive actions, and (c) the board's capability to drive competitive actions. The AMC model has been a linchpin for understanding how the perceptions, opinions, and capabilities of corporate leaders shape competitive patterns of actions (Chen & Miller, 2012). The model has been useful for differentiating and predicting why two firms facing exactly the same market conditions may evaluate those conditions and compete very differently (Chen, 1996; Chen et al., 2007). Although previous scholars have applied the AMC framework to understanding the general characteristics of firms and their competitive posture, we expand its application to board-level characteristics.

A final contribution of our study is to shed more light on the importance of context when exploring the role of female directors. Specifically, we focus on how the presence of a female CEO moderates the relationship between female board representation and competitive actions. Female CEOs have been found to possess specific traits, "courage, risk taking, resilience, and the ability to manage ambiguity," that contribute to their success in facing market and competitive demands (Stevenson & Orr, 2017).

Recent empirical evidence confirms that firms with female CEOs may improve firm decision-making processes due to superior leadership qualities stemming from better communication and listening skills (Peni, 2014). In addition, having female CEOs is associated with an increase in the number of female directors and may also lead to a more supportive environment in which female board members are encouraged to apply their skills and resources (Bernardi, Bosco, & Vassill, 2006; Hoobler et al., 2016). Consistent with those arguments, we posit that a female CEO will enhance the ability of female directors to contribute to the development of various patterns of competitive actions.

Theoretical Background and Hypotheses

Employing the AMC Framework

The AMC model has been the prevalent framework for enriching understanding about CD in general as well as the three widely used dimensions of competitive actions—complexity, heterogeneity, and volume (Chen & Miller, 1994, 2012; Chen et al., 2007; Hughes-Morgan et al., 2018; Uhlenbruck et al., 2017). Given calls to analyze how micro factors, especially corporate governance characteristics, drive competitive actions (Chen & Miller, 2012), we view the AMC model as an appropriate theoretical framework for examining how female board members affect the competitive repertoire of the firm. Moreover, the AMC model provides a broad theoretical hook for linking the conceptual arguments on the role and function of female directors (see, for review, Hoobler et al., 2016; Post & Byron, 2015) with their potential to shape CD.

The awareness component of the AMC framework allows us to theorize whether female board members are more cognizant of the firm's surrounding industry and the characteristics of the external environment (Haleblian, McNamara, Kolev, & Dykes, 2012; Smith, Ferrier, & Ndofor, 2001) than their male counterparts. Prior research drawing from resource dependency theory and upper echelon theory has extensively linked female directors with enhanced awareness about possible strategic options (Hillman, Cannella, & Harris, 2002; Hillman et al., 2007; Post & Byron, 2015). For example, Parola, Ellis, and Golden (2015) examine how female executives facilitate the identification and selection of potential target firms during the pre-acquisition stage. If female directors possess different cognitive frames, education, skills, experiences, and social ties, then their inclusion on corporate boards may facilitate the identification of additional/disparate potential threats and opportunities facing the firm (Hillman et al., 2002, 2007; Post, Rahman, & Rubow, 2011). As a result, a greater number of women in the boardroom should enhance the overall board's awareness about possible competitive actions.

The second component of the framework, motivation, generally refers to the willingness to pursue various activities based on their perceived gains and losses (Haleblian et al., 2012; Smith et al., 2001). Thus, we examine whether female board members affect the board's willingness to engage in various competitive actions. Research based on agency theory finds that female directors are more diligent monitors (Adams & Ferreira, 2009) and, as a result, may be more likely to avoid decisions that create legal, ethical, and/or reputational risks (Cumming, Leung, & Rui, 2015; Post & Byron, 2015). Prior research also suggests that women are more risk averse than men, which may lead to greater willingness to avoid decisions that are inherently more uncertain (Cumming et al., 2015; Jeong & Harrison, 2017). Another factor impacting the board's motivation to pursue more uncertain outcomes

is associated with the consensus of the board when it faces challenging decisions. Research utilizing social identity theory suggests that adding female directors could generate interpersonal conflict in the boardroom and hinder directors' willingness to collaborate (Chen et al., 2016), decreasing the overall motivation of the board to take strategic actions.

The last component, capability, focuses on the ability to make strategic decisions, deploy resources, and take actions (Haleblian et al., 2012; Smith et al., 2001). In the context of corporate boards, this component of the AMC suggests that female board members may affect the decision-making processes in the boardroom. On one hand, previous research suggests that the unique education, experiences, and skills of female board directors could facilitate the sharing and discussion of diverse ideas and alternatives (Hillman et al., 2002; Hillman & Dalziel, 2003), which may enhance the board's problem-identifying and problem-solving capabilities. For example, female board members may use their unique networks to access external resources and help in developing strategies for the firm (Andrevski et al., 2014). On the other hand, scholars provide evidence that female directors' different experiences and perspectives could hinder the board's ability to reach consensus and agree on a common course of action. This results in the implementation of fewer strategic actions (Chen et al., 2016).

In summary, using the AMC model makes it possible to discuss the effects that female board members may have on competitive actions. Female board members with different career trajectories, functional backgrounds, more education, and an exposure to a broader range of stakeholders than their male counterparts should provide the board with greater awareness about competitive opportunities (Cook & Glass, 2014). In terms of motivation, we expect that adding women to the board may lead to more diligent monitoring and more risk aversion reducing the board's willingness to pursue various competitive actions (Chen et al., 2016). Finally, previous research indicates that female directors could have a mixed effect on the capability of the board to implement competitive actions—although they could enhance the board's problem-solving capabilities (Hambrick, Cho, & Chen, 1996) and facilitate a collaborative effort toward the implementation of a common course of action (Post & Byron, 2015), women may generate more interpersonal conflict (Chen et al., 2016; Triana et al., 2013) and encumber the board's ability to implement firm strategies (Ancona & Caldwell, 1992).

Strategy as Action—CD

Based on the notion within Austrian economics that views competition as a process in which firms continually strive to outcompete each other (Jacobson, 1992; Kirzner, 1973), the competitive dynamic framework has garnered widespread attention not only in the field of strategic management, but also in entrepreneurship, marketing, sociology, and interorganizational networks (Hutzschenreuter & Horstkotte, 2013; Ketchen, Snow, & Hoover, 2004; Smith et al., 2001). At its core, CD views a firm's strategy as observed competitive action (Grimm, Lee, & Smith, 2006; Smith, Grimm, & Gannon, 1992) and scholars in this area explore how individual competitive actions stimulate competitive responses (Chen & Miller, 1994; Chen, Smith, & Grimm, 1992), and how characteristics of the firm's entire repertoire of competitive actions influence firm performance (Ferrier et al., 1999; Miller & Chen, 1996a, 1996b).

A central idea in CD research relates to the conceptualization and measurement of the aggressiveness with which a firm carries this repertoire of competitive actions or responses. CD scholars have

traditionally examined three key dimensions of the firm's competitive repertoire: competitive complexity, heterogeneity, and volume. These dimensions differ with respect to the cost and risk involved with their implementation. First, competitive complexity encompasses a broad range of competitive actions, such as price cuts, product improvements, advertising campaigns, new products introductions, and acquisitions (Chang & Park, 2012; Connelly, Tihanyi, Ketchen, Carnes, & Ferrier, 2016; Ferrier, 2001; Hughes-Morgan & Ferrier, 2014; Uhlenbruck et al., 2017; Young, Smith, & Grimm, 1996). As these complex competitive actions require the mobilization of sizable resources and cognitive efforts, they are inherently more costly and carry greater levels of risk than patterns of competitive actions that are narrowly focused and more simple in nature (Miller & Chen, 1994). Second, competitive heterogeneity relates to actions that differ from the actions of industry competitors (Basdeo, Smith, Grimm, Rindova, & Derfus, 2006; Ferrier et al., 1999; Miller & Chen, 1996a). As these actions are unproven in the industry and associated with uncertain performance outcomes, heterogeneous actions carry greater levels of risk than patterns of competitive actions that are proven in the industry (Miller & Chen, 1996b). Third, competitive volume reflects the number of actions carried out and is generally considered not only the least risky dimension of a firm's competitive repertoire, but also the easiest for competitors to replicate (Hughes-Morgan, Ferrier, & Labianca, 2010).

Recently, research has begun to explore the governance and cognitive drivers of competitive action. For example, Connelly et al. (2016) examine how ownership structure and executive compensation drive competitive complexity and Andrevski et al. (2014) study how top management team racial diversity affects competitive intensity. Livengood and Reger (2010) develop the concept of an "identity domain"—defined as the areas of the competitive market that are psychologically important to managers—to explain why firms might compete more aggressively than usual. Marcel, Barr, and Duhaime (2011) explore how different managerial cognitive schemes influence the likelihood and speed with which a firm carries out retaliatory actions against rivals. Following this line of research, we examine how female directors, by affecting the awareness, motivation, and capability of the entire board, influence the complexity, heterogeneity, and volume of the firm's competitive repertoire.

Hypotheses

Female Directors and Competitive Complexity

Drawing on prior research, we believe that a greater number of female directors will enhance the awareness of the board and facilitate the execution of more complex competitive actions. The addition of women to a traditionally male-dominated boardroom should position the board to more fully understand the firm's surrounding environment and various stakeholders (Post & Byron, 2015). Due to the potentially different professional, nonprofessional, educational experiences and cognitive frames that female board members bring to the boardroom, female board members may increase the board's awareness about pending strategic issues and challenges (Peterson & Nemeth, 1996; Post & Byron, 2015). In addition, female directors may be linked to different networks of managers and firms, and this could enhance the board's understanding of the complexities and heterogeneity in a firm's external environment (Hillman et al., 2002, 2007). Combining the different interlocked networks of female directors with those of male directors may enable a corporate board to have a more comprehensive and diverse perspective about potential threats and opportunities facing the firm

(Cook & Glass, 2014). In contrast, if the board consists only of men, it is likely to have a more limited view on the firm's environment and be much less aware of the various external cues surrounding the firm.

In terms of motivation, we expect that corporate boards with more female directors will weaken the overall board's motivation to undertake complex competitive actions. Such actions are associated with greater uncertainty and risk because they are more difficult to execute and have a relatively higher probability of failure than pursuing a simpler competitive repertoire (Connelly et al., 2016; Ferrier et al., 1999; Hughes-Morgan & Ferrier, 2014). For a firm to engage in more complex actions, consensus is needed among the directors to pursue such actions. However, prior research provides evidence that women compared with men are generally less open to and willing to engage in risky strategies (Adams & Ferreira, 2009; Barber & Odean, 2001; Byrnes, Miller, & Schafer, 1999; Powell & Ansic, 1997; Sunden & Surette, 1998). As a result, the overall motivation of the board to pursue these types of competitive actions is likely to decrease.

Finally, we posit that female directors may have a positive or negative effect on capability. On one hand, female directors may add unique experiences, different viewpoints, and diverse cognitive frames to the boardroom resulting in decreased groupthink. This could stimulate the sharing and discussion of a greater number of and more complex alternatives, enhance the board's problem-solving skills (Hambrick et al., 1996), and lead to the identification and eventual implementation of more complex competitive repertoires. In addition, women have been found to be more cooperative (Bart & McQueen, 2013; Post & Byron, 2015), which facilitates agreement on pursuing more complex competitive actions. On the other hand, questions remain about whether female board directors will be able to exercise their voice in the boardroom and facilitate extensive discussions about diverse ideas and alternatives (Hoobler et al., 2016). Several researchers (Hoobler et al., 2016; Joecks, Pull, & Vetter, 2013; Torchia, Calabrò, & Huse, 2011) have raised the issue of female board members being a token, which restricts their capability to contribute to board decision-making processes. Previous research has also suggested that more heterogeneous boards may lead to more conflict and slow the approval process concerning complex competitive actions (Chen et al., 2016; Triana et al., 2013). If these conditions persist, female directors may limit rather than enhance the capability of the board to engage in more complex competitive actions.

The above arguments indicate that female board members' effect on the awareness, motivation, and capability of the board to pursue complex competitive actions may follow two different paths. If female board members have a positive impact on awareness and capability, this may outweigh the weakened motivation of the board and lead to a positive association with competitive complexity. Conversely, if female board members exhibit a negative effect on motivation and capability, this may outweigh the enhanced awareness of the board and lead to a negative association with competitive complexity. As we are not aware of prior theorizing on whether a board's awareness or motivation, or capability has greater impact on its decisions, we could not make definite predictions on the sign of the relationship between female directors and competitive complexity. Subsequently, we present competing hypotheses regarding the role of female directors on competitive complexity.

- **Hypothesis 1a:** Female board representation is positively associated with competitive complexity.

- **Hypothesis 1b:** Female board representation is negatively associated with competitive complexity.

Female Directors and Competitive Heterogeneity

The theorizing on how female board members could affect the heterogeneity of competitive actions should parallel the arguments underlying the influence of female directors on the complexity of competitive patterns. In terms of awareness, the unique experiences, knowledge, and expertise of female board members (Hillman et al., 2002, 2007) may facilitate the identification of competitive actions that diverge from rival firms. Moreover, the possible exposure of female board members to a broader range of stakeholders should help a corporate board identify various alternatives to compete differently than their rivals (Post & Byron, 2015). As heterogeneous actions are the riskiest types of competitive activities due to their divergence from established industry norms (Crossland, Zyung, Hiller, & Hambrick, 2014; Haynes & Hillman, 2010), we expect female and male directors to differ in their motivation to undertake these actions. Given the likelihood that female board members may be more hesitant to undertake risky actions (Barber & Odean, 2001; Byrnes et al., 1999; Jeong & Harrison, 2017), it is less likely that female board members will encourage the board to pursue this type of competitive activity. Finally, with respect to capability, female board members may either enhance or hinder the board's capabilities to pursue heterogeneous actions. Female directors may contribute to discussions of diverse competitive actions and encourage more cooperation and collaboration (Bart & McQueen, 2013) to pursue these actions. However, their minority status in the boardroom could limit their voice and participation in discussions and ultimately reduce the board's capability to thoroughly examine and pursue heterogeneous actions. Thus, we present competing hypotheses analogous to those concerning competitive complexity.

- **Hypothesis 2a:** Female board representation is positively associated with competitive heterogeneity.
- **Hypothesis 2b:** Female board representation is negatively associated with competitive heterogeneity.

Female Directors and Competitive Volume

We posit that more women in the boardroom may enhance the awareness of the board through increased knowledge and cognitive frames (Finkelstein & Hambrick, 1996; Hillman et al., 2007; Post & Byron, 2015) resulting in a more comprehensive assessment and an increased responsiveness to a firm's external environment (Carpenter & Fredrickson, 2001; Jackson & Joshi, 2004). For example, Hillman et al. (2002) emphasize that a key benefit of adding women to the boardroom is an improved understanding of customers and various constituents of the firm. Post and Byron (2015) also note that women board members may have diverse experiences due to their knowledge about marketing and sales. These arguments suggest that female directors could enhance the board's awareness of the demands of the external environment and the necessity for executing a large volume of strategic actions, especially when the competitive environment requires more proactive undertakings.

Based on existing research, we surmise that female directors will encumber the board's overall motivation for implementing a large volume of actions. Female board members have been found to exercise their monitoring role more diligently than male board members (Adams & Ferreira, 2009) by

analyzing board decisions more thoroughly and comprehensively (Cumming et al., 2015; Miller & Triana, 2009; Post & Byron, 2015). Although this thoroughness may lead to better board decisions, it is likely to reduce the speed of board decision making and the overall volume of competitive actions. Prior research also finds that differences among group members, including gender, could undermine the willingness to interact (Chatman, Polzer, Barsade, & Neale, 1998; Chattopadhyay, George, & Lawrence, 2004; Hogg & Terry, 2000) and communicate (Smith et al., 1994). In particular, male directors (female directors) may exhibit bias toward female members (male members) and be hesitant to interact with them (Hogg, 2006; Hogg & Mullin, 1999; Pelled, 1996). This type of conflict leads to less cohesiveness and desire for cooperation among board members (Harrison, Price, Gavin, & Florey, 2002; Williams & O'Reilly, 1998). Ultimately, a board consisting of male and female members could exhibit lower motivation to agree on and pursue a larger volume of competitive actions (Baugh & Graen, 1997).

Finally, we propose that the effect of female directors on the board's capability to carry out a greater volume of competitive actions is mixed. The addition of women to the board could undermine its behavioral integration (Simsek, Veiga, Lubatkin, & Dino, 2005) and hinder its ability to implement firm strategies (Ancona & Caldwell, 1992). Stated differently, the presence of women in the boardroom might put strains on the capability of the whole board to execute more competitive actions. Conversely, prior research provides evidence that more diverse groups could encourage rather than undermine volume of actions. Hambrick and colleagues (1996) emphasize that a diverse group "has access to such wide-ranging stimuli and a broad potential repertoire that its ability to conceive and launch actions on many fronts should outweigh the dampening effects of internal strains" (p. 655). In addition, compared with men, women have been found to value interdependence and be less focused on power (Adams & Funk, 2012), allowing them to stimulate collaboration (Post & Byron, 2015). If this type of cooperative board culture emerges, then the presence of female directors may facilitate the execution of a greater volume of competitive actions. As a result, we propose the following competing hypotheses.

- **Hypothesis 3a:** Female board representation is positively associated with competitive volume.
- **Hypothesis 3b:** Female board representation is negatively associated with competitive volume.

The Moderating Role of CEO Gender

While the board of directors plays a key role in a firm's strategy, the board does not exist in a vacuum and regularly cooperates with the CEO in driving the firm's competitive repertoire. Furthermore, a CEO plays an important role in shaping the board's decision-making processes and collaborative decisions (Brown, Buchholtz, Butts, & Ward, 2016) and an important driver of these board interactions is the gender of the CEO (Oliver, Krause, Busenbark, & Kalm, 2018). Consequently, we hypothesize that a female CEO will moderate the relationship between female directors and the implementation of competitive actions by affecting the awareness, motivation, and capability of the board. In terms of awareness, female CEOs are likely to have experienced a much tougher and challenging career path to become the firm's leader than male CEOs (Hillman et al., 2002; Stern & Westphal, 2010). Through this process, female CEOs may gain valuable experiences and business acumen to identify the necessary responses to competitive challenges. Such strong alertness to external cues should complement the enriched awareness of the surrounding environment provided by female directors; as a result, the

combination of a female CEO and female directors could lead to stronger awareness of what competitive actions are necessary for the firm.

A female CEO is also expected to facilitate the motivation of the board to pursue competitive actions. A female CEO is likely to encourage a more supportive board culture where female directors are more easily accepted and where male and female directors are encouraged to collaborate in the boardroom (Nielsen & Huse, 2010). A board operating in this type of organizational climate should be less confrontational and exhibit more cohesiveness (Chatman et al., 1998). Ultimately, this could increase the motivation of the entire board to work collectively resulting in a greater volume, variety, and heterogeneity of competitive repertoires.

Finally, in her role at the top of the firm, a female CEO has likely been involved in complex and heterogeneous patterns of action and has gained enough knowledge of how to execute them. Previous academic research (Conyon, He, & Zhou, 2015; Eagly & Carli, 2003; Frye & Pham, 2018; Krishnan & Park, 2005) suggests that women possess more effective leadership styles and have better management skills. In addition, Nielsen and Huse (2010) contend that women leaders are better at strategic control tasks, which include managerial decisions regarding firm strategy as well as organization practices and policies (Frye & Pham, 2018). Consequently, female CEOs should be able to share their valuable expertise and insights about formulating strategy and encourage all of the board's directors, including female directors, to pursue a range of competitive actions. According to the homophily perspective (Glass & Cook, 2018), women's ability to take actions depends on the presence of other women in the organization. Having a female CEO could create a more trusting and supportive environment, which may enhance the capability of female board directors to pursue competitive actions. As a result, female directors (and ultimately the whole board) may be better positioned and more capable of handling greater volume and greater diversity of competitive actions.

- **Hypothesis 4:** CEO gender will moderate the relationship between female board representation and competitive complexity, such that the relationship will be more positive or be less negative with a female CEO.
- **Hypothesis 5:** CEO gender will moderate the relationship between female board representation and competitive heterogeneity, such that the relationship will be more positive or be less negative with a female CEO.
- **Hypothesis 6:** CEO gender will moderate the relationship between female board representation and competitive volume, such that the relationship will be more positive or be less negative with a female CEO.

Method

Sample

Our sample consists of an original hand-collected data set of publicly traded firms in the pharmaceutical industry from 2000 to 2017. This industry provides an ideal context for studying how female directors influence competitive actions directed at improving a company's position vis-à-vis other industry players (Uhlenbruck et al., 2017). First, there is substantial information available about the types of competitive actions that pharmaceutical companies undertake. Second, as development

processes are lengthy and market appraisals of pharmaceutical firms depend in large part upon estimates of eventual cash flows, companies widely announce competitive moves that are intended to boost future valuations (Cardinal, 2001). Third, the relatively higher level of female representation in the pharmaceutical industry serves to enhance the variability in our sample (Catalyst, 2015).¹ Data on firm characteristics came from Compustat, corporate board information was obtained from ISS (formerly RiskMetrics), and CEO characteristics were accessed through Execucomp. The final sample for testing the proposed hypotheses consists of an unbalanced panel of 358 firm-year observations (34 firms with about 11 annual observations per firm).

Measures

Dependent variables

Research in CD defines competitive actions as observable, specific, and externally directed moves aimed at outsmarting rivals to gain a superior competitive position (D’Aveni, 1994; Ferrier, 2001; Smith et al., 2001). Consistent with previous studies, we use structured content analysis (Jauch, Osborn, & Martin, 1980) to gather and categorize published reports about firms’ competitive actions. We searched Factiva, the Dow Jones–sponsored database of published news articles. Specifically, we identified articles announcing competitive actions by searching keywords chosen to discover various types of competitive actions. We modified the action type categories found in earlier research (Ferrier, 2001; Ferrier et al., 1999) to fit the competitive dimensions and characteristics of the pharmaceutical industry. Consequently, we selected these action categories: capacity, clinical trials, legal, licensing actions, marketing, new product introduction, overt signals, price, product improvement actions, and promotional activities. These 10 action categories serve as the building blocks for creating a pharmaceutical firm’s competitive repertoire for each year of our sample period. Table 1 provides action categories, search keywords, and specific firm examples.

Table 1. Action Categories, Coding Keywords, and Example Headlines.

Action category	Content analysis coding scheme	Examples of headlines
Pricing actions	Keywords: price, cut, discount, change	“Abbott Laboratories has lowered prices on about 50 of its drugs (mostly injectable anesthetics and intravenous products).”
Marketing actions	Keywords: advertise, commercial, television, campaign, spot	“Interneuron Pharmaceuticals announces alliance with American Cyanamid to market anti-obesity product”
Product actions	Keywords: introduce, launch, unveil, roll out, approve	“Merck introduces <i>Mevacor</i> , to reduce serum cholesterol”
Capacity actions	Keywords: raises, boosts, increase, expand	“Alpharma Reaches Agreement to Expand Vancomycin Capacity”
Legal actions	Keywords: sue, litigate, settle, infringement	“Allergan Sues Santen Pharmaceutical, Alleges Rights Infringement”
Signaling actions	Keywords: vows, promises, says, seeks, aims	“Elan restructuring aims to please market.”

Improvement actions	Keywords: improve, enhance, update, change	“Systematic Tooling Analysis Improves Warner-Lambert Product Transfer”
Promotion actions	Keywords: donate, contest, sponsor, promote	“Eli Lilly To Donate Drugs To Battle Tuberculosis Crisis In Russia”
Clinical trial actions	Keywords: phase, clinical, trial	“Bristol-Myers, Liposome Begin Phase II Testing Of ABLC Drug”

Note. Using Perreault and Leigh’s (1989) index of reliability, an index of 89% was attained for these action types.

To ensure coding reliability, two strategic management scholars independently categorized a randomly selected sample ($N = 300$) of news article headlines into the 10 categories, and then compared their respective coding. This approach produced a reliability index of .89, exceeding the conventionally acceptable level of .70 (Denzin & Lincoln, 2000).

Competitive complexity

To gauge the degree to which a company’s competitive repertoire includes a wide range of different competitive action types, we used a Herfindahl-type index that accounts for the weighted variety among 10 competitive action types (i.e., the number of competitive action categories used in a year and the extent of action concentration within each category). For example, if one competitive action category, say, product improvements, dominates the annual repertoire, it is deemed a simple repertoire. Alternatively, if an annual repertoire comprises various competitive actions in a balanced mix, that repertoire is more complex. Competitive complexity was computed as follows:

$$\text{Complexity} = 1 - \sum_a \left(\frac{N_a}{NT_L} \right)^2$$

where N_a/NT_L is the proportion of competitive actions in the a th action category carried out in a given year.

Therefore, a company with a low complexity score used only a few competitive action types, while a company with a high complexity score implemented a wide range of competitive action types.

Competitive heterogeneity

To assess the differences among firms’ competitive action repertoires, we compared Euclidean distance scores (Ferrier et al., 1999; Miller & Chen, 1996b). We first computed the annual frequency for each of the types of competitive actions carried out by each firm in a given year. We next calculated the Euclidean distance between each firm’s repertoire of competitive actions in the year relative to the industry average:

$$\text{Heterogeneity} = \sum_a \left(\frac{I_a}{I_T} - \frac{F_a}{F_T} \right)^2$$

where I_a = industry average of the frequency of competitive actions in the a th category,

I_T = industry total competitive actions,

F_a = frequency of firm’s competitive actions in the a th category, and

F_T = firm total competitive actions.

A low score suggests that the firm executes a mix of competitive actions very similar to those of other companies within the industry. A high score indicates that the firm executes competitive actions different from those of rivals.

Competitive volume

To measure the extent to which a firm's competitive repertoire consists of a greater or smaller total number of competitive actions (irrespective of the types of actions), we tallied the number of competitive actions carried out each year. This measure is consistent with prior research analyzing volume of competitive actions (Ferrier et al., 1999; Young et al., 1996). The dependent variables were measured in period t , while all independent and control variables were measured in period $t - 1$.

Independent Variables

Following previous research, we measure *female board representation* as the number of female board members divided by total board size (Abdullah, Ismail, & Nachum, 2014; Chen et al., 2016). About 78% of the firms in our sample had at least one female board member: 37% of the firms had one female director, 28% had two female directors, and 13% had three or four female members.

CEO gender

Following previous research, we used a dummy variable where 1 represents a female CEO and 0 indicates a male CEO (Lee & James, 2007).²

Controls

We incorporated an extensive number of control variables that have been shown to affect a firm's competitive actions. As larger firms are more likely to undertake greater number and variety of competitive actions, we controlled for *firm size* using the log of total assets (Audia & Greve, 2006). To measure *prior performance*, which may impact the ability to undertake new actions, we used return on assets (Andrevski et al., 2014). We accounted for the investment patterns of the firm that could affect its ability to carry out competitive actions by including *capital intensity* (capital expenses divided by sales; Crossland et al., 2014) and *R&D intensity* (research and development expenses divided by sales; Greve, 2003). As excess resources could encourage more competitive actions, we also controlled for *slack* (selling, general, and administrative expenses divided by sales; Iyer & Miller, 2008). As longer tenure has been linked to maintaining the status quo in the firm (Hambrick, Geletkanycz, & Fredrickson, 1993), we included *CEO tenure* measured as the number of years the CEO has occupied the position. At the board level, we controlled for variables that may affect directors' decision-making processes. In particular, we accounted for *board size* (Chen et al., 2016), *duality* (dummy variable where 1 indicates the CEO is also the chairman of the board and 0 otherwise; Boyd, 1995), *board independence* (ratio of directors who are classified as neither "inside" nor "related outside" to total board members; Chen et al., 2016; Dalton, Daily, Ellstrand, & Johnson, 1998; Triana et al., 2013), and *board racial diversity* (measured through the Blau index where directors belong to four categories: Asian, Black, Hispanic, and White; Miller & Triana, 2009). Finally, we included year dummy variables due to the fluctuating economic conditions during our sample period.

We estimated the variance inflation factors and none of them exceeded the conventional threshold of 10 (the mean value being 2.7), which further reduces concerns over multicollinearity (Cohen, Cohen, West, & Aiken, 2003). We handled extreme outliers in the data through winsorizing—R&D intensity

and slack were winsorized at the 99th percentile (Haleblian et al., 2012; Kolev, Wiseman, & Gomez-Mejia, 2014). In a robustness check, we obtained the same results without winsorizing.

Analysis and Results

As we have a data set where a firm engages in multiple competitive actions over time, it is important to account for the lack of independence among observations within a firm (Bliese, 2000). Consequently, we relied on generalized estimation equations (GEEs) with robust standard errors (Crossland et al., 2014; Quigley & Hambrick, 2012). The advantage of GEEs is that they offer maximum likelihood estimates, control for unobserved differences between firms, and account for nonindependence of multiple observations per firm (Hanley, Negassa, Edwardes, & Forrester, 2003). With GEE models, it is necessary to specify a distribution family, link function, and correlation structure for each regression. Competitive volume is a limited-count variable, so we used a negative binomial distribution, negative binomial link function, and independent correlation structure. Competitive complexity is a variable that takes nonnegative values, so we used a Poisson distribution, log link function, and independent correlation structure. Competitive heterogeneity also takes on nonnegative values and we relied on Poisson distribution, log link function, and exchangeable correlation structure. To choose the appropriate correlation structures, we applied the quasi-likelihood under the independence model criterion prescribed by Cui and Qian (2007).

While we are interested in the effect of female board representation on various competitive actions, female directors might not be appointed randomly to the board (Hillman et al., 2007). This creates a potential endogeneity problem, which we addressed with a Heckman two-stage model. In the first stage, we used a probit regression model to predict the probability of having a woman on the board. The dependent variable—female dummy—is a binary variable, measured as one when there was at least one female director and zero otherwise. This variable (measured in period $t - 1$) was regressed on several variables: firm size, prior performance, capital intensity, absorbed slack, CEO gender, board racial diversity, industry female directors (all those variables were measured in period $t - 2$), and year dummies. From that regression, we calculated an inverse Mills ratio that was used as a control variable in the regressions testing our hypotheses. Heckman two-stage models require the inclusion of at least one independent variable in the first-stage regression, which is not entered in the second-stage regressions (Sartori, 2003). In addition, this variable must be a valid exclusion restriction—it should be significantly correlated with the dependent variable in the first-stage regression (female dummy) but not correlated with the competitive action variables in the second-stage regression. In our case, industry female directors served as this variable. The inverse Mills ratio was not significantly related to our three dependent variables indicating that there were no serious endogeneity concerns. As its inclusion in the main regression models did not change our results, we decided to exclude it from the table for brevity.

Table 2 presents descriptive statistics and correlation coefficients for the variables in our models. Table 3 presents the GEE regression results for testing the proposed hypotheses.

Table 2. Means, Standard Deviations, and Correlations ($N = 358$).

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Complexity	0.44	0.33	1.00													
2. Heterogeneity	0.26	0.32	-.89	1.00												
3. Volume	4.02	3.04	.80	-.66	1.00											
4. Firm size	7.85	1.88	.50	-.47	.56	1.00										
5. Prior performance	0.07	0.12	.06	-.05	.09	.38	1.00									
6. Capital intensity	0.05	0.05	.16	-.14	.07	-.10	-.29	1.00								
7. R&D intensity	0.16	0.28	.03	.01	-.00	-.23	-.62	.50	1.00							
8. Slack	0.43	0.38	.02	.01	.01	-.28	-.56	.41	.90	1.00						
9. CEO gender	0.02	0.15	.02	-.01	-.05	-.07	.01	.13	.00	-.01	1.00					
10. CEO tenure	8.11	7.89	-.34	.32	-.28	-.40	-.16	-.09	-.06	.07	-.17	1.00				
11. Board size	9.28	2.36	.40	-.39	.44	.74	.27	-.03	-.18	-.23	.02	-.42	1.00			
12. Duality	0.58	0.49	.16	-.17	.19	.26	.04	.07	-.10	-.04	-.03	.20	.20	1.00		
13. Board independence	0.78	0.14	.22	-.19	.27	.44	.11	-.13	-.02	-.00	-.16	-.13	.34	.04	1.00	
14. Racial diversity	0.12	0.14	.30	-.32	.37	.49	.26	-.07	-.19	-.17	.05	-.37	.44	.19	.22	1.00
15. Female representation	0.14	0.10	.44	-.42	.45	.60	.19	-.07	-.11	-.20	.02	-.42	.51	.07	.43	.32

Note. Correlations larger in absolute value than .11 are significant at $p < .05$.

Table 3. GEEs Regressions of Female Representation on Competitive Actions ($N = 358$).

	Complexity			Heterogeneity			Volume		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Constant	-2.81*** (0.77)	-2.29*** (0.81)	-2.24*** (0.83)	0.16 (0.57)	-0.52 (0.64)	-0.51 (0.66)	-0.75*** (0.16)	-0.65*** (0.16)	-0.64*** (0.16)
Firm size	0.24*** (0.06)	0.21*** (0.06)	0.21*** (0.06)	-0.20** (0.08)	-0.17* (0.07)	-0.17* (0.08)	0.05*** (0.01)	0.04*** (0.01)	0.04*** (0.01)
Prior performance	-0.87† (0.52)	-0.95† (0.49)	-0.88† (0.50)	.10* (0.43)	11.21** (0.45)	1.21** (0.45)	-0.11 (0.11)	-0.15 (0.10)	-0.13 (0.10)
Capital intensity	2.99** (0.99)	2.85** (0.98)	3.03** (1.03)	-2.01* (0.95)	-2.00* (0.96)	-2.01* (0.95)	0.59** (0.20)	0.54** (0.18)	0.61*** (0.17)
R&D intensity	-0.55 (0.45)	-0.68 (0.43)	-0.67 (0.43)	0.83** (0.27)	1.02*** (0.26)	1.02*** (0.27)	-0.10 (0.09)	-0.11 (0.08)	-0.11 (0.08)

Slack	0.42 (0.34)	0.54† (0.33)	0.53 (0.33)	-0.57** (0.18)	-0.75*** (0.19)	-0.75*** (0.20)	0.08 (0.06)	0.09 (0.06)	0.09 (0.06)
CEO gender	0.09 (0.23)	0.08 (0.19)	-0.10 (0.21)	0.26* (0.12)	0.22* (0.09)	0.22* (0.10)	-0.01 (0.05)	-0.02 (0.04)	-0.10* (0.04)
CEO tenure	-0.02* (0.01)	-0.02* (0.01)	-0.02* (0.01)	0.01 (0.01)	0.00 (0.01)	0.00 (0.01)	-0.00† (0.00)	-0.00 (0.00)	-0.00† (0.00)
Board size	-0.01 (0.02)	-0.02 (0.02)	-0.02 (0.02)	-0.01 (0.04)	0.01 (0.04)	0.00 (0.04)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Duality	0.11 (0.14)	0.09 (0.14)	0.12 (0.14)	-0.12 (0.14)	-0.11 (0.15)	-0.10 (0.15)	0.01 (0.02)	0.00 (0.02)	0.01 (0.02)
Board independence	0.13 (0.76)	-0.18 (0.75)	-0.20 (0.75)	-0.54 (0.45)	-0.24 (0.43)	-0.25 (0.45)	0.05 (0.15)	0.00 (0.15)	-0.00 (0.15)
Racial diversity	-0.16 (0.58)	-0.12 (0.52)	-0.09 (0.52)	0.11 (0.88)	-0.25 (0.78)	-0.25 (0.78)	0.03 (0.09)	0.05 (0.09)	0.06 (0.09)
Female representation		0.24* (0.09)	0.23* (0.09)		-0.24* (0.10)	-0.24* (0.11)		0.04** (0.01)	0.04** (0.01)
Female Representation × CEO Gender			0.30* (0.15)			0.04 (0.16)			0.09*** (0.02)
Wald χ^2	752***	3,233***	1,556***	677***	3,113***	4,301***	2,098***	2,344***	31,650***

Note. Robust standard errors in parentheses. GEE = generalized estimation equation.

†p < .1. *p < .05. **p < .01. ***p < .001 (two-sided tests).

Models 1, 4, and 7 are the base models including only the control variables. Hypotheses 1a and 1b were related to the influence of female board representation on competitive complexity. Model 2 shows that we found support for Hypothesis 1a where more female directors lead to greater competitive complexity ($p < .05$). In terms of practical significance, we estimated that for two otherwise identical boards, the competitive complexity for a board with female directors at 1SD above the mean is about 74% higher compared to a board with 0 female directors. In Hypotheses 2a and 2b, we examined how female board representation affects competitive heterogeneity. Consistent with Hypothesis 2b, the coefficient of female board representation is negative and significant ($p < .05$; see Model 5). Examining the practical significance of those results, we found that all else being equal moving from a board with no female directors to a board with female directors at 1SD above the mean resulted in about 43% reduction in competitive heterogeneity. In Hypotheses 3a and 3b, we theorized about the relationship between female board representation and competitive volume. We found support for Hypothesis 3a as the coefficient of female board representation in Model 8 is positive and significant ($p < .01$). Regarding the practical significance of this finding, we estimated that for two otherwise identical boards, the competitive volume for a board with female directors at 1SD above the mean is about 52% higher compared to a board with 0 female directors. In support of Hypothesis 4, the interaction coefficient of female board representation and CEO gender was positive and significant ($p < .05$; see Model 3). Stated differently, a female CEO strengthened the positive relationship between female board representation and competitive complexity. Hypothesis 5 proposed a moderation effect of a female CEO on the relationship between female board representation and competitive heterogeneity. We did not find support for this hypothesis. Finally, consistent with Hypothesis 6, a female CEO interacted with female directors to increase the volume of competitive actions conducted by the firm (the interaction coefficient of female board representation and CEO gender is positive and significant in Model 9, $p < .001$). Figures 1 and 2 provide graphical representations of the interactions.

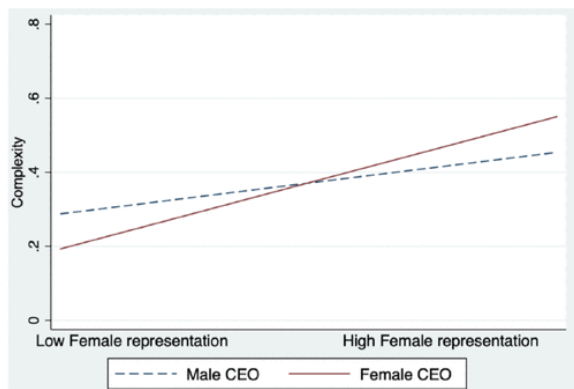


Figure 1. Interaction of female representation and CEO gender on complexity.

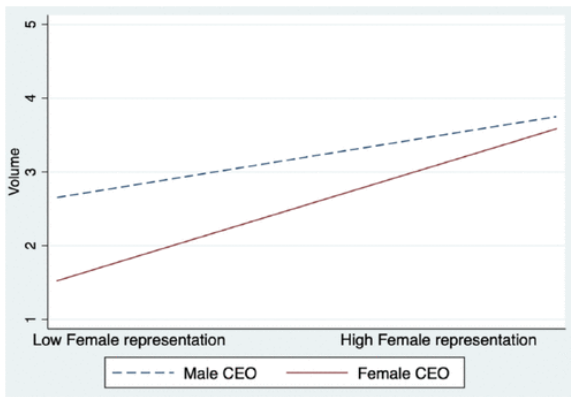


Figure 2. Interaction of female representation and CEO gender on volume.

Discussion

Faced with increasing pressure for greater female representation in the boardroom, many firms are struggling to determine how adding female directors affects the strategic direction of the firm. Combining research on female board representation with research on CD enables us to contribute to both streams of research. In terms of competitive dynamic research, we address calls to examine the role of board gender composition on competitive actions (Hughes-Morgan et al., 2018). By utilizing the AMC model, we show that female directors play a key role in shaping the competitive repertoire of the firm. Specifically, the presence of female board members leads to the initiation of more complex competitive actions, less heterogeneous competitive actions, and a greater volume of competitive actions. With respect to competitive complexity and competitive volume, female directors may draw on different cognitive frames, experiences, and social ties to enhance both the board's awareness of the necessity to pursue more complex actions and greater volume of actions, and the board's capability to implement such competitive action. This increased awareness and capability appear to outweigh some of the other aspects of having a female presence in the boardroom, such as reduced cohesiveness and more conflict, which hinder the board's motivation for action. With respect to competitive heterogeneity, it appears that by engaging in more deliberate monitoring and greater risk aversion, female directors affect the whole board to pursue competitive actions that adhere closely to the industry status quo (i.e., actions that are less heterogeneous).

In addition to extending CD research, this study also contributes to research that investigates whether adding female directors to corporate boards shape firms' strategic involvement (Post & Byron, 2015). Our empirical results provide further understanding to two questions: Do female board members have an effect on the firm's competitive repertoire? Under what conditions is this effect more or less pronounced? With respect to the first question, our results clearly demonstrate that female directors play a key role in shaping the competitive posture of the firm and the variety of competitive actions necessary to compete with rivals. Moreover, by identifying some of the specific activities that female board members impact, we extend prior research discussing female directors' involvement with firm strategy (Chen et al., 2016; Miller & Triana, 2009; Post & Byron, 2015; Triana et al., 2013). This allows us to move away from the rather distant link between women and performance and instead "get closer to the action" (Devers, McNamara, Wiseman, & Arrfelt, 2008) by studying a more proximal issue—how women on corporate boards influence competitive actions.

In terms of the second question, empirical results suggest that female board members may exert greater influence on competitive actions when the firm is run by a female CEO. Specifically, our moderation analyses indicate that firms combining female directors with a female CEO engage in more complex competitive actions and a greater volume of competitive actions. Our findings build on previous findings (Hoobler et al., 2016) that suggest having a female CEO may enable female board members to exercise their unique talents and play an active role in strategy ratification. We speculate that having a female CEO helps overcome some of the barriers that female directors face, such as being considered a token and excluded from decision-making processes (Cook & Glass, 2014). This is in line with prior research arguing for developing a climate of inclusion and tolerance (Chatman et al., 1998; Hopkins & Hopkins, 2002) toward minorities in the upper ranks of the firm to encourage effective team functioning.

Limitations

Our study is not without limitations. Although, we show that women on corporate boards drive a firm's pattern of competitive actions that are essential in capturing a competitive advantage in the marketplace, we did not examine how female directors' impact on competitive actions affects the firm's financial performance. This is an important next step to substantiate the business case for women. Future research should test whether and how the market reacts to the announcement of competitive actions driven by corporate boards with female members. Second, we did not measure or observe board processes. Instead, we inferred board interactions and dynamics that affect competitive actions. We encourage future research to draw on surveys, interviews, and other primary data options (Tuggle, Schnatterly, & Johnson, 2010) to capture the specific mechanism and dynamics in the boardroom.

Third, our sample consists of firms in a single industry. We chose this approach for two primary reasons: (a) the greater level of female representation in the pharmaceutical industry ensures enough variability in our sample (Catalyst, 2015), and (b) there is readily available information about the types of competitive actions that pharmaceutical companies undertake to boost future valuations (Cardinal, 2001). While the relationship between female board representation and competitive actions could vary across industries, we believe that female directors could be an important driver of competitive actions in industries outside of the pharmaceutical domain. For example, prior research provides evidence that female directors have a strong influence on various strategic activities across diverse industries (Chen et al., 2016; Miller & Triana, 2009; Triana et al., 2013).

Finally, we focused on various characteristics of competitive actions, such as complexity, heterogeneity, and volume, to capture the strategic outcomes of female presence in the boardroom. Yet, much research in CD has examined the timing of competitive actions and reactions. We did not account for the speed or timing of actions but studying the impact of female directors on those outcomes could be a fruitful avenue of future research.

Practical Implications

By demonstrating the role of women in both board and CEO positions on strategic decision making, we provide evidence of the importance inherent in the dynamics of gender-diverse boards with the female leadership at the top level. With respect to the market for managerial talent, boards of directors and

CEOs are the critical drivers of a firm's strategy. Selecting not just the best talent, but the best *combination* of talent is crucial to firm outcomes. This argument stems from the insight that female board members combined with a female CEO may be better equipped to develop beneficial strategic repertoires (Hughes-Morgan et al., 2010).

It is also important to acknowledge that female directors play a differentiated role in terms of various competitive actions. This suggests that the board's gender composition is an important precursor to the firm's competitive repertoire. Thus, by making structural changes to board composition, firms may alter their competitive behavior and the pattern of industry rivalry. As competitive actions are the mechanism that firms use to outmaneuver competitors to gain a superior competitive position (D'Aveni, 1994; Ferrier, 2001; Smith et al., 2001), there is a strong motivation to understand how adding female board members affects board dynamics and decisions concerning competitive actions.

We hope that our study provokes more scholarly interest in how firm-level strategic behaviors are influenced by the increasingly diverse world in which we live. We have demonstrated that gender affects the motivation and capability of corporate boards to carry out varying repertoires of competitive actions. By the same token, political affiliation or country of origin may also impact the awareness, motivation, and capability of upper management to engage in aggressive competition, as these views may either enhance or hinder cooperative tendencies. After all, corporations are run by individuals and their mind-sets may have a significant influence on how firm resources are used (Lyles & Schwenk, 1992). Toward this end, we think that management scholars are well positioned to contribute, given our field's focus on the firm-environment interface. Indeed, the distinctive role of management research among the social sciences has always been its capacity to integrate behavioral and motivational theories with our own understanding of firms to provide insights and guidance to individuals who oversee them.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Notes

1. Although our chosen industry has a greater female representation, we acknowledge the "small numbers" limitation that is inherent in most studies that examine women in upper echelons.
2. In five of the firms in the data, there was at least one year with a female CEO.

References

- Abdullah, S., Ismail, K., Nachum, L. (2014). Does having women on boards create value? The impact of societal perceptions and corporate governance in emerging markets. *Strategic Management Journal*, 11, 25-32.

- Adams, R. B., Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, 94, 291-309.
- Adams, R. B., Funk, P. (2012). Beyond the glass ceiling: Does gender matter? *Management Science*, 58, 219-235.
- Ahern, K. R., Dittmar, A. (2012). The changing of the boards: The impact on firm valuation of mandated female board representation. *Quarterly Journal of Economics*, 127, 137-197.
- Ancona, D. G., Caldwell, D. F. (1992). Demography and design: Predictors of new product team performance. *Organization Science*, 3, 321-341.
- Andrevski, G., Richard, O., Shaw, J., Ferrier, W. (2014). Racial diversity and firm performance: The mediating role of competitive intensity. *Journal of Management*, 40, 820-844.
- Audia, P. G., Greve, H. R. (2006). Less likely to fail: Low performance, firm size, and factory expansion in the shipbuilding industry. *Management Science*, 52, 83-94.
- Bøhren, Ø., Strøm, R. Ø. (2010). Governance and politics: Regulating independence and diversity in the board room. *Journal of Business Finance & Accounting*, 37, 1281-1308.
- Barber, B. M., Odean, T. (2001). Boys will be boys: Gender, overconfidence, and common stock investment. *Quarterly Journal of Economics*, 116, 261-292.
- Bart, C., McQueen, G. (2013). Why women make better directors. *International Journal of Business Governance and Ethics*, 8, 93-99.
- Basdeo, D., Smith, K., Grimm, C., Rindova, V., Derfus, P. (2006). The impact of market actions on firm reputation. *Strategic Management Journal*, 27, 1205-1219.
- Baugh, S. G., Graen, G. B. (1997). Effects of team gender and racial composition on perceptions of team performance in cross-functional teams. *Group & Organization Management*, 22, 366-383.
- Bernardi, R. A., Bosco, S. M., Vassill, K. M. (2006). Does female representation on boards of directors associate with Fortune's "100 best companies to work for" list? *Business & Society*, 45, 235-248.
- Bliese, P. D. (2000). An introduction to multilevel modeling techniques. *Personnel Psychology*, 53, 1062-1065.
- Boyd, B. K. (1995). CEO duality and firm performance: A contingency model. *Strategic Management Journal*, 16, 301-312.
- Brown, J., Buchholtz, A., Butts, M., Ward, A. (2016). Board socio-cognitive decision-making and task performance under heightened expectations of accountability. *Business & Society*, 58, 574-611. doi:10.1177/0007650316675597
- Byrnes, J. P., Miller, D. C., Schafer, W. D. (1999). Gender differences in risk taking: A meta-analysis. *Psychological Bulletin*, 125, 367-383.
- Campbell, K., Minguez-Vera, A. (2010). Female board appointments and firm valuation: Short and long-term effects. *Journal of Management & Governance*, 14, 37-59.
- Cardinal, L. (2001). Technological innovation in the pharmaceutical industry: The use of organizational control in managing research and development. *Organization Science*, 12, 19-36.
- Carpenter, M. A., Fredrickson, J. W. (2001). Top management teams, global strategic posture, and the moderating role of uncertainty. *Academy of Management Journal*, 44, 533-545.
- Carter, D. A., D'Souza, F., Simkins, B. J., Simpson, W. G. (2010). The gender and ethnic diversity of US boards and board committees and firm financial performance. *Corporate Governance: An International Review*, 18, 396-414.
- Catalyst . (2015). Quick take: Women on corporate boards. New York, NY: Author.

- Chang, S., Park, S. (2012). Winning strategies in China: Competitive dynamics between MNCs and local firms. *Long Range Planning*, 45, 1-15.
- Chatman, J. A., Polzer, J. T., Barsade, S. G., Neale, M. A. (1998). Being different yet feeling similar: The influence of demographic composition and organizational culture on work processes and outcomes. *Administrative Science Quarterly*, 43, 749-780.
- Chattopadhyay, P., George, E., Lawrence, S. A. (2004). Why does dissimilarity matter? Exploring self-categorization, self-enhancement, and uncertainty reduction. *Journal of Applied Psychology*, 89, 892-900.
- Chen, G., Crossland, C., Huang, S. (2016). Female board representation and corporate acquisition intensity. *Strategic Management Journal*, 37, 303-313.
- Chen, M. J. (1996). Competitor analysis and interfirm rivalry: Towards a theoretical integration. *Academy of Management Review*, 21, 100-134.
- Chen, M. J., Miller, D. (1994). Competitive attack, retaliation and performance: An expectancy-valence framework. *Strategic Management Journal*, 15, 85-102.
- Chen, M. J., Miller, D. (2012). Competitive dynamics: Themes, trends, and a prospective research platform. *Academy of Management Annals*, 6, 135-210.
- Chen, M. J., Smith, K., Grimm, C. (1992). Action characteristics as predictors of competitive responses. *Management Science*, 38, 439-455.
- Chen, M. J., Su, K., Tsai, W. (2007). Competitive tension: The awareness-motivation-capability perspective. *Academy of Management Journal*, 50, 101-118.
- Cohen, J., Cohen, P., West, S. G., Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum.
- Connelly, B., Tihanyi, L., Ketchen, D., Carnes, C., Ferrier, W. (2016). Competitive repertoire complexity: Governance antecedents and performance outcomes. *Strategic Management Journal*, 38, 1151-1173.
- Conyon, M. J., He, L., Zhou, X. (2015). Star CEOs or political connections? Evidence from China's publicly traded firms. *Journal of Business Finance & Accounting*, 42, 412-443.
- Cook, A., Glass, C. (2014). Signaling diversity and increasing shareholder value: Conflicting, complementary or unrelated goals? *Human Resource Development Quarterly*, 25, 471-491.
- Crossland, C., Zyung, J., Hiller, N. J., Hambrick, D. C. (2014). CEO career variety: Effects on firm-level strategic and social novelty. *Academy of Management Journal*, 57, 652-674.
- Cui, J., Qian, G. (2007). Selection of working correlation structure and best model in GEE analyses of longitudinal data. *Communications in Statistics-Simulation and Computation*, 36, 987-996.
- Cumming, D., Leung, T. Y., Rui, O. (2015). Gender diversity and securities fraud. *Academy of Management Journal*, 58, 1572-1593.
- Dalton, D. R., Daily, C. M., Ellstrand, A. E., Johnson, J. L. (1998). Meta-analytic reviews of board composition, leadership structure, and financial performance. *Strategic Management Journal*, 19, 269-290.
- Darmadi, S. (2011). Board diversity and firm performance: The Indonesian evidence. *Corporate Ownership and Control Journal*, 8, 450-466.
- D'Aveni, R. (1994). *Hypercompetition: Managing the dynamics of strategic maneuvering*. New York, NY: Freedom Press.
- de la Merced, M. (2018, June 27). New York city comptroller touts progress in latest corporate governance push. *The New York Times*. Retrieved from <https://www.nytimes.com/2018/06/27/business/dealbook/scott-stringer-board-accountability.html>

- Denzin, N. K., Lincoln, Y. (2000). Introduction: The discipline and practice of qualitative research. In Denzin, N. K., Lincoln, Y. (Eds.), *Handbook of qualitative research* (pp. 1-28). London, England: Sage.
- Devers, C. E., McNamara, G., Wiseman, R. M., Arrfelt, M. (2008). Moving closer to the action: Examining compensation design effects on firm risk. *Organization Science*, 19, 548-566.
- Eagly, A. H., Carli, L. L. (2003). The female leadership advantage: An evaluation of the evidence. *Leadership Quarterly*, 14, 807-834.
- Ferrier, W. (2001). Navigating the competitive landscape: The drivers and consequences of competitive aggressiveness. *Academy of Management Journal*, 44, 858-877.
- Ferrier, W., Smith, K., Grimm, C. (1999). The role of competition in market share erosion and dethronement: A study of industry leaders and challengers. *Academy of Management Journal*, 43, 372-388.
- Finkelstein, S., Hambrick, D. C. (1996). *Strategic leadership: Top executives and their effects on organizations*. Minneapolis, MN: West Publishing.
- Frye, M. B., Pham, D. T. (2018). CEO gender and corporate board structures. *The Quarterly Review of Economics and Finance*, 69, 110-124.
- Galbreath, J. (2018). Is board gender diversity linked to financial performance? The mediating mechanism of CSR. *Business & Society*, 57, 863-889.
- Geletkanycz, M., Clark, C. E., Gabaldon, P. (2018, October). When boards broaden their definition of diversity, women and people of color lose out. *Harvard Business Review*. Retrieved from <https://hbr.org/2018/10/research-when-boards-broaden-their-definition-of-diversity-women-and-people-of-color-lose-out>
- Glass, C., Cook, A. (2018). Do women leaders promote positive change? Analyzing the effect of gender on business practices and diversity initiatives. *Human Resource Management*, 57, 823-837.
- Greve, H. R. (2003). A behavioral theory of R&D expenditures and innovations: Evidence from shipbuilding. *Academy of Management Journal*, 46, 685-702.
- Grimm, C. M., Lee, H., Smith, K. (2006). *Strategy as action: Competitive dynamics and competitive advantage*. Oxford, UK: Oxford University Press.
- Grosvold, J. (2011). Where are all the women? Institutional context and the prevalence of women on the corporate board of directors. *Business & Society*, 50, 531-555.
- Haleblian, J. J., McNamara, G., Kolev, K., Dykes, B. J. (2012). Exploring firm characteristics that differentiate leaders from followers in industry merger waves: A competitive dynamics perspective. *Strategic Management Journal*, 33, 1037-1052.
- Hambrick, D. C., Cho, T. S., Chen, M.-J. (1996). The influence of top management team heterogeneity on firms' competitive moves. *Administrative Science Quarterly*, 41, 659-684.
- Hambrick, D. C., Geletkanycz, M. A., Fredrickson, J. W. (1993). Top executive commitment to the status quo: Some tests of its determinants. *Strategic Management Journal*, 14, 401-418.
- Hanley, J. A., Negassa, A., Edwardes, M. D., Forrester, J. E. (2003). Statistical analysis of correlated data using generalized estimating equations: An orientation. *American Journal of Epidemiology*, 157, 364-375.
- Harrison, D. A., Price, K. H., Gavin, J. H., Florey, A. T. (2002). Time, teams, and task performance: Changing effects of surface-and deep-level diversity on group functioning. *Academy of Management Journal*, 45, 1029-1045.
- Haunschild, P. R. (1993). Interorganizational imitation: The impact of interlocks on corporate acquisition activity. *Administrative Science Quarterly*, 38, 564-592.

- Haynes, K. T., Hillman, A. (2010). The effect of board capital and CEO power on strategic change. *Strategic Management Journal*, 31, 1145-1163.
- Hillman, A. J., Cannella, A. A., Harris, I. C. (2002). Women and racial minorities in the boardroom: How do directors differ? *Journal of Management*, 28, 747-763.
- Hillman, A. J., Dalziel, T. (2003). Boards of directors and firm performance: Integrating agency and resource dependence perspectives. *Academy of Management Review*, 28, 383-396.
- Hillman, A. J., Shropshire, C., Cannella, A. A. (2007). Organizational predictors of women on corporate boards. *Academy of Management Journal*, 50, 941-952.
- Hogg, M. A. (2006). Social identity theory. In Burke, P. J. (Ed.), *Contemporary social psychological theories* (pp. 111-136). Stanford, CA: Stanford University Press.
- Hogg, M. A., Mullin, B.-A. (1999). Joining groups to reduce uncertainty: Subjective uncertainty reduction and group identification. In Abrams, D., Hogg, M. A. (Eds.), *Social identity and social cognition* (pp. 249-279). Malden, MA: Blackwell Publishing.
- Hogg, M. A., Terry, D. I. (2000). Social identity and self-categorization processes in organizational contexts. *Academy of Management Review*, 25, 121-140.
- Hoobler, J. M., Masterson, C. R., Nkomo, S. M., Michel, E. J. (2016). The business case for women leaders: Meta-analysis, research critique, and path forward. *Journal of Management*, 44, 2473-2499. doi:10.1177/0149206316628643
- Hopkins, W. E., Hopkins, S. A. (2002). Effects of cultural recomposition on group interaction processes. *Academy of Management Review*, 27, 541-553.
- Hughes-Morgan, M., Ferrier, W. (2014). Competitive action repertoires and stock risk. *Journal of Managerial Issues*, 26, 55-69.
- Hughes-Morgan, M., Ferrier, W., Labianca, J. (2010). Competitive strategy and stock risk: Investors' responses to perceived incongruity between TMT heterogeneity and competitive actions. In Carpenter, M. (Ed.), *Handbook of top management team research* (pp. 261-283). Northampton, MA: Edward Elgar.
- Hughes-Morgan, M., Kolev, K. D., McNamara, G. (2018). A meta-analytic review of competitive aggressiveness research. *Journal of Business Research*, 85, 73-82.
- Hutzschenreuter, T., Horstkotte, J. (2013). Performance effects of top management team demographic faultlines in the process of product diversification. *Strategic Management Journal*, 34, 704-726.
- Iyer, D. N., Miller, K. D. (2008). Performance feedback, slack, and the timing of acquisitions. *Academy of Management Journal*, 51, 808-822.
- Jackson, S. E., Joshi, A. (2004). Diversity in social context: A multi-attribute, multilevel analysis of team diversity and sales performance. *Journal of Organizational Behavior*, 25, 675-702.
- Jacobson, R. (1992). The "Austrian" school of strategy. *Academy of Management Review*, 17, 782-807.
- Jauch, L. R., Osborn, R., Martin, T. (1980). Structured content analysis of cases: A complementary method for organizational research. *Academy of Management Review*, 5, 517-527.
- Jeong, S. H., Harrison, D. A. (2017). Glass breaking, strategy making, and value creating: Meta-analytic outcomes of women as CEOs and TMT members. *Academy of Management Journal*, 60, 1219-1252.
- Joecks, J., Pull, K., Vetter, K. (2013). Gender diversity in the boardroom and firm performance: What exactly constitutes a "critical mass"? *Journal of Business Ethics*, 118, 61-72.
- Johnson, J. L., Daily, C. M., Ellstrand, A. E. (1996). Boards of directors: A review and research agenda. *Journal of Management*, 22, 409-438.

- Ketchen, D., Snow, C., Hoover, V. (2004). Research on competitive dynamics: Recent accomplishments and future challenges. *Journal of Management*, 30, 779-804.
- Kirzner, I. (1973). *Competition and entrepreneurship*. Chicago, IL: University of Chicago Press.
- Kolev, K., Wiseman, R. M., Gomez-Mejia, L. R. (2014). Do CEOs ever lose? Fairness perspective on the allocation of residuals between CEOs and shareholders. *Journal of Management*, 43, 610-637.
- Krishnan, H. A., Park, D. (2005). A few good women—On top management teams. *Journal of Business Research*, 58, 1712-1720.
- Lee, P., James, E. (2007). She'-e-os: Gender effects and investor reactions to the announcements of top executive appointments. *Strategic Management Journal*, 28, 227-241.
- Livengood, R., Reger, R. (2010). That's our turf! Identity domains and competitive dynamics. *Academy of Management Review*, 35, 48-66.
- Lyles, M. A., Schwenk, C. R. (1992). Top management, strategy and organizational knowledge structures. *Journal of Management Studies*, 29, 155-174.
- Marcel, J. J., Barr, P. S., Duhaime, I. M. (2011). The influence of executive cognition on competitive dynamics. *Strategic Management Journal*, 32, 115-138.
- Marquardt, C., Wiedman, C. (2016). Can shareholder activism improve gender diversity on corporate boards? *Corporate Governance: An International Review*, 24, 443-461.
- Miller, D., Chen, M. J. (1994). Sources and consequences of competitive inertia: A study of the U.S. airline industry. *Administrative Science Quarterly*, 39, 1-23.
- Miller, D., Chen, M. J. (1996a). Nonconformity in competitive repertoires: A sociological view of markets. *Social Forces*, 74, 1209-1234.
- Miller, D., Chen, M. J. (1996b). The simplicity of competitive repertoires: An empirical analysis. *Strategic Management Journal*, 17, 419-439.
- Miller, T. L., Triana, M. (2009). Demographic diversity in the boardroom: Mediators of the board diversity-firm performance relationship. *Journal of Management Studies*, 46, 755-786.
- Mínguez-Vera, A., Martín, A. (2011). Gender and management on Spanish SMEs: An empirical analysis. *The International Journal of Human Resource Management*, 22, 2852-2873.
- Nielsen, S., Huse, M. (2010). The contribution of women on boards of directors: Going beyond the surface. *Corporate Governance: An International Review*, 18, 136-148.
- Oliver, A. G., Krause, R., Busenbark, J. R., Kalm, M. (2018). BS in the boardroom: Benevolent sexism and board chair orientations. *Strategic Management Journal*, 39, 113-130.
- Parola, H. R., Ellis, K. M., Golden, P. (2015). Performance effects of top management team gender diversity during the merger and acquisition process. *Management Decision*, 53, 57-74.
- Pelled, L. H. (1996). Demographic diversity, conflict, and work group outcomes: An intervening process theory. *Organization Science*, 7, 615-631.
- Peni, E. (2014). CEO & chairperson characteristics and firm performance. *Journal of Management & Governance*, 18, 185-205.
- Perreault, W. D., Leigh, L. E. (1989). Reliability of nominal data based on qualitative judgments. *Journal of Marketing Research*, 26, 135-148.
- Peterson, R. S., Nemeth, C. J. (1996). Focus versus flexibility: Majority and minority influence can both improve performance. *Personality and Social Psychology Bulletin*, 22, 14-23.
- Post, C., Byron, K. (2015). Women on boards and firm financial performance: A meta-analysis. *Academy of Management Journal*, 58, 1546-1571.
- Post, C., Rahman, N., Rubow, E. (2011). Green governance: Boards of directors' composition and environmental corporate social responsibility. *Business & Society*, 50, 189-223.

- Powell, M., Ansic, D. (1997). Gender differences in risk behaviour in financial decision-making: An experimental analysis. *Journal of Economic Psychology*, 18, 605-628.
- Quigley, T. J., Hambrick, D. C. (2012). When the former CEO stays on as board chair: Effects on successor discretion, strategic change, and performance. *Strategic Management Journal*, 33, 834-859.
- Rose, C. (2007). Does female board representation influence firm performance? The Danish evidence. *Corporate Governance: An International Review*, 15, 404-413.
- Ross-Sorkin, A. (2018, January 15). BlackRock's message: Contribute to society, or risk losing our support. *The New York Times*. Retrieved from <https://www.nytimes.com/2018/01/15/business/dealbook/blackrock-laurence-fink-letter.html>
- Sartori, A. E. (2003). An estimator for some binary-outcome selection models without exclusion restrictions. *Political Analysis*, 11, 111-138.
- Shrader, C. B., Blackburn, V. B., Iles, P. (1997). Women in management and firm financial performance: An exploratory study. *Journal of Managerial Issues*, 9, 355-372.
- Simsek, Z., Veiga, J. F., Lubatkin, M. H., Dino, R. N. (2005). Modeling the multilevel determinants of top management team behavioral integration. *Academy of Management Journal*, 48, 69-84.
- Smith, K. G., Ferrier, W., Ndofor, H. (2001). Competitive dynamics research: Critique and future directions. In Hitt, M., Harrison, J. (Eds.), *Handbook of strategic management* (pp. 315-361). Malden, MA: Blackwell Publishers.
- Smith, K. G., Grimm, C. M., Gannon, M. J. (1992). *Dynamics of competitive strategy*. Thousand Oaks, CA: Sage.
- Smith, K. G., Smith, K. A., Olian, J. D., Sims, H. P. J., O'Bannon, D. P., Scully, J. A. (1994). Top management team demography and process: The role of social integration and communication. *Administrative Science Quarterly*, 39, 412-438.
- SpencerStuart . (2018). *Spencer Stuart board index*. New York, NY: Author.
- Stern, I., Westphal, J. D. (2010). Stealthy footsteps to the Boardroom: Executives' backgrounds, sophisticated interpersonal influence behavior, and board appointments. *Administrative Science Quarterly*, 55, 278-319.
- Stevenson, J., Orr, E. (2017, November). We interviewed 57 female CEOs to find out how more women can get to the top. *Harvard Business Review*. Retrieved from <https://hbr.org/2017/11/we-interviewed-57-female-ceos-to-find-out-how-more-women-can-get-to-the-top>
- Sunden, A. E., Surette, B. J. (1998). Gender differences in the allocation of assets in retirement savings plans. *American Economic Review*, 88, 207-211.
- Torchia, M., Calabrò, A., Huse, M. (2011). Women directors on corporate boards: From tokenism to critical mass. *Journal of Business Ethics*, 102, 299-317.
- Triana, M., Miller, T. L., Trzebiatowski, T. M. (2013). The double-edged nature of board gender diversity: Diversity, firm performance, and the power of women directors as predictors of strategic change. *Organization Science*, 25, 609-632.
- Tuggle, C. S., Schnatterly, K., Johnson, R. A. (2010). Attention patterns in the boardroom: How board composition and processes affect discussion of entrepreneurial issues. *Academy of Management Journal*, 53, 550-571.
- Uhlenbruck, K., Hughes-Morgan, M., Hitt, M., Ferrier, W., Brymer, R. (2017). Response to mergers and acquisitions: A competitive dynamics perspective. *Strategic Organization*, 15, 40-66.

- Williams, K. Y., O'Reilly, C. A.. (1998). Demography and diversity in organizations: A review of 40 years of research. In Staw, B. M., Cummings, L. L. (Eds.), *Research in organizational behavior* (Vol. 20, pp. 77-140). Greenwich, CT: JAI Press.
- Young, G., Smith, K., Grimm, C. (1996). "Austrian" and industrial organization perspectives on firm-level competitive activity and performance. *Organization Science*, 7, 243-254.