

Women Directors on Corporate Boards: From Tokenism to Critical Mass

Mariateresa Torchia
Andrea Calabrò
Morten Huse

ABSTRACT. Academic debate on the strategic importance of women corporate directors is widely recognized and still open. However, most corporate boards have only one woman director or a small minority of women directors. Therefore they can still be considered as tokens. This article addresses the following question: does an increased number of women corporate boards result in a build up of critical mass that substantially contributes to firm innovation? The aim is to test if ‘at least three women’ could constitute the desired critical mass by identifying different minorities of women directors (one woman, two women and at least three women). Tests are conducted on a sample of 317 Norwegian firms. The results suggest that attaining critical mass – going from one or two women (a few tokens) to at least three women (consistent minority) – makes it possible to enhance the level of firm innovation. Moreover, the results show that the relationship between the critical mass of women directors and the level of firm innovation is mediated by board strategic tasks. Implications for both theory and practice, and future research directions are discussed.

KEY WORDS: corporate governance, critical mass theory, board strategic tasks, organizational innovation, tokenism, women directors

Introduction

The contribution of women directors to corporate value creation has been widely studied (see Terjesen et al., 2009, for a review of recent literature on women directors). Most of these studies make the ‘business case’ for more women on corporate boards, arguing that if a segment of society’s talent is systematically excluded from boards, not because of talent but gender, then such boards are sub-optimal (Carver, 2002; Cassell, 2000). Despite these arguments, in most corporate boards, there is only one

woman or a small minority of women. As such, they are often considered tokens (Kanter, 1977a). While previous studies have measured gender diversity through the *ratio* of women directors or simply through their *presence* on corporate boards (e.g. Campbell and Mínguez-Vera, 2008; Hillman and Cannella, 2007; Huse et al., 2009), this article focuses on the *number* of women directors (more specifically on the *size* of the minority group).

Drawing on the critical mass theory (Granovetter, 1978; Kanter, 1977a, b, 1987), this article addresses the question of whether an increased number of women directors results in the build-up of critical mass that substantially contributes to firm innovation. By identifying different minorities of women directors (one woman, two women and at least three women), we test whether, and to what extent, they could have an impact on the level of firm innovation. First, we test whether ‘at least three women directors’ is the critical mass. This is achieved by suggesting that with an increase in the number of women directors, from one or two women (a few tokens) to at least three women (consistent minority), the level of firm innovation will be greater. Second, we explore how women directors contribute to the level of firm innovation by exploring boards as decision-making groups performing different tasks (Forbes and Milliken, 1999; Robinson and Dechant, 1997). Specifically, we analyse whether, and to what extent, the contribution of women directors to the level of firm innovation could be mediated by board strategic tasks.

The key research questions are: (1) Is there a critical mass to reach (‘three women directors’) to have a bearing on the level of firm innovation? (2) Do board strategic tasks mediate the relationship between the critical mass of women directors and

the level of firm innovation? To address these questions, the article statistically tests the effects that different sizes of minority group (one woman, two women and three women) could have on firm organizational innovation. Moreover, the mediating role of board strategic tasks is tested using Baron and Kenny's (1986) mediating model. Tests were conducted on a sample of 317 Norwegian firms.

The selection of the country is critical since Norwegian legislation makes Norway one of the few countries in the world with a sufficient number of companies where gender diversity can be said to have been taken beyond tokenism and thus enabling us to select a good number of companies in the independent variables of one, two or three women directors. Indeed, in 2005, the Norwegian government passed a quota law requiring Norwegian public limited-liability companies (ASAs) to have at least 40% of each gender represented on their board of directors. These companies were in 2002 given a few years to voluntarily implement this requirement – otherwise the law would be ratified and enforced. Law enforcement began at the beginning of 2008 and by then all ASA-companies (with very few exceptions) had already met the requirement of at least 40% (Rasmussen and Huse, 2011). The article builds on a survey conducted in Norway before the law came into force (2005/2006), thus giving us the opportunity to explore the 'non-enforced' effects on task performance and organizational innovation of women directors on boards.

The results suggest that women directors' contribution to the level of firm innovation becomes evident when the critical mass (at least three women directors) is reached and that board strategic tasks have a relevant mediating effect on this relationship.

The article makes several contributions to the academic debate on women directors. First, it addresses the gap in the literature on studies testing the validity of the critical mass theory in the field of corporate governance (Erkut et al., 2008; Konrad et al., 2008). Indeed, to our knowledge, there are no empirical studies testing the effective validity of the critical mass theory in studies on women directors. Moreover, our results shift the debate from the ratio and/or the presence of women directors to the importance of their number (in other words, the size of the minority group). Second, the article fills an important gap on women directors' contribution to

the level of firm innovation. Despite numerous studies on the contribution of board diversity to firm innovation, very few studies focus on the contribution of gender diversity to firm innovation (Miller and Triana, 2009). Third, our study can be positioned in the research stream that deals with 'board behaviours and boardroom culture' (Terjesen et al., 2009). Studies in this direction suggest that the boardroom presence of women leads to more civilized behaviour and sensitivity to other perspectives (Bilimoria, 2000; Fondas and Salsalos, 2000), thus influencing board tasks. Indeed, our main findings answer the question of how women directors contribute to firm innovation. This is achieved by considering boards as a decision-making group and investigating the mediating role that board strategic tasks have on women's contribution to firm innovation. Finally, the article stresses the need for an increased number of women in boardrooms by suggesting that reaching the critical number (at least three women directors) enhances the overall level of firm innovation and board strategic tasks.

The rest of the article is organized as follows: the theoretical framework and the hypotheses formulation are presented in the next section. The research method is detailed in "Methods" section. The results are described in "Results" section and the discussion follows in "Discussion and findings" section. Final remarks and future research directions are presented in the last section.

Theoretical framework

Before testing the relationships between the critical mass of women directors and firm innovation and the mediating effect of board strategic tasks, in this section, we describe the research model and provide the theoretical framework of this study.

In order to test the validity of the critical mass theory, the different sizes of minority groups of women directors (one woman, two women and at least three women) are identified. We analyse the impact that these minorities can have on firm innovation. Consequently, first we explore the direct relationship between different women directors' minorities and the level of firm innovation (hypothesis 1). Second, by considering boards as decision-making groups performing multiple tasks, we analyse whether, and to

what extent, the contribution of women directors to the level of firm innovation could be mediated by board strategic tasks (hypothesis 2). Figure 1 summarizes the research model.

From tokenism to critical mass

The arguments for a higher number of women in corporate boards are numerous (Burke, 1997; Carver, 2002; Cassell, 2000; Huse, 2005; Singh et al., 2006) but in many countries, women who serve as board members are still tokens (Daily and Dalton, 2003; Kanter, 1977a, b; Singh et al., 2001; Terjesen et al., 2009).

Research on women directors questions how many women a board should have to have a bearing on firm value and how women directors actually contribute to firm performance. However, most of the studies are not conclusive, and one of the main difficulties is in trying to find a direct correlation between gender diversity and firm performance. In this respect, our article presents an interesting angle; namely, the relation of gender diversity in corporate boards to the firm's level of innovation achieved through the direct relationship of gender diversity to board tasks. Indeed, questions on the effects that different sizes of minority groups of women could have on board tasks and firm value still seem to be under-researched (Terjesen et al., 2009). Drawing on the critical mass theory, we build on research on the minority and majority influence on group decision-making as well as on tokenism theories. In particular, we look at women directors as a minority

subgroup within a larger group. In this regard, for decades research has studied the effects of majority and minority influence in small groups. These studies demonstrate that the majority exerts more influence in a group of people than minorities do, by virtue of their greater numbers (Asch, 1951, 1955; Tanford and Penrod, 1984). Minorities are easily marginalized when their presence in a larger group is modest. Due to their under-representation in the group, they are viewed as a symbol or a token (Kanter, 1977a, b). Kanter (1977a, b) studied women working within a male-dominated firm to explore how the number of women in a group affects group processes. She defined the members of the majority as 'dominants' while the remaining minority members were labelled as 'tokens'. Kanter suggested that for these tokens, stereotyping could result in the perception of barriers to exerting influence on decisions in the group. Moreover, tokens are perceived negatively, sometimes with downright derision (Maass and Clark, 1984; Nemeth and Wachtler, 1983) and are often doubted and not trusted; as a result being labelled as a token often creates discomfort, isolation and self-doubt (Kanter, 1977a, b), being perceived as a token can interfere with performance (Powell, 1993). In fact, because of their high visibility, tokens face additional performance pressures and are singled out because they are different not because of their own particular accomplishments. These reactions to tokens seem to occur whether the token is a woman or a minority in a larger group.

However, when the size of the minority group increases to the point that it is no longer a token

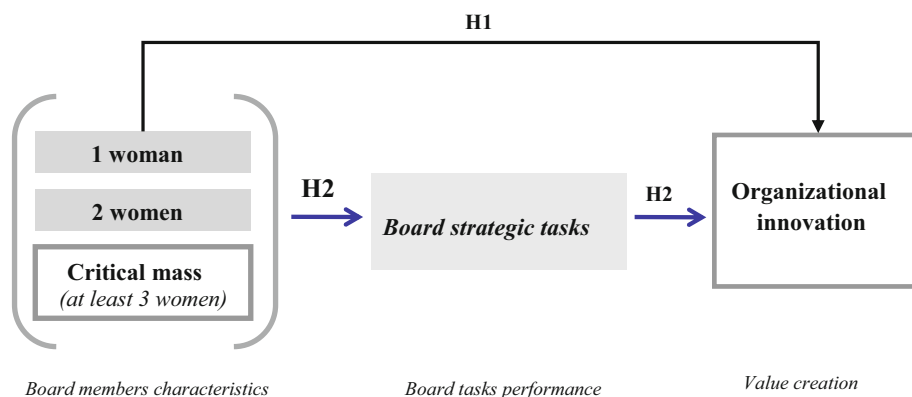


Figure 1. Research model and hypotheses.

minority, the perspective of its members and the nature of the relations between the minority and majority changes qualitatively (Bear et al., 2010; Etzkowitz et al., 1994). Kanter (1977a, b) argues that when the size of the minority group increases, it gains trust, and the majority benefits from the resources women can bring to the organization. Therefore, the influence of a minority in a group depends upon the strength, immediacy and number of its members (Latané, 1981).

Critical mass theory (Kanter, 1977a, b, 1987; Granovetter, 1978), in particular, suggests that the nature of group interactions depends upon size. When the size of the subgroup reaches a certain threshold, or critical mass, the subgroup's degree of influence increases. In other words, this theory suggests that when the minority group reaches critical mass, a qualitative change will take place in the nature of group interactions.

Most studies on critical mass begin with Kanter's (1977a) work on how women behave in corporations. Essentially, she suggests that women, as minorities in male-dominated environments, have little chance to exert influence on the organization until they become a consistent or significant minority. Above that point, they could begin to effect organizational changes.

Critical mass theory has gained wide currency over the last twenty years among politicians, the media and international organizations as a justification for measures to bring more women into political office (Grey, 2006). Moreover, several scholars have applied the critical mass theory to the legislative and political setting (Childs and Krook, 2008; Grey, 2002). Despite the appeal of critical mass theory and its use in legislative and political research, there are few studies that have used critical mass theory to explore women's contributions to corporate boards of directors (Erkut et al., 2008; Konrad et al., 2008).

Critical mass theory predicts that when a certain threshold is reached, the degree of the subgroup's influence grows; it does not, however, suggest what number represents the critical mass. To answer this question, we use Asch's (1951, 1955) studies and experiments leading us to the definition of a threshold that represents critical mass. These studies suggest that when an individual is faced with the unanimous opinion of three people, s/he feels pressure to conform to the others. In his studies,

Asch used groups of students who were told they were participating in a study on visual perception ('vision test'). In reality, all but one of the participants was a confederate of the experimenter – confederates were rehearsed to give the wrong answer in the vision test. The study was therefore about how the remaining student would react to the confederates' behaviour. The participants – the real subject and the confederates – were seated in a classroom where they were told to pronounce their judgment of the length of several lines drawn in a series of displays. They were asked which line was longer than the others, which were the same length, etc. Faced with confederates who all gave the same incorrect answer, one-third of the time the real subject gave the same wrong answer as the majority. This tendency to be influenced by the majority's wrong answer was obtained when there were 'at least three confederates' present. The Asch experiment demonstrates that the effectiveness of group pressure increases markedly when the group size is three, but further increases in group size add little to the overall effect. In accordance, other studies suggest that three usually represents the tipping point (critical mass) influencing the group setting (Bond, 2005; Nemeth, 1986; Tanford and Penrod, 1984).

Drawing on preceding arguments, recent studies of women on corporate boards (Erkut et al., 2008; Konrad et al., 2008) suggest that the critical mass of women directors is reached when boards of directors have 'at least three women'. These are interview- and discussion-based studies involving 50 women directors. The main findings show that boards with at least three women directors change their working-style, thus influencing the dynamics and the processes among board members. The core idea is that, with at least three women directors, it is possible to increase the likelihood that women's voices and ideas are heard and that boardroom dynamics change substantially (Erkut et al., 2008; Konrad et al., 2008).

While these studies help to identify the critical mass of women directors, empirical tests are still required to strengthen its overall validity of corporate board studies. This article thus fills a much needed gap in the literature, using arguments from critical mass theory and testing the validity of the 'at least three women' critical mass of women directors. Specifically, we test the relationships between

different minorities of women directors (one woman, two women, at least three women) and the level of firm innovation.

Women directors and firm innovation

In order to test the validity of the critical mass theory, first we explore the direct relationships between different women director minorities and the level of firm innovation. Firm innovation is one of the most important predictors of firm performance (Caves and Ghemawat, 1992; Teece et al., 1997; Zahra and Garvis, 2000), helping firms gain competitive advantage (Hitt et al., 1996), expand market share (Franko, 1989) and increase their performance (Morbey, 1988).

Because innovation is vital to a firm, researchers have increasingly examined the relationship between governance and innovation strategies (Baysinger et al., 1991; Hansen and Hill, 1991; Hill and Snell, 1988; Hitt et al., 1996; Zahra, 1996). Theoretical and empirical literature is especially focused on board demographic characteristics (Hermalin and Weisbach, 2003). Indeed, the studies that link board demographic characteristics to firm innovation are numerous. Baysinger et al. (1991), for example, established that board structure influences corporate innovation by aligning ownership incentives for directors. Theoretically, board directors are challenged with the task of allocating resources and providing ideas and relationships that increase the firm's innovation.

Zahra and Stanton (1988) suggest that the board of directors is considered a necessary factor to support all the innovation activities. Moreover Zahra et al. (2000) stress the importance of the board of directors in influencing the level of firm innovation. Consistent with these studies, in this article we focus on the importance of board demography (critical mass of women directors) to enhance the level of firm innovation.

There are numerous definitions of innovation and their multiplicity suggests an amorphous concept. This article defines innovation as a company's commitment to create and introduce new products, processes and organizational systems (Zahra et al., 2000). The article addresses the board members' perceptions on firm innovation. However, it is

useful to contrast *innovation perception* versus *innovation key indicators* (Mairesse and Mohnen, 2001). Indeed, as noted by Blackman and Davison (2004), although the focus of innovation is, historically, economic (Nystrom, 1980; Scherer, 1984) the source of innovation perception is social (Burns and Stalker, 1961; Zaltman et al., 1973). Zaltman et al. (1973, p. 14) suggest, 'the distinguishing characteristic of an innovation is that, instead of being an external object, it is the perception of a social unit that decides its newness'. Thus, while most studies are based on traditional measures of innovation (R&D, patents, publications), and others use measures such as the proportion of innovative firms by sector and country, and the percentage of innovative products on sale (Mairesse and Mohnen, 2001), in this article, we address board members' perceptions on firm innovation highlighting the different perspectives of the individuals involved in the innovation process.

We focus on a specific aspect of firm innovation: organizational innovation. In a general sense, the term 'organizational innovation' refers to the creation or adoption of an idea or behaviour that is new to the organization (Daft, 1978; Damanpour, 1996; Damanpour and Evan, 1984). It brings a new problem-solving idea into use (Amabile, 1988; Kanter, 1983) and is seen as a significant, non-routine and discontinuous organizational change (Mezias and Glynn, 1993).

When studying women directors' contributions to firm innovation, it seems more appropriate to focus on firm organizational innovation rather than on product and/or process innovation. It is more 'people oriented' and influenced by their individual characteristics (Kimberly and Evanisko, 1981). Relating more to cognitive processes than product or process innovation, organizational innovation could be seen as the output of various intervening mental processes (Hodgkinson, 2003).

Several studies relate board diversity to firm innovation. These studies suggest that board diversity delivers a broad range of perspectives, increases the search for information, enhances the quality of brainstormed ideas, facilitates creativity, generates more strategic alternatives (Erhardt et al., 2003; Watson et al., 1993), enhancing in this way the level of innovation. In particular, homogeneous boards of directors are more likely to inhibit the critical

evaluation of alternatives with negative effects on innovation (Janis, 1982). However, to date, only few studies have investigated the effect of gender diversity on innovation (Miller and Triana, 2009), and there is consequently a need for more research on this aspect.

The issue of women on corporate boards is studied from different perspectives and with different methods. Existing studies often use alternative measures to capture the effect of gender diversity: the ratio of women, the presence of women, and the number of women.

In this article, we use the number of women directors (the size of the minority group), and by drawing on critical mass theory identify the different minorities of women directors (one woman, two women, at least three women). We expect that women directors contribute to firm organizational innovation when the critical mass of three women is reached.

Women may differ from men in several aspects in this sphere. Some scholars argue that women can add unique perspectives, experiences and working styles compared to their male counterparts (Daily and Dalton, 2003; Huse and Solberg, 2006). Women are generally considered to have more wisdom and diligence than many male board members (Huse and Solberg, 2006). Moreover, they are also able to create a good atmosphere in the boardroom, representing diversity, different values and women's issues (Bilimoria and Huse, 1997). Indeed, they may bring different values (Selby, 2000), knowledge, and expertise (Hillman et al., 2002) to boards thus positively influencing the level of organizational innovation. These arguments lead us to expect that women directors enhance boardroom diversity (Bilimoria and Wheeler, 2000; Eagly, 2005), contributing positively to the level of firm organizational innovation, defined as a process of bringing new, problem solving, ideas into use (Amabile, 1988; Kanter, 1983). Drawing on critical mass arguments, we expect that the contributions of women directors become more pronounced once there are 'at least three women' in the boardroom. In order to test the validity of the critical mass arguments, we also test the impact that different sizes of minority groups (one woman, two women) may have on firm organizational innovation. We expect that boards with one woman or two women have no impact on

the level of organizational innovation. Hence, the influence of women directors on organizational innovation becomes pronounced when they reach the size of at least three. Therefore, we formulate the following three hypotheses:

Hypothesis 1a: There is no relationship between one woman director and the level of firm organizational innovation.

Hypothesis 1b: There is no relationship between two women directors and the level of firm organizational innovation.

Hypothesis 1c: There is a positive relationship between the critical mass of women directors (at least three women) and the level of firm organizational innovation.

The mediating role of board strategic tasks

Many studies on boards of directors have identified different sets of board tasks (Stiles and Taylor, 2001; Zahra and Pearce, 1989) and have suggested that board tasks mediate the relationship between board member characteristics and firm level outcome (Forbes and Milliken, 1999; Zahra and Pearce, 1989). Board tasks are usually grouped into strategic tasks, service tasks and control tasks (Huse, 2007; Stiles and Taylor, 2001; Zahra and Pearce, 1989).

While the contribution of women on board tasks has been widely studied (Arfken et al., 2004), we analyse the mediating role of board strategic tasks in the relationship between the critical mass of women directors and the level of firm organizational innovation.

Board strategic tasks are widely recognised as the most important tasks of the board (Andrews, 1981; Baysinger and Hoskisson, 1990; Finkelstein and Hambrick, 1996; Golden and Zajac, 2001; Huse, 2007; McNulty and Pettigrew, 1999; Pugliese et al., 2009; Zahra and Pearce, 1990). This refers to a complex and multidimensional concept (Ravasi and Zattoni, 2006) and scholars define it in several ways (Stiles and Taylor, 2001; Zahra and Pearce, 1990). In spite of the numerous definitions of this concept, we adopt the definition that board strategic tasks refer to the degree to which boards and board members are involved in the strategic process. It requires board

members to be involved in the initiation and implementation phases of the strategic process (Huse, 2005, 2007; Zahra and Pearce, 1990). In particular, board strategic involvement refers to the level of attention given by directors to the various elements of the strategic process. Hence, board strategic involvement covers corporate mission development, strategy conception and formulation, and strategy implementation (Zahra and Pearce, 1990). We anticipate a mediating role of board strategic tasks and to verify this mediating effect first argue that women directors impact on board strategic tasks and second, that the board strategic tasks impact on the level of firm organizational innovation.

The literature on management teams suggests that groups composed of demographically dissimilar members have the potential to generate original approaches to intellectual and decision-making tasks (Bantel and Jackson, 1989; Williams and O'Reilly, 1998). Moreover, minorities (as women directors) can stimulate other board members to consider a wider range of potential solutions (Nemeth, 1986). Indeed, when the majority of group members share a particular background, for instance, the influence exerted by a director with a different background can lead board members to change or expand the criteria used for evaluating strategic alternatives (Hitt and Tyler, 1991). This pattern of results may suggest that minority directors (as women) have the potential to contribute to board decision-making by providing unique perspectives on strategic issues and by prompting divergent thinking among the majority group (Westphal and Milton, 2000). According to this perspective, reaching a critical number of women directors is desirable because it not only affects the nature of group interactions but also increases the diversity of viewpoints within a group. Furthermore, we expect that the level of firm organizational innovation can benefit from board strategic tasks. Recent literature has investigated, through a value chain approach, how the various board tasks contribute to the value creation process (Huse, 2007; Huse et al., 2005). They found that the greatest degree of board contribution to innovation is through strategic involvement. In fact, they suggest that board strategic involvement has a positive impact on firm innovation. Accordingly, we formulate the following hypothesis:

Hypothesis 2: Boards strategic tasks mediate the relationship between the critical mass of women directors and the level of firm organizational innovation.

Methods

Data collection and sample

This study is based on a unique survey conducted among Norwegian companies during the winter 2005/2006 and the first half of 2006 (Huse, 2009).

Data were gathered from a questionnaire sent to 2954 firms in different categories: firms on the Oslo Stock Exchange, publicly limited firms that are not on the Oslo Stock Exchange, limited firms with >100 employees, limited firms with between 50 and 100 employees and a total turnover of >5 million NOK, smaller limited firms with less than 50 employees and a total turnover of >5 million NOK.

We used a 6–8-page questionnaire and asked a total of 265 questions (the number of questions changed depending on the different roles of respondents).¹

The Norwegian database was used for many different reasons. First, it provides more observations compared with similar studies based on the survey method. Second, there are no significant surveys that focus on board dynamics and board member characteristics in studies on women directors. Moreover, the Norwegian database, by way of its construction, allows us to better understand what occurs within boards of directors by analyzing aspects related to innovation and board tasks. Finally, Norway has the highest ratio of women directors in Europe. Analyzing Norwegian data is interesting because, in 2002, the Norwegian government issued a legislative proposal aimed at achieving an overall target of 40% female representation on boards. The law became effective in 2005 and offered a 2-year transition period (the deadline was December 2007). Our analysis does not capture the full effect of the law because we analyse data from 2005/2006, but it may create some basis for future comparative investigations. In January 2009, the Norwegian press announced a ratio of 39.8% of women on Norwegian boards of directors.

The hypotheses were tested on CEO responses, with an overall response rate of 33%. We selected 328 firms excluding those with a small board size. Specifically, we excluded firms with a board size of less than 6, and so our sample included firms with boards that have from 6 to 12 as board members. A selection of boards of these size characteristics was needed because this allows us to use the critical mass theory appropriately. In fact, we are testing whether 'at least three women directors' (the minority group) is the critical mass, and on boards with less than six members, three women no longer represents a minority. Furthermore, to investigate boards with women director minorities, we used the 'ratio of women directors' (number of women directors/total number of board members) to exclude from the sample boards in which women directors were not a minority group (i.e. the ratio of women directors was higher than 49%). Eleven boards have a majority of women directors, and thus the final sample consists of 317 firms.

The responding firms have 437 employees on average (the median value is 135). The average age of firms is 55.6 (the median value is 41.0). 39% of the sample are high-tech firms. The average number of board members is 7.12 and the average number of women directors is 1.5. 26% of firms have '0' women directors, 28% '1' woman, 27% '2' women directors and, finally, 19% have 'at least three women directors' (the critical mass). The maximum number of women directors is five. The average tenure of the CEO is 6.82, and the average tenure of the chairperson is 4.77. Only 5% of CEOs and 7% of chairpersons are women. Each year on average six board meetings take place, and the average length of board meetings is 3.95 h.

Measures

Dependent variable

The dependent variable (*organizational innovation*) was measured with several items on a seven-point Likert-type scale (7 = fully agree, 1 = fully disagree). In this article, we address the board members' perceptions on firm innovation, highlighting the different perspectives of individuals involved in the innovation process. The CEOs were asked to value to what extent their firms are characterized by: (a)

being the first firm in the industry to develop an innovative management system; (b) being the first firm in the industry to introduce new business concepts and practices; (c) considerably changing the organizational structure to facilitate innovation; (d) implementing development programs for personnel to facilitate creativity and innovation. The organizational innovation output variable was constructed as the mean of the four items. Cronbach's Alpha coefficient was equal to 0.82. The organizational innovation multi-item measure was subjected to a Confirmatory Factor Analysis (CFA) using LISREL to assess dimensionality and convergent validity (Conway and Huffcutt, 2003). The CFA grouped the organizational innovation items. All the goodness-of-fit indices (GFIs) are higher than the accepted international standards, suggesting that the hypothesized measurement model fits the data reasonably well as indicated by a comparative fit index (CFI) value of 0.92 ($\chi^2 = 133$; $p < 0.001$), the goodness-of-fit index (GFI) was 0.88, and the root mean square error of approximation (RMSEA) was 0.06. The results of the CFA offered clear evidence of the construct validity of this multi-item variable.

Independent variables

The number of women directors is the independent variable. The sample was divided in four groups considering the number of women. In particular, the first group included firms with boards without any woman; the second had only one woman, the third had two women directors and the last had 'at least three women directors'. Thus, we used a set of $n - 1$ dummy variables as tools to represent an n -group variable. The first group (boards without women) served as the baseline (or reference group) to which we compared the others. Furthermore, we created dummy variables (0/1) to represent each of the other groups. Each dummy was coded so that it has the value '1' if a case is within that group, and '0' if not. We used three dummy variables: *one woman* (assuming value '1' if boards had only one woman, '0' otherwise); *two women* (assuming value '1' if boards had two women, '0' otherwise); *at least three women – critical mass* (assuming value '1' if boards had at least three women, '0' otherwise). Dummy variables are useful because they enabled us to use a single regression equation to represent multiple groups (different women minorities) and to interpret

the regression coefficient for each dummy variable in terms of how that group compares to the baseline.

Mediating variable

The mediating variable (board strategic tasks) was measured with several items on a seven-point Likert-type scale (7 = fully agree, 1 = fully disagree). The CEOs were asked to assess the involvement of the board in (a) making proposals on long-term strategies and main goals; (b) making decisions on long-term strategies and main goals; (c) putting decisions on long-term strategies and main goals into action; (d) controlling follow up of decisions on long-term strategies and putting main goals into action. The board strategic task output variable was built as the mean of the four items. Cronbach's Alpha coefficient is equal to 0.89. The multi-item measure board strategic tasks was subjected to a Confirmatory Factor Analysis (CFA) using LISREL to assess dimensionality and convergent validity (Conway and Huffcutt, 2003). The CFA grouped the board strategic tasks items. All the GFIs are higher than the accepted international standards suggesting that the hypothesized measurement model fits the data reasonably well as indicated by a CFI value of 0.95 ($\chi^2 = 143$; $p < 0.001$), GFI was 0.89, and the root mean square error of approximation (RMSEA) was 0.08. The results of the CFA offered clear evidence of the construct validity of this multi-item variable.

Control variables

We control for different variables influencing the level of firm organizational innovation. *Firm size* was measured as a linear transformation (ln) of the absolute number of employees. We used the number of employees provided by the CEOs in the survey. We used a dummy variable for *industrial sector* coded '1' if the target is a high-tech firm and '0' otherwise. Furthermore, we controlled for the most investigated board demographic characteristics (board size, CEO and chairperson tenure, CEO and chairperson gender). *Board size* was measured as the total number of members with voting rights (we investigated relatively large boards of directors, ranging from 6 to 12 members). *CEO tenure* was measured by counting the years a chief executive had been in office. *Chairperson tenure* was measured by counting the years he/she had been in office. *CEO gender* was a dummy variable, with '1' indicating that the CEO

was male and '0' otherwise. *Chairperson gender* was a dummy variable, with '1' indicating that the chairperson was male and '0' otherwise.

The *length of board meetings* was measured by the general duration of information exchange in board meetings. It was measured as the duration in hours of an ordinary board meeting transformed into its natural logarithmic function.

Finally, *director's knowledge and competence* was measured by six items on a seven-point Likert-type scale (7 = fully agree, 1 = fully disagree). CEOs assessed the board members' those six factors of knowledge (a) knowledge of the firm's main operations; (b) knowledge of the firm's critical technology and key competence; (c) knowledge of the firm's weak sides and its products and services; (d) knowledge of the development of the firm's customers, markets, products and services; (e) knowledge of the firm's suppliers and customer negotiation power; and (f) knowledge of threats from entrants and new products and services. The knowledge and competences output variable was built as the mean of the six items. Cronbach's Alpha coefficient was equal to 0.87.

Analyses

We statistically tested the effects that the different sizes of the minority group (one woman, two women and three women) could have on firm organizational innovation. Moreover, the mediating role of board strategic tasks was tested using Baron and Kenny's (1986) mediating model. The hypotheses were tested using multiple linear regressions.

In line with recommendations for testing mediating effects (Baron and Kenny, 1986), we tested three models (Model 1, Model 2 and Model 3). Accordingly, three conditions should be met to support a mediating relationship. Model 1 tests the direct relationship between the different sizes of the minority group (one woman, two women and three women) and firm organizational innovation (the independent variable must be significantly associated with the dependent variable). Furthermore, in Model 2, the independent variable must be significantly associated with the mediator (board strategic tasks). Finally, after the mediator (board strategic tasks) is entered, the relationship between the

independent and dependent variables should either disappear (full mediation) or significantly diminish (partial mediation). We test this last relationship in Model 3.

Results

Pearson's correlation analyses were performed and the results are reported in Table I. The correlation matrix shows that there was no significant correlation between the variables. Possible collinearity among the variables was tested by estimating variance inflation factors (VIF test) (all < 8.125), which passed the recommended standards (Hair et al., 1998). The VIF test suggests that multicollinearity does not affect results. The condition index was also estimated to ensure that collinearity was not a problem for the estimation of regression models.

Table II summarizes the results from the hypotheses testing.

Model 1 tested the effects of the independent variable on the dependent variable. Hypotheses 1a and 1b were supported, suggesting that if the size of the minority group is *one woman* or *two women* directors there will be no effects on the level of firm organizational innovation. Moreover, when considering the baseline group (boards with only male directors) our results suggest that there is no difference between boards with only male directors and boards with one or two women directors. They are all unable to contribute to firm organizational innovation.

Hypothesis 1c was supported showing a positive and significant relationship between the critical mass of women directors ('at least three women directors') and the level of firm organizational innovation (0.50; $p < 0.05$). The adjusted R^2 was 0.14.

In Model 2, the independent variable must be significantly associated with the mediator (board strategic tasks). The results show a significant and positive relationship between the critical mass of women directors and board strategic tasks (0.72; $p < 0.01$). The adjusted R^2 was 0.15.

In Model 3, we tested the mediating role of board strategic tasks. The results suggest that board strategic tasks mediate the relationship between the critical mass of women directors and firm organizational innovation. Specifically, the relationship between

the independent and the dependent variables disappears when the mediator is entered. We can hence suggest the existence of full mediation effects of board strategic tasks. The adjusted R^2 was 0.18.

Discussion and findings

Drawing on critical mass theory and its application to the corporate board domain, our results suggest that women directors' contribution to the level of firm organizational innovation depends on the size of the minority group (the number of women directors). By validating 'at least three women directors' as the size that the minority group has to reach to make a significant contribution to firm organizational innovation, our findings clearly show that it is possible to operationalize the critical mass construct. This contributes substantially to strengthening the importance and challenges of the critical mass of women directors in the corporate board debate. Moreover, our results shift the debate from the ratio and/or the presence of women directors to the importance of their number (the size of the minority group).

Two sets of hypotheses were formulated and tested. First, we explored the direct relationships between different sizes of the minority group of women directors and the level of firm innovation (hypotheses 1a–1b–1c). Second, by considering boards as decision-making groups performing numerous tasks, we analysed whether, and to what extent, women directors' contribution to the level of firm innovation could be mediated by board strategic tasks (hypothesis 2).

The results from hypotheses 1a and 1b suggest that there are no relationships between a certain size of the minority group (*one woman* or *two women* directors) and the level of firm organizational innovation. Indeed, when there is only one woman, she conforms to the majority group's ideas and behaviours. This finding is in line with previous studies showing that if an individual is faced with the unanimous opinion of a group, that person is likely to conform to the unanimous 'majority' opinion (Asch, 1951, 1955). When there is only one woman director (hypothesis 1a), she is assumed to be a token and is perceived as representing an entire demographic group. Hence, she is stereotyped by the

TABLE I
Correlation matrix (317 firms)

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Firm size	437.2	891.4	–													
2. Industrial sector	0.39	0.48	0.06	–												
3. Board size	7.12	1.22	0.34**	0.04	–											
4. CEO tenure	6.82	5.95	0.01	0.01	0.03	–										
5. Board chairperson tenure	4.77	5.35	–0.05	0.01	–0.07	0.18**	–									
6. CEO gender	0.95	0.23	0.05	0.03	–0.04	0.07	0.11	–								
7. Board chairperson gender	0.93	0.25	0.01	–0.05	–0.07	–0.12*	0.09	0.11	–							
8. Length board meetings	3.95	1.88	0.18**	0.02	0.09	0.09	0.01	0.01	0.03	–						
9. Knowledge and competence	5.04	0.96	0.03	–0.01	–0.07	–0.06	0.01	0.03	0.17**	0.03	–					
10. One woman	0.28	0.45	–0.14*	–0.01	–0.25**	–0.09	–0.04	0.15**	0.11*	–0.01	0.11*	–				
11. Two women	0.27	0.44	0.04	–0.02	0.07	0.03	–0.01	–0.14*	–0.18**	–0.07	–0.19**	–0.38**	–			
12. At least three women (critical mass)	0.19	0.39	0.15**	0.06	0.39**	–0.03	–0.04	–0.02	–0.06	0.07	–0.05	–0.31**	–0.30**	–		
13. Board strategic tasks	5.13	1.40	0.21**	0.08	0.18**	0.15**	–0.08	0.01	–0.02	0.26**	0.18**	0.01	–0.09	0.15**	–	
14. Organizational innovation	4.09	1.30	0.27**	0.05	0.13*	0.04	–0.04	–0.12*	0.10	–0.03	0.05	–0.03	0.03	0.09	0.27**	–

**Correlation is significant at the 0.01 level (2-tailed); *Correlation is significant at the 0.05 level (2-tailed).

TABLE II
Regression analyses (317 firms)

Control and independent variables	Model 1	Model 2	Model 3
	Organizational innovation	Board strategic tasks	Organizational innovation
Firm size	0.23*** (0.06)	0.15** (0.06)	0.20*** (0.06)
Industrial sector	0.19 (0.17)	0.17 (0.17)	0.15 (0.17)
Board size	-0.028 (0.08)	0.01 (0.08)	-0.04 (0.08)
CEO tenure	0.09 (0.11)	0.20* (0.11)	0.04 (0.12)
Board chairperson tenure	-0.06 (0.11)	-0.18 (0.12)	-0.02 (0.12)
CEO gender	-0.93** (0.39)	-0.46 (0.38)	-0.81** (0.39)
Board chairperson gender	-0.74* (0.39)	-0.08 (0.39)	0.76* (0.38)
Length board meetings	-0.51* (0.30)	1.10*** (0.30)	-0.75** (0.30)
Knowledge and competence	-0.06 (0.09)	0.25*** (0.08)	-0.01 (0.08)
One woman	0.28 (0.23)	0.28 (0.23)	0.24 (0.22)
Two women	0.31 (0.24)	0.17 (0.24)	0.28 (0.24)
Critical mass (at least three women)	0.50** (0.27)	0.72*** (0.27)	0.37 (0.27)
Board strategic tasks			0.22*** (0.06)
Adj R^2	0.14	0.15	0.18
F change	2.9***	4.71***	3.81***

Standard errors are in parentheses.

The levels of significance are * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

majority group (Kanter, 1977a, b). Hypothesis 1b is also supported by a regression analysis, which shows that if the size of the minority is two women directors then there are no effects on the level of organizational innovation. Consequently, having two women directors does not make any significant difference. These findings are in line with previous studies that suggest that two women are not always enough to eliminate the evidence of tokenism. It is thus difficult to avoid that they become categorized, stereotyped and ignored by the majority group (Erkut et al., 2008; Konrad et al., 2008). Indeed, being a token has three behavioural consequences: *visibility*, *polarization* and *assimilation*. Visibility im-

plies that tokens find themselves being watched all the time, resulting in perceptions of performance pressure. Polarization implies that the dominant group feels threatened or uncomfortable around tokens, and they therefore heighten their boundaries by exaggerating both the commonality and the differences of tokens. The majority may thus exclude tokens from informal networks where important socialization takes place, and tokens may as a result experience social isolation. Finally, assimilation implies that tokens are forced into stereotypical categories defined by the dominants and even if there are differences among members of the minority group these are not perceived by the majority group. To

tokens, stereotyping may thus result in perceptions of barriers to exerting influence on decisions in the group (Kanter, 1977a, b). For all these reasons, two women will experience difficulties in impacting on the level of firm organizational innovation and their contribution remains inevident in a male-dominated board of directors.

Once the number of women directors increases from a few tokens (one woman, two women) to a consistent minority ('at least three women'), they are able to effectively influence the level of organizational innovation (hypothesis 1c). This finding is in line with previous studies showing that three people constitute a critical mass that can be very influential in a group setting (Asch, 1955; Bond, 2005; Nemeth, 1986; Tanford and Penrod, 1984). Having 'at least three women directors' makes boards more heterogeneous and allows majority-minority interactions and processes to take place thereby enabling the overall board to take high-quality decisions. This view is also supported by previous studies suggesting that heterogeneous groups produce higher quality decisions than homogeneous groups on complex tasks (Amason, 1996; Hoffman, 1959; Hoffman and Maier, 1961), and generate more innovative solutions than homogeneous groups (Amason, 1996). Hoffman (1959) and Hoffman and Maier (1961) recognized that pressures for uniformity are an impediment to good problem solving. Homogeneous groups may hamper innovation because high levels of cohesion produce pressures towards conformity (Miller and Triana, 2009). These studies stress the value of heterogeneity, assuming that persons differing in category will provide diverse approaches to problems and therefore overall performance will improve.

Finally, our findings show that hypothesis 2 is also supported showing that women directors contribute to firm organizational innovation by the intervening (mediating) effects of board strategic tasks. The mediating role of board strategic tasks requires that the critical mass of women directors positively impacts on board strategic tasks, in turn influencing the level of firm organizational innovation. Board strategic tasks require qualitative skills in making proposals and decisions on long-term strategies and main goals and in controlling the following-up of decisions. This result is consistent with previous studies suggesting that women directors have the

potential to contribute to boards by providing unique perspectives on strategic issues (Loden, 1985). Moreover, three or more women are even more likely to express their views freely when they do not agree with the rest of the board. People who think differently consider more viewpoints than merely the one proposed. The consequence is that the quality of decisions tends to be better because more alternatives are considered. Majority and minority groups attempt to influence differential thought processes and together with these, differential problem solving and decision-making processes (Nemeth, 1986). In particular, minority views can stimulate consideration of the non-obvious; they often detect novel solutions (Nemeth and Wachtler, 1983), use more varied strategies and think in more original ways (Nemeth and Kwan, 1985).

The positive effect of board strategic tasks on firm organizational innovation is also in line with other studies. Huse (2005) suggested that the degree of board contribution to innovation is expected to be through its strategic involvement. What is more, board contribution to the strategic process is considered an important factor leading the firm to acquire and retain a competitive advantage in the industry (Andrews, 1981). Therefore, the greater the involvement of board members in board strategic tasks, the higher the level of firm organizational innovation. Finally, only when women directors become a consistent minority ('at least three') do they reach the critical mass that can positively impact on the level of firm organizational innovation. This positive impact is mediated by women directors' involvement in board strategic tasks.

Further reflections on the effects that CEO and chairperson gender have on the level of firm organizational innovation have to be undertaken. Indeed, our study suggests a consistently negative relationship between these variables. This is an interesting finding and is consistent with previous findings suggesting that the gender of the leader may influence women directors' contributions to board decision-making processes (Nielsen and Huse, 2010a). Indeed, Nielsen and Huse (2010a) found a negative association between male CEO and chairperson and women's contributions to board decision-making, suggesting that the gender of the leader may be an important factor in determining the level of influence of women directors. Having a female

leader may make women directors more comfortable in expressing their opinions while at the same time male directors may show more respect and openness towards views raised by women. The negative association between CEO and chairperson gender and innovation is consistent with previous studies. Indeed, it has been found that women managers are likely to be more comfortable with and have a greater preference for change than their male counterparts. As Mainiero (1994) observed in her interviews of 55 high-profile female executives, women managers often have to prove themselves by showing initiative, more entrepreneurial attitude and the ability to solve problems in fresh, innovative ways despite the conservative corporate norms. The notion that women are likely to be more accustomed to change and to innovation, and view it in a positive light, is also supported by Paton and Dempster (2002), who found that significantly more women than male managers strongly identified with situations of change in which they saw themselves as pioneers.

Conclusions and future research directions

By looking at the critical mass of women directors, the article attempts to investigate the contribution of women directors to the level of firm organizational innovation through their involvement in board strategic tasks.

The article offers theoretical and practical insights into the board diversity debate. The first contribution refers to the use of arguments from critical mass theory to investigate women directors' contribution to value creation and board tasks. Shifting the debate from ratios/presence of women directors to the size of the minority group (the number of women directors), enabled us to understand the importance of boardroom processes, dynamics and interactions. We analysed step by step the impact of different sizes of the minority group on the level of firm organizational innovation. The results show that the boards' contribution to the level of firm organizational innovation is higher in boards with 'at least three women': boards where women directors reach critical mass. This study highlights that heterogeneous boards are better than homogeneous male-dominated boards in terms of contribution to firm

organizational innovation. In addition, the article offers a sorting logic for the definition of the critical mass of women directors by addressing the theories, methods and findings. Consistent with previous studies suggesting that critical mass of women directors is reached if there are 'at least three women' (Erkut et al., 2008; Konrad et al., 2008), our study makes further contributions by empirically testing the validity of the construct in the corporate board debate.

The article fills an important gap. While previous studies focused on women directors' *influence* on firm performance, we investigated their *contribution* to the level of firm organizational innovation by answering the question: how do women directors contribute to firm organizational innovation? This aspect has been addressed by focusing attention on the mediating role of board strategic tasks. Indeed, in contrast to previous studies, we not only tested the direct impact of women directors on the level of firm organizational innovation, but we also explored what was happening in the 'black box' of board behaviour, moving from an intermediate step analysis. Considering boards as decision-making groups performing different tasks, we explored women directors' contribution to the level of organizational innovation through their involvement in board strategic tasks. Finally, the article has important implications for corporate boards and policy-makers, suggesting the importance of increasing the number of women in boards of directors to benefit from the diversity in value, perspectives, backgrounds and skills they bring to boardrooms. The size of the minority group of women directors requires particular attention: appointing only one woman director would seem to be inexpedient since, as suggested by tokenism theories, they will be *categorized*, *stereotyped* and *ignored* by the majority group (of male directors). They have to conform to the majority and are unable to make any contributions. The problem remains open if two women directors are appointed. The cut-off point seems to be 'three'. Boards of directors need to have 'at least three women' to enable them to interact and exercise an influence on board working-style, processes and tasks, in turn positively impacting on the level of firm organizational innovation.

Despite these interesting results, there is still much more work that needs to be done and future

investigations need to address other issues to increase the findings that support the presence of a consistent minority of women in corporate boards of directors. While this article focuses on gender differences among board members (*surface-level* diversity), future studies could focus on *deep-level* diversity (Harrison et al., 1998; Nielsen and Huse, 2010b), considering actual differences between women and men directors [e.g. recent studies found that women directors have more diverse backgrounds in the education and non-profit sectors, for example (Bernardi et al., 2009)] and looking at the different backgrounds, levels of knowledge, and expertise of women directors to analyse their impact on firm innovation.

It seems essential to underline that, even if this article highlights the importance of heterogeneity in demographic characteristics, we are not assuming that there is no intra-group heterogeneity. Indeed, women directors are considered a non-homogeneous group. Each woman is unique with different values and characteristics to the rest of the sub-group (Huse et al., 2009; Nielsen and Huse, 2010b). This is in line with Mansbridge (2005), who attaches a caveat to the idea of essentialism inherent in gender quotas. Indeed, gender essentialism – the idea that all women possess some sort of shared characteristics simply because they are women – is a too-frequent side effect of the efforts to achieve equal representation of women. Essentialist understandings of gender are dangerous not only because they mask diversity among women, but also because they treat gender identity as rigid and defined by a limited set of characteristics. In exaggerating differences between males and females, the less powerful female group is often seen as more homogeneous. However, this emphasis on gender differences tends to ignore differences of class, race, age, marital status and social circumstances among women. In order to fill this gap, future research could analyse deep-level diversity and not only the diversity in demographic characteristics (such as gender). Our article focuses on one type of firm innovation, namely, organizational innovation; however, there are other types of innovations within firms. Further investigations could explore the contribution of the critical mass of women directors on firm product and process innovations that relate more to technical issues, thus requiring specific knowledge and expertise. Another interesting area of research could be the analysis of

the effect of CEO or chairperson gender on firm innovation. Indeed, our results suggest that CEO and chairperson gender influences the level of organizational innovation. This in itself is a very interesting subject of study. Furthermore, while we consider women directors as the most important minority in boards of directors, it would be interesting to include and analyse the contrast with other minorities (e.g. whether being a minority or being a women minority is the main factor of influence on innovation). Finally, we mainly focus on the Norwegian context, and hence contingency aspects have to be included. In fact, Norway is different from other countries because it has the highest ratios of women directors, mainly due to the Norwegian quota law. However, it may be useful to implement cross-country analyses to investigate women directors' contributions to innovation in different political and institutional contexts.

Acknowledgment

We appreciate the support from Research Council of Norway and Innovation Norway for collecting and analyzing the data used in this study.

Note

¹ The same questions were sent out to different respondents (Chairperson, board members etc.). Most of the questions were identical, and the difference in number of questions (265 for CEOs, 235 for Chairpersons and 215 for other Board members) depended on the fact that we asked for aspects specifically related to the CEO in the CEO questionnaire, etc. A key characteristic of this survey is having multiple respondents to capture differences in perceptions on the same phenomena.

References

- Amabile, T. M.: 1988, 'A Model of Creativity and Innovation in Organizations', in N. M. Staw and L. L. Cummings (eds.), *Research in Organizational Behaviour* (JAI Press, Greenwich, CT), pp. 123–167.
- Amason, A. C.: 1996, 'Distinguishing the Effects of Functional and Dysfunctional Conflict on Strategic

- Decision Making: Resolving a Paradox for Top Management Teams', *Academy of Management Journal* **39**(1), 123–148.
- Andrews, K.: 1981, 'Corporate Strategy as a Vital Function of the Board', *Harvard Business Review* **59**(11), 174–184.
- Arfken, D. E., S. L. Bellar and M. M. Helms: 2004, 'The Ultimate Glass Ceiling Revisited: The Presence of Women on Corporate Boards', *Journal of Business Ethics* **50**(2), 177–186.
- Asch, S. E.: 1951, 'Effects of Group Pressure upon the Modification and Distortion of Judgement', in H. Guetzkow (ed.), *Groups, Leadership and Men* (Carnegie Press, Pittsburgh, PA), pp. 177–190.
- Asch, S. E.: 1955, 'Opinions and Social Pressure', *Scientific American* **193**(5), 31–35.
- Bantel, K. A. and S. E. Jackson: 1989, 'Top Management and Innovations in Banking: Does the Composition of the Top Team Make a Difference?', *Strategic Management Journal* **10**(2), 107–124.
- Baron, R. M. and D. A. Kenny: 1986, 'The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic and Statistical Considerations', *Journal of Personality and Social Psychology* **51**(6), 1173–1182.
- Baysinger, B. D. and R. E. Hoskisson: 1990, 'The Composition of Boards of Directors and Strategic Control: Effects on Corporate Strategy', *Academy of Management Review* **15**(1), 72–87.
- Baysinger, B. D., R. D. Kosnik and T. Turk: 1991, 'Effects of Board and Ownership Structure on Corporate R&D Strategy', *Academy of Management Journal* **34**(1), 205–214.
- Bear, S., N. Rahman and C. Post: 2010, 'The Impact of Board Diversity and Gender Composition on Corporate Social Responsibility and Firm Reputation', *Journal of Business Ethics* **97**(2), 207–222.
- Bernardi, R., S. Bosco and V. L. Columb: 2009, 'Does Female Representation on Boards of Directors Associate with the 'Most Ethical Companies' List?', *Corporate Reputation Review* **12**(3), 270–280.
- Bilimoria, D.: 2000, 'Building the Business for Women Directors', in R. J. Burke and M. C. Mattis (eds.), *Women on Corporate Boards: International Challenges and Opportunities* (Kluwer Academic Publishers, Dordrecht), pp. 25–40.
- Bilimoria, D. and M. Huse: 1997, 'A Qualitative Comparison of the Boardroom Experiences of U.S. and Norwegian Women Corporate Directors', *International Review of Women and Leadership* **3**(2), 63–73.
- Bilimoria, D. and J. V. Wheeler: 2000, 'Women Corporate Directors: Current Research and Future Directions', in M. Davidsson and R. Burke (eds.), *Women in Management: Current Research Issues* (Paul Chapman, London), pp. 138–163.
- Blackman, D. and G. Davison: 2004, 'The Role of Mental Models in Sustaining Innovative Teams', in *Proceedings of the Fifth CINET Conference*, Sydney, Australia, 22–25 September.
- Bond, R.: 2005, 'Group Size and Conformity', *Group Processes and Intergroup Relations* **8**(4), 331–354.
- Burke, R.: 1997, 'Women on Corporate Boards of Directors: A Needed Resource', *Journal of Business Ethics* **16**(9), 37–43.
- Burns, T. and G. Stalker: 1961, *The Management of Innovation* (Tavistock, London).
- Campbell, K. and A. Mínguez-Vera: 2008, 'Gender Diversity in the Boardroom and Firm Financial Performance', *Journal of Business Ethics* **83**(3), 435–451.
- Carver, J.: 2002, *On Board Leadership* (Jossey-Bass, San Francisco, CA).
- Cassell, C.: 2000, 'Managing Diversity in the New Millennium', *Personnel Review* **29**(3), 268–274.
- Caves, B. E. and P. Ghemawat: 1992, 'Identifying Mobility Barriers', *Strategic Management Journal* **13**(1), 1–12.
- Childs, S. and M. L. Krook: 2008, 'Critical Mass Theory and Women's Political Representation', *Political Studies* **56**(3), 725–736.
- Conway, J. M. and A. I. Huffcutt: 2003, 'A Review and Evaluation of Exploratory Factor Analysis Practices in Organizational Research', *Organizational Research Methods* **6**(2), 147–168.
- Daft, R. L.: 1978, 'A Dual-Core Model of Organizational Innovation', *Academy of Management Journal* **21**(2), 193–210.
- Daily, C. M. and D. R. Dalton: 2003, 'Women in the Boardroom: A Business Imperative', *Journal of Business Strategy* **24**(5), 8–10.
- Damanpour, F.: 1996, 'Organizational Complexity and Innovation: Developing and Testing Multiple Contingency Models', *Management Science* **42**(5), 693–716.
- Damanpour, F. and W. M. Evan: 1984, 'Organizational Innovation and Performance: The Problem of Organizational Lag', *Administrative Science Quarterly* **29**(3), 392–402.
- Eagly, A. H.: 2005, 'Achieving Relational Authenticity in Leadership: Does Gender Matter?', *Leadership Quarterly* **16**(3), 459–474.
- Erhardt, N. L., J. D. Werbel and C. B. Schrader: 2003, 'Board of Director Diversity and Firm Financial Performance', *Corporate Governance: An International Review* **11**(2), 102–111.
- Erkut, S., V. W. Kramer and A. M. Konrad: 2008, 'Critical Mass: Does the Number of Women on a

- Corporate Board Make a Difference?', in S. Vinnicombe, V. Singh, R. Burke, D. Bilimoria and M. Huse (eds.), *Women on Corporate Boards of Directors: International Research and Practice* (Edward Elgar, London), pp. 222–232.
- Etzkowitz, H., C. Kemelgor, M. Neuschatz, B. Uzzi and J. Alonzo: 1994, 'The Paradox of Critical Mass for Women in Science', *Science* **266**(5182), 51–54.
- Finkelstein, S. and D. C. Hambrick: 1996, *Strategic Leadership: Top Executives and Their Effects on Organizations* (West, St. Paul).
- Fondas, N. and S. Salsalos: 2000, 'A Different Voice in the Boardroom: How the Presence of Women Directors Affects Board Influence Over Management', *Global Focus* **12**(2), 13–22.
- Forbes, D. P. and F. J. Milliken: 1999, 'Cognition and Corporate Governance: Understanding Boards of Directors as Strategic Decision-Making Groups', *Academy of Management Review* **24**(3), 489–506.
- Franko, L. G.: 1989, 'Global Corporate Competition: Who's Winning, Who's Losing and the R&D Factor as One Reason Why', *Strategic Management Journal* **10**(5), 449–474.
- Golden, B. R. and E. J. Zajac: 2001, 'When Will Boards Influence Strategy? Inclination \times Power = Strategic Change', *Strategic Management Journal* **22**(12), 1087–1111.
- Granovetter, M.: 1978, 'Threshold Models of Collective Behavior', *American Journal of Sociology* **83**(6), 1420–1443.
- Grey, S.: 2002, 'Does Size Matter? Critical Mass and New Zealand's Women MPs', *Parliamentary Affairs* **55**(1), 19–29.
- Grey, S.: 2006, 'New Zealand', in M. Sawer, M. Tremblay and L. Trimble (eds.), *Representing Women in Parliament: A Comparative Study* (Routledge, New York), pp. 134–151.
- Hair, J. F., R. E. Anderson, R. L. Tatham and W. C. Black: 1998, *Multivariate Data Analysis* (Prentice Hall, Englewood Cliffs, NJ).
- Hansen, G. S. and C. W. L. Hill: 1991, 'Are Institutional Investors Myopic? A Time-Series Study of Four Technology-Driven Industries', *Strategy Management Journal* **12**(1), 1–16.
- Harrison, D. A., K. H. Price and M. P. Bell: 1998, 'Beyond Relational Demography: Time and the Effects of Surface and Deep-Level Diversity on Work Group Cohesion', *Academy of Management Journal* **41**(1), 96–107.
- Hermalin, B. and M. Weisbach: 2003, 'Boards of Directors as an Endogenously Determined Institution: A Survey of the Economic Literature', *Economic Policy Review* **9**(1), 7–26.
- Hill, C. W. L. and S. A. Snell: 1988, 'External Control, Corporate Strategy, and Firm Performance in Research-Intensive Industries', *Strategic Management Journal* **9**(6), 577–590.
- Hillman, A. J. and A. A. Cannella: 2007, 'Organizational Predictors of Women on Corporate Boards', *Academy of Management Journal* **50**(4), 941–952.
- Hillman, A. J., A. A. Cannella and I. C. Harris: 2002, 'Women and Racial Minorities in Boardroom: How Do Directors Differ?', *Journal of Management* **28**(6), 747–763.
- Hitt, M. A., R. E. Hoskisson, R. A. Johnson and D. D. Moesel: 1996, 'The Market for Corporate Control and Firm Innovation', *Academy of Management Journal* **39**(5), 1084–1119.
- Hitt, M. A. and B. B. Tyler: 1991, 'Strategic Decision Models: Integrating Different Perspectives', *Strategic Management Journal* **12**(5), 327–351.
- Hodgkinson, G. P.: 2003, 'The Interface of Cognitive and Industrial, Work and Organizational Psychology', *Journal of Occupational and Organizational Psychology* **76**(1), 1–24.
- Hoffman, L. R.: 1959, 'Homogeneity of Member Personality and Its Effect on Group Problem Solving', *Journal of Abnormal and Social Psychology* **58**(1), 27–32.
- Hoffman, L. R. and N. R. F. Maier: 1961, 'Quality and Acceptance of Problem Solutions by Members of Homogeneous and Heterogeneous Groups', *Journal of Abnormal and Social Psychology* **62**(2), 401–407.
- Huse, M.: 2005, 'Accountability and Creating Accountability: A Framework for Exploring Behavioural Perspectives of Corporate Governance', *British Journal of Management* **16**(1), 65–79.
- Huse, M.: 2007, *Boards, Governance and Value Creation: The Human Side of Corporate Governance* (Cambridge University Press, Cambridge).
- Huse, M.: 2009, *The Value Creating Board: Corporate Governance and Organizational Behaviour* (Routledge, London/New York).
- Huse, M., A. Minichilli and M. Shoning: 2005, 'Corporate Boards as Assets for Operating in New Europe. The Value of Process-Oriented Boardroom Dynamics', *Organizational Dynamics* **34**(3), 285–297.
- Huse, M., S. T. Nielsen and I. M. Hagen: 2009, 'Women and Employee Elected Board Members, and Their Contributions to Board Control Tasks', *Journal of Business Ethics* **89**(4), 581–597.
- Huse, M. and A. G. Solberg: 2006, 'Gender Related Boardroom Dynamics: How Women Make and can Make Contributions on Corporate Boards', *Women in Management Review* **21**(2), 113–130.
- Janis, I. L.: 1982, *Groupthink* (Houghton-Mifflin, Boston).

- Kanter, R. M.: 1977a, *Men and Women of the Corporation* (Basic Books, New York).
- Kanter, R. M.: 1977b, 'Some Effects of Proportions on Group Life', *American Journal of Sociology* **82**(5), 965–990.
- Kanter, R. M.: 1983, *The Change Masters* (Simon and Schuster, New York).
- Kanter, R. M.: 1987, 'Men and Women of the Corporation Revisited', *Management Review* **76**(3), 14–16.
- Kimberly, J. R. and M. J. Evanisko: 1981, 'Organizational Innovation: The Influence of Individual, Organizational, and Contextual Factors on Hospital Adoption of Technological and Administrative Innovations', *The Academy of Management Journal* **24**(4), 689–713.
- Konrad, A. M., V. W. Kramer and S. Erkut: 2008, 'Critical Mass: The Impact of Three or More Women on Corporate Boards', *Organizational Dynamics* **37**(2), 145–164.
- Latané, B.: 1981, 'The Psychology of Social Impact', *American Psychologist* **36**(4), 343–356.
- Loden, M.: 1985, *Feminine Leadership or How to Succeed in Business Without Being One of the Boys* (Times Books, New York).
- Maass, A. and R. D. Clark: 1984, 'Hidden Impact of Minorities: Fifteen Years of Minority Influence Research', *Psychological Bulletin* **95**(3), 428–450.
- Mainiero, L. A.: 1994, 'On Breaking the Glass Ceiling: The Political Seasoning of Powerful Women Executives', *Organizational Dynamics* **22**(4), 5–20.
- Mairesse, J. and P. Mohnen: 2001, 'To be or Not to be Innovative: An Exercise in Measurement', *STI Review* **27**(1), 103–128.
- Mansbridge, J.: 2005, 'Quota Problems: Combating the Dangers of Essentialism', *Politics and Gender* **1**(4), 622–638.
- McNulty, T. and A. Pettigrew: 1999, 'Strategists on the Board', *Organization Studies* **20**(1), 47–74.
- Mezias, S. J. and M. A. Glynn: 1993, 'The Three Faces of Corporate Renewal: Institution, Revolution, and Evolution', *Strategic Management Journal* **14**(2), 77–101.
- Miller, T. and M. C. Triana: 2009, 'Demographic Diversity in the Boardroom: Mediators of the Board Diversity–Firm Performance Relationship', *Journal of Management Studies* **46**(5), 755–786.
- Morbey, G. K.: 1988, 'R&D: Its Relationship to Company Performance', *Journal of Product Innovation Management* **5**(3), 191–200.
- Nemeth, C. J.: 1986, 'Differential Contributions of Majority and Minority Influence', *Psychological Review* **93**(1), 23–32.
- Nemeth, C. and J. Kwan: 1985, 'Originality of Word Associations as a Function of Majority vs. Minority Influence', *Social Psychology Quarterly* **48**(3), 277–282.
- Nemeth, C. J. and J. Wachtler: 1983, 'Creative Problem Solving as a Result of Majority and Minority Influence', *European Journal of Social Psychology* **13**(1), 45–55.
- Nielsen, S. and M. Huse: 2010a, 'The Contribution of Women on Boards of Directors: Going Beyond the Surface', *Corporate Governance: An International Review* **18**(2), 136–148.
- Nielsen, S. and M. Huse: 2010b, 'Women Directors' Contribution to Board Decision-Making and Strategic Involvement: The Role of Equality Perception', *European Management Review* **7**(1), 16–29.
- Nystrom, H.: 1980, *Creativity and Innovation* (Wiley, New York).
- Paton, R. and L. Dempster: 2002, 'Managing Change from a Gender Perspective', *European Management Journal* **20**(5), 539–548.
- Powell, G. N.: 1993, *Women and Men in Management* (Newbury, Park, CA).
- Pugliese, A., P. Bezemer, A. Zattoni, M. Huse, F. A. J. Van den Bosch and H. W. H. W. Volberda: 2009, 'Board of Directors' Contribution to Strategy: A Literature Review and Research Agenda', *Corporate Governance: An International Review* **17**(3), 292–306.
- Rasmussen, J. L. and M. Huse: 2011, 'Corporate Governance in Norway: Women Directors and Employee Elected Board Members', in C. Mallin (ed.), *International Corporate Governance* (Elgar, Cheltenham), pp. 121–146.
- Ravasi, D. and A. Zattoni: 2006, 'Exploring the Political Side of Board Involvement in Strategy: A Study of Mixed-Ownership Institutions', *Journal of Management Studies* **48**(3), 1672–1704.
- Robinson, G. and K. Dechant: 1997, 'Building a Business Case for Diversity', *Academy of Management Executive* **11**(3), 21–25.
- Scherer, F. M.: 1984, *Innovation and Growth, Schumpeterian Perspectives* (MIT Press, Massachusetts).
- Selby, C. C.: 2000, 'From Male Locker Room to Co-ed Board Room: A Twenty-Five Year Perspective', in R. Burke and M. C. Mattis (eds.), *Women on Corporate Boards of Directors: International Challenges and Opportunities* (Kluwer, Dordrecht), pp. 239–251.
- Singh, V., S. Vinnicombe and P. Johnson: 2001, 'Women Directors on Top UK Boards', *Corporate Governance: An International Review* **9**(3), 206–216.
- Singh, V., S. Vinnicombe and S. Terjesen: 2006, 'Women Advancing onto the Corporate Board', in D. Bilimoria and K. S. Piderit (eds.), *Handbook on Women in Business and Management* (Edward Elgar, Cheltenham), pp. 304–329.

- Stiles, P. and B. Taylor: 2001, *Boards at Work: How Directors View Their Roles and Responsibilities* (Oxford University Press, Oxford).
- Tanford, S. and S. Penrod: 1984, 'Social Influence Model: A Formal Integration of Research on Majority and Minority Influence Processes', *Psychological Bulletin* **95**(2), 189–225.
- Teece, D., G. Pisano and A. Shuen: 1997, 'Dynamic Capabilities and Strategic Management', *Strategic Management Journal* **18**(7), 509–533.
- Terjesen, S., R. Sealy and V. Singh: 2009, 'Women Directors on Corporate Boards: A Review and Research Agenda', *Corporate Governance: An International Review* **17**(3), 320–337.
- Watson, W. E., K. Kumar and L. K. Michaelson: 1993, 'Cultural Diversity's Impact on Interaction Process and Performance: Comparing Homogeneous and Diverse Task Groups', *Academy of Management Journal* **36**(3), 590–602.
- Westphal, J. D. and L. P. Milton: 2000, 'How Experience and Network Ties Affect the Influence of Demographic Minorities on Corporate Boards', *Administrative Science Quarterly* **45**(2), 336–398.
- Williams, K. Y. and C. A. O'Reilly: 1998, 'Demography and Diversity in Organizations: A Review of 40 Years of Research', in B. M. Staw and L. L. Cummings (eds.), *Research in Organizational Behavior* (JAI Press, Greenwich), pp. 77–149.
- Zahra, S. A.: 1996, 'Governance, Ownership, and Corporate Entrepreneurship: The Moderating Impact of Industry', *Academy of Management Journal* **39**(6), 1713–1735.
- Zahra, S. A. and D. M. Garvis: 2000, 'International Corporate Entrepreneurship and Firm Performance: The Moderating Effect of International Environmental Hostility', *Journal of Business Venturing* **15**(5–6), 469–492.
- Zahra, S. A., D. O. Neubaum and M. Huse: 2000, 'Entrepreneurship in Medium-Size Companies: Exploring the Effects of Ownership and Governance Systems', *Journal of Management* **26**(5), 947–976.
- Zahra, S. A. and J. A. Pearce: 1989, 'Boards of Directors and Corporate Performance: A Review and Integrative Model', *Journal of Management* **15**(2), 291–334.
- Zahra, S. A. and J. A. Pearce: 1990, 'Determinants of Board of Directors' Strategic Involvement', *European Management Journal* **8**(2), 164–173.
- Zahra, S. A. and W. W. Stanton: 1988, 'The Implications of Board of Directors' Composition for Corporate Strategy and Value', *International Journal of Management* **5**(2), 229–236.
- Zaltman, G., R. Duncan and J. Holbek: 1973, *Innovations and Organizations* (Wiley, New York).

Mariateresa Torchia

Department of Business Studies,
University of Rome "Tor Vergata",
Via Columbia, 2, 00133 Rome, Italy
E-mail: mariateresa.torchia@uniroma2.it

Andrea Calabrò

Department of Business Studies,
University of Rome "Tor Vergata",
Via Columbia, 2, 00133 Rome, Italy
E-mail: andrea.calabro@uniroma2.it

Morten Huse

BI Norwegian School of Management,
Oslo, Norway
E-mail: morten.huse@bi.no

Copyright of Journal of Business Ethics is the property of Springer Science & Business Media B.V. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.