

CRITICAL MASS THEORY AND WOMEN DIRECTORS' CONTRIBUTION TO BOARD STRATEGIC TASKS

*Mariateresa Torchia**#, *Andrea Calabrò*** , *Morten Huse****, *Marina Brogi*****

Abstract

In this article we offer an empirical test of the critical mass arguments in the discussion of women on corporate boards. The literature in the women on corporate board debate concludes that there must be at least three women on a board before the women really make a difference. These arguments are frequently used in the public debate about the understanding the impact of women on corporate boards, but they have never really been empirically tested on a large sample. In this paper we use a sample of 317 Norwegian firms. Our dependent variable is board strategic involvement. The findings support the critical mass arguments. This study offers useful insights to policy-makers interested in defining legislative measures mandating the presence of women directors in corporate boards by showing that “at least three women” may be particularly beneficial in terms of contribution to board strategic tasks.

Keywords: corporate governance, critical mass, women directors, board strategic tasks

*PhD student in Management and Governance, University of Rome “Tor Vergata”, Department of Business Studies, Via Columbia, 2 – 00133, Rome

Tel: +39 06 72595402; +39 333 4421680

Fax: +39 06 72595804

Email: mariateresa.torchia@uniroma2.it

#corresponding author

**PhD in Management and Governance, University of Rome “Tor Vergata”

***President of the European Academy of Management; Professor of Organization and Management, Norwegian School of Management BI, Oslo

**** Professor of Capital Markets, University of Rome “La Sapienza”

1. Introduction

The issue of women in corporate boards has internationally gained considerable interest in practice as well as in the corporate governance literature. Many authors argued that women directors on corporate boards offer many contributions (Bilimoria, 1995; Bilimoria and Huse, 1997) such as new ideas, more communication and transformation in the management style (Rosener, 1990; Milliken and Martins, 1996; Daily, Certo and Dalton, 1999), and lead to an increase of firm performance (Erhardt, Werbel and Schrader, 2003; Farrell and Hersch, 2005).

Several studies identify significant ethical and economic reasons for the appointment of more women in the corporate boardrooms. The “normative case” for more women and minorities suggests that it is unethical for groups of people to be denied access to societal power solely as a result of individual traits, unrelated to ability, such as their gender, race, religion (Keasey, Thompson and Wright, 1997; Carver, 2002). Other researchers make a “business case” for more women on corporate boards. The main argument is that women represent a diversity that is needed in the boardrooms (Milliken and Martin, 1996; Huse and Solberg, 2006). Another argument is about the use of knowledge. If a segment of society talent is systematically excluded from board directorships not because of competence, but due to gender, this leads to suboptimal company boards (Burke, 1999; Cassell, 2000; Carver, 2002).

Previous studies (Huse, 2005; Nielsen and Huse, 2010; Singh, Vinnicombe and Terjesen, 2007) show that there are two sets of benefits deriving from board diversity: one relating to the boardroom; the other to the company. Diversity should lead to more effective boardroom behaviour, a better understanding of the marketplace and the workforce and better decision-making. Corporate performance, instead, is impacted

by board diversity in terms of enhancing the reputation of the company, bringing legitimacy, attracting funds from ethical investors and inspiring women at lower management tiers in the organization.

However, we still need to improve our understanding of how women directors behave in boards as workgroups, and how their behaviour is different when they are alone among a large group of male directors, or in a more qualified minority. The article contributes to the existing debate using the critical mass perspective to analyse the contribution of women directors to board strategic tasks.

According to previous studies on group dynamics we consider boards as workgroups performing many tasks (Bettenhausen, 1991; Forbes and Milliken, 1999; Huse, 2005). Moreover, we develop a model relating board member characteristics to board strategic tasks (Zahra and Pearce, 1989; Forbes and Milliken, 1999; Huse, 2005) and test the validity of the critical mass arguments examining the impact of “at-least-three” women directors on board strategic tasks.

Previous studies have introduced the theoretical implications of the critical mass perspective in corporate governance settings (Kanter, 1977a; 1977b; 1987; Greed, 2000; Lortie-Lussier and Rinfret, 2002; Erkut et al., 2008; Childs and Krook, 2008). This article adds to existing research by proposing and testing an operational application of critical mass in the corporate board. Hence, testing the validity of the critical mass perspective on women directors (Erkut et al., 2008), advances studies of corporate boards. Our test was conducted on a sample of 317 Norwegian firms. A Norwegian sample is a necessity and, at the same time, a great opportunity. A necessity, because Norway offers researchers a considerable number of companies in which women are a qualified minority, also because it was the first mover in the introduction of a quota laws mandating a minimum 40% representation of women on the boards of publicly tradable companies. In addition to contributing to the long-lasting academic debate on women of boards (over 400 articles recently reviewed by Terjesen et al., 2009) insights, "lessons", from Norway may be of great interest for policy-makers and practitioners from other countries which more recently introduced quota laws (such as Spain) are in the process of passing quota laws (such as France and Italy) or are considering them (such as the UK).

The article is organized as follows: in the next section we discuss the main arguments in the critical mass perspectives, highlighting its importance and challenges for the debate on women on corporate boards, and present our research model and hypothesis. Methods (sample, data and variable operationalization) are presented in section three. Results and conclusions follow in sections four and five.

2. Critical mass perspective and women directors

There are numerous arguments supporting the need for more women on corporate boards. Some focus on ethical issues (Keasey et al., 1997; Carver, 2002) while others highlight the economic rationale (Burke, 1999; Cassell, 2000; Carver, 2002; Huse, 2005; Singh et al., 2007). While there is a general consensus in favour of more women on boards in theory, in practice, the number of women on corporate boards around the world is still extremely limited (Bilimoria and Piderit, 1994; Conyon and Mallin, 1997; Singh, Vinnicombe and Johnson, 2001; Thomas, 2001; Daily and Dalton, 2003; Singh and Vinnicombe, 2004; European Commission, 2010).

Studies on women directors raise the following questions: how many women are there? Are they able to express their capabilities, personalities, feelings, and behaviours? How many women must be introduced in the board to make a difference? One, two, three or more? And which are the effects of different women minorities in the boardroom? When do women directors behave effectively acting as a qualified minority? These and other questions still remain unanswered. We argue that the critical mass theory (Kanter, 1977a; 1977b; 1987; Greed, 2000; Lortie-Lussier and Rinfret, 2002; Childs and Krook, 2008; Erkut et. al., 2008) may improve our understanding of the contribution of women to corporate boards.

Starting from group dynamics theories and explaining minority and majority influences on decision-making in groups, we look at women on board of directors as a minority subgroup within a larger group. For decades scholars have studied the effects of majority and minority influence in small groups, beginning with Asch, experiments on conformity to majority influence (Asch, 1951; 1955). Studies on the influence of a majority within a group show that it exerts more influence than minorities (Kalven and Zeisel, 1966; Tanford and Penrod, 1984). Minorities are viewed negatively, sometimes with downright derision (Nemeth and Wachtler, 1983; Maass and Clark, 1984). Majorities, instead, have more impact and

exert more influence, due to their greater numbers (Moscovici, 1980). Some authors, from a different angle, studied the effects of minorities on a majority (Nemeth and Wachtler, 1974; Moscovici, 1980; Mugny, 1982) and show that a minority can in any case influence a majority. Latané (1981) argues that the amount of influence produced by either a majority or a minority will be the multiplicative function of strength, immediacy, and number of its members. Therefore subgroup size seems to have great importance.

The critical mass perspective or theory (Kanter, 1977a; 1977b; 1987; Greed, 2000; Lortie-Lussier and Rinfret, 2002; Erkut et al., 2008; Childs and Krook, 2008) falls within this second strand of literature. It derives from nuclear physics and its application to social science can be traced to Granovetter's analysis of collective behaviour (Granovetter, 1978). Applied to social science, its main contribution is to suggest that the nature of group interactions depends upon minority group size. In particular, shifting the size of a minority group also changes the impact on the larger group, moreover, that impact becomes more pronounced when the size of the minority group reaches a certain threshold, or a critical mass. In particular when a certain threshold is reached the degree of a subgroup's influence grows. Because, as suggested by the theory, there is a qualitative change in the nature of group interactions, as the minority starts to assert itself and thereby transforms the institution's culture, norms and values (Norris and Lovenduski, 2001).

Kanter analysed experiences of women who form small minorities in corporate spheres. She observed that the relative numbers of socially and culturally different people in a group are critical in shaping interaction dynamics in group life (Kanter, 1977a; 1977b). In theorising these interactions she identified four types of groups with different majority-minority ratios: (1) uniform, with no significant minority; (2) skewed, with a minority of perhaps up to 15.0%; (3) tilted, with perhaps a 15.0 – 40.0% minority; and (4) balanced, perhaps with a minority of more than 40.0% (Kanter, 1977a; 1977b). With higher relative numbers, minority members are potentially allies, can form a coalition and can affect the culture of the group. Stemming from these considerations, other scholars deduced the concept of "critical mass" (Oliver, Marwell and Teixeira, 1985; Greed, 2000; Lortie-Lussier and Rinfret, 2002; Childs and Krook, 2008).

Over the last twenty years, the critical mass perspective or theory has gained wide currency among politicians, the media and international organizations as a justification for measures to bring more women into political offices (Grey, 2006). Moreover, several scholars have applied Kanter's work to the legislative and political setting. Saint-Germain (1989), for example, found that significant gender differences in the introduction of traditional women's interest measures were evident once the percentage of women reached approximately 15.0%. Thomas (1991; 1994) presented evidence that gender differences in the prioritizing of legislation involving women, children, and families were least marked in States with low percentages of women, and most evident in States with high percentages of women. Grey (2002) found that women in politics were more actively involved in debates regarding feminist issues as they approached a critical mass of 15.0%.

Despite the evident appeal of critical mass theory and its widespread application to legislative and political research, there are few studies that draw upon the critical mass theory to explain the contribution of women on corporate boards (Erkut et al., 2008). These studies apply the theory and analyse cases without testing the validity of its use in the corporate governance domain. Also a recent study on women on corporate boards (Terjesen et al., 2009) points to the critical mass perspective as a rapidly-growing research framework in the analysis on women and board related issues. Especially, they identify three perspectives and dimensions in the study of women on corporate boards (Terjesen et al., 2009). The critical mass is identified in the impact perspective and the analysis with this approach is at various levels (micro, meso, macro). Referring to boards of directors the analysis is at a meso-level (Terjesen et al., 2009). This recent contribution addresses better the actual need of understanding this issue and its related dynamics.

Some immediate reflections follow: which is the critical mass? What number is likely to constitute a critical mass of women directors? While critical mass theory predicts that at a certain threshold the degree of the minority group's influence grows, the theory does not suggest what number is likely to constitute a critical mass. In order to understand how many women directors constitute a critical mass we focus our attention on the studies of Asch (1951; 1955). Asch shows that when an individual is faced with the opinion of three unanimous people, he/she is likely to conform to the unanimous "majority" opinion.

Moreover the effectiveness of the group pressure markedly increases when a group size is three (Asch, 1955). Asch concluded that a minority size of three is sufficient for the full impact of the group to be felt. Accordingly also other studies suggest that three people constitute a critical mass that can be very influential in a group setting (Tanford and Penrod, 1984; Bond, 2005; Nemeth, 1986). Moreover, previous studies on women on corporate boards (Erkut et al., 2008) suggested that the presence of three or more women can create a critical mass which enables women to substantially influence the content and process of board discussions. Therefore, according to these studies critical mass is reached when there are “at-least-three” women directors, and our objective is to test three as the threshold for the impact of women directors on board strategic tasks. We focus on board tasks because we are interested in analysing the contribution of board members. Assuming that board tasks mediate the relationship between board member characteristics and firm level outcome (Zahra and Pearce, 1989; Forbes and Milliken, 1999; Nielsen, 2009), we postulate that boards including “at-least-three-women” are different from those with less than three women in terms of involvement in strategy and we therefore test the effect of critical mass (at least three women directors) on board strategic tasks.

2.1 Critical mass of women directors and board strategic tasks

Many studies on boards of directors have identified different sets of board tasks (Zahra and Pearce, 1989; Stiles and Taylor, 2001). Board tasks are usually grouped into strategic tasks, service tasks and control tasks (Zahra and Pearce, 1989; Stiles and Taylor, 2001; Huse, 2007).

The article focuses on strategic tasks in relation to women directors for many reasons. Board strategic tasks are better suited to our analysis because they i) require considerable interactions among directors on future scenarios, ii) necessitate great director attention to the various elements of the strategic process, the board’s strategic involvement covers corporate mission development, strategy conception and formulation, and strategy implementation (Zahra and Pearce, 1989), iii) are widely recognised as one of the major tasks of the board (Andrews 1981; Baysinger and Hoskisson, 1990; Zahra and Pearce, 1989; Finkelstein and Hambrick, 1996; McNulty and Pettigrew, 1999; Golden and Zajac, 2001; Huse, 2007) and iv) entail a complex and multidimensional concept (Ravasi and Zattoni, 2006) defined by scholars in several ways (Zahra and Pearce, 1989; Stiles and Taylor, 2001; Ruigrok, Peck and Tacheva, 2007; Schmidt and Bauer, 2006).

We examine the impact of the critical mass of women directors on board involvement in strategic tasks which require board members to be involved in the initiation and implementation phases of the strategic process (Zahra and Pearce, 1989; Huse, 2005). Following this reasoning we argue that board strategic tasks are the most representative tasks for testing the validity of the critical mass theory in board of directors, because effectiveness of both minority groups and the boards as teams are based on interactions and behavioural-related aspects. We investigate this relation, because the literature on management teams suggests that groups composed by demographically dissimilar members have the potential to generate original approaches to intellectual and decision-making tasks (McGrath, 1984; Williams and O’Reilly, 1998). Moreover, minorities (such as women directors) can stimulate other board members to consider a wider range of potential solutions (Nemeth, 1986). For example, when the majority of group members share a particular background, influence exerted by a director with a different background can lead board members to change or expand the criteria used to evaluate strategic alternatives (Hitt and Tyler, 1991). This pattern of results may suggest that minority directors (as women) may contribute to board decision-making by providing unique perspectives on strategic issues and by prompting divergent thinking among majority directors (Westphal and Milton, 2000). Therefore, according to this perspective achieving a critical number of women directors is desirable not only because it influences the nature of group interactions but also because it increases the diversity of viewpoints within a group (Chaney, 2006). For this reasoning, we formulate the following hypothesis:

There is a positive relationship between a critical mass of women directors (at least three women) and the involvement of boards in strategic tasks.

3. Methods

3.1 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. Data were gathered from a questionnaire sent out to 2954 firms grouped in several sets with different characteristics: firms listed on the Oslo Stock Exchange; unlisted publicly limited firms; private joint stock companies with more than 100 employees; private joint stock companies with between 50 to 100 employees and a total turnover of more than 5 million NOK; smaller private joint stock companies with less than 50 employees and total turnover exceeding 50 million NOK. The survey used a questionnaire of 265 questions to the CEOs, 235 to the chairperson and 215 to the other board members.

The Norwegian database was used for many different reasons. First, it provides more observations compared with similar studies based on the survey method. Second, in studies on women directors there are no significant surveys which try to focus on board dynamics and board member characteristics. Moreover, the construction of this database allows us to better understand what happens inside the board of directors by analyzing aspects related to board tasks. Finally, Norway has the highest ratio of women directors in Europe and it is interesting to analyze Norwegian data because in 2003 the Norwegian government issued a legislative proposal aimed at achieving an overall target of 40% female representation on the boards. The law became effective in 2005 and offered two years for transition time. The deadline was January 2008. Our analysis does not take the full effect of the law because we analyze data from 2005/2006 but it may be the basis for future comparative investigations. The targeted women ratio in the Norwegian companies was met in 2008.

We tested our hypotheses on a sample using CEOs responses, which showed an overall response rate of 33.0%. We selected firm in which women directors don't represent a minority. We built a "women ratio" (number of women directors/total number of board members) and excluded the boards with a women ratio higher than 49.0%. 317 firms are included in the final sample. Thus our sample included firms with a board size ranging from 6 to 12 board members.

The responding firms have, on average, 437 employees (median, 135). The firm age is on average 55.6 (median, 41). 39% of the firms are in the high-tech industry. Board size on average is 7.12 and the average of women directors is 1.5. 26.0% of firms have 0 women directors in their boards, 28.0% have 1 woman, 27.0% have two women directors and, finally, 19% of the firms have "at least three women directors", considering that the maximum number of women directors in a board is 5. CEO tenure is on average 6.82 and board chair tenure is on average 4.77. 5.0% of CEOs are women, and 7.0% of board chairs are women. Each year there are on average 6 board meetings and each meeting is, on average, just under 4 hours long.

3.2 Measures

Data related to dependent, independent and control variables were collected through the questionnaire survey.

Dependent variable – The dependent variable (board strategic tasks) was measured by several items on a seven points Likert-type scale (7 = fully agree, 1 = fully disagree). The CEOs were asked to value the involvement of the board in: a) making proposals on long-term strategies and main goals; b) deciding on long-term strategies and main goals; d) implementing decisions on long-term strategies and main goals into action; e) controlling the follow up of decisions on long-term strategies and main goals into action. The output variable board, strategic tasks, was built as a mean of the four items. The Cronbach's alpha coefficient equals 0.89.

Independent variables – *Critical mass (at least three women directors)* is the independent variable. Critical mass is a dummy variable assuming value 1 when in boards there are at least three women directors, 0 otherwise.

Control variables - We control for firm and context features, which are: firm size and industrial sector. *Firm size* is measured by the number of employees on 31st December 2004. In order to meet the normal

distribution requirement a log-linear transformation was used. *Industrial sector* is a dummy variable coded 1 when the firm is a high-tech firm, 0 otherwise. We also control for board composition features, i.e. board size, CEO tenure, CEO gender, length of board meetings and knowledge and competence of directors. *Board size* indicates the number of board directors with voting rights. In the sample construction we discarded small boards considering only relatively-large boards, ranging from 6 to 12 members. *CEO tenure* is equal to the number of years the CEO has served on the board. *CEO gender* is measured by a dummy variable coded 1 when the CEO is a man, 0 otherwise. *Length of board meetings* reflects 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 points Likert-type scale (7 = fully agree, 1 = fully disagree). The CEOs were asked to value the board members: 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 regarding the firm's customers, markets, products and services; e) Knowledge of the firm's suppliers and customer negotiation power; f) Knowledge of threats from entrants and new products and services. The output variable *knowledge and competences* was built as a mean of the six items. The Cronbach's alpha coefficient equals 0.87.

3.3 Analysis

We tested the hypothesized effect of the critical mass of women directors on board strategic tasks using multiple linear least-square regression analyses.

4. Results

The Pearson's product-moment correlation coefficients of all variables are reported in Table 1. The correlation matrix shows that there is no significant correlation among variables.

Table 1. Correlation matrix (317 firms)

| | Mean | S.D. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|--------|--------|-------|------|-------|-------|------|-------|-------|-------|---|
| 1. Firm size (number of employees) | 437.25 | 891.42 | - | | | | | | | | |
| 2. Industrial sector (high-tech) | .39 | .48 | .06 | - | | | | | | | |
| 3. Board size (number board members) | 7.12 | 1.22 | .34** | .04 | - | | | | | | |
| 4. CEO tenure (years) | 6.82 | 5.95 | .01 | .01 | .03 | - | | | | | |
| 5. CEO gender (male) | .95 | .23 | .05 | .03 | -.04 | .07 | - | | | | |
| 5. Length board meetings (hours) | 3.95 | 1.88 | .18** | .02 | .09 | .09 | .01 | - | | | |
| 7. Knowledge and competence | 5.04 | .96 | .03 | -.01 | -.07 | -.06 | .03 | .03 | - | | |
| 8. At least three women (Critical mass) | .19 | .39 | .15** | .06 | .39** | -.03 | -.02 | .07 | -.05 | - | |
| 9. Board strategic tasks | 5.13 | 1.40 | .21** | .08 | .18** | .15** | .01 | .26** | .18** | .15** | - |

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

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

Results of the hypothesis testing are presented in Table 2.

Table 2. Regression analyses (317 firms). Dependent variable Board Strategic Tasks

| | Model I | | Model II | |
|--------------------------------------|------------------|------------|------------------|------------|
| | B | Std. Error | B | Std. Error |
| Firm size (ln employees) | .10 [†] | .08 | .11 [†] | .06 |
| Industrial sector (high-tech) | .10* | .13 | .17 | .17 |
| Board size (number of board members) | .15* | .07 | .07 | .08 |
| CEO tenure (years) | .20 [†] | .11 | .21 [†] | .12 |
| CEO gender (male) | -.20 | .37 | -.05 | .38 |
| Length board meetings (hours) | .92** | .30 | .87** | .30 |
| Knowledge and competence | .09 | .08 | .08 | .09 |
| At least three women (Critical mass) | | | .74*** | .21 |
| Adj R2 | .12 | | .19 | |
| F | 5.28*** | | 6.69* | |

Unstandardized coefficients are displayed. The levels of significance are: [†]< 0.1; *<0.05; **<0.01; ***<0.001

Two models are presented. Model I regressed the board strategic tasks on the control variables, the adjusted R² is 0.12. Model II regressed the board strategic tasks on the control variables and the independent variable (critical mass of women directors), the adjusted R² is 0.19.

Hypothesis 1 is supported, suggesting that there is a positive relationship between the critical mass of women directors (“at least three women”) and board strategic tasks (.74; p<.0001).

We made also some residual analyses where the dichotomous number of three women was replaced with one or two women. These analyses did not show any significant relationships between the women variable and board strategic tasks.

5. Conclusions and future investigations

The article builds on critical mass theory and provides empirical test that women directors significantly increase boards’ strategic tasks involvement only when there is a minimum number of three women.

This result suggests that, when in the boardroom there is just one woman her “isolated presence” means that she may only to a limited extend perform and contribute through her work and behaviour to the strategic tasks. Just one woman on a board may be a token risking stereotyped actions by the dominant group, and she may adapt to the existing boardroom behaviour (Kanter, 1977; Crocker and McGraw, 1984; Cohen and Swin, 1995). Similarly, when there are two women in the board they do not have an impact on board strategic tasks, because they are not enough to eliminate the evidences of tokenism (Kramer et al., 2006; Erkut et al., 2008).

The article contributes to the existing debate by proposing and testing an operational application of the critical mass perspective in relation to corporate boards. Hence, testing the validity of the critical mass perspective on women directors advances corporate boards studies. Moreover the critical mass test has been made on Norwegian firms giving potential relevance to the result. Indeed, Norway offers researchers a playground or a research laboratory in which women are a qualified minority, also because it was the first mover in the introduction of a quota law mandating a minimum 40% representation of women on the boards of listed companies. Lessons from Norway may be of great interest for policy-makers and practitioners from other countries that are considering the possibility of introducing a similar law.

The article offers some insights for future research. First, this paper analyse the impact that a certain number of women has on board strategic tasks. Future studies may take into account differences in women directors' backgrounds, skills and personalities with respect to their male counterparts. It could be interesting to test the validity of the critical mass theory in a model which also considers other differences in addition to gender (Nielsen and Huse, 2010). It could also be useful to take the critical mass theory beyond surface level diversity by exploring how the critical mass of women directors on board affects board dynamics.

Moreover, considering that Norway represents the first mover in the mandatory introduction of a certain percentage of women directors in the board, a cross-country analysis of the different political and institutional contexts in other countries that have introduced quota laws (Spain) or are discussing bills (Italy and France) could be another interesting research direction.

Finally, the critical mass test has been made on the board strategic tasks. Future research may take into account whether the critical mass influence the value creation of the firm. In this sense it could be of great interest analyse how women impact on the value creation, considering also the mediating and moderating role of board processes and dynamics as well as on corporate innovative behaviour.

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