Exploring effects of board diversity on strategic decision making: Benefiting from board processes, coping with social barriers

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DOCTORAL THESIS

Title	EXPLORING EFFECTS OF BOARD DIVERSITY ON STRATEGIC DECISION MAKING: BENEFITING FROM BOARD PROCESSES, COPING WITH SOCIAL BARRIERS
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To everyone who helped me construct my life which takes me to this point…

ABSTRACT

Strategic decision making is no longer only top management's land. Moreover, it is not only through traditional control and advisory tasks that boards influence strategy process. Corporate boards participate strategic decision making processes and, hence, not only influence characteristics (e.g. speed) of these processes but also strategic decision outcomes. Corporate leaders are aiming to enrich the variety of skills, knowledge, and professional experience in their boardrooms under the assumption that such variety will lead to strategic decisions with better quality and creativity. Despite the ongoing increase in diversity of boards and critical role boards plan in strategic decision making, our knowledge about the relationship between board diversity-strategic decision making is limited.

The main purpose of this dissertation research is to enrich our understanding about the effects of directors' different knowledge, skills, and professional experience on strategic decision making; not only on strategic decision outcomes but also comprehensiveness and speed of strategic decision making. Both gender diversity and job-related diversity reflects such variety. Therefore, in the main Chapters of this dissertation we explore whether and how gender diversity and job-related diversity may impact board decision making which, in turn, may impact not only strategic decision making as well as strategic decision outcomes. Additionally, we investigate the direct link between gender diversity and strategic decisions, namely organizational innovation. To this end, we apply a micro analysis, adopts a behavioral perspective and use upper echelons theory, behavioral theory, social categorization and recategorization theories. In conducting this dissertation, we used the value creating boards survey developed in Norway in 2005 and 2006, which is still the richest and most comprehensive data set on decision making and boardroom dynamics.

This dissertation research generate three clear research outcomes which has important theoretical and practical implications. 1) Diversity as variety in directors knowledge, skills, and

professional experience contribute to firms' strategic decisions, 2) board processes play a vital for the utilization of such potential, and 3) solutions should be generated to cope with obstacles that might limit directors' sharing unique information and communicating different perspectives during board discussions. When its positive effects on strategic decision making are considered, board diversity as variety in directors' knowledge, skills, and professional experience is a necessary but not a sufficient condition. We believe the findings of this dissertation would draw attention to benefiting from board processes and coping with obstacles that might limit diversity' potential.

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INTRODUCTION

1.1 BOARD OF DIRECTORS AS A STRATEGIC DECISION-MAKING GROUP

Most organizations are governed by a board of directors. In fact, having a board is one of the legal requirements for incorporation. Hermalin and Weisbach say (2003, p.7): "Given the myriad boards in place today, it is reasonable to ask, Why do they exist? What do they do? Can they be "improved"? These questions are at the heart of governance and, to a certain extent, management.". After the corporate scandals of early 21st Century, spot-lights have turned on boards more than ever and such questions have been started to be asked not only by scholars but also by policy makers, corporate leaders, institutional investors, journalists, etc. (Finkelstein and Mooney, 2003).

This growing interest in governance of firms, has triggered remarkable developments in board of directors literature, altering the conceptual framework and traditional theoretical perspectives applied in the field as well as factors that are subject to scholarly interest. Inevitably, some of the answers to aforementioned questions have changed. In other words, increasing number of studies have started to disentangle "the fortresses of corporate governance" (Daily et al., 2003). Agency theory has been the dominant theoretical perspective which conceptualizes boards only as monitoring mechanisms of managerial actions and decisions. Moreover, board research has been mainly focusing on the direct link from board compositional factors, or "usual suspects" (board size, director ownership, CEO duality, outsider/insider ratio) as it is popularly known, to firm financial performance (Gabrielsson and Huse, 2004; Finkelstein and Mooney, 2003).

Thanks to early efforts, in addition to control tasks, boards' resource provision tasks, which are rooted in resource dependency theory, have been identified as a second main function of boards (Hillman and Dalziel, 2003). Accordingly, different than usual suspects, research has started to investigate also the effects of board capital (board human capital and board social

capital) on firm financial performance (Hillman and Dalziel, 2003; for a literature review see Johnson, Schnatterley, and Hill, 2013). Still, previous studies, which this time mainly adopt agency and resource dependency perspectives, have been criticized for suggesting an under-socialized model of board behavior (Westphal and Zajac, 2013), lacking both a contingency (Aguilera and Jackson, 2003) and a behavioral perspective (Van Ees et al., 2009; Gabrielsson and Huse, 2004). Interactions between and among board members inside the boardrooms are called the "black box" of board behavior. These two dominant perspectives of board literature have been also seen limited in explaining how boards make decisions (Huse, 2007; Huse et al., 2011). This is understandable since these two economic theories of the firm, working on the assumption of Homo Economicus, focus on board control and advisory tasks but board decision making (Goshal, 2005; Van Ees et al., 2009).

As a matter of fact, long before boards have been conceptualized as "strategic decision-making groups", together with top management teams, participating strategic decision making processes and, accordingly, influencing strategic decisions (Forbes and Milliken, 1999; Ingley and Van der Walt, 2001; Rindova, 1999; Stiles, 2001; Zahra and Pearce, 1989). However, it is only recently that decision making has started to be seen as the most important responsibility of boards (Adams et al., 2015; Bailey and Peck, 2013). Several calls are placed that future research should address whether and how boards make decisions and/or influence strategic decisions (e.g. Adams et al., 2015; Bailey and Peck, 2013; Huse, 2007; Hillman, 2015).

Changing conceptualization of boards has further altered board tasks as well as typologies. Reflecting boards' involvement in strategy process, for example, studies have introduced a more fine grained specification of traditional board tasks (e.g. strategic control, operational control) (Minichilli et al., 2009; Nielsen and Huse, 2010a). Additionally, scholars have introduced boards' strategic participation task which is defined as the extent boards

participate strategy process by making decisions, suggesting proposals, and contributing to implementation of a chosen strategy (Gabaldon et al., 2018; Minichilli et al., 2009).

Relatedly, it is not surprising that dominant framework of board behavior, Input-Output Model (IO), has been altered as well. An Input-Process-Output (IPO) model has been suggested that considers behavioral factors in better understanding and explaining boards' participation and contribution to strategic decision making (Forbes and Milliken, 1999, Gabrielsson and Huse, 2004; Pettigrew, 1992; Zahra and Pearce, 1989). Researchers' growing interest in behavioral factors, has lead the way to bring along different theoretical approaches to board literature (Huse et al., 2011; Westphal and Zajac, 2013). The behavioral theory of the firm (e.g. van Ees et al, 2009), upper echelons theory (e.g. Hambrick and Mason, 1984; Hambrick, 2007), team production theory (Machold et al., 2011); information processing theory (Dalton and Dalton, 2011; Boivie et al., 2016), power theory (Pearce and Zahra, 1991; Shen, 2003) and a social categorization perspective (including social identity, self-identity, social attraction, recategorization theories) (Harrison and Klein, 2007) have become theoretical perspectives drawing increasing academic attention in literature.

It should be also noted that, in addition to scholars' interest in investigating behavioral factors inside boardrooms (closed system focusing inside the firm), contingencies of diverse environments surrendering board behavior (open system) has also started to attract remarkable attention, further bringing new theoretical perspectives (e.g. Aguilera et al., 2008; Aguilera et al., 2015; Terjesen et al., 2015).

It seems board research has complied with these developments in theory, particularly after the accumulation of evidence that indicates there might not be a systematic relationship between usual suspects and firm financial performance (Bhagat and Black, 2000; Dalton et al., 1998; Finkelsteian and Mooney, 2003). For example, following scholars' call for more research on mediating and intervening factors of the relationship between board inputs and firm

financial performance (Gabrielsson and Huse, 2004), research on the relationship between board processes and various board tasks has proliferated (for a literature review see Pugliese et al., 2009).

Increasing number of studies have shifted attention to other factors, other than usual suspects, particularly those that might impact board processes and, hence, board decision making. Coupled with the developments in corporate world and political arena, board diversity has appeared to be one such factor (for a literature review see Roberson et al., 2016). Previous studies have investigated effects of board diversity, mainly gender diversity, on board task performance (e.g. Zhang, 2010; Nielsen and Huse, 2010b), board decisions (e.g. Nielsen and Huse, 2010a; Zhu, 2013; 2014) as well as strategic decisions (e.g. Abdullah et al., 2016; Chen et al., 2016; Haynes and Hillman, 2010; McDonald and Westphal, 2010; Sun et al., 2015). However, previous studies have revealed that board diversity may have positive (e.g. Miller and Triana, 2009) as well as negative effects on decision outcomes (e.g. Zhu, 2014). Accordingly, more research is called for on mediating (Post and Byron, 2015) and contingency factors (Eagly, 2016) in relation to board diversity-board/strategic decisions link. Additionally, criticizing the extent research attention on gender diversity, more research is called for investigating effects of different types of board diversity (e.g. job-related diversity) on board decisions and strategic decisions (Adams et al., 2015; Hillman, 2015).

All in all, reflecting this important evaluation in board literature, Hambrick et al. (2008) summarize the overall picture of board research in a two dimension matrix: three major categories (formal structure, behavioral structure, and behavioral process) and two level of analysis (micro and macro). This dissertation focuses on behavioral process and adopts a micro level of analysis to investigate whether and how board diversity may impact strategic decision making.

1.2 FOCUS OF THE THESIS: MAIN RESEARCH QUESTIONS

Diversity is inevitable in the boardrooms. Whether it is due to regulations (e.g. gender quota) of national governments or pressure from institutional investors or corporate leaders' will, diversity keeps increasing in EU and American boards (Catalyst, 2017; Deloitte, 2016). Despite the fact that in the last decade board diversity, particularly gender diversity, has become one of the most-researched topics in board literature, still there is an ongoing interest of scholars, corporate leaders, and policy makers in the topic.

Board diversity is one of the main topics of upcoming academic conferences (EURAM 2018 and AOM 2018). Recent studies have been introducing board diversity as a future research area, highlighting the importance of considering mediating (e.g. board processes) (Post and Byron, 2015) and moderating variables (e.g. board leadership) in better explaining effects of board diversity particularly on decision outcomes (e.g. Adams et al., 2015; Eagly, 2016; Hillman, 2015). On popular periodicals, corporate leaders are expressing their goals of creating boards with variety in directors' skills, knowledge, and professional experience under the assumption that such boards will better contribute to strategic decision making (e.g. Fairchild, 2015). Finally, particularly in continental Europe (EU 2020 Targets), board diversity has become a core subject of regulations and laws, spreading to many countries (e.g. gender quota laws in Italy, Spain, Iceland, France, Germany) (Terjesen et al., 2015).

Recognizing the ongoing attention on board diversity, a topic which has enormous practical and political importance, and considering boards' important role in strategic decision making, this dissertation centers specifically on the question of "How does board diversity impact strategic decision making?".

Strategic decision-making can be divided into three stages. The first is information search and filtering where each decision maker collects information depending on his/her

cognitive frames. For instance, the issues an executive with a finance background recognizes will most likely related to financial aspects of a strategic decision. The second is interpretation where each decision maker harnesses available information with knowledge and beliefs to generate an alternative. Decision makers' experience will shape their domain of knowledge and skills in problem solving. This will greatly influence the generation of alternatives to the decision problem at hand. The third is choice where alternatives are evaluated to reach a final decision choice (Milliken and Vollrath, 1991; Rindova, 1999). Decision-makers will engage in the last phase as a group until one of the alternatives is interpreted as the "best". When no one best alternative exists (objectively identified solution), decision-making resembles a negotiation and thus group dynamics as well as factors (e.g. group structure) impacting group dynamics matter (Rindova, 1999).

Reflecting on this brief definition of strategic decision making is important for two main reasons in the scope of this dissertation research. First, it explains the theoretical focus of this dissertation research and emphasis put on board processes. For example, as a researcher if you follow the tradition of economic theories of firm (e.g. agency theory) and adopt a rational model of a decision maker, it is understandable that your focus will be on board compositional factors (e.g. board size, board independence) rather than board processes. There is no room for conflicts, debates, discussions as there is always a best alternative (objectively-identified decision choice) visible to decision makers. However, if you adopt a behavioral perspective, because you recognize that decision makers can be only bounded rationale, possessing limited information and being open to cognitive biases, inevitably you will be willing to understand the role of board processes on board decision making. Therefore, behavioral research that aims to better understand and explain boards' influence on strategic decision making will be incomplete unless board processes are considered.

Once decision making is characterized with task-related disagreements, use of directors' knowledge and skills, evaluations of decision alternatives, it is not only the quality or creativity of final decision choice that will be affected but also the comprehensiveness and speed of making that decision (Eisenhardt, 1989; Hambrick et al., 1996; Rindova, 1999; Simons et al., 1999). Therefore, boards' influence on strategic decision making should be considered not only in relation to their effects on strategic decision outcomes but also on strategic decision making processes.

Second, adopting a behavioral perspective, board diversity will become may be the most important factor influencing strategic decision making. Board diversity in knowledge and perspectives (e.g. gender diversity, job-related diversity) will turn into an asset for decision making groups, in coping with cognitive biases by providing a broader range of relevant information and increased number of alternatives (Milliken and Martins, 1996). In turn, we can expect to see important effects of diversity on quality as well as creativity of strategic decisions. Additionally, board diversity will also impact comprehensiveness and speed of board decision making processes by influencing board processes (Forbes and Milliken, 1999; Rindova, 1999). As a matter of fact, only when the mediating role of board processes is considered, we can make sense of a commonly and widely recognized understanding that board diversity is a "double-edged sword," or a "mixed blessing", related to its impact on board decision making processes (Rindova, 1999) as well as decision outcomes (Forbes and Milliken, 1999; Milliken and Martins, 1996; Zhu, 2014).

Harrison and Klein (2007) provided one explanation for the double-edged sword nature of board diversity, noting that diversity can mean variety as well as separation. The positive effects of diversity on decision outcomes can be rooted in different perspectives, such as an upper echelons theory (Hambrick 2007, Hambrick and Mason 1984), behavioral theory (Argote and Greve, 2007; Cyert and March, 1963; Van Ees et al., 2009) and information processing

perspective (Boivie et al., 2016; Hinsz et al., 1997; Van Knippenberg et al., 2004). Commonly these perspectives posit that strategic decision making is under the threat of decision making and information processing biases (e.g. group think), creating adverse consequences on quality as well as creativity of decision outcomes. Therefore, board diversity as variety in directors' knowledge, skills, and professional experience might work against those cognitive biases. Such that convergence of different perspectives and use of a broader range of relevant information during board discussions might reveal greater insights to the decision issue at hand.

Job-related diversity is defined as the variety in knowledge, skills, and professional experience (Forbes and Milliken, 1999). Job-related diversity (also called as knowledge-based diversity, cognitive diversity) is commonly and widely accepted as the most important diversity type, affecting complex and highly cognitive tasks, such as decision making (Forbes and Milliken, 1999; Milliken and Martins, 1996; Pelled, 1996). However, our body of knowledge about the effects job-related diversity may have is limited due to extent research interest in gender diversity (Adams et al., 2015; Ferreira, 2015; Hillman, 2015).

Although few, previous studies have investigated effects of job-related diversity on strategic decisions (strategic change), (e.g. Golden and Zajac, 2001; Haynes and Hillman, 2010) and critical board decisions (e.g. CEO compensation) (e.g. Zhu, 2013; 2014). However, how such variety may influence board decision making processes (speed and comprehensiveness) which, in turn, will impact overall strategic decision making processes has never been put to empirical testing. Rather, importing from diversity research on top management teams (Hambrick et al., 1996), it is assumed that job-related diversity may enhance comprehensiveness of decision making with a cost of being slow in reaching a final decision choice (e.g. Rindova, 1999). This assumption, reflecting the double-edged nature of board diversity, needs validation in board context as there are also opposing views (Eisenhardt, 1989; Kim et al,. 2009). Additionally, up to date the role of board processes in this relationship

or the link between job-related diversity and strategic decisions (Golden and Zajac, 2001; Haynes and Hillman, 2010; Triana et al., 2013) or board decisions (Zhu, 2013; 2014) has never been investigated.

Going back to explaining double-edged sword nature of board diversity, Harrison and Klein (2007) theoretically argue that diversity can also mean separation (male vs. female). The negative effects of board diversity and/or a failure to utilize board diversity's potential on decision making can be explained through a social categorization perspective (Ashforth and Mael, 1989; Tajfel and Turner, 1979; Turner et al., 1987). Diversity as separation might lead to social barriers (e.g., out-group categorization, tokenism, unequal membership) which may have negative consequences on minorities (e.g. women directors) as they are instantly and automatically categorized as members of out-group (Fiske et al., 1991). Out-group members may choose to play a low profile, refrain from challenging majority group's ideas, opinions, and perspectives. Accordingly, variety in skills, knowledge, and professional experience brought along by minorities can be only partially realized during competent board work.

We agree that more research is required on other types of board diversity to enrich our knowledge about board diversity-strategic decision making link (Hillman, 2015). However, we believe research on gender diversity is far from reaching a maturity. Our body of knowledge about the link between gender diversity and strategic decisions is limited and more research is called for investigating the role of board processes in this regard (Triana et al., 2013). It is not surprising that how women directors may influence innovativeness of their firms has been drawing research attention (e.g. Midavaine et al., 2016; Miller and Triana, 2009; Torchia et al., 2011). There is a strong rationale to expect positive effects of women directors' on creativity of decision outcomes because they have different knowledge, skills, professional experience as well as values than their male counterparts (Eagly, 2016). However, up to date how or

through which mechanisms effects of gender diversity is transmitted to innovativeness of firms has never been explored.

In addition, gender diversity still deserves a special research attention as it can mean variety as well as separation and this unique aspect of gender diversity might provide one explanation for the mixed results of research on gender diversity (Gabaldon et al., 2016; Hillman, 2015; Post and Byron, 2015). Diversity researchers have mainly seen gender diversity as variety in skills, knowledge, and professional experience, contributing to generation of creative solutions to the decision issues at hand (e.g. Carter et al., 2003; Miller and Triana, 2009). There is support, indicating a positive association between gender diversity and innovativeness of firms (Midavaine et al., 2016; Miller and Triana, 2009; Torchia et al,. 2011).

On the other hand, interview-based studies have revealed that a woman director may be categorized as an out-group or perceived as an unequal member or a token in a male-dominated board (Groysberg and Bell, 2013; Huse and Solberg, 2006; Kakabadse et al., 2015; Erkut et al., 2008; Yamak et al., 2016). Research has demonstrated that such social barriers have negative consequences on utilization of women talent on board decision-making (e.g. Nielsen and Huse, 2010a) and strategic decisions (e.g. Torchia et al., 2011; Sun et al., 2015). Therefore, there is a strong rationale that increasing number of women on board may provide limited benefits on board decision making and, hence, strategic decision making unless solutions that can be created by and within boards to cope with such social barriers are generated.

Indeed, despite scholars' calls (Eagly, 2016), previous studies have neglected considering contingencies under which gender diversity potential can be fully realized on board decision making (Nielsen and Huse, 2010a; Westphal and Milton, 2000) or strategic decisions (Midavaine et al., 2016; Miller and Triana, 2009; Torchia et al,. 2011). One explanation might be that, our body of knowledge about how and through which mechanisms effects of gender diversity are transmitted to board decision making and/or strategic decision making has stayed

greatly limited (Post and Byron, 2015; Triana et al., 2013). A richer understanding might point out contingencies which would work as solutions to cope with social barriers women directors face in male dominated boards.

All in all, this dissertation addresses three research questions (see Figure 1.1):

- How does job-related diversity impact comprehensiveness and speed of board decision-making processes? This question is addressed through an upper echelons lens, by considering the mediating role of a core board process; use of directors' knowledge and skills. The double-edged nature of board diversity has been questioned and important role board processes play on comprehensiveness and speed of board decision making has been highlighted (Chapter 2).
- How does gender diversity influence firm organizational innovation? Through a behavioral theory perspective, the importance of variety women directors bring along to board discussions and the mechanisms that transmit positive effects of such variety to innovativeness of a firm have been explored. (Chapter 3).
- How do women directors affect board decision making? Benefiting from social categorization perspective, out-group categorization of women directors in male-dominated boards and negative consequences of such a social barrier on women directors' contribution to board decision making have been pointed out. Applying a recategorization theory lens, such bias categorization can be altered to better benefit from women talent. The role of a chairperson with leadership efficacy and an open board atmosphere on recategorization of women directors have been explored (Chapter 4).

In conducting this dissertation, we used the value creating boards survey developed in Norway in 2005 and 2006 (Huse, 2009; Sellevoll et al., 2007). We acknowledge that using this

data set would mainly raise methodological issues related to the time of data collection, leading to rightful questions such as whether and to what extent data collected in 2005-2006 is relevant for understanding boards in 2018. Moreover, we understand such concerns will grow stronger when the fact that the 40% female director quota system becomes fully enforced in 2008 (Sweigar, 2012) is taken into account.

Norway was the first country, in 2003, to pass quota legislation regarding the presence of women on supervisory boards. The fact that this survey was conducted before the regulation was fully implemented helps us to understand the dynamics of the boards without the mandatory perspective but with an already present strong pressure to appoint women. Before implementing a mandatory gender quota on boards, the Norwegian government tried to follow a more voluntary approach, incentivizing companies to increase the representation of women on boards (Seierstad and Huse, 2018). Therefore, during the period of analysis, we can observe voluntary actions resulting from strong pressure. Still, we address validity as well as generalizability of the results of this dissertation research in details in each of the main chapters as well as in concluding chapter.

One other concern that should be addressed related to our choice of using value creating boards dataset might be related to the fact that the data is reporting processes (e.g. cognitive conflict) and facts (job-related diversity) as perceived by the participants of the study. Indeed, different than most previous studies that focus on actual diversity, we have considered perceived dissimilarities among board members in terms of education, background, and professional experience in measuring job-related diversity variable (Chapter 2).

However, there is an growing awareness in board diversity research that it might be the perceived differences that matter most to better understand and explain effects of board diversity on board processes and board decision making (Nielsen and Huse, 2010a; Westphal and Milton, 2000; Zhu et al., 2014). The logic behind rests on the use of social categorization

perspective which posits that categorization processes occur on the basis of individual perceptions of similarity or dissimilarity with others. For example, based on actual difference, a women director would be expected to be instantly and automatically categorized as an out-group member by members of majority group, male directors. However, male directors may recategorize the same woman director as an in-group member based on unobservable similarities (e.g. educational or functional background, professional experience) woman director may share with them. In other words, it might not be the actual dissimilarities/similarities but rather perceived ones that impact board functioning and, eventually, board decision making. Consistently, Chapter 4 supports this perspective (see also Zhu et al., 2014).

Besides these issues, considering the focus of our dissertation research (behavioral factors, strategic decision making), we also realize several advantages of using value creating boards dataset. Most survey studies of boards have been subject to criticism, concerns mostly focusing on methodological challenges such as development of measurements based on accumulated knowledge, increases in response rates, the use of several respondents, the use of longitudinal data-set, and the use of samples other than large US corporations (Daily et al., 2003). Additionally, in their seminal study, a review of the governance literature, Daily, Dalton, and Cannella highlight that getting access to process data is one of the major empirical challenges for board researchers, yet the potential value of such data is considerable (Daily, Dalton, & Cannella, 2003:378).

The value creating boards survey is one of the few available surveys exploring board behavior. The construction of this dataset, and its question about the internal dynamics of boards, allows for the understanding of the interactions in the boardroom and the potential effects of diversity on the decision-making process and, in turn, on strategic decisions. In addition, Norway follows the Nordic two-tier board system, with a supervisory board led by

the board chairperson and an executive board led by the CEO. Supervisory boards are in charge of overall long-term decision making and the strategic processes of the business —including the innovation strategy— which brings even more importance to the role of each board member and the dynamics among them. The dataset has been developed in several surveys, in several countries over years, and it contains a large number of previously validated scales related to actual board behavior (Forbes and Milliken, 1999; Hillman and Dalziel, 2003; Huse, 2007, 2009; Nielsen and Huse, 2010b; Van Ees et al., 2008; Zona & Zattoni, 2007).

It was directed at CEOs, chairpersons and board members in large, medium and small Norwegian firms. The aim was to survey 2,954 firms (firms on the Oslo Stock Exchange, other publicly limited firms, Ltd. firms with more than 100 employees, Ltd. firms with 50 to 100 employees and a total turnover of more than 5 million NOK, and smaller Ltd. firms including fewer than 50 employees and a total turnover of more than 50 million NOK). The survey includes 265 questions to CEOs, 235 to chairpersons and 215 to other board members, and the answers are organized in mainly seven-point Likert scales (where 1 means disagreement and 7 agreement). During 2005-2006, a total of 973 questionnaires from CEOs, 562 questionnaires from board chairpersons are received, resulting in an above average CEO response rate of % 33 (Sellevoll et al., 2007). Board members from 396 different boards answered. All in all, considering the focus of our research and several important advantages of value creating boards survey, we are convinced that this is still the most convenient data set.

As mentioned above, three different questionnaires were sent out, one for each type of respondent. However, only in Chapter 2 we benefit from this unique aspect of value creating boards data set by using both CEO and chairperson responses in our analysis. While Chapter 3 focuses only on CEO responses, Chapter 4 use only board members' responses in exploring identified research questions.

The main reason for the choice that shape our analysis in Chapter 2 is only related to coping with common method bias that has become legendary among business researchers. Although we acknowledge that it is a common and generally accepted practice to use CEO answers both in top management team and board research (e.g. Simons et al., 1999; Zona and Zattoni, 2007) and, additionally, we conclude that observed relationships do not face common method bias problem by running pre-tests that are commonly used (e.g. Harmon's one factor test), we aim to take one extra step and use both CEO and chairperson responses. We found no differences between those two analyses, in terms of observed relationships, but obliged to report several extra figures and tables in Chapter 2.

A recent study on common method variance and common method bias note "Researchers should not automatically conclude that CMV biases data unless viable evidence suggests the presence of CMB. Survey research should not be presumed guilty of CMB. In fact, the results suggest the opposite. Only when researchers face specific situations should they present elaborate and lengthy reports of steps to assess CMV needed to allay fears of consequent misleading results." (Fuller et al., 2016). In Chapter 3 we decided to use only CEO answers and several test demonstrated that common method bias was not a problem related to our findings.

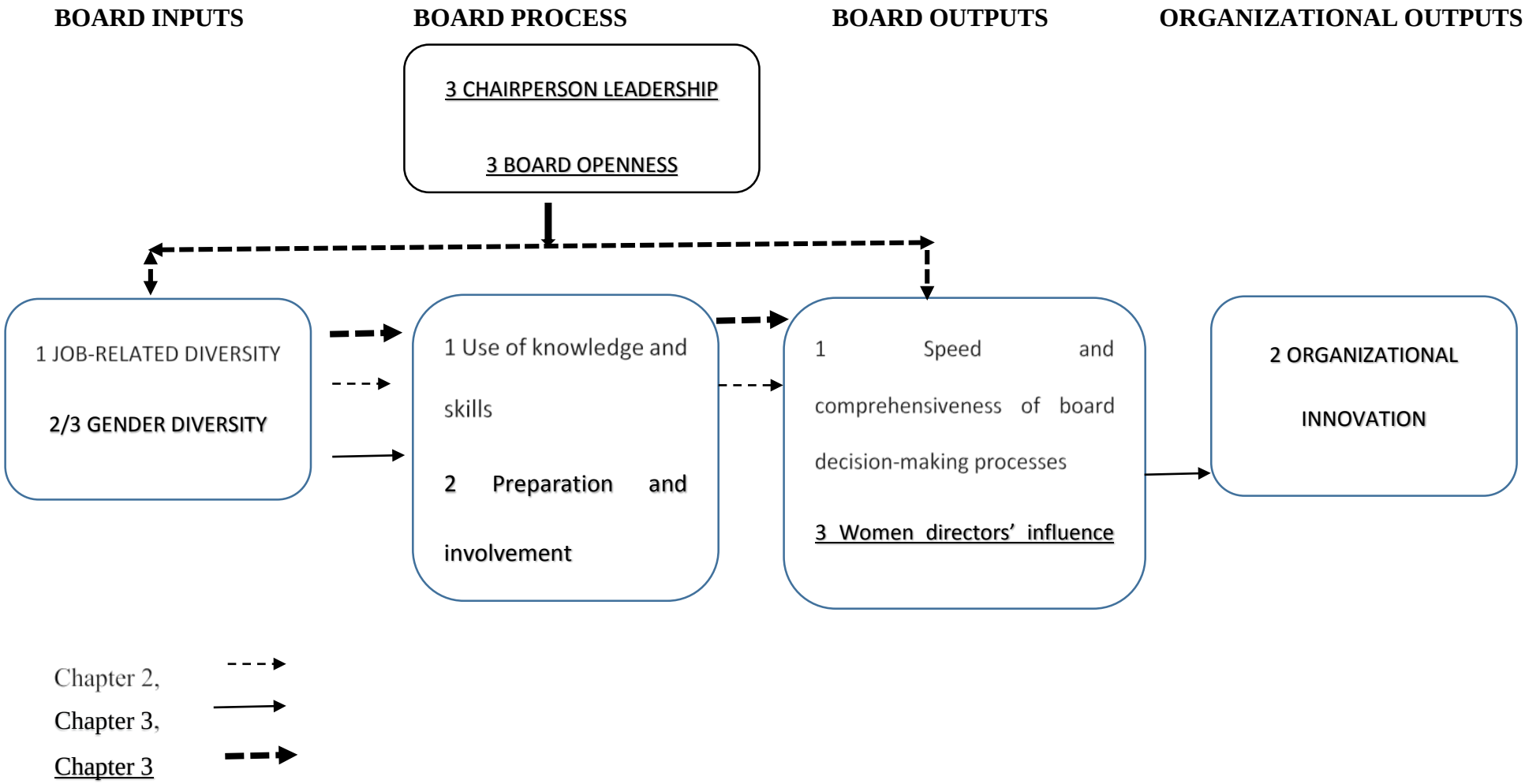
Moreover, in Chapter 3 our choice of medium-sized Norwegian companies is based on two reasons. First, medium-sized companies struggle a great deal to include changes and new diversities in their boards. It will be interesting to observe the dynamic relationship between the increasing representation of women on boards and board dynamics and innovation. Second, this choice guarantees that the sample firms will be influenced but not obligated by the introduction and legislation of the quota. Therefore, medium-sized companies have more freedom to increase the number of women on their boards. We selected 341 medium-sized

firms with 51 to 250 employees, which is the European Union's cut-off for medium-sized firms.

While most of the questions incorporated in 2005-2006 value creating boards survey were the same, some of the questions (for instance the specific questions about women directors) were targeted at board members only. As the questions regarding women directors were only answered if there were women on the board. 272 useful questionnaires were received from board members (Sellovoll et al., 2007). This is why in Chapter 4 we use only board members answers to measure our dependent variable, women directors' influence on board decision making, as other respondents were not targeted.

We selected firms with more than 50 employees in order to find companies that were more likely to have formal governance arrangements (Maula et al., 2013; Veltrop et al., 2015; Zahra and Filatotchev, 2004). Second, as we looked for minority representation on boards, we selected companies with optimum board sizes, those between six and 12 members where decision making dynamics can be observed (Ning et al., 2010). We excluded companies without women directors to investigate the interactions between genders. Finally, as a reflection of the forecasts that women are unlikely to comprise 30% of directorships in publicly held companies worldwide until 2027 (MSCI Women on Boards Report, 2015), we included in our model companies where women represented 30% of the board or less. This led to a final sample of 146 firms.

Figure 1.1: Conceptual Framework of Main Chapters (2-3-4)



1.3 CONTRUBUTIONS AND STRUCTURE OF THE THESIS

This thesis is structured as a compendium of publications. In the following main chapters (2, 3, and 4); aforementioned main research questions are addressed.

Chapter 2 explores whether and how job-related diversity may impact comprehensiveness and speed of board decision making by considering board processes. My contribution to this chapter includes generating all the sections but the section "2.3 METHOD". In other words, I mainly detected the research gap, applied upper echelons theory and benefit from behavioral and information processing theories to introduce the theoretical model and the hypotheses, and, in the light of the results (see Table 1.1), discuss the implications of the findings, present limitations and future research options.

My contribution to sample selection and running statistical tests was comparatively limited. That covers highlighting some important boundaries that would impact sample selection. In the light of my choices about the theoretical perspectives to be applied and independent variables to be investigated, I suggested that it is important to select firms (firm size) with formal governance structures as well as boards (board size) where we can expect to see decision making dynamics. In addition, although I did not run the statistical tests on SPSS, I still contributed this important process by; identifying validated scales from previous studies for measurement of each variable, detecting related scales in value creating boards survey, and identifying previous studies that we benefit from should we need to overcome some pitfalls in the analysis (for example whether to use or not a single-measure item). Finally, I also contributed to the selection of control variables in the light of previous studies as well as theory applied. Besides these contributions to sample selection and running statistical tests, I put emphasis on reflecting on the other interesting results (e.g. correlation matrix), other than the results related to the main research question, by interpreting them in the discussion section.

Chapter 3 investigates whether and how gender diversity may influence volume of organizational innovation by considering board processes (different than the one investigated in Chapter 2). I was asked to review this chapter which was generated quite some time ago by my colleagues. Keeping the original model, I re-developed all the sections (excluding the section "3.3 METHOD") as I applied a different theoretical lens than the one used in the original version. In other words, I applied a behavioral theory lens to introduce the theoretical model and the hypotheses, and, in the light of the results, discuss the implications of the findings, present limitations and future research options.

Chapter 4 addresses the relationship between gender diversity and women directors' influence on board decision making by considering two contingencies, namely chairperson leadership efficacy and board atmosphere of openness. My contribution to this chapter includes generating all the sections but the section "4.3 METHOD". In other words, I mainly detected the research gap, applied upper echelons theory and benefit from behavioral and information processing theories to introduce the theoretical model and the hypotheses, and, in the light of the results, discuss the implications of the findings, present limitations and future research options.

My contribution to sample selection and running statistical tests was comparatively limited. That covers highlighting some important boundaries that would impact sample selection. In the light of my choices about the theoretical perspectives to be applied and independent variables to be investigated, I suggested that it is important to select firms (firm size) with formal governance structures as well as boards (board size) where we can expect to see decision making dynamics. In addition, although I did not run the statistical tests on SPSS, I still contributed this important process by; identifying validated scales from previous studies for measurement of each variable, detecting related questions in value creating boards survey, and identifying previous studies that we benefit from should we overcome some pitfalls in the

analysis (for example whether to use or not a single-measure item). Finally, I also contributed to the selection of control variables in the light of previous studies as well as theory applied. Besides these contributions to sample selection and running statistical tests, I put emphasis on reflecting on the other interesting results (e.g. correlation matrix), other than the results related to the main research question, by interpreting them in the discussion section.

Chapter 5 presents a general discussion comprised of theoretical and practical implication, limitation and future research. Conclusion of the thesis is followed by the references.

1.4 MAIN OUTPUTS OF THE THESIS

The central chapters, Chapter 2, Chapter 3, Chapter 4, are already published in Journal of Management and Governance, Scandinavian Management Journal, and European Management Journal, respectively (see Table 1.2).

Table 1.1: Summary of Main Chapters (2-3-4) and Main Findings

Cha-pter	**Research question**	**Theoretical focus**	**Data set-Method**	**Main Findings**
2	How does job-related diversity impact comprehensiveness and speed of board decision-making processes? What is the role of board process?	An Upper Echelons Approach	Value Creating Boards survey developed in Norway during 2005 and 2006 (377 firms) – Structural Equation Modelling	We show that directors' diverse educational background, functional background, and industry experience (job-related diversity) have a positive effect on comprehensiveness as well as the speed of board decision-making. In addition, our results indicate that board processes (directors' use of their knowledge and skills) play an important role by transmitting the positive effects of diversity.
3	How does gender diversity contribute to firm organizational innovation? What is the role of board processes?	A Behavioral Approach	Value Creating Boards survey developed in Norway during 2005 and 2006 (341 firms) - Multiple linear regression analysis	The results suggest that women directors contribute positively and significantly to organizational innovation. Furthermore, the positive relationship between women

				directors and the level of organizational innovation is mediated by some decision-making culture dimensions: the degree of cognitive conflict and the degree of preparation and involvement during board meetings.
4	How do women directors affect board decision making? What are the contingencies that may enhance this contribution?	Social Categorization and Decision-making approaches Recategorization Theory	Value Creating Boards survey developed in Norway during 2005 and 2006 (146 firms) - ordinary linear regressions	We found a positive relationship between women minorities and women directors' contribution to board decision-making. Moreover, we found that this positive impact increases when the board chairperson exercises leadership and the board operates in an atmosphere of openness.

Table 1.2: This table shows the list of publications which are presented as main Chapters (2-3-4) of doctoral research

Chapter	Title	Journal and Impact Factor	Authors
2	Job-related diversity-the comprehensiveness and speed of board decision-making processes: An upper echelons approach.	Journal of Management & Governance, 2017, 1-30. IF: 1.254	Kanadlı, S. B., Bankewitz, M., & Zhang, P.
3	Women Directors Contribution to Organizational Innovation?: A Behavioral Approach	Scandinavian Journal of Management. 2018. https://doi.org/10.1016/j.scaman.2018.02.001. IF: 1.450	Torchia, M., Calabrò, A., Gabaldon, P., & Kanadli, S. B.
4	Increasing women's contribution on board decision making: The importance of chairperson leadership efficacy and board openness.	European Management Journal. 2018, 36(1), 91-104. IF: 2.481	Kanadlı, S. B., Torchia, M., & Gabaldon, P.

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CHAPTER 2:

JOB-RELATED DIVERSITY–THE COMPREHENSIVENESS AND SPEED OF BOARD DECISION-MAKING PROCESSES: AN UPPER ECHELONS APPROACH[1]

[1] Kanadlı, S. B., Bankewitz, M., & Zhang, P. (2017). Job-related diversity: the comprehensiveness and speed of board decision-making processes—an upper echelons approach. Journal of Management & Governance, 1-30.

Abstract

Strategic decision-making processes influence firm-level outcomes. Using the theory of upper echelons, this study investigates how diversity in directors' skills, knowledge, and industry experience influence board decision-making processes that may impact overall strategic decision-making processes. Such diversity has been commonly accepted to be a 'double-edged sword'—enhancing comprehensiveness but hindering the speed of decision-making. On the contrary, we used an existing large survey database to show that directors' diverse educational background, functional background, and industry experience (job-related diversity) have a positive effect on comprehensiveness as well as the speed of board decision-making. In addition, our results indicate that board processes (directors' use of their knowledge and skills) play an important role by transmitting the positive effects of diversity. The study is in a tradition of exploring how boards may influence firms' strategic decision-making processes. Our findings provide additional arguments for adding job-related diversity to boards of directors.

Key words: board processes; decision-making comprehensiveness; decision-making speed; job-related diversity; upper echelons theory.

2.1 INTRODUCTION

Boards have been facing increasing pressure to be influential players in firms' strategic decision-making—particularly after the corporate scandals of the beginning of this century (Bailey and Peck, 2013; Finkelstein and Mooney, 2003). This used to be the province only of top management teams (TMTs) (Hambrick and Mason, 1984). In addition, corporate leaders have been placing more emphasis on building diverse boards comprised of directors with different skills, knowledge, and experience (Fairchild, 2015). The underlying assumptions are that such variety would potentially lead to a comprehensive evaluation of strategic issues at hand and improve the quality as well as creativity of board decision outcomes (Milliken and Martins, 1996; Harrison and Klein 2007). However, theory also emphasizes that board diversity might be a double-edged sword because comprehensiveness may hinder the speed of boards in reaching consensus on a final decision (Forbes and Milliken, 1999; Rindova, 1999).

Several studies have investigated the effects of board diversity on board decisions (e.g. Zhu, 2013; 2014; Zhu and Westphal, 2014) as well as strategic decisions (e.g. investments, innovation, strategic change) (e.g. Bear et al., 2010; Golden and Zajac, 2001; Haynes and Hillman, 2010; Miller and Triana, 2009; Sun et al. 2015; Triana et al., 2013). Moreover, scholars have been suggesting board diversity-strategic decisions link as an important future research avenue (Adams et al., 2015; Hillman, 2015). However, whether and how diverse boards might influence strategic decision-making processes (SDPs) remains a greatly neglected topic in the literature.

This is surprising because the characteristics of board decision-making processes (BDPs) can change the overall characteristics of SDPs (Rindova, 1999). The TMTs research demonstrates important effects of SDPs on firm-level outcomes (Eisenhardt, 1989; Fredrickson and Mitchell, 1984; Hambrick et al., 1996). It is possible that while a TMT may aim for a fast strategic decision-making in a competitive environment to immediately cope with threats and

catch opportunities (Eisenhardt, 1989), a board's comprehensiveness in evaluating those strategic issues might jeopardize such a goal.

The purpose of this study is to investigate how job-related diversity may influence comprehensiveness and the speed of decision-making processes in boards. After adopting an upper echelons perspective in board context (Hambrick, 2007, Hambrick and Mason, 1984), we hypothesize that boards with members having diverse educational background, functional background, and industry experience (job-related diversity) will experience more comprehensive decision-making processes. This is because such diversity reflects directors' different skills, knowledge, and experiences (Forbes and Milliken, 1999) and will enrich the pool of information available for decision-making. This will increase the number of alternatives to be evaluated and reach a final decision choice.

The general understanding is that job-related diversity would enhance comprehensiveness but hinder the speed of BDPs rests on the idea that the evaluation of different perspectives might lead to task-related disagreements. The resolution of such conflicts might take a long time and might impede competent board work (Forbes and Milliken, 1999; Rindova, 1999). In contrast to this double-edged nature of diversity, we hypothesize that job-related diversity would also enhance the speed of reaching a consensus on a final decision. This is because an increased number of decision alternatives will help boards evaluate alternatives simultaneously (Eisenhardt, 1989; Kauer et al., 2007; Kim et al., 2009; Talaulicar et al., 2005).

In addition, related to the negative effects of task-related disagreements on the speed of decision-making, we note that it might not be the occurrence but the level of conflict that matters. Research suggests that while intense and frequent disagreements adversely impact group performance, moderate-levels of conflict may benefit the quality of decision outcomes (De Dreu, 2006; Jehn et al., 1999). It is not unusual for task-related disagreements to be kept

under control during board discussions (Ravasi and Zattoni, 2006; Zhang, 2010), and conflicts would hardly intensify in the boardrooms (Hambrick et al., 2008).

From an upper echelons lens, we also recognized that job-related diversity is a key asset in coping with cognitive biases surrounding decision-making due to upper echelons' bounded rationality (Tuggle et al; 2010). However, while often required, diversity cannot be seen a sufficient condition unless directors' use their knowledge and skills during board decision-making (Zhang, 2010). The importance of board processes (e.g. sharing information, communicating different perspectives) in coping with cognitive biases finds support in behavioral theory (Ees et al., 2009), but this is often downplayed in upper echelons theory (Cannella and Halcomb, 2005). Thus, to better explain how job-related diversity may impact BDPs, we examine the mediation effect of board members' use of knowledge and skills—a core board process specified in theory (Forbes and Milliken, 1999). Indeed, diversity researchers have suggested considering mediating variables to better explain the complex effects of board diversity (Eagly, 2016; Post and Byron, 2015).

This study contributes to theory in several ways. Our study introduces an upper echelons approach as a novel theoretical lens to better understand and explain behavior of diverse boards. In contrast to previous studies that have mainly investigated board diversity's impact on board/strategic decision outcomes (e.g. Sun et al., 2015; Triana et al., 2013; Zhu, 2014), this is the first study to explore how variety in directors' skills, knowledge, and experience might impact BDPs that, in turn, would influence SDPs. Our findings suggest that corporate leaders add job-related diversity to their boards and make sure that necessary mechanisms are in place to take advantage of such variety. If this is the case, such a variety might not be a double-edged sword: boards can make fast decisions by thoroughly evaluating different alternatives. In the next section, we will first present our key concepts, a brief overview of upper echelons theory, and our hypotheses about decision comprehensiveness and

speed. The sample, variables, and analyses are presented in the methods section. After presenting the results, we close with a discussion and conclusion.

2.2 THEORY DEVELOPMENT

2.2.1 Key Concepts

Job-Related Diversity. Recent studies about board diversity have mainly focused on examining the direct effects of gender diversity on decision outcomes, e.g. innovativeness and investments (Adams et al., 2015; Hillman, 2015). The majority of recent studies examining the links between gender diversity and decision outcomes assume a non-tested correlation between gender diversity and job-related diversity (e.g. Miller and Triana, 2009). Job-related diversity is clearly different from demographic diversity. Job-relatedness is the extent to which a type of diversity captures distinct skills, perspectives, and experiences relative to the task at hand (Pelled, 1996). Glick and colleagues (1993) found that demographic features of executives do not correlate with diversity assessed in the form of job-related features. Studies on the link between gender diversity and decision outcomes often assume that female directors are different from their male counterparts, but this assumption is now increasingly being questioned (Singh et al., 2008; Zhu et al., 2014).

Moreover, business people, politicians and scholars have reacted to the recent strong focus on gender diversity and have started to redirect their attention to other forms of diversity including the diversity impact of minorities, worker directors, digital specialists, etc. (Adams et al., 2015; Hillman, 2015). Calls are also returning to work about job-related diversity in relation to board decisions (Hillman, 2015). Job-related diversity can affect cognitive tasks such as decision-making (Pelled, 1996; van Knippenberg et al., 2004). Therefore, in this study we focused on job-related diversity rather than other types of diversity. We adopted Forbes and Milliken's (1999) conceptualization of job-related diversity among board members. This is

defined as the variety among board members in the form of educational background, functional background, and industry background.

Comprehensiveness of BDPs. Decision comprehensiveness is an influential process in TMTs (Miller et al., 1998; Simons et al., 1999). However, both in the board and the TMT literature, the concepts of decision comprehensiveness and decision quality are often used interchangeably. We conceptualize comprehensive board decision-making as a process and differentiate it from decision quality (Forbes, 2007). Decision comprehensiveness is an important antecedent of decision quality (Forbes, 2007).

Fredrickson and Mitchell (1984, p. 445) define decision comprehensiveness as "the extent to which organizations attempt to be exhaustive or inclusive in making and integrating strategic decisions". Previous studies used different measures of comprehensiveness (see Atuahene-Giman and Li, 2004; Simons et al., 1999; Talaulicar et al., 2005). All of these measures aimed to capture whether a broad range of information is collected, whether multiple alternatives are created, and whether these multiple courses of action are evaluated thoroughly. Accordingly, we define comprehensive board decision-making as a process in which board members often have very different understandings regarding important board issues. Board members have very different perspectives regarding what is the best for the firm and have a very unique approach to thinking and reasoning.

Speed of BDPs. Compared to the comprehensiveness of decision-making processes, knowledge on the speed of decision-making processes is limited. The general understanding of board and TMT literature is that the comprehensiveness and speed are mutually exclusive. While a number of studies have challenged this understanding in the TMT context (e.g. Eisenhardt, 1989; Talaulicar et al., 2005; Kauer et al., 2007), comprehensiveness and the speed of BDPs have not yet been subject to empirical studies in the context of a board. Following Eisenhardt

(1989), the speed of board decision-making refers to the average amount of time spent to reach a consensus on a final decision choice (see also Talaulicar et al., 2005; Kauer et al., 2007). This perspective is different than the implementation speed (Dooley et al., 2000) and speed of strategic action (Kim et al., 2009).

2.2.2 Upper Echelons Theory

The main premise of upper echelons theory is that organizations reflect senior executives' (the upper echelons) cognitive frames (e.g. knowledge, skills, values, beliefs, biases) (Hambrick and Mason, 1984). The model assumes that executives have bounded rationality—this notion explains why there are far too many complexities in most strategic situations for complete rationality to exist. Thus, decision-makers must work within the limits of their own cognitive frames (Canella and Holcomb, 2005). Therefore, in line with behavioral theory (Cyert and March, 1963), the upper echelons model emphasizes cognitive biases such as availability bias, overconfidence, anchoring, and illusion of control in explaining executives' influence over all stages of decision-making (Canella and Holcomb, 2005; Rost and Osterloh, 2010).

Strategic decision-making can be divided into three stages. The first is information search and filtering where each decision maker collects information depending on his/her cognitive frames. The second is interpretation where each decision maker harnesses available information with knowledge and beliefs to generate an alternative. The third is choice where alternatives are evaluated to reach a final decision choice (Milliken and Vollrath, 1991; Rindova, 1999). An executive's cognitive frame can first limit his/her field of vision or the areas in the environment to which attention is directed. It is most likely that executives will notice issues in the strategic situation that they personally care about, are familiar with, and have knowledge about. For instance, the issues an executive with a finance background recognizes will most likely related to financial aspects of a strategic decision. In addition, even when attention is directed, only part of the stimuli in a field of vision will actually receive direct

attention. This is commonly described as “selective perception” (Cannella and Holcomb, 2005).

People engage in interpretation or sense-making when they directly notice those factors (Weick, 1995). During the interpretation phase, decision-makers will apply their existing knowledge and beliefs to incoming information to identify problems and develop solutions (Dosi and Egidi, 1991). In this regard, decision makers’ experience will shape their domain of knowledge and skills in problem solving. This will greatly influence the generation of alternatives to the decision problem at hand. In the final stage, choice, alternatives are evaluated and selected. Decision-makers will engage in the last phase as a group until one of the alternatives is interpreted as the “best”. When no one best alternative exists (objectively identified solution), decision-making resembles a negotiation and thus group dynamics as well as factors (e.g. group structure) impacting group dynamics matter (Rindova, 1999).

Although executives’ background (e.g., functional background) and experience themselves are important in shaping how they frame issues of a strategic situation, it is the heterogeneity or homogeneity of these traits among executives that affects how they work together to reach a final decision choice. Heterogeneity has both advantages and disadvantages. Heterogeneity represents diversity in executives’ cognitive frames (e.g. knowledge, skills, experience). Executives’ demographic attributes such as age, gender, education, functional background, and industry experience are used as measures of unobservable constructs of executives’ knowledge, skills, and experience (Canella and Holcomb, 2005; Webber and Danahue, 2001). Diversity in demographic traits can lead to greater diversity on information sources and perspectives as well as more creative and innovative discussions (Bantel and Jackson, 1989; De Dreu and Canevale, 2003; Eisenhardt, 1989; Milliken and Martins, 1996). However, diversity can also lead to task-related conflict, disagreements about the content of tasks, the way tasks are performed (Jehn et al., 1999; Simons and Peterson, 2000), and impede

(De Dreu and Weingart, 2003). In this view, diversity may be associated not with the comprehensiveness of discussion per se, but with inhibiting the speed of decision-making (Amason, 1996; Milliken and Martins, 1996).

2.2.3 Job-Related Diversity and Board Members' Use of Knowledge and Skills

Although upper echelons theory is typically applied to explain how TMTs shape strategic decisions, it does not require a focus on TMTs (Hambrick, 2007) and can also be applied to other corporate elites such as the board of directors (e.g., Tuggle et al., 2010). Strategic decision-making is no longer only top executives' task, but is shared with boards (Baily and Peck, 2013; Finkelstein and Mooney, 2003). Thus, a board's cognitive frames play an important role and impact both comprehensiveness as well as the speed of SDPs (Rindova, 1999).

Directors with different functional background, educational background, and industry experience can direct attention to different fields of vision and hence can collect information from different sources. Having different experiences that shape their knowledge, the interpretation of such information can lead to different perspectives on the issues of a strategic situation. Accordingly, board discussions have broad-ranging information during evaluation and selection of alternatives (choice phase). The evaluation of more alternatives can lead to better and more creative decisions (Rindova, 1999).

Board diversity is an important board demographic that works against cognitive biases by increasing the comprehensiveness of decision-making. The cognitive limit of a director is compensated with other directors' different information, knowledge, and perspectives. Accordingly, when a broader range of information is processed, an increased number of perspectives are weighed against one another. However, it may not be the presence of directors with different skills, knowledge, and experience per se, but rather the sharing of individually-

collected information and the communication of different perspectives openly and freely that reveals the positive effects of diversity on cognitive biases surrendering BDPs (Cannella and Holcomb, 2005).

Upper echelons theory does not address how interactions among executives in diverse groups influence strategic decisions. Rather, it assumes that there is a group climate of open debate and dialog on the issues and choices (Cannella and Holcomb, 2005). However, diversity within a group does not always lead to elaboration of task relevant information and perspectives (Brodbeck et al., 2007; Greitemeyer and Schulz-Hardt, 2003). For example, Zhu (2013; 2014) demonstrated that minority perspectives might not be presented during board discussions. This can lead to cognitive biases. Research indicates that while different perspectives about the task being performed or issues to be evaluated are overlooked during board discussions, the former perspective that leads to satisfactory results is preserved (e.g. Westphal and Bednar, 2005). Therefore, it is questionable to think that once a diverse board is generated, the diversity's potential will be realized on BDPs. Zhang (2010) showed that diversity improved board work only when different knowledge and perspectives are shared and communicated.

This idea is supported by behavioral theory perspective, which posits that interactions between decision makers (e.g. conflict) can be vital to cope with cognitive biases. This influences strategic decision-making (Ees et al., 2009). Moreover, several studies on the work team literature has demonstrated that group processes facilitate the sharing of unique information and evaluation of different perspectives. This can transmit a positive impact to diversity on decision outcomes by enhancing the comprehensiveness of group decision-making (Amason, 1996; Simon et al., 1999). For example, after showing the positive effects of debate, Simon et al. (1999) says: "The conclusion to be drawn from these results is that for diversity to benefit a company's bottom line, there must be a process by which the positive aspects of

diversity are brought to bear." Amason (1996) indicated that cognitive conflict is a factor that transmits diversity potential on the comprehensiveness of decision-making.

In the board context, the use of knowledge and skills is specified as a core board process and is defined as the board's ability ''to tap the knowledge and skills available to it and then apply them to its tasks'' (Forbes and Milliken, 1999, p. 495). The link between job-related diversity and board members' use of knowledge and skills is rarely empirically tested. Instead, theory emphasizes a negative association between job-related diversity and the use of knowledge and skills (Forbes and Milliken, 1999). This negative effect is because job-related diversity may lead to high task-related disagreement resolution that may prevent directors from using their knowledge and skills to accomplish board tasks and goals. Moreover, such a shift from accomplishment of board tasks or goals to the resolution of high task-related conflict could increase the time that boards spend to reach a consensus on a final decision (Rindova, 1999).

Indeed, both decision making and information processing perspectives (De Dreu, 2007; Hinsz et al., 1997) support the idea that diversity may lead to task-related conflict. When this intensifies, it can negatively affect group performance (De Dreu and Weingart, 2003; Jehn and Mannix, 2001; Simons and Peterson, 2000). However, these perspectives also emphasize that moderate levels of conflict may benefit the quality of decision outcomes and enhance the comprehensiveness of group decision-making (De Dreu, 2006; Jehn et al., 1999). Therefore, it might not be task-related disagreements but rather the level of such conflicts that benefit or hinder board decision-making. It is rare that conflicts intensify in the boardroom (Hambrick et al., 2008), and it is likely that board discussions and decision-making processes are routinized to keep conflicts at moderate levels (Ravasi and Zattoni, 2006; Zhang, 2010).

In contrast, we think that the availability of different skills, knowledge, and experience during board decision-making will have a positive effect on the volume of information shared

and the number of perspectives communicated. Fredrickson and Mitchell (1984) and Glick et al. (1993) have emphasized that when there are debates on strategic proposals, upper-echelon executives are more likely to expend the resources necessary for more analyses, more consultants, and more discussions. Facing the accountability of board decisions (Finkelstein and Mooney, 2003; Aguilera, 2005), directors can be motivated to benefit from their peers' cognitive resources. Diversity generally implies that there is a greater probability that individual exchanges will be with dissimilar others (Pelled et al., 1999) who are experts in solving decision problems and have timely and task-related information about the decision task at hand and existing knowledge in certain fields (Carpenter and Westphal, 2001; Hillman et al., 2002; Rindova, 1999). In addition, Minichilli and colleagues have shown that job-related diversity could further encourage board members to seek new information from their network resources (2009). Following these discussions, we hypothesize that:

Hypothesis 1.

There is a positive relationship between job-related diversity and board members' use of knowledge and skills.

2.2.4 The Mediating Role of Board Members' Use of Knowledge and Skills

Previous studies have examined the effect directors' use of knowledge and skills may have on board tasks (e.g. Minichilli et al., 2009; Zona and Zattoni, 2007) but not on BDPs. Our theoretical model suggests a positive association between job-related diversity and the use of knowledge and skills in Hypothesis 1. We further argue that job-related diversity may enhance the comprehensiveness of BDPs through the use of knowledge and skills.

The use of board members' knowledge and skills plays a critical role in benefiting from diversity's potential—having board members who possess unique information and different

perspectives does not automatically imply that diverse boards will benefit from broad-ranging information and will thoroughly evaluate alternatives. The exchange of unique information and communication of different perspectives is likely to enhance the comprehensiveness of decision-making processes. Therefore, we hypothesize that:

Hypothesis 2.

Board members' use of knowledge and skills mediates the positive relationship between job-related diversity and comprehensiveness of board decision-making processes.

In addition, directors' use of knowledge and skills is an important mediator in understanding the effects that job-related diversity might have on the speed of BDPs. As mentioned before, our model suggests a positive association between job-related diversity and board members' use of knowledge and skills in Hypothesis 1. We further argue that job-related diversity may enhance the speed of BDPs through this positive association.

In the board context, the diversity effect on the speed of decision-making is commonly suggested to be negative (Forbes and Milliken, 1999; Rindova, 1999). As mentioned before, the logic behind this is that diversity may generate an increased number of different perspectives—the convergence of which might lead to high levels of conflict during board discussions. Accordingly, the resolution of conflicts might on the one hand provide new insights on the decision problem at hand but on the other might lead to long discussions. This, in turn, may hinder boards to reach a fast consensus on a final decision choice (Rindova, 1999). However, we argued above that it is unlikely that conflict would intensity and the resolution of conflicts would refrain directors from accomplishing board tasks and goals.

Although empirical studies are scarce, an alternative perspective has been developed in the board context focusing on communication of an increased number of alternatives that might permit boards to evaluate decision alternatives simultaneously and thus quickly. Kim and

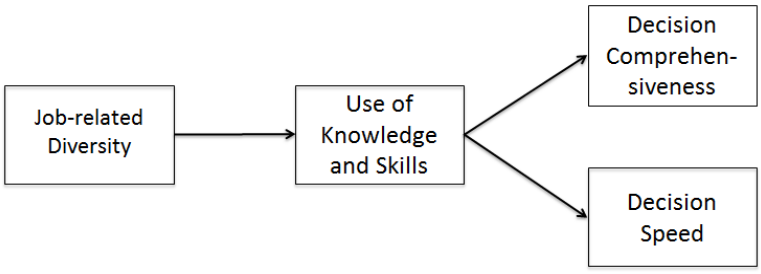
colleagues (2009, p. 733) stated: "diverse boards provide multiple alternatives and benchmarking criteria, permitting simultaneous evaluation of strategic options and promoting speed in strategic decision making processes." Directors, with different skills, knowledge and experience, may collect information on a broad range, and this information is timely and related to a decision topic at hand (Carpenter and Westphal, 2001). Benefiting from this information during discussions (exchange of unique information), boards can process information more accurately and quickly (Carpenter and Westphal, 2001). Otherwise, extensive data analysis to reach timely and relevant information may severely delay decision-making (Eisenhardt, 1989). In addition, the availability and communication of an increased number of alternatives may permit boards to evaluate decision alternatives simultaneously. This, in turn, can be increase the time needed to reach consensus on a final decision choice.

Support comes from research in the TMT context. Many scholars have demonstrated the positive effects of developing multiple decision alternatives and comparing them simultaneously on the speed of decision-making (e.g. Kauer et al., 2007; Talaulicar et al., 2005). Eisenhardt (1989) also showed that fast strategic decision-makers (TMTs) benefit from broad-ranging information and multiple alternatives. We hypothesize that:

Hypothesis 3.

Board members' use of knowledge and skills mediates the positive relationship between job-related diversity on the speed of board decision-making.

Figure 2.1 Research Model



2.3 METHOD

To empirically test our model, we found that the "Value Creating Board" research instrument (Huse, 2009) could be used. This instrument is well established and has been used for data collection in many European countries such as Italy (Minichilli et al., 2009; Zona and Zattoni, 2007), the Netherlands (van Ees et al., 2008), Belgium (van den Heuvel et al., 2006), and Norway (Machold et al., 2011). Applying this unique research instrument helps to overcome these difficulties and provides meaningful insights into what actually happens inside and outside the boardrooms because data on board processes and board behavior is traditionally difficult to access (see e.g. Daily et al., 2003). Such an approach follows earlier calls to go beyond the surface level and develop measures aiming to capture actual board behavior (Hambrick et al., 2008). Therefore, to examine board decision-making, we mainly see opportunities in this research instrument and are convinced that our methodological approach fits the purpose of this study.

2.3.1 Data and Sample

Data from some of the surveys based on this research instrument are publicly available. The data from one of the Norwegian surveys nicely met our research questions and fitted our theoretically-derived research model, and thus we decided to use this data set. Surveys within the Norwegian research program were conducted in 2003/2004 and 2005/2006. We decided to use questionnaire survey data from 2005 (Sellevoll et al., 2007). Several board process studies have used this unique data set before (see e.g. Minichilli et al., 2012; Zattoni et al., 2015), but none of these studies have focused on the relationship between diversity and board decision-making.

Most importantly, we decided to use this data set because it is the most comprehensive of the European surveys (Huse 2009, p. 370) as well as one of the largest addressing 2,954

firms. It covers more in-depth questions related to board behavior and board decision-making than the 2003/2004 surveys from Norway or the surveys from other countries. Most of the 265 questions are linked to constructs that have been empirically applied or theoretically argued for by previous board research. Moreover, the survey addresses CEOs, chairpersons, and board members, and question formulation varied according to the different respondents. Still, it has a fairly high response rate of about 33%, which is significantly higher than most other board surveys (Finkelstein et al., 1996). In addition, the survey is based on the second generation of the research instruments applying mostly seven point Likert-type scales. Most of the other available surveys from Italy, the Netherlands, Belgium, as well as the 2003/2004 Norwegian studies are based on the first generation that uses a five point Likert-type scale. A detailed description of the survey can be found in Huse (2009).

Besides these arguments, the Norwegian context is particular interesting. The findings from this data set may be applicable and interesting in other settings because we are using a theory-generated empirical test. First, the governance system in Norway has many similarities with those found in other countries (Machold et al., 2011). Second, formal legal institutions play a less important role, and guidance is dominated by process-related governance mechanisms (Sinani et al., 2008). Finally, Norway has a long tradition of active boards (Huse, 1990) and a pioneering role in board approaches and board composition improvements (Singh and Vinnicombe, 2003). Thus, lessons learnt from the past in Norway remain highly relevant. Empirical evidence suggests that findings from data sets on Norwegian boards could be interesting in other settings as in Oxelheim and Randøy (2003) as well as Zhang (2010). In line with other research in the field, we acknowledge the importance of interpreting board behavior based on the socially situated context (Westphal and Zajac, 2013). However, we are convinced that due to the cross-sectional design including different firms across industries (mostly not

affected by legislative regulations), our contextual setting does not have a major influence on board decision-making.

Using a survey design like this, the possibility of potential common method bias (Podsakoff et al., 2003) cannot be ruled out completely; however, several measures to address the common method bias with regard to the data collection process were conducted (see Huse, 2009 for a detailed summary). Besides these measures, Harman's one factor test was conducted to test for common method bias potentially affecting the results (Podsakoff et al., 2003). An exploratory factor analysis including all constructs provides evidence that the majority of variance accounts for more than one general factor. We identified multiple factors with eigenvalues greater than one. To control for the effects of method variance, a partial correlation procedure was performed (Lindell and Whitney, 2001). The results show no indication that common method bias could be an issue in our study.

We decided to use the CEO responses for the purpose of this study. The application of a single-respondent design is a common approach in primary data governance studies (see e.g. Minichilli et al., 2012; Zattoni et al., 2015; Zhang, 2010). Because of his/her knowledge on board decision-making, the CEO is the most knowledgeable informant about phenomena pertinent to our study (Zattoni et al., 2015). Overall, 973 questionnaires answered by CEOs were returned (approx. 1/3 response rate), and a non-response analysis performed by Huse (2009) showed no significant differences between responding and non-responding organizations. Micro-sized firms often lack formal governance structures (Gedajlovic et al., 2004), and thus we excluded all firms having fewer than 10 employees from our analysis to ensure that this does not impact our results. Furthermore, the sample includes only boards with at least two members. We examined group decision-making processes, and we want to make sure that group dynamics (e.g. interactions, participation and debate) are present at the board. To ensure the quality of the data for the structural equation modeling (SEM) technique, we

have deleted cases with missing values for all variables used in this study. In total, our sample consists of valid answers from 377 CEOs. The size is adequate for SEM analysis.

However, we acknowledge the potential limitations that a single-respondent design may have (Gabrielsson and Winlund, 2000). Using only CEO responses means that our research design is based on how the CEO perceives the concepts of interest. Previous research on boards showed how different factors such as positions, background, and identities might influence these perceptions (Huse and Rindova, 2001). Therefore, there is a need to further increase the validity and reliability of our model and the variables used in this study—these are often a major concern in behavioral research (Nunnally and Bernstein, 1994).

To do so, we used a multiple-respondent design for the research instrument and repeated the empirical tests using chairperson answers (Zhang, 2010). This approach might limit the chance that our results are affected by a potential common method bias. As mentioned before—even though the possibility that such bias occurs in a cross-sectional research design on board behavior cannot be excluded completely (Doty and Glick, 1998; Melkumov et al., 2015)—we are convinced that our approach addresses this in the most thorough way in combination with the aforementioned actions. There were 228 responses from board chairpersons used here.

2.3.2 Measures

Dependent Variable

Following the theoretical suggestion by Forbes and Milliken (1999) and later conceptualizations as in Torchia et al. (2015), job-related diversity refers to the degree of diversity the board has with regard to i) functional background, ii) industrial background, and iii) educational background. This composite index of three items has a Cronbach alpha of .728. Consistent with our overall approach, we measure the perceived diversity on the board level by asking the CEO to what degree he/she agrees with the items presented above using a 7-point

Likert scale. Relying on CEO perceptions of job-related diversity has been used in previous studies on board diversity (Nielsen and Huse, 2010). Miller and colleagues (1998) provide support for this approach arguing that perceived diversity (measured by asking the CEO) is a reasonable proxy for actual diversity.

Mediating Variable

The construct of board members' use of knowledge and skills (Huse 2005) is measured as the mean of three items on how board members perform in board meetings: i) board members actively engage in board discussions during board meetings, ii) present many creative and innovative advices and suggestions, and iii) often find very creative and innovation solutions. This construct aims to capture the use of knowledge and skills through discussions to find solutions—a similar idea has been captured by various previous studies (see e.g. Gabrielsson et al. 2007). Cronbach's alpha for this construct equals .803.

Independent Variables

Building on Fredrickson and Mitchell's (1984) conceptualization and operationalization of decision comprehensiveness in previous studies (e.g. Atuahene-Giman and Li, 2004; Talaulicar et al., 2005; Simons et al., 1999), the measure we used in our study to estimate comprehensiveness of board decision-making captures the degree and the depth of discussion that is inclusive of unique information and knowledge embedded in directors' job-related diversity. This construct is thus characterized by board meetings where: i) board members often have very different understandings regarding important board issues, ii) board members bring in very different perspectives regarding what is the best for the firm, and iii) have very unique approach to thinking and reasoning. Cronbach's alpha coefficient was .817.

Decision-making speed refers to the CEO's assessment on whether board meetings are characterized by very quick decision-making. Decision comprehensiveness was computed as a

multi-item measure, and decision-making speed is a single-item construct. This construct measures the degree of fast board decision-making character and respondents used a 7-point scale. Even though single-item measures were subject to criticism in previous studies, we are convinced that one should prefer one 'good' over many 'bad' items when evaluating reliability and validity (Gardner et al., 1998; Nielsen and Nielsen, 2009). As in our case where response biases are of concern, the application of one/few elaborate questionnaire items (see e.g. Nielsen and Huse, 2010) might thus be more appropriate (Russell et al., 1989).

Control Variables

In board research, it is important to pay attention to context (Zahra and Pearce 1989), and certain contextual variables are frequently used because they may shape board behavior and the way that information is processed. Following previous studies, we control for contextual variables on different levels. At the organizational level, we control for i) firm age, and ii) firm size by number of employees. To create normal distributions, firm age and firm size are measured as natural logarithmic transformation of these items in 2005. Our theorizing suggests that different board variables may influence decision-making and information processing on the board. At the board level we control for iii) the number of board members, iv) the length of board meetings, and v) the number of board meetings. We further controlled for vi) gender diversity to capture other dimensions of diversity potentially affecting board decision-making and information processing. The number of board members refers to how many board members with full voting rights the firm had per October 2005. The length of board meetings covers how long board meetings last (measured in hours). The numbers of board meetings refers to the number of meetings being held in 2004 with a physical presence. Gender diversity is measured as the percentage of female board members. We further control at the CEO level for vii) CEO tenure measured by the number of years he/she functioned in this position as CEO board power relations may affect board work (Shen, 2003).

2.3.3 Measurement models

There are three constructs: job-related diversity, use of knowledge and skills, and decision comprehensiveness. To assess the measurement model validity and construct discriminant validity, we performed a confirmatory factor analysis (CFA). Results of the CFA for the measurement model suggest a good model fit with values not exceeding the critical thresholds (CMIN/DF=1.484; CFI=.990; RMSEA=.036). Table 2.1 presents the construct discriminant validity of the multi-item constructs using composite reliability scores. Factor loadings ranged between .542 and .913 ($p<.001$) with reliability scores all >.7. The analyses using the chairperson's answers show similar results and support our findings by indicating a good fit of the measurement model validity (CMIN=1.434; CFI=.986; RMSEA=.044) and construct discriminant validity (see Table 2.4 in Appendix). We also obtained factor scores of the three constructs for the structural analysis below. In conclusion, we have a strong measurement model.

2.4 DESCRIPTIVE DATA

We present descriptive statistics for the variables used in our analyses in Table 2.2. The minimum, maximum, mean, and standard deviation are reported.

In Table 2.3 we present Pearson's correlation coefficients among the variables. As expected, the number of board meetings is positively associated with the comprehensiveness of decision-making processes, whereas the length of board meetings negatively affects the speed of board decision-making processes. Furthermore, comprehensiveness and the speed of decision-making processes are both significantly and positively (but to different degrees) related to the mediating variable. To test whether multi-collinearity may affect our results, we performed VIF-tests. All VIF values are within acceptable ranges between one and three (Myers, 1990).

Table 2.1. Construct Reliability and Factor Loadings

Constructs	Measures	Factor Loadings	Cronbach Alpha
Job-related Diversity	Our board members represent diversity with regards to ….		.728
	a... functional background (e.g. sales, finance, accounting, marketing etc.)	.773	
	b… industrial background (e.g. different industries and firms)	.646	
	c… educational background (different universities, schools and type of education)	.680	
Use of Knowledge and Skills	In board meetings, … our board members		.803
	a ... actively engage in board discussions.	.542	
	b ... present creative and innovative advice and suggestions.	.913	
	c ...often find very creative and innovative solutions.	.831	
Decision Comprehen-siveness	The board meetings, our board members…		.817
	a … often have very different understandings regarding important board issues.	.734	
	b … bring in very different perspectives regarding what is the best for the firm.	.851	
	c … have very unique approach to thinking and reasoning.	.735	

Table 2.2. Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
Ln Firm Age	0.00	3.88	2.41	.549
Ln Firm Size	2.30	8.86	4.19	1.12
Board Size	2.00	12.00	5.44	1.94
Length of Board Meetings	0.50	9.00	3.62	1.40
Number of Board Meetings	1.00	14.00	5.52	2.50
Gender Diversity	0.00	1.00	0.16	0.17
CEO Tenure	2.00	30.00	8.17	6.15
Job-related Diversity	0.89	5.40	3.67	0.88
Use of Knowledge and Skills	0.92	6.10	3.56	1.19
Decision Comprehensiveness	0.78	5.34	3.07	1.01
Decision Speed	1.00	7.00	5.07	1.41

Valid N (listwise) 377

Table 2.3. Correlation Matrix

Pearson Correlation	1	2	3	4	5	6	7	8	9	10	11
1. Ln Firm Age	1										
2. Ln Firm Size	.016	1									
3. Board Size	-.085	.489**	1								
4. Length of board meetings	-.060	.030	.213**	1							
5. Number of board meetings	-.085	.114*	.432**	.206**	1						
6. Gender diversity	-.045	.175**	.323**	-.020	.203**	1					
7. CEO tenure	.217**	-.114*	-.120*	-.064	-.007	-.055	1				
8. Job-related diversity	-.045	-.015	-.050	.071	.042	-.041	.072	1			
9. Use of knowledge and skills	.063	-.198**	-.207**	.069	.044	-.045	.195**	.391**	1		
10. Decision comprehensiveness	-.030	.006	.054	.085	.202**	.101	-.008	.188**	.233**	1	
11. Decision speed	-.025	-.066	-.228**	-.198**	-.219**	-.064	.055	.138**	.236**	-.053	1

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

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

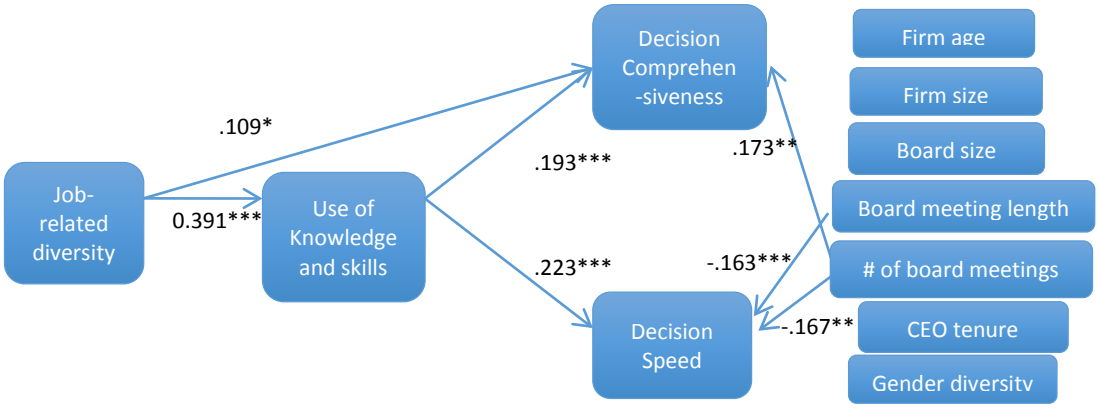
N=377

The descriptive statistics and the correlation matrix for the chairperson's answers can be found in Tables 2.5 and 2.6 of "Appendix".

2.5 STRUCTURAL EQUATION MODELING (SEM) ANALYSIS

Structural equation modeling examines the relationships between constructs and tests our hypotheses. The basic structural model is also termed as the structural model 1 and is presented in Figure 2.2. We obtained adequate model fit for the basic structural model where CIMN/DF=2.587, CFI=0.906, and RMSEA=0.065. The model fit is acceptable. Only significant relationships are reported in Figure 2.2.

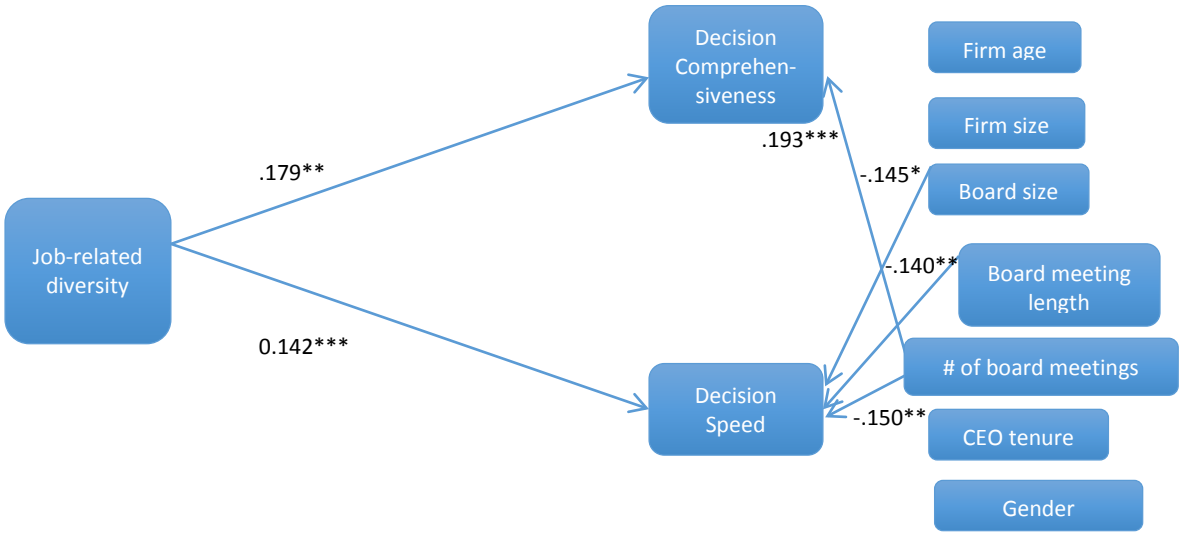
Figure 2.2 Structural Model 1



*** p<0.001, ** p<0.01, * P<0.1 CMIN/DF=2.578, CFI=0.906, RMSEA=0.065

In accordance with Baron and Kenney (1986), three conditions support a mediating relationship. As a result, two additional structural models are built for this purpose (see structural model 2 in Figure 2.3 and structural model 3 in Figure 2.4). Structural model 2 examines direct relationships between job-related diversity and two dependent variables: decision comprehensiveness and decision speed. The relationships should be significant for a potential mediation effect to exist.

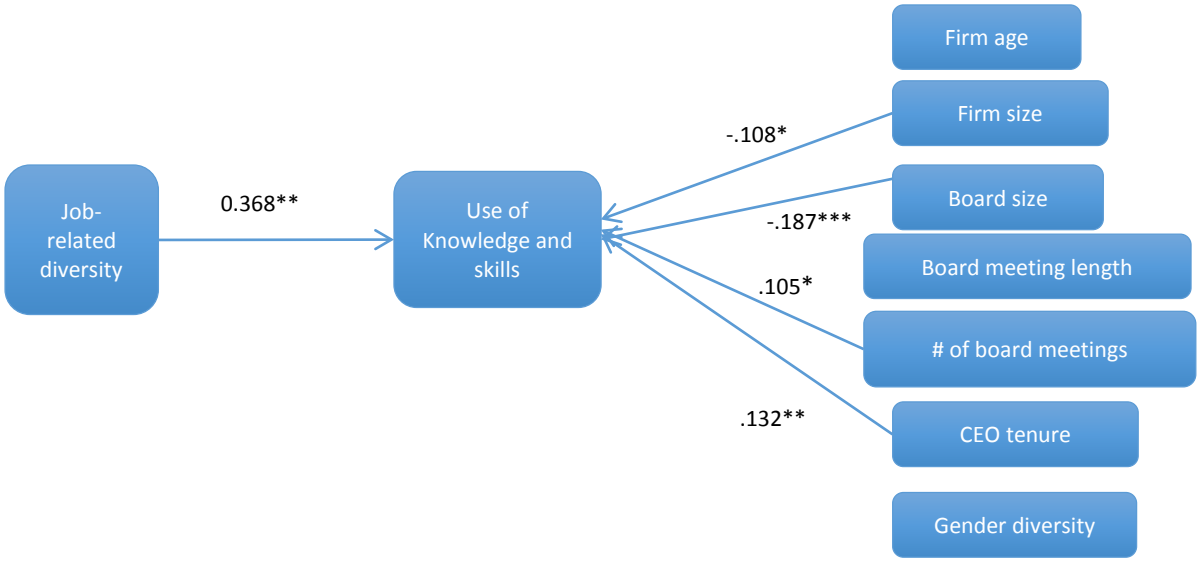
Figure 2.3 Structure Model 2



*** p<0.001, ** p<0.01, * P<0.1 CMIN/DF=1.369, CFI=0.978, RMSEA=0.031

In addition, structural model 3 examines the relationship between job-related diversity and the mediator, use of knowledge and skills; this relationship should also be significant. The last step is to examine the relationship between job-related diversity and the dependent variables. This should either disappear (full mediation) or significantly diminish (partial mediation). This examination is performed by structural model 1 presented earlier. The model fit of structural model 2 and 3 is also acceptable.

Figure 2.4 Structural Model 3



*** p<0.001, ** p<0.05, * P<0.1 CMIN/DF=1.413, CFI=0.979, RMSEA=0.033

2.6 RESULTS

To test Hypothesis 1, structural model 1 examines the relationship between job-related diversity and board members' use of knowledge and skills. Our findings suggest that job-related diversity positively affects board members' use of knowledge and skills (B = .391, P < .001). It is interesting to note that in structural model 3 (see Figure 2.4), the coefficient is also significant (B=0.368, P<.001). Hypothesis 1 is supported.

Hypothesis 2 tests the mediation effect of the construct of use of knowledge and skills on the construct of decision comprehensiveness. The first condition of the Baron and Kenny mediation holds because structural model 2 (see Figure 2.3) shows a positive direct effect between the independent variable and the dependent variable (B = .179, P < .001). The second condition is also met when there is a significant and positive relationship between job-related diversity and the use of knowledge and skills in structural model 3 (B=.368, p<.001, See Figure 2.4). The last condition is when mediators are involved—the direct relationship between job-related diversity and decision comprehensiveness is reduced (B=.109, P<.1). Thus, we conclude that there is a partial mediation between job-related diversity and decision comprehensiveness through use of knowledge and skills. Hypothesis 2 is supported.

Hypothesis 3 tests the mediation effect of the construct on the use of knowledge and skills on decision speed. First, the coefficient between job-related diversity and decision speed is significant and positive in structural model 2 (B=.142, p<.001, see Figure 3). Second, the coefficient between job-related diversity and the use of knowledge and skills is also positive and significant in structural model 3 (see Figure 2.4). Third, in structural model 1 (Figure 2.2), the direct relationship between job-related diversity and decision speed is not significant. Combining structural model 1, 2 and 3, there is a full mediation between job-related diversity and decision-speed through the use of knowledge and skills. Hypothesis 3 is supported.

We also tested the structural models using chairpersons' responses and received similar results. The structural models are presented in Figs. 2.5, 2.6, and 2.7 of "Appendix". While the model fit using chairperson responses is not as good as that using CEO responses, it still illustrates the relationship among constructs. Figure 2.5, 2.6, and 2.7 show that all three hypotheses received support. One solution to increase the model is to reduce the control variables. When the control variables are set to firm age, board meeting length, and the number

of board meetings, all three structural model fits increase where RMSEA is at .030. Moreover, all significant relationships remain unchanged.

In summary, the three hypotheses received support from the Norwegian survey database. Job-related diversity is significantly and positively associated with use of knowledge and skills (H1). At the same time, the use of knowledge and skills mediates the positive and significant relationship between job-related diversity and decision comprehensiveness (H2) as well as between job-related diversity and decision speed (H3).

2.7 DISCUSSION AND CONCLUSION

Research on both TMT and board diversity in a strategic decision-making context has often relied on the argument that job-related diversity is a 'double-edged sword'. While job-related diversity enhances the comprehensiveness of strategic decision-making, it comes at the cost of being slower in making such decisions. This study is among the first to empirically assesses the validity of this argument in board context through an upper echelons lens. Our findings reveal that variety in board members' educational background, functional background, and industry background has a positive effect on both comprehensiveness and speed of board decision-making processes through the mediator of the use of knowledge and skill in the board.

2.7.1 Theoretical Implications

This work contributes to research on board diversity by introducing upper echelons theory as a novel theoretical perspective in better understanding and investigating the effects that job-related diversity might have on BDPs. Through an upper echelons lens, we suggested and found that different backgrounds and experience of board members may increase the comprehensiveness of BDPs. These results concur with previous studies conducted in the TMTs context (e.g. Hambrick et al., 1996; Simons et al., 1999). This also validates the theory that emphasizes the positive effects of board diversity on comprehensiveness of SDPs

(Rindova, 1999). Although group processes are specified as keys in coping with cognitive biases surrounding decision-making, prior studies that have applied an upper echelons approach (Tuggle et al., 2010) have not examined the effects that board processes might have. We enrich the upper echelons literature in the board context by showing the role of board processes in transmitting the cognitive frames of directors on strategy process.

In addition, both the TMT and board diversity literature show that job-related diversity have the greatest potential in influencing cognitive tasks including decision-making (e.g. Forbes and Milliken, 1999; Miller et al., 1998; Pelled, 1996). However, research on board diversity thus far has mainly focused on gender diversity. Following scholars' call for more research on other types of board diversity (Adams et al., 2015; Hillman, 2015), we further contribute to research on board diversity by showing the important effects that job-related diversity might have. Indeed, we control for the possible effects that gender diversity might have and found no significant effects. Thus, we provided support for the argument that job-related diversity might have the greatest potential to influence particularly cognitive tasks such as decision-making. To the best of our knowledge, our study is the first to empirically show the effects that job-related diversity might have on BDPs.

Moreover, our results of mediation analyses better explain the diversity effects on processes by challenging the existing knowledge. The findings show that board members' use of knowledge and skills partially mediates the positive relationship between job-related diversity and comprehensiveness of BDPs, but it fully mediates the relationship between job-related diversity and the speed of BDPs. These results contradict the propositions of cognitive perspective (Forbes and Milliken, 1999) that suggest a negative relationship between diversity and the use of directors' knowledge and skills. As a matter of fact, a number of studies have used a social categorization perspective to show negative effects of diversity on the presentation of different (minority) perspectives during board decision-making (e.g. Zhu, 2013;

2014). On the other hand, others have demonstrated that when board members (minorities) have different backgrounds and experience, negative effects of bias categorization and perceptions on board discussions may be less detrimental by limiting representation of different (minorities') perspectives (McDonald et al., 2008; Westphal and Milton, 2000). Our results support the later perspective—job-related diversity may enhance the use of knowledge and skills.

The positive effect of job-related diversity on decision-making speed through the use of knowledge and skills is also an interesting finding because it contradicts the main proposition both in a TMT and a board context: Diversity is a 'double-edged sword' in relation to its effects on comprehensiveness and speed (e.g. Hambrick et al., 1996; Miller and Triana, 2009). We argue and demonstrate that diverse boards may be fast in making decisions because they benefit from the simultaneous evaluation of decision alternatives to reach a final decision. This concurs with previous studies (Eisenhardt, 1989; Kauer et al., 2007; Talaulicar et al., 2005). In contrast, theory emphasizes that diversity may lead to task-related disagreements, because different perspectives should be converged, resolution of which might require long discussions (Rindova, 1999). However, it might be high-levels of task-related conflicts, rather than solely occurrence, which might impede competent board work (Jehn et al., 1999; De Dreu, 2006). It may be rare for conflicts to intensify in the boardroom (Hambrick et al., 2008). It is not unlikely that board discussions and decision-making processes are routinized (Ravasi and Zattoni, 2006; Zhang 2010). This explanation is in line with the results of a meta-analysis conducted by De Dreu and Weingart (2003) showing that conflict interferes less with routine tasks than with non-routine tasks.

2.7.2 Practical Implications

In summary, the results of this study point to the importance of diversity in board members´ functional and educational backgrounds as well as industry experience. It also suggests the

critical mediating role played by board processes such as the use of knowledge and skills. This has implications for practitioners and policy-makers. For practitioners, it first suggests the fostering of job-related diversity in corporate boards because such variety in timely and relevant information and perspectives helps boards make decisions comprehensively. This most likely leads to decisions with better quality and creativity. Second, it shows that this variety enhances the speed of BDPs. Third, to fully exploit diversity's potential on decision-making processes, a board atmosphere should be created to facilitate board members use of their knowledge and skills.

For policy makers, our results suggest that boards should be conceptualized as strategic decision-making groups—not only monitoring decision outcomes but also influencing firms' strategic decision-making processes. Thus, we suggest that policy-makers focus on board members' backgrounds and experience and the inner working of boards rather than only on the independence of board members from management. This can facilitate the generation of boards as value-creating decision-making groups. For example, the Russian Code of Corporate Governance (Moscow Exchange, 2014) states; "2.5.2. … that board meetings are held in a constructive atmosphere and that any items on the meeting agenda are discussed freely."

2.8 LIMITATIONS AND FUTURE RESEARCH

The limitations of our study point out several opportunities for future research. Even though we show the positive relationship, job-related diversity may not have the greatest power to explain the speed of board decision-making. For instance, in the board context, cohesiveness and communication have been linked to board decision-making (Forbes and Milliken, 1999). Acknowledging the lack of academic attention on the speed of decision-making, we suggest that future research explore other factors that serve as antecedents for the speed of board-decision-making processes.

We addressed issues related to construct validity, and thus we used answers from different respondents. Still, future research may apply mixed method approaches (e.g. Bailey and Peck, 2013; Ravasi and Zattoni, 2006) combining qualitative and quantitative research designs to further increase the understanding of our findings and the validity of the constructs. More fine-grained analyses may then be conducted. Such an approach might shed light on whether faultlines occur in diverse boards. Faultline theory addresses demographic dissimilarity between subgroups within an overall group (Li and Hambrick, 2005). Faultlines may be important aspects of decision-making processes due to their effects on group processes (Lau and Murnighan, 2005; Li and Hambrick, 2005) impacting the selection of a final decision choice (Tuggle et al., 2010).

In addition, mixed method approaches might also help explain one main proposition adopted in this study: it is unlikely that task-related conflict will intensify in boardroom. Although this proposition is based on previous studies (e.g. Hambrick et al., 2008), effects of conflict (task, process, relational) on board behavior can be more complex and complicated. In fact, previous studies have demonstrated mixed results on the link between a task conflict and a board task (e.g. Minichilli et al., 2009; Zona and Zattoni, 2007). More research that applies a mixed method approach is needed to understand these results and reveal whether it is the management of conflict or certain barriers (e.g. social or power related) that keep task-related agreements at low levels.

Identifying specific circumstances under which diversity might have positive or negative effects is a challenging and important task (Eagly, 2016; Post and Byron, 2015). Indeed, upper echelons theory can be enriched by investigating contingencies under which diversity might have positive or negative effects on strategic decision-making processes as well as decision outcomes (Li and Hambrick, 2005; Rost and Osterloh, 2010). Cannella and Holcomb (2005, p. 231) noted, “Additionally, if the CEO does not support open debate and

dialog on the issues and choices, the team is not likely to act in the ways predicted by the upper echelons model." In this regard, it may be interesting to see how a powerful CEO may influence diversity's potential on strategic decision-making processes.

Moreover, the theory of upper echelons theory proposes that under great job pressure, job-related diversity might benefit from decision-making and thus will enhance firm performance (Hambrick et al., 2005). Applying an information-processing perspective (Boivie et al., 2016), previous studies have demonstrated that information-processing overload (information processing demands exceed information processing capacity) can limit boards in their ability to benefit from board members' information, perspectives, and knowledge (Khanna et al., 2014).

From this perspective, it can be interesting to see whether and how busy board conditions (Kaczmarek et al. 2014) might influence diversity's potential to influence board decision-making through an upper echelons lens. As more scholars conceptualize boards as decision-making groups participating and contributing to firms' strategic decisions together with TMTs, they are likely to find a rich set of theories and dynamics waiting for academic attention.

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2.10 APPENDIX

Table 2.4. Construct Reliability and Factor Loadings – Chairperson Answers

Constructs	Measures	Factor Loadings	Cronbach Alpha
Job-related Diversity	Our board members represent diversity with regards to ….		.744
	a... functional background (e.g. sales, finance, accounting, marketing etc.).	.731	
	b… industrial background (e.g. different industries and firms).	.674	
	c… educational background (different universities, schools and type of education).	.651	
Use of Knowledge and Skills	In board meetings, … our board members		.786
	a ... actively engage in board discussions.	.446	
	b ... present many creative and innovative advices and suggestions.	.857	
	c ...often find very creative and innovative solutions.	.851	
Decision Comprehen-siveness	The board meetings, our board members…		.824
	a … often have very different understandings regarding important board issues.	.705	
	b … bring in very different perspectives regarding what is the best for the firm.	.901	
	c … have very unique approach to thinking and reasoning.	.707	

Table 2.5. Descriptive Statistics – Chairperson Answers

	Minimum	Maximum	Mean	Std. Deviation
Ln Firm Age	0.69	2.93	2.44	0.49
Ln Firm Size	2.30	9.29	4.29	1.31
Board Size	2.00	12.00	5.56	2.06
Length of Board Meetings	0.50	10.00	3.66	1.36
Number of Board Meetings	1.00	20.00	6.42	2.77
Gender Diversity	0.00	1.00	0.18	0.18
CEO Tenure	2.00	30.00	7.67	6.97
Job-related Diversity	0.88	4.78	3.42	0.72
Use of Knowledge and Skills	1.28	6.24	4.06	1.11
Decision Comprehensiveness	0.89	5.27	3.19	1.00
Decision Speed	1.00	7.00	4.95	1.49
Valid N (listwise)	228			

Table 2.6. Correlation Matrix – Chairperson Answers

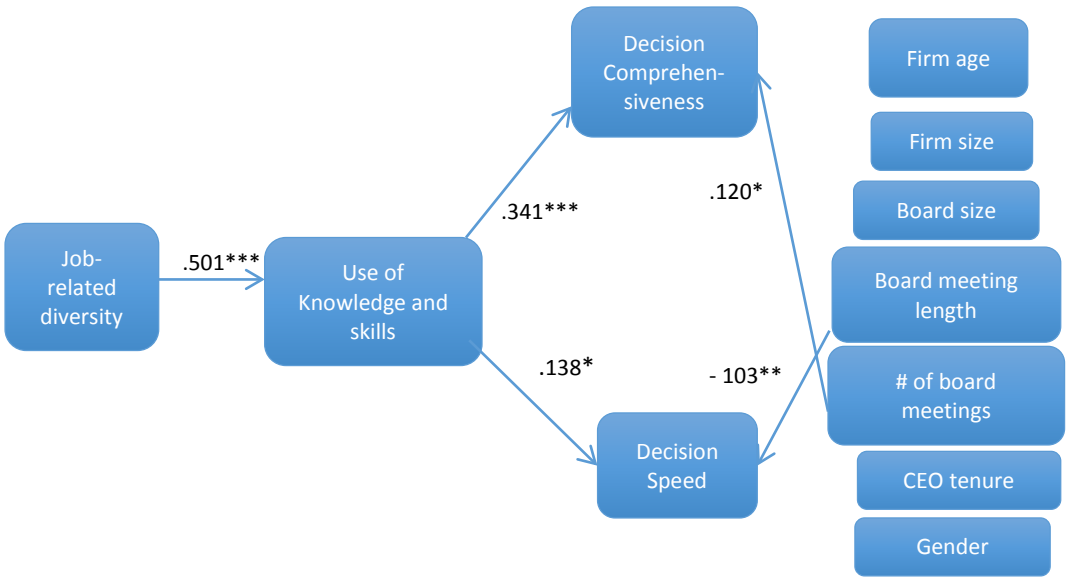
Pearson Correlation	1	2	3	4	5	6	7	8	9	10	11
1. LnFirmAge	1										
2. LnFirmSize	.039	1									
3. Board Size	-.038	.590**	1								
4. Length of board meetings	.162*	.350**	.420**	1							
5. Number of board meetings	-.072	.257**	.422**	.337**	1						
6. Gender diversity	-.032	.257**	.317**	.146*	.240**	1					
7. CEO tenure	.162*	-.178**	-.199**	-.041	-.109	-.090	1				
8. Job-related diversity	.043	.000	.116	.221**	.223**	-.006	.042	1			
9. Use of knowledge and skills	.031	-.160*	-.094	.073	.118	.050	.061	.501**	1		
10. Decision comprehensiveness	-.010	.127	.097	.143*	.222**	.110	-.109	.292**	.383**	1	
11. Decision speed	.085	-.139*	-.307**	-.184**	-.209**	-.089	.069	.039	.152*	-.047	1

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

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

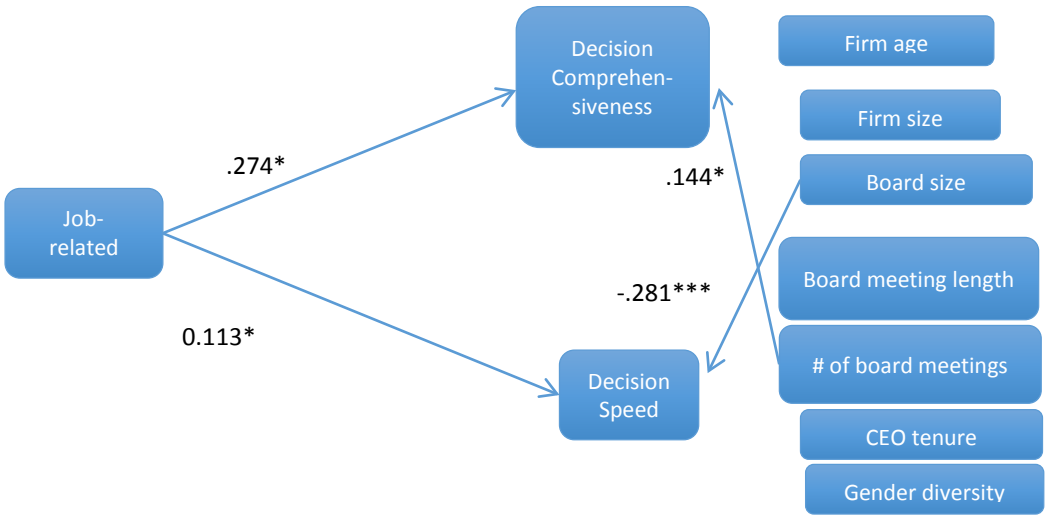
N=228

Figure 2.5 Structural Model 1 – Chairperson Answers



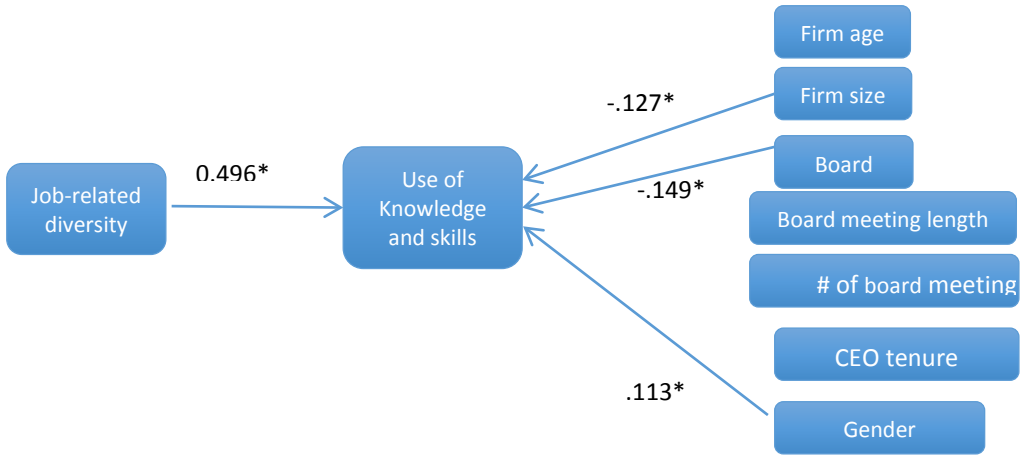
CMIN/DF=2.851, CFI=0.874, RMSEA=0.090

Figure 2.6 Structural Model 2 - Chairperson Answers



CMIN/DF=3.00, CFI=0.865, RMSEA=0.094

Figure 2.7 Structural Model 3 - Chairperson Answers



CMIN/DF=3.173, CFI=0.873, RMSEA=0.098

CHAPTER 3:

WOMEN DIRECTORS CONTRIBUTION TO ORGANIZATIONAL INNOVATION: A BEHAVIORAL APPROACH[2]

[2] Torchia, M., Calabrò, A., Gabaldon, P., & Kanadli, S. B. (2018). Women directors contribution to organizational innovation: A behavioral approach. *Scandinavian Journal of Management*. https://doi.org/10.1016/j.scaman.2018.02.001.

Abstract

This paper aims to analyze the relationships between women directors (a demographic characteristic) and organizational innovation (a predictor of firm performance) by considering the mediating role of the board's decision-making culture. To scrutinize board processes and behaviors, we use survey data to test our hypotheses on a sample of 341 Norwegian firms. The results suggest that women directors contribute positively and significantly to organizational innovation. Furthermore, the positive relationship between women directors and the level of organizational innovation is mediated by some decision-making culture dimensions: the degree of cognitive conflict and the degree of preparation and involvement during board meetings. Implications for theory and practice and future research directions are discussed.

Keywords: Women directors · Board processes · Organizational innovation · Decision-making culture · Cognitive conflict · Preparation and involvement

3.1 INTRODUCTION

Board diversity is one of the most researched topics in the board of directors literature. Gender diversity, in particular, has largely attracted researchers' attention, and the direct link between gender diversity and firm performance has been investigated. Reviewing the literature, two different views can be observed about the current situation in gender diversity research. One view emphasizes the need to focus on other types of diversity, which, in a way, is implicitly stating that research on gender diversity might be reaching its maturity (e.g., Hillman, 2015).

The other view, indicating the mixed results of gender diversity-firm performance research, calls for more research on the variables that moderate and mediate the relationship between gender diversity and firm performance (e.g., Eagly, 2016; Post and Byron, 2015). We follow the latter view for two main reasons: First, gender diversity continues to increase in boardrooms worldwide (GAO, 2015), and especially in continental Europe, it is clear that the increasing number of women on boards is a target specified in policy makers' agendas (e.g., quota laws in Italy, Spain, Iceland, France, and Germany, and EU 2020 Targets). Second, relatedly, research has yet to better explain how women directors might be affecting competent board work (Huse and Solberg, 2006; Post and Byron, 2015) and, consequently, firm level outcomes (Finkelstein et al, 2009; Johnson et al, 2013).

Indeed, previous studies have demonstrated that the effect that gender diversity may have on board tasks and on strategic decisions is complex due to the factors surrounding the effects of gender diversity (Eagly, 2016). For example, a number of studies, applying a social categorization perspective, have indicated that women directors' contribution to board tasks may be limited due to the social barriers (e.g., tokenism, out-group categorization, and unequal membership) they face in boardrooms (e.g., Nielsen et al., 2010; Torchia et al, 2011). Others have shown that women directors' impact on strategic decisions may be contingent on turbulent

events (Sun et al., 2015) or individual power (Triana et al., 2013). Some studies have even suggested that women directors (minorities) may have a detrimental influence on board decisions by triggering cognitive biases, such as information processing and decision-making biases (e.g., Zhu, 2013; 2014; Kanadlı et al., 2017).

From this perspective, while previous studies emphasize the fact that gender diversity may have limited or even negative consequences on board task performance or board decision making, interestingly, the question of how these unfavorable effects may be reduced or avoided has remained unclear (Zhu et al., 2014). Thus, more research is needed on gender diversity specifically to generate solutions to the obstacles that limit women directors' potential. Examining the mediating role of board processes may provide a better understanding of how the complex effects of gender diversity may arise and (Post and Byron, 2015; Triana et al., 2013), therefore, shed light on the way to generate solutions in the literature.

The purpose of this study is to examine the influence of gender diversity on organizational innovation by considering the mediating effect of board processes, namely, cognitive conflict and preparation and involvement. We use the behavioral theory of the firm (Cyert et al., 1963), which is acknowledged as a main perspective for understanding organizational behavior and decision making (Argote and Greve, 2007; Van Ees et al, 2009). We focus on two core board processes: a) cognitive conflict and b) preparation and involvement (Forbes and Milliken, 1999). We focus on these concepts because, in the behavioral approach, internal processes are seen as key factors in coping with cognitive biases and, hence, provide a better understanding of decision making (Argote and Greve, 2007) and because they are closely linked to board decision making (Nielsen and Huse, 2010).

According to the behavioral theory perspective, decision makers generate solutions that are "good enough" rather than optimum (satisfying behavior), as the decision makers are limited in their ability to process information and solve complex decision problems (bounded

rationality). This results in the routinization of decision making (routinization) and, thus, leads to information processing and decision-making biases during decision making. To avoid or reduce such biases, conflict can be vital and may be inevitable in decision-making groups. According to the behavioral perspective, a firm is seen as a coalition of stakeholders or actors (Cyert and March, 1963; March, 1962), and boards are representatives of those actors who may have conflicting goals (Van Ees et al., 2009). Therefore, a behavioral lens suggests that the more comprehensive the information is that is available and evaluated during the decision-making process, the more innovative a group's decision will be (Cyert and March, 1963). We argue that due to the different human capital (knowledge, experience, and perspectives) (Hillman et al, 2002), values and views (Eagly, 2005) that women bring compared to their male counterparts, women directors on boards will positively impact cognitive conflict. Moreover, the minimum acceptable effort level for "directors doing their homework" will be leveraged by women directors' preparation for and involvement in board discussions. In turn, such processes will result in innovative ideas (Amason, 1996; Hillman et al., 2002; Rindova, 1999), which enhance innovation.

This study builds on previous studies in several ways. First, it makes a theoretical contribution to board diversity research, applying the behavioral theory of the firm as a novel approach. As proposed by the behavioral perspective, we show that board processes are the key to generating decision outcomes with better creativity. This study also makes a theoretical contribution to gender diversity research by pointing out the importance of enabling women directors' active participation in boardroom interactions. One solution to coping with obstacles that limit women directors' contributions to competent board work and innovation might be to create a boardroom environment (Huse, 2005, Roberts et al., 2005) or to demonstrate a certain leadership efficacy (Gabrielsson et al, 2007; Machold et al, 2011) that facilitates open constructive interactions in the boardrooms. In reality, with an increasing number of women

joining boards, the practical implications of this study are of high relevance, as it improves the understanding of the maximization of outcomes from gender diversity on boards.

Moreover, our results may explain why not all gender diverse boards may be equally innovative. It may be unrealistic to assume that once the number of women on boards is increased, boards will benefit from the women's talent. Research has provided evidence that this might be difficult to achieve. Examining the effects of women on board processes may shed light on practices and policies to create regulations or best practices to complement the phenomenon of the increasing number of women directors on boards. Our findings draw practitioners' and policy makers' attention to two pitfalls: the quality of newly appointed women directors and the number of board appointments they have.

The paper is organized as follows: In the next section, the main theoretical arguments are addressed, and the relationships among women directors, decision-making culture and firm innovation are highlighted. Moreover, the research model is presented, and the hypotheses are formulated. In section 3.3, our methods are described. The results are presented in section 4.4. A discussion and final remarks are presented in the last sections.

3.2 THEORETICAL FRAMEWORK AND HYPOTHESES FORMULATION

Several studies link aspects of board demography (e.g., board members' gender) to firm performance (Bilimoria, 2006; Burke, 2000; Carter et al., 2003) but with inconsistent findings (Burke, 2000; Carter et al., 2003; Erhardt et al, 2003; Rose, 2007; Singh et al., 2001; Terjesen et al., 2009). Indeed, research on boards of directors has failed to establish any clear relation between board demographic characteristics and firm performance. This suggests that the relationship between board demography and firm performance may not be simple and direct but rather complex and indirect (Finkelstein et al., 2009). Therefore, looking at the intervening and mediating variables between board demography and firm performance is a good choice

(Post and Byron, 2015; Eagly, 2016). Among these intermediate steps, board processes are expected to play an important mediating role in the relationship between board composition and firm-level outcomes (Huse, 2005; Roberts et al., 2005).

There are many intermediate steps that may be analyzed (Torchia et al. 2015), and this study investigates the relationships among women directors (a demographic variable), board processes (cognitive conflict and preparation and involvement) and firm organizational innovation in particular. The focus is on firm organizational innovation rather than on firm performance for many reasons. First, firm innovation is considered a mediating variable between the board of directors and firm performance (Miller and Triana, 2009). Indeed, firm innovation leads the firm to develop certain capabilities that, in turn, enhance its performance (Caves and Ghemawat, 1992; Teece et al., 1997; Zahra and Garvis, 2000). Second, we want to address the need for more research on the relationship between gender diversity and firm innovation (Bantel and Jackson, 1989; Cox, 1991; Miller and Triana, 2009; Torchia et al., 2011).

We consider board processes to be explanatory mechanisms of women directors' contribution to board decision making (Huse et al, 2009; Huse and Solberg, 2006; Nielsen et al., 2010; Singh et al, 2008), which influences strategic decisions (Nielsen and Huse, 2010; Westphal and Milton, 2000). To explain this contribution, we use a behavioral approach. Considering the main concepts of the behavioral approach, we argue that one of the most important challenges decision makers could face is the cognitive biases surrounding decision making.

Indeed, board research has provided support for the idea that diverse boards' work is under threat from various biases and social barriers. For example, both Nielsen and Huse (2010a) and Westphal and Milton (2000) demonstrated that social barriers limit women

directors' influence over board decision making. Moreover, Zhu (2013; 2014) and Westphal and Bednar (2005) indicated that a failure to present minority perspectives during board decision making may lead to information processing and decision-making biases, which negatively affect decision outcomes. Still, how boards may cope with these obstacles has remained greatly underexplored (Zhu et al., 2014). From a behavioral perspective, a better understanding of the mechanisms of —board processes— for the utilization of women directors' contributions to board decision making and strategic decisions can lead to the development of solutions to various obstacles (Groysberg and Bell, 2013) that limit women directors' potential. The behavioral approach posits that processes that facilitate the comprehensiveness of decision making can be the key to overcoming such biases, leading to decision outcomes with better quality or creativity. We use the degree of cognitive conflict and the degree of preparation and involvement in the boardroom (as it is explained in section 3.2.2).

3.2.1 A Behavioral Theory Perspective

The behavioral theory of the firm is acknowledged as the main perspective for understanding organizational behavior and decision making (Argote and Greve, 2007; Ees et al., 2009), although empirical studies adopting this lens remain scarce in the board context (e.g., Miller and Triana, 2009). The behavioral theory of the firm builds on well-known key concepts: bounded rationality, satisficing, problemistic search, the routinization of decision making in standard operating procedures, and the dominant coalition (Argote and Greve, 2007).

A behavioral approach recognizes the cognitive limitations of individuals in upper echelon decision making, positing that decision outcomes are threatened by cognitive biases. Decision makers are limited in their ability to completely understand all the linkages among the variables around them and, therefore, make decisions that are "good enough". The cognitive bias of decision makers allows only imperfect mapping of the decision-making environment

and rather limited and selective information processing (Ees et al., 2009). In turn, the bounded rationality and satisficing behavior of decision makers lead to the routinization of decision-making processes until a problem has been faced in attaining current goals. This also creates decision-making biases so that while different perspectives about the task being performed or issues to be evaluated are overlooked during board discussions, a former perspective, which leads to satisfactory results, is preserved (e.g., Westphal and Bednar, 2005; Zhang, 2010). Interactions between decision makers (e.g., conflicts) can be vital to coping with cognitive biases (Ees et al., 2009).

From a behavioral approach, diversity can be seen as an important group of demographics working against cognitive biases. The cognitive limitation of an individual decision maker is compensated by other members' different information, knowledge and perspectives. Diversity is suggested as an important group level factor in both the work team and board literature, enhancing the comprehensiveness of decision-making processes, which may lead to decision outcomes with better quality or creativity (De Dreu et al, 2008; Milliken and Martins, 1996; Rindova, 1999; van Knippenberg et al, 2004). However, the presence of different information and perspectives does not mean, per se, that group decision making will benefit from these resources of the group members. For example, Zhu (2013; 2014) demonstrated that minority perspectives might not be presented during board discussions, which, consequently, suffer from cognitive biases. Zhang (2010) showed that only when different knowledge and perspectives are shared and communicated can diversity benefit competent board work.

Several studies in the work team literature have demonstrated that group processes facilitate the sharing of unique information and the evaluation of different perspectives, transmitting the positive impact of diversity on decision outcomes by enhancing the comprehensiveness of group decision making (Amason, 1996; Simons et al., 1999). For

example, demonstrating the positive effect of debate, Simons et al. (1999) states that "The conclusion to be drawn from these results is that for diversity to benefit a company's bottom line, there must be a process by which the positive aspects of diversity are brought to bear." Amason (1996) indicated that cognitive conflict is a factor in transmitting diversity potential to the decision-making process to achieve comprehensiveness.

In the board context, involvement and preparation —effort norms— and cognitive conflict are core board processes. Both practices are theoretically suggested to influence strategic decisions by transmitting diversity's effects on the comprehensiveness of board decision making (Forbes & Milliken, 1999; Rindova, 1999).

3.2.2 The relationships between gender diversity and organizational innovation

Despite the numerous studies that relate board diversity to firm innovation (Erhardt et al., 2003; Watson et al., 1993), to date, few studies have investigated the effect of gender diversity on innovation (Miller and Triana, 2009). Firm innovation can be defined as a company's commitment to creating and introducing new products, processes and organizational systems (Zahra and Garvis, 2000). However, previous studies (Miller and Triana, 2009; Torchia et al., 2011) in this research stream have yet to investigate the important effects board processes may have on the gender diversity-innovation link.

The behavioral theory of the firm posits that the comprehensiveness of decision-making processes can influence innovation in organizations. During the decision-making process, homogeneous groups tend to focus exclusively on areas in which group members have previous experience (Hambrick and Mason, 1984; Miller and Triana, 2009). Homogeneous groups may actually hamper innovation. Indeed, some authors note that homogeneous boards of directors are more likely to inhibit the critical evaluation of alternatives, and this may negatively impact innovation (Janis, 1972).

In contrast, diverse groups have a greater variety of ideas and different perspectives. Gender diversity allows for a more thorough evaluation of choices because of the increased information available. Indeed, heterogeneous groups produce higher quality decisions (Amason, 1996; Hoffman, 1959; Hoffman and Maier, 1961) and generate more innovative solutions compared to homogeneous groups (Amason, 1996; Chen et al., 2005).

In this study, we focus on one aspect of firm innovation, though common categorizations of innovation include product, process or organizational innovation (Damanpour and Evan, 1984; Damanpour, 2001). We analyze the contribution of women directors to organizational innovation. The term "organizational innovation" refers to the creation or adoption of an idea or behavior that is new to the organization (Damanpour and Evan, 1984; Damanpour, 1996).

By exploring the effect of gender diversity on organizational innovation, we assume that women have different values (Selby, 2000; Eagly, 2016) and different knowledge and expertise (Hillman et al., 2002; Singh et al., 2008; van der Walt and Ingley, 2003; Westphal and Milton, 2000) compared to their male counterparts. Hence, organizational innovation is more related to cognitive processes than to product and process innovation. Organizational innovation is influenced by learning processes and organizational knowledge (Nonaka and Takeuchi, 1995) and is the output of various intervening mental processes (Hodgkinson, 2003). Indeed, while product and process innovations require specific knowledge and competences (Ettlie, Bridges, and O'Keefe, 1984), organizational innovation is especially influenced by the individual characteristics of people (Kimberly and Evanisko, 1981).

Women directors can bring to the boards different attitudes, opinions and problem solving skills (Bilimoria and Wheeler, 2000; Eagly, 2005). Therefore, women serving the board of directors enhance the level of diversity in the boardroom. Gender diversity may deliver a broad range of perspectives, increase the search for information, enhance the quality of

brainstormed ideas, facilitate creativity, and generate more strategic alternatives (Post and Byron (2015). This, in turn, can be expected to enhance the comprehensiveness of decision-making processes, avoid decision making and information processing biases, and positively impact organizational innovation. Thus, we formulate the following hypothesis:

Hypothesis 1.

There is a positive relationship between women directors (ratio) and the level of firm organizational innovation.

3.2.3 The mediating role of board processes

While in the previous section we explored the direct contribution of women directors to organizational innovation (Hypothesis 1), now we investigate how the process unfolds. We expect that women influence organizational innovation through board processes: cognitive conflict and preparation and involvement. To capture the mediating effect of cognitive conflict and preparation and involvement, we argue first that women directors positively impact it and, second, that organizational innovation benefits from cognitive conflict and preparation and involvement.

Conflict can have potentially contradictory effects on social interactions (Jehn, 1997; Pinkley, 1990). Schweiger et al. (1986) assert that conflict can, on the one hand, improve decision quality and, on the other, threaten decision quality by weakening the ability of individuals to work together. Conflict that has beneficial effects has been referred to as cognitive conflict, while conflict that is dysfunctional is called affective conflict (Amason & Schweiger, 1994).

Cognitive conflict is a disagreement about the content of the tasks performed, for example, differences in viewpoints, ideas and opinions (Jehn, 1995). In the board context,

cognitive conflict implies that board members may have different opinions on important board issues, different perspectives and very different ways of arguing and reasoning (Forbes and Milliken, 1999). We follow the arguments of both Adams and Ferreira (2004) and Nielsen and Huse (2010a). Adams and Ferreira (2004) suggest that women serving as board members behave differently than men during board meetings and that their behavior should affect the working style of the board. Having women directors in the boardrooms creates positive environments and cognitive conflicts because they provide alternative viewpoints and exchange positive and negative comments (Watson et al., 1993). Indeed, the level of cognitive conflict may be influenced by women directors' behavior during board meetings. For example, their behavior requires the consideration of more alternatives leading to a broader view and a better understanding of the complexities of the environment (Cox, 1991; Eisenhardt et al., 1997; Jackson, 1992; Milliken and Vollrath, 1991).

Despite the negative impact that cognitive conflict may have on group effectiveness (De Dreu and Weingart, 2003), the theory and several empirical studies support the arguments about its positive effects (Finkelstein and Mooney, 2003; Melkumov et al, 2015; Minichilli et al, 2009; Schweiger et al., 1986). Evidence supports the view that cognitive conflict encourages a thorough evaluation of the alternative underlying assumptions (Schweiger and Sandberg, 1989; Schweiger et al., 1986) and encourages alternative ideas and approaches (Amason, 1996; Valacich and Schwenk, 1995).

From a behavioral lens, the more comprehensive the information that is available and evaluated during the decision-making process is, the more innovative a group's decision will be (Cyert and March, 1963). A diverse board may possess that variety, through conflict, and can make use of that broad-ranging information and increased number of perspectives in its decision outcomes. In turn, the convergence of different perspectives may lead to greater insights into the issue at hand, leading to creative solutions. Cognitive conflict is positively

related to the quality of group decisions (Amason, 1996). Cognitive conflict (a) makes members more open to new information, (b) results in a deeper understanding of task issues, (c) increases the range of alternatives considered, (d) motivates assumption questioning, and (e) allows assumptions and recommendations to be evaluated systematically (Amason, 1996; Pelled et al., 1999; Schweiger et al., 1986; Schwenk, 1990). Jehn (1997) and Woodman et al. (1993) explained the task conflict/performance relationship with similar logic.

A variety of determinants that facilitate innovation within an organization have been studied thus far; these determinants include structure, slack resources, technology, and culture (Amabile et al., 1996; Damanpour, 1991; Frambach and Schillewaert, 2002; Glynn, 1996). Some studies suggest that cognitive conflict can promote innovation by encouraging members to reassess familiar practices, identify problems within an organization, and come up with creative solutions if the conflict is linked to a challenging task (Leonard-Barton, 1995; Nonaka and Takeuchi, 1995; Jehn, 1995; Amabile et al., 1996). Therefore, considering the previous arguments about the relationships among gender diversity, cognitive conflict and organizational innovation, we can formulate the following hypothesis:

Hypothesis 2.

Cognitive conflict mediates the relationship between women directors (ratio) and firm organizational innovation.

Finally, we explore the mediating role of the preparation and involvement of board members in the relation between women directors and organizational innovation. Board members' preparation before meetings refers to their willingness and ability to participate in board meetings with a deep knowledge of the discussed topics. Board members' preparation is related to the quality of the information they receive, the time they devote to scrutinizing that information, the effort they make collecting further information beyond that provided by

managers and, ultimately, the competences they possess (Forbes and Milliken, 1999; Huse, 2007). On the other hand, involvement in board meetings is a strongly related concept. It is not just about attending a meeting, but it is also about the attention given and the activities undertaken during the meeting (Huse, 2007).

Huse and Solberg (2006) suggested that women directors are generally more prepared and involved than men and that the unsatisfactory preparation and involvement of male directors also presented opportunities to women. In fact, when attending board meetings well prepared, women gain the ability to influence the decision making and improve their status as directors. In this way, directors are able to prove their positive influence on board effectiveness. Furthermore, having women on corporate boards may create a positive virtuous circle for improving board behavior and board effectiveness (Huse, 2007; Huse and Solberg, 2006). In fact, during board meetings, the presence of women directors that are more prepared for the board meetings obliges male directors to improve their preparation as well. Indeed, having well-prepared women on corporate boards may create positive competition among board members, stimulating male board members to perform their tasks in the best way. This virtuous circle enhances the general level of preparation and involvement during board meetings.

Having more prepared and involved board members clearly influences the comprehensiveness of information processing and the evaluation of different perspectives, which can be expected to positively influence the board's outcomes (Finkelstein and Mooney, 2003). Indeed, if all board members are prepared and involved during board meetings, they are more able to have discussions during the meeting, are more inclined to present their points of view and are more likely to suggest several creative solutions. The preparation and involvement of all board members during meetings stimulate creative discussions (Huse and Solberg, 2006), new ideas and solutions and have a positive influence on organizational innovation. Therefore, women directors increase the level of preparation and involvement during the board meetings

that in turn enhances the level of organizational innovation. Thus, we formulate the following hypothesis:

Hypothesis 3.

Preparation and involvement mediate the relationship between women directors (ratio) and firm organizational innovation.

3.3 METHODS

3.3.1 Data collection and sample

To test our hypotheses, we used the value creating boards survey developed in Norway in 2005 and 2006 (Sellevoll et al., 2007). Norway was the first country, in 2003, to pass quota legislation regarding the presence of women on supervisory boards. The fact that this survey was conducted before the regulation was fully implemented helps us to understand the dynamics of the boards without the mandatory perspective but with an already present strong pressure to appoint women. Before implementing a mandatory gender quota on boards, the Norwegian government tried to follow a more voluntary approach, incentivizing companies to increase the representation of women on boards (Seierstad and Huse, 2018). Therefore, during the period of analysis, we can observe voluntary actions resulting from strong pressure.

In addition, Norway follows the Nordic two-tier board system, with a supervisory board led by the board chairperson and an executive board led by the CEO. Supervisory boards are in charge of overall long-term decision making and the strategic processes of the business — including the innovation strategy— which brings even more importance to the role of each board member and the dynamics among them.

The value creating boards survey is one of the few available surveys exploring board behavior. It was directed at CEOs, chairpersons and board members in large, medium and small

Norwegian firms. The aim was to survey 2,954 firms (firms on the Oslo Stock Exchange, other publicly limited firms, Ltd. firms with more than 100 employees, Ltd. firms with 50 to 100 employees and a total turnover of more than 5 million NOK, and smaller Ltd. firms including fewer than 50 employees and a total turnover of more than 50 million NOK). The survey includes 265 questions to CEOs, 235 to chairpersons and 215 to other board members, and the answers are organized in seven-point Likert scales (where 1 means disagreement and 7 agreement). The construction of this dataset, and its question about the internal dynamics of boards, allows for the understanding of the interactions in the boardroom and the potential effects of diversity on the decision-making process and, in turn, on firm value creation.

Our choice of medium-sized Norwegian companies is based on two reasons. First, medium-sized companies struggle a great deal to include changes and new diversities in their boards. It will be interesting to observe the dynamic relationship between the increasing representation of women on boards and board dynamics and innovation. Second, this choice guarantees that the sample firms will be influenced but not obligated by the introduction and legislation of the quota. Therefore, medium-sized companies have more freedom to increase the number of women on their boards. However, in this scenario, medium-sized companies might be following the path of larger corporations and trying to aim for potentially better results (Nygaard, 2011).

We tested our hypothesis on CEO responses with an overall response rate of 33.0%. We selected 341 medium-sized firms with 51 to 250 employees, which is the European Union's cut-off for medium-sized firms. The responding firms have, on average, 114 employees. Of the firms, 38.0% are high-tech firms. The board size, on average, is 4.04. CEO tenure and board chair tenure are, on average, respectively, 7.08 and 5.62 years. The length of board meetings is, on average, 3.83 hours. The boards have, on average, 16% women directors, and in the

sample, 44% of the boards have no women directors. Fifty-six percent of the boards have at least one woman director.

3.3.2 Variables and Measurement

Dependent variable: Organizational innovation

The dependent variable, organizational innovation, was measured by several items on a seven-point Likert-type scale (7 = fully agree and 1 = fully disagree). The CEOs were asked to value to what extent their firms were characterized as a) being the first firm in the industry to develop an innovative management system, b) being the first firm in the industry to introduce a new business concept and practice, c) considerably changing the organizational structure to facilitate innovation, and d) implementing development programs for personnel to facilitate creativity and innovation. Organizational innovation, the output variable, was built as a mean of the four items. The Cronbach's alpha coefficient is .82.

Independent variable: The ratio of women directors

The ratio of women directors' is our independent variable, and it was calculated as the number of women directors divided by the total number of board members. It is important to highlight that in the sample women directors are a minority group; therefore, there are no cases of boards with more female directors than men directors. Hence, using a ratio of women directors in order to capture the level of the boards' gender diversity seems to be appropriate.

Mediators: cognitive conflict and preparation and involvement

The mediating variables are two dimensions of decision-making culture: cognitive conflict and preparation and involvement.

Cognitive conflict was measured using three items that consider the degree to which board members a) have different views on important board issues, b) contribute with very

different perspectives on what is best for the firm, and c) think and reason in different ways. The variable was built as the mean of the items. The Cronbach's alpha coefficient is .79

Preparation and involvement were measured using three items that consider the degree to which board members a) prioritize substantial and sufficient time for their assignment as board members in the firm, b) are always available if board activity demands it, and c) are always very well prepared for the board meetings. The variable was built as the mean of the items. The Cronbach's alpha coefficient is .78.

Control variables

We control for firm and context features, which are firm size and industrial sector. 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. Firm size typically comes with some features that may be conducive to attempts at organizational innovation. As Kimberly & Evanisko (1981) argue, firm size necessitates and facilitates the firm's innovative behavior. Indeed, large firms might be more inclined to make changes to their organization as they are generally in a better position, having a higher financial status and more resources.

With regard to the industrial sector, we classified firms as competing in high (coded 1) and low (coded 0) technology industries. In high technology sectors, firm organizational innovation can enhance firm survival and success (Von Glinow and Mohrman, 1990). In these sectors, the high investments in R&D can influence the level of firm organizational innovation (McDougall and Oviatt, 1996). Indeed, in growing industries, organizational innovation strategies are often necessary (Andersson, 2004). Therefore, organizational innovation is more common in high technology industries. We also control for board composition features, which are board size, CEO tenure and board chair tenure.

Board size indicates the number of directors with voting rights. Board size becomes a potentially important determinant of organizational innovation. Indeed, the total number of directors may influence the way they perform their tasks (Fama and Jensen, 1983) and may determine their ability to promote innovation.

CEO tenure is equal to the number of years the CEO has served on the board. CEO tenure, or length of service, is another characteristic of boards of directors that may affect firm organizational innovation. There are two competing perspectives regarding the relationship between CEO tenure and firm organizational innovation (Vafeas, 2003). The first one suggests that longer tenure is related to CEO experience, commitment, and competence, resulting in better firm organizational innovation. In contrast, the second perspective suggests that longer CEO tenure is associated with a management-friendly board. In this last case, boards may lose their objectivity and independence and have difficulty or be unwilling to monitor management, resulting in lower levels of organizational innovation.

Board chair tenure is equal to the number of years he/she has served as a chair on the board. This measure indicates the board's ability to access information from within the organization. According to Tainio et al. (2003), the board's ability to access information is crucial to organizational innovation, and the chairperson may help accomplish this task. In this regard, adequate access to information during board meetings can support the board's role in enhancing feedback related to organizational innovation choices.

The length of board meetings is the duration of the information exchange in board meetings. It is measured as the duration, in hours, of an ordinary board meeting transformed into its natural logarithmic function. The amount of time directors work together can substantially determine the degree to which boards fulfill their tasks (Forbes and Milliken, 1999). An effective board requires time for preparation and influences the board task involvement (Huse, 2007) that in turn may influence the level of innovation. Spending time

together in board meetings is important to maintaining effective boardroom dynamics and creating innovative board behavior (Nordqvist and Minichilli, 2009).

Finally, directors' knowledge of the firm was measured by six items on a seven-point 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 competences; c) knowledge of the firm's weaknesses 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 powers; and f) knowledge of threats from entrants and new products and services. The variable output of directors' knowledge of the firm was built as a mean of the items. The Cronbach's alpha coefficient is .87.

Boards require a high degree of specialized knowledge and competences to function effectively (Forbes and Milliken, 1999). Boards, as elite and strategic-issue-processing groups, must have members who possess knowledge and competences useful for problem solving (Ancona and Caldwell, 1988). Boards of directors need to have knowledge and competencies in order to deal effectively with strategic issues (Forbes and Milliken, 1999) and then influence the level of innovation. However, this measure refers to directors' knowledge of the firm and not to the personal knowledge and competences of each board member with relation to their background. It is possible that because women more often occupy staff positions and are generally younger than their male counterparts, women do not contribute significantly to the knowledge of the firm, especially at the moment they are appointed (Singh et al., 2008). A lag time should be necessary in order to acquire the necessary experience related to firms' operations.

3.3.3 Analysis

Multiple linear regression analysis was used in order to test the influence of women directors (ratio) on the level of organizational innovation while also considering the mediating roles of cognitive conflict and preparation and involvement (decision-making culture dimensions). In Model I, we tested the direct relationship between women directors (ratio) and the level of organizational innovation.

To analyze the mediating effect of the decision-making process variables, we tested three models, which is consistent with the recommendations for testing mediating effects (Baron & Kenny, 1986). Accordingly, three conditions should be met to support a mediating relationship. First, the independent variable (the ratio of women directors) must be significantly associated with the mediator (cognitive conflict and preparation and involvement). We tested this as models II(a) and II(b). Second, the independent variable (the ratio of women directors) must be significantly associated with the dependent variable (organizational innovation). This condition is tested in Model I.

Finally, in Model III, once the mediator(s) is entered (cognitive conflict and preparation and involvement), the relationship between the independent variable (the ratio of women directors) and the dependent variable (organizational innovation) should either disappear (full mediation) or significantly diminish (partial mediation).

3.4 RESULTS

The correlations of all the variables are reported in Table 3.1. Intercorrelations among the independent variables were generally low, thereby minimizing the problem of unstable coefficients (because of collinearity) in the linear regression models. In addition, the variance inflation factors (VIF) test suggests that multicollinearity does not create a defect in the results. We also conducted various residual analyses with log-linear transformation of firm size and

length of board meetings. These transformations did not significantly change the results. The results of the multiple linear regressions are presented in Table 3.2.

In Model I, we tested the direct relationship between the independent (the ratio of women directors) and the dependent (organizational innovation) variables. The results show that there is a significant and positive relationship between the ratio of women directors and the level of organizational innovation (1.08; $p<.05$). The adjusted R^2 is .12. Thus, hypothesis 1 is supported.

Hypotheses 2 and 3 are also supported, suggesting that cognitive conflict and preparation and involvement mediate the relationship between women directors and organizational innovation. Specifically, in models II(a) and II(b), we tested the mediating effect as suggested by Baron and Kenny (1986). We found that all three conditions for the mediating effects were satisfied. In fact, in models II(a) and II(b), we found a positive and significant relationship between the independent variable (the ratio of women directors) and both mediators (cognitive conflict and preparation and involvement) (1.60; $p<.001$ and .97; $p<.05$). The adjusted R^2 for models II(a) and II(b) are, respectively, .14 and .16. Finally, in Model III, we tested for the mediating effects of cognitive conflict and preparation and involvement on the relationship between women directors and organizational innovation. Both cognitive conflict and preparation and involvement behave as mediators between the presence (ratio) of women directors and organizational innovation. In particular, when both mediators are entered, the relation between the independent variable and the dependent variable (Model I) disappears and the mediators are related significantly to the dependent variable. Hence, we may argue that there is full mediation by both decision-making culture dimensions. The adjusted R^2 for the last model is .23.

Table 3.1 – Correlation matrix (341 firms)

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11
1. Organizational innovation	4.22	1.30	-										
2. Firm size (employees)	114	52.22	-.01	-									
3. Industry (high-tech/low-tech)	.38	.49	.08	-.04	-								
4. Board size	4.04	1.70	.01	.15(**)	.14(*)	-							
5. CEO tenure	7.08	6.80	.02	-.02	.05	-.07	-						
6. Board chair tenure	5.62	6.51	-.09	-.09	-.08	-.11	.28(**)	-					
7. Length of board meetings (in hours)	3.83	4.30	-.02	.01	.05	-.10	.08	.01	-				
8. Directors' knowledge of the firm	5.08	1.08	.19(**)	-.08	-.01	-.16(**)	-.01	-.15	.12(*)	-			
9. Women directors (ratio)	.16	.17	.05	-.01	.05	.20(**)	-.04	.03	.01	-.20(**)	-		
10. Preparation and involvement	4.87	1.15	.17(**)	-.05	-.01	-.10	.13(*)	.02	.08	.38(**)	.01	-	
11. Cognitive conflict	3.88	1.25	.17(**)	.13(*)	.13(*)	.10	-.08	-.02	.14(*)	-.08	.12(*)	-.12(*)	-

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

Table 3.2 – Multiple linear regression analyses (341 firms)

	Model I	**Model II(a)**	**Model II(b)**	**Model III**
	Organizational Innovation	Cognitive Conflict	Preparation and Involvement	Organizational Innovation
Firm size (employees)	.17	.26	-.08	.17
	(.19)	(.18)	(.15)	(.18)
Industry (high-tech/low-tech)	.24	.30	-.01	.20
	(.17)	(.16)	(.13)	(.17)
Board size	-.20	.14	-.26	-.17
	(.31)	(.30)	(.25)	(.31)
CEO tenure	.07	-.14	.17**	.06
	(.11)	(.10)	(.09)	(.11)
Board chair tenure	.02	.-06	-.05	.04
	(.11)	(.10)	(-09)	(.11)
Length of board meetings (in hours)	.05	.54**	.02	-.07
	(.25)	(.24)	(.20)	(.25)
Directors' knowledge of the firm	.25***	.15*	.36***	.15
	(.08)	(.08)	(.06)	(.08)
Women directors (ratio)	1.08**	1.60***	.97**	.59
	(.50)	(.47)	(.39)	(.50)
Cognitive conflict				.17***
				(.07)
Preparation and involvement				.19**
				(.08)
Adjusted R^2	.12	.14	.16	.23
F Change	2.02**	3.74***	5.17***	6.18***

Standard errors are in parentheses. The levels of significance are *<.1, **<.05, and ***<.01.

3.5 DISCUSSION AND CONCLUSION

Seen as a main theoretical perspective in explaining organizational behavior and decision making (Argote and Greve, 2007), this paper applies a behavioral approach to explore the contribution of women directors to the level of organizational innovation. The behavioral approach proposes that board processes play a vital role in addressing the cognitive biases surrounding board decision making, which otherwise would have detrimental effects on the quality and creativity of decision outcomes (Ees et al., 2009). Therefore, following the call of scholars (Post and Byron, 2015), we consider the mediating role of board processes, namely, cognitive conflict and preparation and involvement, to better understand and explain the influence women directors may have on the level of organizational innovation.

The analysis was divided in two main steps. First, we explored the direct contribution of women directors to the level of organizational innovation. Consistent with the research showing positive effects of gender diversity on firm innovation (Miller and Triana, 2009; Torchia et al., 2011), we found a positive effect of gender diversity on the volume of organizational innovation. However, these results, related to women directors' influence on decision outcomes, should be considered within the larger research demonstrating mixed results from women directors' influence on decision outcomes.

With a particular focus on the effects of gender diversity on strategic decisions, research, for instance, has demonstrated that the social barriers (e.g., out-group categorization) women minorities face in boardrooms may limit their influence on board decision making (Nielsen and Huse, 2010; Westphal and Milton, 2000) and strategic decisions (Sun et al., 2015) as well as on board tasks (Zhu et al., 2014). Others have shown that women minorities may fail to present their perspectives in male-dominated boards and that, as a result, critical board decisions suffer from decision-making and information-processing biases (Westphal &

Khanna, 2003; Westphal and Bednar, 2005; Zhu, 2013; 2014). Considering this extent literature, to move the field forward, scholars have called for more research on the mediating or moderating variables of the relationship between gender diversity and decision outcomes (e.g., Eagly, 2016; Post and Byron, 2015).

While previous studies have taken a step forward in gender diversity research and have largely investigated the contingencies to utilizing women's talent on boards, the question of how or through which mechanisms women directors may influence strategic decisions has remained unclear. Indeed, very few studies have gone under the surface (e.g., Nielsen and Huse, 2010) and investigated women directors' impact on board processes, which may better explain this influence (Post and Byron, 2015). Instead, previous studies mainly explored the effects board processes may have on board performance (e.g., Minichilli et al, 2009; 2012; Zona & Zattoni, 2007). A better understanding and explanation of the mechanisms through which women directors influence decision outcomes may shed light on an important question that has been greatly neglected in the literature: "How do boards cope with obstacles that limit women directors' influence?" (for an exception see Kanadlı et al., 2017).

For this reason, in the second step, we go beyond the surface of this relation to explore *how* women influence the level of organizational innovation. From a behavioral lens, board processes may be vital to coping with the cognitive biases surrounding decision making. For instance, the resolution of task-related disagreements (cognitive conflicts) may enrich the information available and increase the number of different perspectives to be evaluated during board decision making. In turn, board decision making can be characterized as comprehensive (Simons et al., 1999). The behavioral approach proposes that the comprehensiveness of decision-making processes may lead to more creative decision outcomes. From this perspective, we argue that due to their different knowledge, experience and values, women directors may enrich task-related arguments and directors' preparation and involvement in

board discussions, which may lead to more creative decision outcomes by avoiding cognitive biases surrounding board decision making.

The results of our mediation analysis suggest that women directors influence the levels of cognitive conflict and preparation and involvement in the boardrooms, which, in turn, influence organizational innovation. Our results show that a greater presence of women on boards positively influences organizational innovation. This positive effect on organizational innovation comes from two sources: the greater presence of women on boards introduces different perspectives and views to the decision-making process and increases the level of preparation and involvement of all directors in the board meetings. In both cases, more gender diversity on boards results in a very positive outcome. These results are in line with previous studies that emphasize the important effects of women directors on board processes (Huse and Solberg, 2006) and the processes' impact on organizational innovation (Chen et al., 2005).

From this perspective, as long as women directors have the chance to actively participate in board discussions and present their perspectives, boards may benefit from their women directors' talent in making strategic decisions. Moreover, such talent contributes to firm organizational innovation. Relatedly, solutions should be in place to cope with obstacles that limit women directors' potential and may focus on facilitating or encouraging women directors' active, open, and free participation in board discussions. Indeed, several scholars have mentioned the importance of board openness (Huse, 2005; Sun et al.; 2015) and the leadership role a chairperson may play (Bailey and Peck, 2013; Machold et al., 2011; Gabrielsson et al., 2007) in fully benefiting from the resources directors may possess.

As a matter of fact, a recent study, which can be seen as a complement study, is to the best of our knowledge, the first one to introduce board-level solutions to cope with social barriers limiting woman directors' influence on board decision making. Kanadlı et al. (2017) suggest that under a board atmosphere of openness and with the lead of a chairperson who

encourages the active participation of each director in board discussions, women directors might have the chance to demonstrate their expertise and knowledge to their male counterparts. In turn, this may result in the recategorization of women directors as in-group members by the majority male directors, avoiding or reducing the negative consequences of the out-group categorization that women directors face. Our results further explain that to demonstrate their expertise and knowledge women directors may disagree with the task-related perspectives generated during board decision making, and to be able to do that, women directors should be well prepared for the board meetings.

The number of women on boards has been increasing, and it seems that this is still an important item on policy makers' agendas, particularly in continental Europe (EU 2020 Targets). One main reason for this increase is the quota regulations that have been spreading among European countries (Øystein Strøm, 2015). Quota legislations have been trying to compensate for the low level of gender diversity on boards. Although we focus on the "business case" reasons to include more women on boards in this article, some other countries have been driven by alternative rationales, such as social justice or equality arguments (e.g., Kotiranta, Kovalainen, & Rouvinen, 2010; Seierstad, 2016).

This study demonstrated, however, that policy makers should be alert to two pitfalls. First, the literature on women on boards has extensively researched the potential barriers for women to access boards (Gabaldon, et al., 2016; Terjesen et al., 2009; Van Den Brink, Holgersson, Linghag, and Deé, 2016; Van den Brink and Stobbe, 2014). These barriers include reduced pipelines due to a lack of family-friendly policies or equal opportunities for women and the biased decisions by boards to include new profiles (homophily or statistical discrimination). It should also be acknowledged that there might not be enough women director candidates in the labor market with the knowledge, skills, and experience that would complement the quota regulations. Therefore, appointing women directors who might lack the

knowledge and skills needed to actively participate in board discussions and communicate alternative perspectives or disagree with peers' perspectives may not lead to favorable results for firms.

Second, with relation to the limited number of competent women director candidates, it might be highly possible that women directors in the market or those who already serve on a board might be appointed to multiple boards (Seierstad and Opsahl, 2011). This will not be surprising, as directors may also be willing to serve on multiple boards due to the prestige, learning opportunities and networking opportunities (Useem, 1982; Withers, Hillman, and Cannella, 2012). Having multiple board appointments may severely hinder women directors' preparation and involvement, and once again, increasing the number of women may not lead to favorable results for firms. Taken together, policy makers might face criticism from corporate leaders about imposing these gender quotas on their firms. As solutions to these two pitfalls, policy makers may consider providing a longer transition period for fully adopting the quota regulation and issue complementary regulations or best practices to limit the multiple board appointments of directors.

As for practitioners, this study indicates the importance of women directors' contribution to strategic decisions (organizational innovation) given that an open board atmosphere or supporting activities are provided. If gender diversity on boards leads to organizational innovation through women's contribution to cognitive conflict and greater preparation and involvement, the contribution of diversity to organizational innovation can easily be reinforced on boards. In particular, supporting activities should consider efficient ways of sharing board meeting agendas and of course providing necessary documents and information prior to board gatherings. Information about the firm is possessed and controlled by the CEOs, who might not be willing to share this information with particularly new directors, to preserve his or her power on the board (Shen, 2003). It might be important for

firms to have third parties, for instance, a board committee, to facilitate the flow of all required information to directors before board meetings. Likewise, to facilitate open and free task-related debates, corporate leaders might consider separating the chairperson and CEO positions, as powerful CEOs may be willing to demonstrate his or her power by opposing the directors' perspectives, ideas, opinions, etc. (Haynes and Hillman, 2010).

3.6 LIMITATTIONS AND FUTURE RESEARCH

The paper allows us to reflect on future research directions. In this paper, we focused on the ratio of women directors and assumed that differences exist with their male counterpart. As in any research where socio-demographic traits are used, categorizing women and men can have limitations, as gender is multifaceted (Huse, 2012). Future investigations may focus on the actual differences between women and men directors by looking at their different backgrounds, levels of knowledge, and expertise and analyzing their impact on firm innovation. The paper focuses on one type of firm innovation – organizational innovation. However, other types of innovations exist within firms. Further investigations may explore women directors' contribution to these other types of innovation (product and process innovation), which are more related to technical issues and thus require specific knowledge and expertise.

Our results demonstrate that cognitive conflict is a beneficial type of conflict. However, previous studies have indicated mixed results from cognitive conflict regarding board tasks (Minichilli et al, 2009; 2012; Zona and Zattoni, 2007) and group performance (De Dreu and Weingart, 2003). Conflict in boards deserves more research attention, with a particular focus on conflict management. Finally, the focus of the paper is on the Norwegian context. Hence, the Norwegian aspects have to be considered. In fact, Norway is different from other countries because of the high ratios of women directors, which is mainly due to the Norwegian quota law; Norway was the first country in the world to implement a mandatory gender quota.

However, it may be useful to perform cross-country analyses in order to investigate how women directors contribute to innovation in different political and institutional contexts.

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CHAPTER 4:

INCREASING WOMEN'S CONTRIBUTION TO BOARD DECISION-MAKING: THE IMPORTANCE OF CHAIRPERSON LEADERSHIP EFFICACY AND BOARD OPENNESS[3]

[3] Kanadlı, S. B., Torchia, M., & Gabaldon, P. (2018). Increasing women's contribution on board decision making: The importance of chairperson leadership efficacy and board openness. *European Management Journal*. 36(1), 91-104.

Abstract

In the last decade, the number of women on corporate boards has increased slightly, but the prevailing minority status of women directors implies that they will continue to face social barriers. While prior research has largely focused on explaining social barriers (e.g., being categorized as an out-group member) to increase diversity and its negative consequences, how boards can avoid these obstacles remains unclear. Stemming from recategorization theory, we examine whether and to what extent board chairperson leadership efficacy and board openness (as mechanisms to avoid out-group bias) enhance the influence of women when they are in the minority in board decision-making. In a sample of 146 Norwegian firms, we found a positive relationship between women minorities and women directors' contribution to board decision-making. Moreover, we found that this positive impact increases when the board chairperson exercises leadership and the board operates in an atmosphere of openness.

Keywords: Board Decisions, Board Openness, Chairperson Leadership, Gender Diversity, Recategorization Theory

4.1. INTRODUCTION

The number of women on corporate boards continues to slightly increase (Catalyst, 2014; GAO Corporate Boards Report, 2015; MSCI Women on Boards Report, 2015). Norway (40.1%) has the highest percentage of board seats filled by women (MSCI Women on Boards Report, 2015); however, worldwide, this is an exception due to a 40% gender quota restriction that came into force in 2008 (Matsa & Miller, 2013). In fact, the percentage of board seats occupied by women in Canadian (20.8%), US (19.1%), the majority of European, and the Asia-Pacific Stock Index Companies are lower than 30% (Catalyst, 2014). Moreover, MSCI ESG Research estimates that according to current "business as usual" trends, women are unlikely to comprise 30% of directorships in publicly held companies until 2027 (MSCI Women on Boards Report, 2015). Considering the present gender diversity landscape and estimations stated in various reports, it is highly probable that the minority status of women directors, with women comprising less than 30% of the total board, will prevail worldwide in the upcoming decades. This long-term issue has important practical implications. Being minorities in male-dominated boards, women directors face social barriers (e.g., being categorized as out-group members) that limit their contribution to the board processes and board decisions (Groysberg and Bell, 2013; Huse and Solberg, 2006).

Indeed, women directors' influence on board decisions has become a widely discussed topic in academic circles (Adams et al., 2015; Hillman, 2015). Research shows that women directors influence strategic decisions (e.g., innovation, investments) (e.g., Miller and Triana, 2009; Sun et al., 2015) through their contribution to board decision-making (Nielsen & Huse, 2010a; Westphal and Milton, 2000). This contribution is contingent upon their knowledge, experience, and values that are different than their male counterparts (Hillman et al., 2002; Letendre, 2004; Post and Byron, 2015). However, considering social barriers they face in the boardrooms, previous studies have suggested that women minorities should also have other

qualities to be influential directors, such as specific prior board experience and network ties (Westphal and Milton, 2000), interlinks with other boards (Cook and Glass, 2015), and individual power (Triana et al., 2013). Others have suggested they should reach a critical mass (Kanter, 1977; Konrad et al., 2008), which the literature identifies as three members (Torchia et al., 2011; Joecks et al., 2013). In this regard, interestingly, solutions that can be created by and within boards to cope with social barriers women minorities face in the boardrooms have remained unclear in the literature.

The purpose of this study is to empirically examine if, and to what extent, chairperson leadership efficacy and a board atmosphere of openness may avoid out-group categorization, the consequences of which stand as a barrier against women minorities' contribution to board decision-making. Board decision-making can be defined as the interactions between and among board members through cognitive stages of decision-making, including processes of collecting and sharing information, creating knowledge and perspectives, and evaluating alternatives to reach a final decision (Bailey and Peck, 2013; Rindova, 1999). From an information/decision-making perspective, women directors may contribute to decision-making processes because of their different knowledge, experience, and values. From a social categorization perspective, because of their visible difference (gender), women minorities may be automatically and instantly categorized as out-group by male-dominated boards and face negative consequences of out-group categorization (Fiske et al., 1991; Milliken and Martins, 1996; Zhu et al., 2014). We integrate and use information/decision-making and social categorization perspectives (van Knippenberg and Schippers, 2007) to argue that women minorities, even if they have the potential, will offer no contribution to board decision-making.

In addition, and more importantly, we apply recategorization theory, which focuses on the occurrence of out-group categorization and its negative consequences, attempting to reduce biases toward minorities (Gaertner et al., 1989; Gaertner and Dovidio, 2000). Bias perceptions

and stereotyping may be avoided when other attitudes, beliefs, or social features that group members have in common are made salient (Kramer, 1991). We argue that certain leadership behaviors (Gabrielsson et al.,, 2007; Machold et al., 2011) and an open atmosphere (Huse, 2005; Roberts et al., 2005; Sun et al., 2015) can facilitate recognition of women directors' other salient features (e.g., functional background, educational background), which are shared by their male counterparts during board decision-making. We further argue that when women minorities are recategorized as in-group members, out-group bias and its negative consequences will be avoided and women directors' potential will be utilized in board decision-making.

This research builds on previous research in several ways. First, it makes a theoretical contribution to the literature on board gender diversity that mainly investigates the effects of gender diversity on organizational outcomes. Previous studies have mainly applied an information/decision-making perspective, arguing that women directors will contribute to quality or creativity of strategic decisions and therefore organizational outcomes. This research, however, has provided mixed results (Post and Byron, 2015). Following scholars' calls (van Knippenberg and Schippers, 2007); we integrate an information/decision-making perspective with a social categorization perspective, which implies that it is unrealistic to think that once a competent woman is appointed to a male-dominated board she will be influential, contributing to board tasks and processes. Our approach may provide one explanation for the mixed results of the link between gender diversity and organizational outcomes.

Second, we contribute to the literature on the link between board diversity and strategic decisions and to the recategorization theory. While prior research has largely focused on explaining social barriers to increase diversity and its negative consequences (Zhu et al., 2014), to the best of our knowledge, this study is the first to advance a novel understanding of how boards can utilize the talents of minority groups on strategic decisions, despite existing

social barriers in the boardrooms. In a board context, the recategorization lens has rarely been empirically tested, and thus, more research is required (Hillman, 2015). Zhu et al. (2014) provided evidence that the recategorization of women directors may contribute to a board's ability to effectively perform control tasks and administer advice and counsel. We apply a recategorization lens to specify certain conditions for positive effects gender diversity may have on board decision-making (Eagly, 2016).

Third, this paper makes an empirical contribution to research that investigates qualities and numerical representation of influential women directors and corporate governance literature. Our findings support the arguments that to be influential directors, the quality of women directors may be more important than their numerical representation on boards. Following scholars' appeals (e.g., Bailey and Peck, 2013; Triana et al., 2013), we demonstrated the importance of leadership behaviors in the boardroom and board norms (openness) in utilizing board members' (minority women's) contribution to board decision-making. The moderation effects of chairperson leadership efficacy and a board atmosphere of openness may explain why some firms benefit better from gender-diverse boards than others in the strategy process.

4.2 THEORIES AND HYPOTHESES

4.2.1. Diversity as a Double-Edged Sword

Diversity research has largely been guided by two traditions: the information/decision-making perspective and the social categorization perspective (Pringle and Strachan, 2015). This focus addresses how differences between work group members affect group processes and group performance (e.g., van Knippenberg and Schippers, 2007; Williams and O'Reilly, 1998). Because of the differing contradictive predictions of these two perspectives, diversity in work

groups is commonly seen as a double-edged sword (e.g., Milliken and Martins, 1996; Williams and O'Reilly, 1998).

According to the information/decision-making perspective, diverse groups should outperform homogeneous groups (Williams and O'Reilly, 1998). Diverse groups are more likely to benefit from a broader range of task-related information, knowledge, and skills and thus generate different opinions and perspectives. This gives diverse groups a larger pool of resources in dealing with non-routine problems. Furthermore, diverse groups may have to thoroughly process task-related information in an effort to reconcile conflicting opinions and perspectives. In turn, this may lead to more creative and better quality group outcomes (Bantel and Jackson, 1989; van Knippenberg et al., 2004; van Knippenberg and Schippers, 2007).

On the contrary, according to the social categorization perspective, homogeneous groups should outperform heterogeneous groups (Williams and O'Reilly, 1998). In explaining social categorization perspective, social identity and self-categorization theories have been extensively overviewed as an integrated whole (Hogg, 2001). While social identity theory (Ashforth and Mael, 1989; Tajfel and Turner, 1979) explains why minorities may be categorized as out-groups, self-categorization theory (Turner et al., 1987) explains the consequences of this intergroup bias on minorities. The term "minority" refers to those individuals who have salient demographic characteristics (e.g., age, gender, and ethnicity) that are possessed by less than half of the group (Nemeth, 1986).

At its core, social identity theory explains how individuals create and define their own place in society by categorizing themselves in social groups with some emotions and values significant to them regarding their group membership (Tajfel, 1972; cf. Hogg, 2001). The process of social categorization segments between in-groups and out-groups, cognitively represented as prototypes. These prototypes are sets of attributes that define and prescribe feelings and behaviors that characterize one group and distinguish it from other groups (Hogg,

2001). This overall process is called “depersonalization” because people are not viewed as unique and multifaceted individuals but as matches relevant to the in-group and out-group prototype.

Out-group categorization is based on differences in salient demographic characteristics and tends to be automatic and instant (Gaertner et al., 1989; Mendoza et al., 2010). Indicators of cognitive processes that give rise to such bias are identified as (1) categorical responses, such as unnecessarily labeling or evaluating someone according to gender, (2) evaluation of people’s credentials along dimensions that are marginally relevant to the group, (3) selective perception and interpretation, and (4) extreme, polarized evaluations based on limited evidence (Fiske et al., 1991).

On the other hand, self-categorization theory explains how such categorization affects oneself and others (Turner et al., 1987). Self-categorization depersonalizes self-perception and goes further in all aspects of one’s attitudes, feelings, and behaviors to the in-group prototype, even changing what people think, feel, and do (Hogg, 2001). The depersonalization process affects people’s feelings about one another. In this context, the social attraction hypothesis explains why in-group members are liked more than out-group members because they are assimilated in a relatively positive in-group prototype or because self-esteem is extended to embrace people who are somehow viewed as extensions of themselves.

For an out-group member, evaluations may be based on category (e.g., woman vs. man) rather than individual merit. Negative attributes may be exaggerated, while positive ones may be discounted, and permissible behavior may be clearly constrained (Fiske et al., 1991). Research has shown that out-group members are at a significant disadvantage for receiving rewards and positive evaluations compared to in-group members (Bodenhausen et al., 2012). Out-group members are less likely to be noticed for their positive behaviors, but they are more likely to be blamed for negative results (Pettigrew and Tropp, 2006). They are thus more likely

to be perceived as less competent (Hewstone, 1990), and their information is perceived as less relevant and credible. There is also evidence that people tend to resist out-group member's influence and dismiss or devalue their inputs when making group decisions (Tanford and Penrod, 1984).

Therefore, a homogeneous work group may experience higher member commitment and group cohesion. Moreover, relational conflict may occur fewer and membership will be less likely to be turned over (van Knippenberg et al., 2004). Indeed, these processes result in overall higher group performance when groups are homogeneous rather than heterogeneous (e.g., Jehn et al., 1999; Simon et al., 1999). In sum, in-group/out-group categorizations may disrupt group process and, accordingly, performance (van Knippenberg and Schippers, 2007).

However, diversity research, applying information/decision-making and social categorization perspectives, has been criticized for generating inconsistent results, raising the question of "...whether, and how, the perspectives on the positive and the negative effects of diversity can be reconciled and integrated" (van Knippenberg and Schippers, 2007: 518). Scholars have suggested that research should consider more complex models, take moderating variables into account, and consider the interaction of social categorization and information/decision-making perspectives (e.g., Eagly, 2016; van Knippenberg and Schippers, 2007).

4.2.2. Women Directors' Contribution to Board Decision-making

The board can shape the strategy of the firm; thus, decision-making is widely recognized as its main responsibility (Bailey and Peck, 2013; Adams et al., 2015). Boards make critical decisions, for example, about strategic change (Triana et al., 2013), investments (Sun et al., 2015), CEO compensation (Zhu, 2014), and acquisition premiums (Zhu, 2013). These decisions are made through a series of cognitive stages, which move the decision from

conceptualization through the evaluation of alternatives to the final choice (Bailey and Peck, 2013; Rindova, 1999). This progression, coupled with the integration of team members, includes how they collect and share information, create knowledge to generate decision alternatives, and evaluate those alternatives to choose a final outcome. This defines the decision-making processes within the boardroom (Rindova, 1999). Therefore, board decision-making is a highly cognitive and intellectual task, and each director's contributions are based on individual skills, knowledge, and experience (Forbes and Milliken, 1999; Hambrick, 2007). Educational background, functional background, and industry experience reflect directors' skills, knowledge, and experience (Khanna et al., 2014; Torchia et al., 2015).

Gender diversity scholars and corporate leaders mainly interpret the potential of board gender diversity from an information/decision-making perspective, assuming that greater gender diversity is beneficial. Gender diversity on boards may influence not only what information is brought to bear in decision-making but may also influence how decisions are made (Post and Byron, 2015). Studies indicate that women's experiences differ in the workplace, public service, community, and backgrounds (e.g., functional background) (Hillman et al., 2002; Konrad and Kramer, 2006; Zelechowski and Bilimoria, 2004). Accordingly, gender diversity on boards may enrich the pool of information to be processed and knowledge to be used in the decision-making processes, increasing the number of different perspectives. In addition, because of differences in values and backgrounds, women directors are more likely to ask questions and peruse answers, provoke lively discussions, speak up when in doubt about an issue or a particular managerial decision, and display collaboration skills (Huse and Solberg, 2006; Konrad and Kramer, 2006; Letendre, 2004). That is, gender diverse boards may be more stimulated to collectively and extensively consider and discuss available information and knowledge and debate different perspectives in depth. This

comprehensiveness in decision-making processes may lead to decision outcomes of better quality or creativity (Eagly, 2016; Finkelstein and Mooney, 2003).

Previous studies have provided evidence that gender diversity may contribute to decisions about a firm's innovativeness (e.g., Miller and Triana, 2009), organizational innovation (Torchia et al., 2011), and board's decision-making quality for counter-cyclical investments (Sun et al., 2015). Nielsen and Huse (2010a) showed that women directors contribute to board decision-making, especially when they share professional experiences with male directors and have different values than them.

Considering the present gender diversity landscape and reports that estimate women to have less than 30% of the board seats in the coming decades worldwide (Catalyst, 2014; GAO Corporate Boards Report, 2015; MSCI Women on Boards Report, 2015), this study focuses on women minorities who comprise less than 30% of the board. Applying a social categorization perspective, we argue that because of their differences in salient demographic characteristics (gender), women minorities may be automatically and instantly categorized as out-group members in male-dominated boards (Groysberg and Bell, 2013). Facing the negative consequences of out-group categorization, women minorities, who have the potential to contribute to decision-making processes because of their different knowledge, experience, and values, may fail to do so.

Women minorities may choose to keep a low profile during decision-making processes, thinking a mistake can be fatal. They may appear to agree and avoid starting an argument, thinking such behavior is not permissible. Women minorities may express the same kinds of interests as in-group members to avoid further isolation or social distancing (Huse and Solberg, 2006; Westphal and Khanna, 2003). Consequently, during decision-making processes, minority women may not exchange individual information, communicate their perspectives, or provoke lively discussions by asking critical questions and pursuing answers. Therefore,

women minorities in male-dominated boards may fail to influence issues and how those subjects are considered during board decision-making (Sun et al., 2015; Zhu, 2013, 2014). Following the above reasoning, we hypothesize the following:

Hypothesis 1.

Women do not contribute to board decision-making when they represent a gender minority in the board.

4.2.3 Recategorizing Women Directors on Boards: Moderation Effects of Chairperson Leadership Efficacy and Board Openness

We argue that recategorizing women directors may be considered an effective approach for coping with out-group bias and the negative consequences that stand as barriers to women directors' contribution to board decision-making. Recategorization theory (Gaertner et al., 1989; Gaertner and Dovidio, 2000) focuses on the occurrence of out-group categorization and its negative consequences in an attempt to reduce biases toward minorities. The recategorization perspective posits that people can change their cognitive representations of a person's category membership if they consciously process additional information about the individual's similarities to the group (Gaertner and Dovidio, 2000). When group members discover unobservable similarities, the parallel dimensions should lead to greater feelings of attraction (Phillips et al., 2006). In turn, this promotes recategorization, increasing the likelihood that out-group members will actually be seen as part of the in-group (Gaertner et al., 1989). Consequently, bias perceptions and stereotyping may be avoided when other attributes, beliefs, or social features that group members have in common are made salient (Kramer, 1991).

Certain demographic characteristics are generally prominent among directors: age, gender, ethnicity, highest degree obtained, industry background, elite education, experience in

top executive positions, board experience, and functional and educational background (Finkelstein et al., 2009; Zhu et al., 2014). In this regard, women directors who are automatically categorized as out-group members (because of gender) can be recategorized if additional information on unobservable similarities is revealed to and processed by male directors. Building on recategorization theory and research, Zhu et al. (2014) showed that male directors are more likely to recategorize a demographically different director as an in-group member when he/she is more similar to them along other shared demographic dimensions.

Moderation effect of chairperson leadership efficacy

Kakabadse et al. (2015: 274) report, "If the chairperson does not pay attention to effective integration of women, it can be very frustrating for those women to take part in and consequently achieve a contribution to board effectiveness." In particular, chairperson leadership is considered crucial in promoting directors' engagement in board processes and tasks (Bailey & Peck, 2013; Roberts et al., 2005). Through this engagement, board leadership ensures that the knowledge and skills of board members are used and decision alternatives are evaluated comprehensively (e.g., Bailey and Peck, 2013; Finkelstein and Mooney, 2003). Research provides evidence that the chairperson's leadership may enhance the boards' involvement in strategic decisions by increasing the directors' participation in board discussions (Bailey and Peck, 2011; Machold et al., 2011).

Applying the recategorization lens, we argue that one intervention that can facilitate women directors' recategorization process is selecting a chairperson with high leadership efficacy who will create women directors' engagement in board decision-making processes. For this purpose, we identified certain leadership attributes in the literature (Gabrielsson et al., 2007) that could be particularly critical. A chairperson who has excellence in leading board discussions, motivating, using each board member's competency, formulating proposals for

decisions, and summarizing conclusions after board negotiation may facilitate each director's (women directors') engagement in board decision-making processes. Concurring with Machold and colleagues (2011), we refer to these attributes as "chairperson leadership efficacy."

Facilitated by the chairperson's leadership efficacy, women minorities may share individually collected information, communicate perspectives, and consider others based on personal knowledge during decision-making processes. The chairperson's efforts in incorporating perspectives and evaluation into proposals or conclusions may send a signal to male directors that women directors are heard and their contribution is taken seriously. Under such leadership, women directors' engagement may reveal additional salient features that they can share with the majority members (i.e., male directors).

As indicated in the above discussions, because of the cognitive nature of board decision-making, it is most likely that these salient features will be educational background, functional background, and industry experience. Consequently, male directors may acquire and process additional information about women directors' unobservable features. However, the recategorization process also requires that the majority members share these revealed features so that a more inclusive in-group category can be constructed. Singh et al. (2008) showed new women directors are similar to their male peers in terms of education, reputation, and board and career experience.

Thus, it is most likely that chairperson leadership efficacy may trigger the recategorization processes of women directors by creating their engagement to board decision-making processes, revealing additional information about women directors' unobservable features. As women directors are recategorized as in-group members, the negative consequences of out-group bias can be avoided. Women may then be more willing to share unique information, communicate their perspectives on peers' proposals, engage in debate, and

ask critical questions to management and other directors and pursue answers. Thus, we hypothesize the following:

Hypothesis 2.

Leadership efficacy of the chairperson will positively moderate the association between women minorities and their contribution to board decision-making such that this relationship will be positive.

Moderation effect of a board atmosphere of openness

Openness is widely specified as one of the core aspects of boardroom atmosphere that is necessary for effective functioning (e.g., Huse, 2005, Roberts et al., 2005). Sun et al. (2015: 364) report, "…(openness in the board) means that a board's decision-making process should recognize distributed knowledge among different stakeholders, especially among marginalized groups such as women directors, and should be open to the participation of people with different experiences and ideas." Gabrielsson et al. (2007) argue that openness is characterized by board members' willingness to give advice based on private knowledge, ideas, and points of view and them accepting and recognizing that they may be wrong in their considerations.

Openness has been considered fundamental for board members' participation in decision-making processes and making decisions with better quality and creativity (Sun et al., 2015; Roberts et al., 2005). Triana et al. (2013) argue, "Openness acknowledges that diverse ideas can be addressed, respecting each team member and discouraging differences in influence within the team. Such norms of openness should facilitate quality decision making." Sun et al. (2015) determined that openness enables minority women to better contribute their knowledge and talent to board decision-making processes, which leads to investment decisions with better quality during economic crises.

Applying the recategorization theory, we argue that another intervention that can facilitate women directors' recategorization process is having an open atmosphere in the boardrooms. In an open atmosphere, women directors may acquire a more positive attitude from their male counterparts, reducing the level of some of the negative consequences of out-group bias (Sun et al., 2015). Respect for each board member and accepting and recognizing that each member may be incorrect in his/her considerations are important aspects of openness (Gabrielsson et al., 2007). In addition, board members are more open to the participation of people with different experiences and ideas (Sun et al., 2015) and discourage differences in influence within the team (Triana et al., 2013). Therefore, for example, women can expect that a mistake (a wrong consideration) will not be exaggerated (e.g., considering a mistake fatal) but tolerated. Sharing individually collected information and communication of different perspectives and/or starting arguments will not be constrained but welcomed.

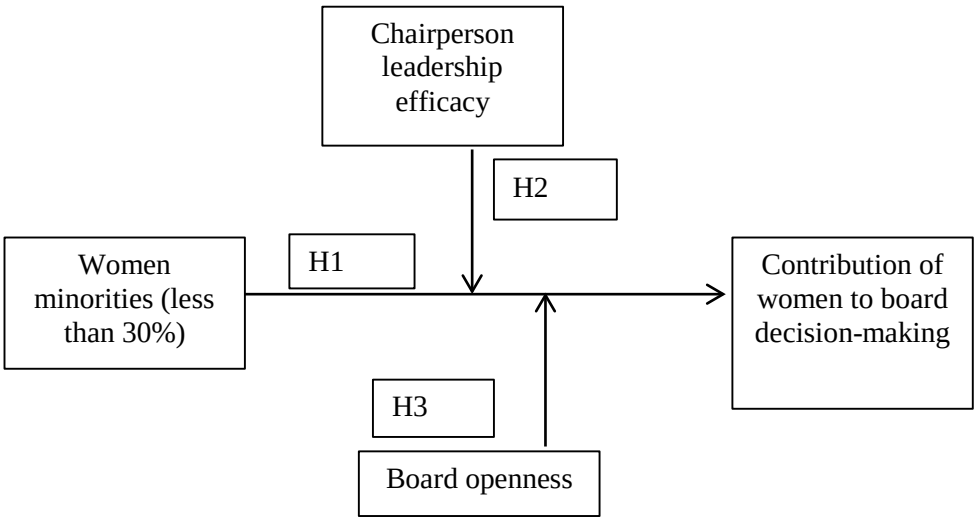
An open atmosphere, thus, does not necessarily avoid out-group categorization but may again enable women minorities' engagement to board decision-making processes (Sun et al., 2015). This engagement, with male directors, in decision-making may reveal additional information about women minorities' similarities to their male counterparts with respect to education, reputation, and board and career experience. When processed by their male counterparts, this additional information may result in recategorization to the in-group for the reasons mentioned above. Once again, as recategorization may avoid out-group bias and its negative consequences, minority women may be as equally active as their male counterparts and contribute to board decision-making processes. Following this reasoning, we hypothesize:

Hypothesis 3.

A board atmosphere of openness will positively moderate the association between women minorities and their contribution to board decision-making such that this relationship will be positive.

The research model is summarized in Figure 4.1.

Figure 4.1: Research model



4.3. METHODOLOGY

4.3.1. Data Collection and Sample

In order to understand the importance of women minorities in board decision-making, we tested our hypothesis using the Value Creating Boards survey developed in Norway during 2005 and 2006 (Sellevoll et al., 2007).

This database is one of the few available surveys that explore board behavior. With a national scope, it was directed at CEOs, chairpersons, and board members in Norwegian large, medium, and small firms. It has previously been used in different analyses, such as board's

strategic tasks in firms (Bankewitz, 2016; Pugliese and Wenstop, 2007), internationalization of family firms (Calabrò and Mussolino, 2013), strategic involvement of boards in small firms (Machold et al., 2011), women's contributions to boards (Nielsen and Huse, 2010a), and the leadership role of chairpersons (Gabrielsson et al., 2007), among others.

The fact that the country of data collection is Norway is of significance in our case. Norwegian board practices are very well established, and have been considered forerunners of other major countries' corporate governance practices (Huse, 2007; Machold et al., 2011; Zhang, 2010). Moreover, it has been proven to be a relevant setting for boards that could be extrapolated to other developed countries (Oxelheim and Randøy, 2003; Zhang, 2013). Finally, Norway was the first country to introduce a gender balance law for corporate boards, which proves the importance of the topic in the country (Seierstad et al., 2015). This article builds on a survey conducted before the Norwegian law came into force, providing the chance to test the "non-enforced" influence of women directors on board decision-making.

The survey was sent to an initial list of 2,954 companies, with a final overall response rate of 33% from CEOs and 21% from chairpersons. These response rates are higher than the majority of the questionnaires in the field (Sellevoll et al., 2007). These companies included publicly limited firms, both in the Oslo Stock Exchange market and in other markets. The respondents also included the largest Norwegian limited firms and a sample of other Norwegian smaller limited firms (from 5 to 50 employees). The survey had 265 questions to CEOs, 235 to chairpersons, and 215 to other board members, with answers organized using a seven-point Likert scale (1 = Disagree; 7 = Agree). For this study, we have focused on the responses of board members.

We reduced the initial sample in different stages. First, we selected firms with more than 50 employees in order to find companies that were more likely to have formal governance

arrangements (Maula et al., 2013; Veltrop et al., 2015; Zahra and Filatotchev, 2004). Second, as we looked for minority representation on boards, we selected companies with optimum board sizes, those between six and 12 members (Ning et al., 2010). Finally, we excluded companies without women directors to investigate the interactions between genders. Moreover, as we have reported that women are unlikely to comprise 30% of directorships in publicly held companies worldwide until 2027 (MSCI Women on Boards Report, 2015), we included in our model companies where women represented 30% of the board or less. This led to a final sample of 146 firms.

4.3.2. Variables

The Value Creating Boards survey offers the possibility of seeing a board's decision-making in many different aspects. To understand the influence of women minorities on a board's decisions and the potential leadership and the board atmosphere, we created constructs based on previously validated arguments. We have provided details on the variables and the items of constructs in Tables 4.1 and 4.2. To check for reliability, we calculated Cronbach's alphas and correlation coefficients for each one of the constructs. According to Cronbach (1951), an alpha value of 0.8 and higher indicates good reliability indicators. All constructs indicated high levels of reliability and are reported in Table 4.2.

From the outset, the survey structure and data collection sought to avoid common method biases (Doty and Glick, 1998; Meade et al., 2007). Anonymity and confidentiality was ensured, giving each company/board a random identification number. According to Machold et al. (2011), questions were designed specifically to avoid ambiguity and pretests were run to assess the questionnaire (pilot surveys, interviews, and boardroom observations). Moreover, the use of seven-point Likert scales in the responses help in reducing potential common method biases.

Table 4.1. Description of variables

Variable	Name of the variable	Type	*Description*
Contribution of women to board decision-making	The influence of women elected board members	Dependent Variable	*Mean of items related to the Influence of women elected board members (see Table 2 for more detail)*
Percentage of women on boards	% of women Directors	Independent variable	*How many board members with full voting rights are women? (Transformed into a ratio over the board size)*
Leadership of board chairperson	Leadership	Moderator	*Mean of items related to Generosity and openness of the board (see Table 2 for more detail)*
Generosity and openness of the board	Openness	Moderator	*Mean of items related to Leadership of board chairperson (see Table 2 for more detail)*
Chairperson characteristics			
Age of the chairperson	Age	Control Variable	*Age of the board chairperson*
Gender of the chairperson	Gender	Control Variable	*Is the board chairperson a man or a woman?*
No. of years of experience as chairperson	Previous experience as CEO	Control Variable	*How many years have the present board chairperson been in this position?*
CEO duality (Chairperson is also CEO)	CEO duality	Control Variable	*Is the board chairperson CEO of the firm?*
Chairperson has previous experience as CEO	Years of experience as Chairperson	Control Variable	*Has the board chairperson previously been CEO of the firm?*
Approximate ownership of stock by the chairperson	% Shares of stock by the Chairperson	Control Variable	*Approximate % ownership in the firm as per October 1st 2005 of the board chairperson*
Firm characteristics			
Size of the board (number of members)	Board size	Control Variable	*How many board members with full voting rights had the firm as per October 10th 2005?*
The firm has relations with government companies (stocks)	Has the government any control?	Control Variable (dummy)	*Approximate % ownership in the firm as per October 1st 2005 by the government and governmental institutions (dummy transform)*
High-tech firm	Is a high tech company?	Control Variable (dummy)	*Do you consider the firm as a high tech firm?*
The firm works in the finance industry	Finance company	Control Variable (dummy)	*Which is the firm's main industry? Finance and real estate*
The firm works in the service industry	Services company	Control Variable (dummy)	*Which is the firm's main industry? Service*
The firm works in manufacturing	Manufacturing company	Control Variable (dummy)	*Which is the firm's main industry? Manufacturing and production*
The firm works in other industry	Other type of company	Control Variable (dummy)	*Which is the firm's main industry? Other*

Table 4.2: Detailed composition of dependent variable and moderator variables

Please, indicate to which degree you agree with the following statement:			
		1 2 3 4 5 6 7 1 = disagree 7 = agree	Cronbach's alpha
The influence of women-elected board members (Contribution of women to board decision-making)	The women in this board are equally active in discussions as the men The women in this board have influenced the way the board conducts business The women in this board have largely influenced which issues are considered by the board		0.81
Generosity and openness of the board	Our board members accept and acknowledge the possibility that they might be wrong in their considerations Our board members willingly offer advice based on private knowledge, ideas, and views Our board members communicate their personal preferences and considerations open and freely		0.84
Leadership of board chairperson	Our board chairperson is excellent in motivating and use each board member's competence Our board chairperson is excellent at formulating proposals for decisions and summarizing conclusions after board negotiation Our board chairperson is excellent at leading board discussion		0.84

In addition, we ran Harman's single factor test (Conway and Lance, 2010). The models created obtained a total number of six factors to explain the variance for *leadership* and five in the case of *openness*. When computing only single factors, they explained 15.56% and 15.86% of the total variance of the models, respectively. In both cases, the Kaiser-Meyer-Olkin adequacy measurement values were below 0.6 (0.487 in the case of *leadership* and 0.480 in the case of *openness*), and therefore, our results can be considered appropriate. Following the procedures of Podsakoff et al. (1993), to control the potential effects of methods variance, we controlled for partial correlation procedure (Lindell and Whitney, 2001), and these analyses do not indicate any common method bias.

Dependent variable

The contribution of women to board decision-making was measured with three items, similar to Westphal and Milton's (2000) measures and consistent with Nielsen and Huse's (2010a) conceptualization. We used a seven-point Likert scale to assess (1 = Disagree; 7 = Agree): women and men are equally active in discussions, women influenced the way the board conducts business, and women influenced which issues are considered by the board.

Moderating variables

Using the same seven-point Likert scale, CEOs were asked to what extent they agreed with assertions about the openness of the board and leadership style of the chairman. *Leadership of the board chairperson* (Gabrielsson et al., 2007; Machold et al., 2011) is measured as the mean of three items in the survey, measuring the chairperson's leadership skills (excellence in motivating and using each board member's competence at formulating proposals for decisions and summarizing conclusions after board negotiations and at leading board discussions).

Openness of the board (Gabrielsson et al., 2007; Huse, 2005; Huse et al., 2009) was calculated as the mean of three elements measuring a positive atmosphere among the board members. These elements evaluated how open and generous board members were toward each other (how board members willingly offered advice on the basis of private knowledge, ideas, and views; how they communicated their personal preferences and considerations openly and freely; and, finally, how board members accepted and acknowledged the possibility they might be wrong in their considerations).

Independent variable

The percentage of women directors reflects the relative presence of women on boards, defined as the number of women directors divided by the total number of board members.

Control variables

Following Minichilli et al. (2009) and Machold et al. (2011), we included control variables in the model. In this case, we controlled for two types of variables: those related to the chairperson of the board and those related to the firm.

The first set of control variables included personal characteristics of the board chairperson. First, gender was included following the results by Nielsen and Huse (2010b). Second, given that board norms usually give higher status to the most senior directors (Whisler, 1984; Demb and Neubauer, 1992), we controlled for chairperson tenure (years of experience as chairperson) and age. Along the same lines, as longer management experience could also be linked with stronger contribution to decision-making, we controlled for prior management experience, operationalized as a dummy variable (previous experience as CEO). Furthermore, previous studies suggested that stock ownership (percentage of shares of stock owned by the chairperson) may increase a director's influence over the decision-making processes (e.g.,

Kosnik, 1990; Hoskisson et al., 1994). The CEO duality dummy variable was included to control for the amount of shares that were in the hands of only one person (Haynes and Hillman, 2010). This set of variables was statistically normalized to be part of the model.

The second set of variables was related to the firm and its environment as these factors might affect boards' strategic participation (Knockaert et al., 2015). Board size, as a normalized continuous variable, was included in the model as previous research showed that older firms have larger and more diverse boards (Corbetta and Salvato, 2004). Dummy variables represented the company's industry (i.e., finance, services, and manufacturing; the option "other" was omitted in the analysis). As in previous studies (see, e.g., Machold et al., 2011), a high-tech company dummy variable was used to control for industry characteristics with potentially different decision-making requirements. In some countries, publicly owned companies have included women as a way to show commitment with society and to create a pipeline of experienced women directors for other private companies (Hillman et al., 2007). Therefore, the relation between the firm and government-owned companies was reflected with a dummy variable (*government control*).

4.3.3. Analysis and Results

We performed analyses on (1) women directors' influence on decision-making when they were a minority group (WDI), (2) the moderating role of chairperson leadership efficacy on the influence of women directors on board decision-making (*leadership*), and (3) the moderating role of openness on the influence of women directors on board decision-making (*openness*). We tested our hypotheses using ordinary linear regressions applied in two steps: first without the interaction term and then with the interaction term so as to test for potential moderation (Aiken and West, 1991).

The analysis tests two-way interactions by regressing the dependent variable Y (contribution to board decisions by women) on the independent variable X (ratio of women on boards), the moderator variable Z (leadership or board openness), and the product (interaction) term of X and Z (XZ) (Wise et al., 1984). The model tested is shown below:

$$Y = b_0 + b_1X + b_2Z + b_3XZ + \epsilon$$

See Table 4.3 for detailed definitions of the variables. Table 4.3 presents the descriptive statistics for the variables used in our analyses. Among the 146 companies with at least one women director but where women were in the minority, the average number of women directors is 1.49 and the maximum number is 3. The percentage presence of women directors ranges from 11.11% to 30.00%, with a mean of 20.53%. In 97% of the cases, this implies the presence of one or two women on the board.

We focused on these 146 boards, where women represent less than 30% of the members of the board. This sample implies that 60% of the boards have between 6 and 12 members with at least one woman in the Value Creation Board Survey, originally composed of 245 firms. This sample does not differ much from the minority rationale as 96.3% of the 245 boards have less than 50% of women on their boards and only 11 boards have more than 50% women. On average, boards with any feminine presence have 2.1 women, meaning an average measure of 28% of the boards. The maximum ratio for women sitting on boards is 66.6%.

Chairperson leadership efficacy and openness were measured using a seven-point Likert scale (1 = Disagree; 7 = Agree). The mean chairperson leadership efficacy was 5.16 and openness was 5.41. The dependent variable (i.e., the contribution of women to boards' decision-making) was also measured with a similar Likert scale indicating an average contribution of 3.69.

Table 4.3: Descriptive statistics of boards where women make up less than 30% of the total board

	Name of the variable	**Observations**	**Min**	**Max**	**Mean**	**Standard Deviation**
Contribution of women to board decision-making	*The influence of women-elected board members*	146	1	7	3.69	1.42
Percentage of women on boards	*% of women Directors*	146	11.11	30.00	20.53	5.86
Chairperson leadership	*Leadership*	141	2	7	5.16	1.31
Board Openness	*Openness*	141	2	7	5.41	1.02
Chairperson characteristics						
Age of the chairperson	*Age*	146	40	70	53.52	7.99
Gender of the chairperson	*Gender*	146	0	1	0.99	0.08
No. of years of experience as chairperson	*Previous experience as CEO*	146	0	25	3.25	3.58
CEO duality (Chairperson is also CEO)	*CEO duality*	146	0	1	0.02	0.16
Chairperson has previous experience as CEO	*Years of experience as Chairperson*	146	0	1	0.04	0.21
Approx. ownership of stock by the chairperson	*% Shares of stock by the Chairperson*	146	0	100	7.30	20.97
Firm characteristics						
Size of the board (number of members)	*Board size*	146	6	10	7.16	0.96
The firm has relations with gov. companies (stocks)	*Has the government any control?*	146	0	1	0.17	0.38
High-tech firm	*Is a high-tech company?*	146	0	1	0.37	0.48
The firm works in the finance industry	*Finance company*	146	0	1	0.05	0.22
The firm works in the service industry	*Services company*	146	0	1	0.28	0.45
The firm works in manufacturing	*Manufacturing company*	146	0	1	0.39	0.48
The firm works in other industry	*Other type of company*	146	0	1	0.72	0.41

The average characteristics of the chairperson were male (99%), approximately 53 years old, with 3.25 years of experience in this board position, and holding approximately 7% of the company stock. The chairpersons, on average, did not hold the CEO position at the same time (*CEO duality*), and most did not have previous experience as CEO. The large majority of boards (95%) had between 6 and 8 members.

Table 4.4 presents Pearson's correlation coefficients. Results show that our constructs gain further validity (Nunnally, 1978).

Our dependent variable corresponds to the intensity of the contribution of women directors to board decision-making. The significance tests for the estimated coefficients use standard errors that remain robust to any departures from the assumption of homoscedasticity (Greene, 2004). To test the hypotheses, we included our variables in different steps to measure the different effects of the independent variables and control variables (Gabrielsson et al., 2007).

The first model attempts to assess the effect of women on board decision-making when they are in the gender minority (i.e., less than 30%). It shows the positive effect of the mean-centered percentage of women on boards (see Table 4.5).

To test Hypotheses 2 and 3, Models 2 and 3 included the main independent variable (i.e., the percentage of women on boards) and the potential effect of chairperson leadership efficacy or openness (Model 2). In the next stage, the interaction between chairperson leadership efficacy or openness and the percentage of women on boards is also included (Model 3). To assess the interaction effects, we followed the procedure suggested by Aiken and West (1991). We formed interaction terms by multiplying the mean-centered values of the interacting variables and then entered these terms in the second stage of the regression equations. This approach minimizes the possibility of multicollinearity. Moreover, the variance

Table 4.4 Pearson product-moment correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Contribution of women to boards (ln)	.														
2. % Women Directors (ln)	.222 ***	.													
3. Openness (ln)	.116	-.048	.												
4. Leadership (ln)	.116	.024	.346 ***	.											
5. Gender of the chairperson (ln)	-.115	-.114	-.049	-.032	.										
6. Age of the chairperson (ln)	-.031	-.044	-.131	-.093	.037	.									
7. CEO duality (Chairperson is CEO; ln)	-.013	-.111	.267 ***	.239 ***	.014	.010	.								
8. Chairperson has previous experience as CEO (ln)	.041	-.109	-.039	.096	.019	.158 *	-.038	.							
9. No. of years of experience as chairperson (ln)	-.192 **	-.197 **	-.210 **	.154 *	.076	.364 ***	-.059	.294 ***	.						
10. Approx. ownership of stocks by the chairperson (ln)	-.074	-.036	-.001	-.223 ***	.029	.206 **	-.051	.153 *	.065	.					
11. High-tech firm (ln)	-.071	-.129	.368 ***	.395 ***	-.107	-.131	.216 ***	.024	-.008	-.207 **	.				
12. The firm has relations with gov. companies (stocks; ln)	-.047	.097	.083	.011	.039	.201 **	-.078	-.104	-.104	-.163 **	.266 ***	.			
13. The firm works in the finance industry (ln)	.017	-.202 **	-.059	.016	.020	-.220 ***	-.040	-.054	-.034	-.084	-.187 **	-.112	.		
14. The firm works in the service industry (ln)	-.072	.021	-.014	-.018	.053	.184 **	.264 ***	.141 *	.138 *	.012	-.119	-.217 ***	-.153 *	.	
15. The firm works in manufacturing (ln)	.031	-.244 ***	.051	.129	.066	-.041	-.134	-.048	-.069	-.019	.392 ***	.141 *	-.193 **	-.509 ***	.

***Correlation is significant at the 0.01 level (two-tailed), **Correlation is significant at the 0.05 level (two-tailed)
*Correlation is significant at the 0.10 level (two-tailed)

Table 4.5: Ordinary linear regressions in two steps: effects of women director's minority status on board decision-making (N = 146), Dependent variable: contribution of women to board decision-making

	Model 1		**Model 2**		**Model 3**	
Constant	0.000		-0.005		-0.003	
	(0.063)		(0.062)		(0.062)	
% of women Directors	0.210	***	0.177	***	0.167	**
	(0.063)		(0.062)		(0.067)	
Age			0.070		0.085	
			(0.066)		(0.072)	
Gender			-0.118	*	-0.127	*
			(0.063)		(0.065)	
Previous experience as CEO			0.109	*	0.112	*
			(0.065)		(0.066)	
CEO duality			-0.059		-0.034	
			(0.062)		(0.064)	
Years of experience as chairperson			-0.211	***	-0.210	***
			(0.065)		(0.066)	
% shares of stock owned by the chairperson			-0.020		-0.043	
			(0.064)		(0.067)	
Board size					0.065	
					(0.07)	
High tech company					-0.075	
					(0.07)	
Government control					-0.032	
					(0.07)	
Finance company					0.031	
					(0.072)	
Services company					-0.071	
					(0.08)	
Manufacturing company					0.032	
					(0.084)	
R^2	0.044		0.109		0.122	
Adjusted R^2	0.04		0.082		0.072	

All variables are normal-centered. Robust standard errors in parentheses. The coefficient's significance is based on the value of a z-statistic.*, **, and *** are statistically significant at 10%, 5%, and 1%, respectively.

inflation factor values are below 3 in all estimated models, suggesting that multicollinearity is not an issue in our analyses (Neter et al., 1985).

Hypothesis 1 predicts that when women are in the gender minority on boards, the group has no impact on board decision-making. However, the evidence in Table 4.3 rejects Hypothesis 1 as women directors, even when they are in the gender minority, show positive and significant effects on board decisions.

Model 1 shows no significance when control variables related to the firm characteristics are included. A significant and positive effect is seen when the chairperson is also the CEO. In contrast, the longer the chairperson has been in charge, the greater the negative effect on the contribution of women to board decision-making.

Hypothesis 2 predicts that women directors could have a growing effect on board decision-making if the board chairperson's leadership efficacy facilitates the involvement of every board member in board activities. Leadership efficacy, when applied to the minority group, does have moderator effects, reinforcing the contribution of women directors. The evidence in Model 2 supports this hypothesis (see Table 4.6). Boards with chairpersons who demonstrate leadership efficacy are better able to incorporate women directors' contributions in their decisions, even when they represent a minority group. The effect is significant and much higher than without this interaction.

The effect of a chairperson with leadership efficacy increases the contribution of women on boards: both chairperson leadership and the contribution of women directors to boards' decision-making is significant, as is the interaction between the two variables (see Figure 4.2).

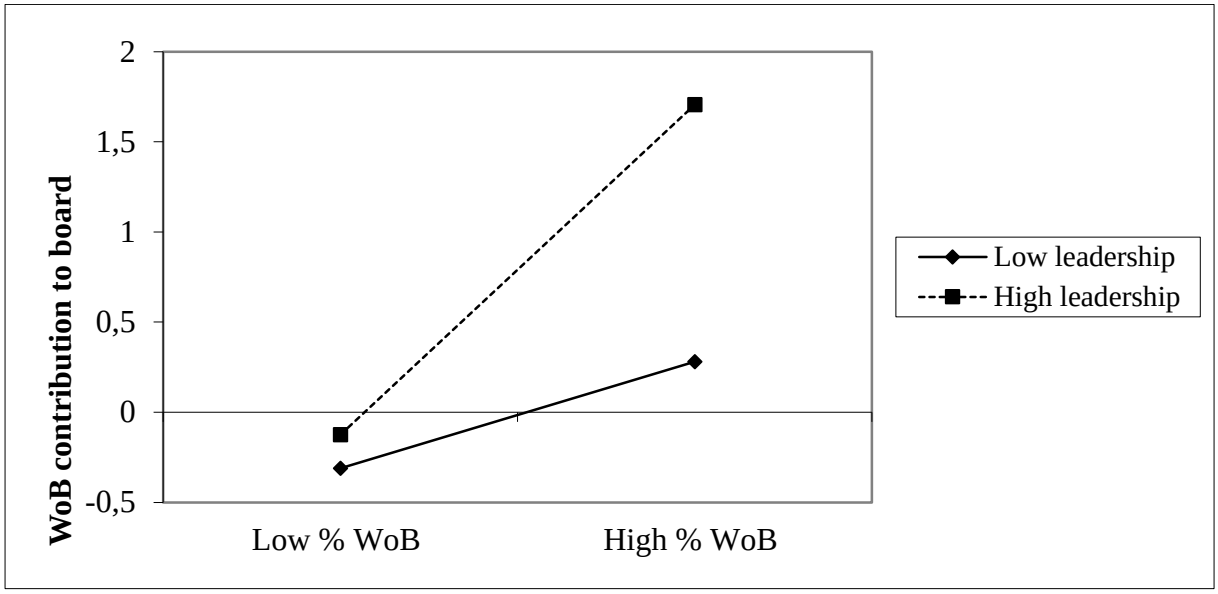
When it comes to control variables, the only significant and negative effect comes from the number of years the chairperson has held this position.

Table 4.6: Ordinary linear regressions in two steps: effects of women director's minority status on board decisions with leadership interaction (N = 141), Dependent variable: contribution of women to board decision-making

	Model 1		**Model 2**		**Model 3**	
	Stage 1	**Stage 2**	**Stage 1**	**Stage 2**	**Stage 1**	**Stage 2**
	Coeff.		**Coeff.**		**Coeff.**	
Constant	0.314 **	0.386 **	0.263	0.321 *	0.318 *	0.388 **
	(0.155)	(0.159)	(0.162)	(0.167)	(0.174)	(0.178)
Leadership	0.106	0.327 **	0.155 *	0.314 **	0.184 **	0.403 **
	(0.079)	(0.148)	(0.086)	(0.151)	(0.092)	(0.160)
% of women Directors	0.564 ***	0.631 ***	0.479 **	0.537 ***	0.540 **	0.606 ***
	(0.182)	(0.185)	(0.191)	(0.196)	(0.223)	(0.225)
Age			0.089	0.321	0.144	0.099
			(0.093)	(0.167)	(0.105)	(0.108)
Gender			-0.073	0.314	-0.079	-0.069
			(0.084)	(0.151)	(0.087)	(0.087)
Previous experience as CEO			0.096	0.537	0.107	0.107
			(0.09)	(0.196)	(0.091)	(0.09)
CEO duality			-0.042	0.054	0.017	0.055
			(0.088)	(0.097)	(0.099)	(0.101)
Years of experience as Chairperson			-0.244 **	-0.066 **	-0.255 **	-0.227 **
			(0.097)	(0.984)	(0.101)	(0.102)
%shares of stock by the Chairperson			0.039	0.095	0.013	-0.005
			(0.106)	(0.09)	(0.108)	(0.108)
Board size					0.023	0.019
					(0.125)	(0.124)
Is a high-tech company?					-0.141	-0.161
					(0.112)	(0.112)
Has the government any control?					-0.130	-0.139
					(0.103)	(0.103)
Finance company					0.046	0.014
					(0.099)	(0.1)
Services company					-0.118	-0.153
					(0.117)	(0.119)
Manufacturing company					0.066	0.056
					(0.126)	(0.125)
Interaction: leadership*wob		***0.299 ****		***0.231***		***0.310 ****
		(0.170)		***(0.181)***		***(0.186)***
R^2		0.098		0.141		0.191
Adjusted R^2		0.078		0.082		0.094
F-change		4.964		2.238		1.969

All variables are normal-centered. Robust standard errors in parentheses. The coefficient's significance is based on the value of a z-statistic.*, **, and *** are statistically significant at 10%, 5%, and 1%, respectively.

Figure 4.2: Interaction between chairperson leadership and women directors' contribution to board decision-making



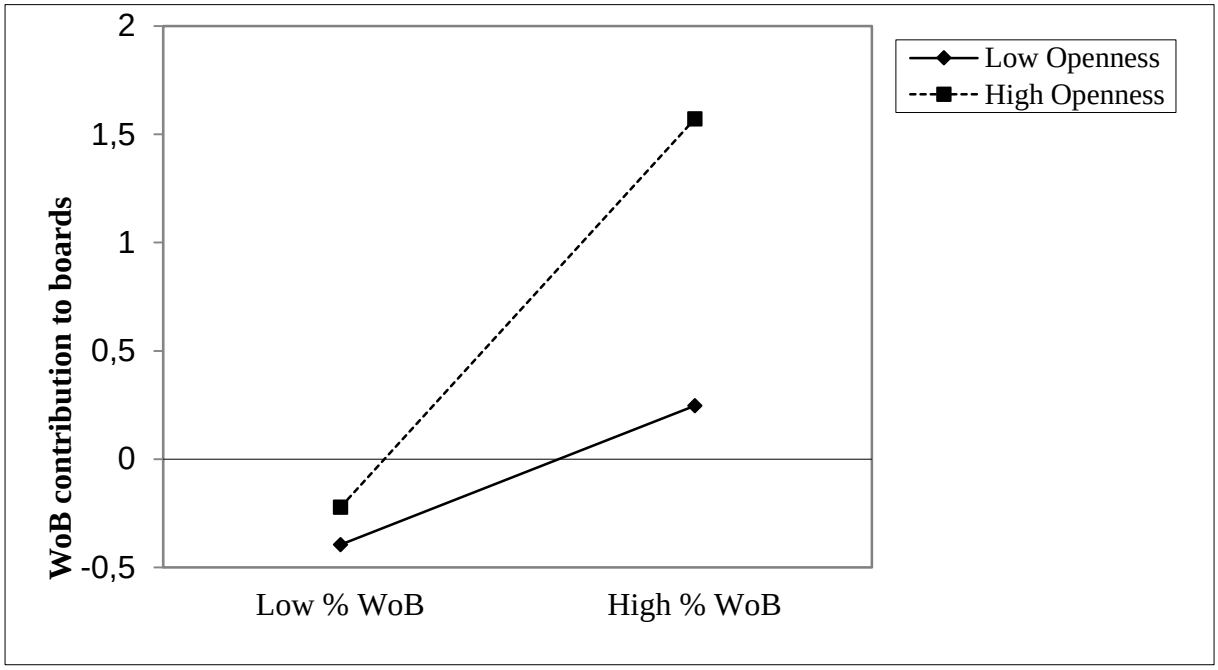
Hypothesis 3 predicts that a board atmosphere of openness facilitates the inclusion of women directors into the decision-making processes. The evidence in Model 3 (141 responses) provides support for this hypothesis. The odds ratio of the interaction between the normal-centered variable on women directors' contribution and the perception of board openness is significant and positive, as is the interaction between these two variables (see Table 4.7). As Figure 4.3 shows, in a climate of high openness, women contribute more. Therefore, Hypothesis 3 is supported.

Table 4.7: Ordinary linear regressions in two steps: effects of women director's minority status on board decisions in a board atmosphere of openness (N = 141), Dependent variable: contribution of women to board decision-making

	Model 1		**Model 2**		**Model 3**	
	Stage 1	**Stage 2**	**Stage 1**	**Stage 2**	**Stage 1**	**Stage 2**
	Coeff	**Coeff**	**Coeff**	**Coeff**	**Coeff**	**Coeff**
Constant	0.322 **	0.371 **	0.270	0.328 **	0.336 *	0.395 **
	(0.155)	(0.156)	(0.163)	(0.165)	(0.174)	(0.176)
Openness	0.137	0.298 **	0.113	0.275 **	0.207 **	0.374 ***
	(0.087)	(0.126)	(0.092)	(0.130)	(0.104)	(0.14)
% of women Directors	0.584 ***	0.622 ***	0.510 ***	0.557 ***	0.569 **	0.609 ***
	(0.182)	(0.182)	(0.192)	(0.193)	(0.221)	(0.22)
Age			0.070	0.094	0.125	0.160
			(0.093)	(0.093)	(0.105)	(0.106)
Gender			-0.075	-0.065	-0.088	-0.074
			(0.085)	(0.085)	(0.087)	(0.087)
Previous experience as CEO			0.112	0.095	0.127	0.103
			(0.090)	(0.090)	(0.090)	(0.091)
CEO duality			-0.027	0.013	0.045	0.078
			(0.088)	(0.090)	(0.096)	(0.098)
Years of experience as Chairperson			-0.186 *	-0.199 **	-0.178 *	-0.203 **
			(0.097)	(0.097)	(0.1)	(0.1)
% shares of stock by the Chairperson			-0.007	-0.005	-0.044	-0.038
			(0.104)	(0.103)	(0.107)	(0.106)
Board size					0.122	0.157
					(0.133)	(0.134)
Is a high-tech company?					-0.163	-0.124
					(0.115)	(0.117)
Has the government any control?					-0.157	-0.189 *
					(0.103)	(0.104)
Finance company					0.085	0.088
					(0.098)	(0.097)
Services company					-0.108	-0.097
					(0.117)	(0.117)
Manufacturing company					0.144	0.151
					(0.127)	(0.126)
Interaction: openness*wob		***0.258 ****		***0.278 ****		***0.288 ****
		(0.148)		***(0.157)***		***(0.163)***
R^2		0.14		0.139		0.193
Adjusted R^2		0.088		0.08		0.097
F-change		0.69 ***		2.349		1.998

All variables are normal-centered. Robust standard errors in parentheses. The coefficient's significance is based on the value of a z-statistic. *, **, and *** are statistically significant at 10%, 5%, and 1%, respectively.

Figure 4.3: Interaction between board openness and women directors' contribution to board decision-making



4.4. DISCUSSION AND CONCLUSION

In this study, we draw scholars' attention to social barriers, particularly out-group categorization that woman directors may face on corporate boards. To the best of our knowledge, this is the first study to demonstrate that solutions created by and within boards can avoid such obstacles, utilizing minorities' potential on corporate boards. Integrating two main perspectives, social categorization and information/decision-making perspectives, we found that women directors as gender minorities make a positive contribution to board decision-making. Building on recategorization theory and research, we found that women minorities on boards are likely to make a larger contribution to board decision-making when the chairperson displays certain leadership attributes and the board atmosphere is characterized by openness.

4.4.1. Implications to Theory

Building on previous studies that indicate women directors' differences from their male counterparts, in forms of knowledge, experience, and values (Hillman et al., 2002; Huse and Solberg, 2006; Zelechowski and Bilimoria, 2004), we argue that women minorities have the potential to influence board decision-making. However, integrating information/decision-making and social categorization perspectives, we further argue that women minorities can be disadvantaged in male-dominated boards. The negative consequences of this disadvantage (out-group categorization) can stand as an obstacle against their influence. This is in line with theoretical perspectives presented by both Eagly (2016) and van Knippenberg and Schippers (2007). Thus, we hypothesize that women minorities will have no influence over board decision-making. However, our findings showed a positive association. One explanation can be that, irrespective of their numbers, women minorities with individual power (Triana et al., 2013), certain network ties, prior board experience (Westphal and Milton, 2000), and interlinks with other firms (Cook and Glass, 2015) may break through social barriers and contribute to board decision-making.

Applying recategorization theory, our results introduce chairperson leadership and boardroom openness as potential solutions (conditions) for boardrooms to better benefit from the talents of women minorities. We argued and found that women minorities' contribution to board decision-making is enhanced when the chairperson has leadership efficacy and the board atmosphere is characterized by openness. These are clearly different solutions than the individual-level solutions, suggesting that women board members, who are different in forms of knowledge, experience, and values, should have certain additional attributes (e.g., prior board experience and network ties) (e.g., Westphal and Milton, 2000). We believe that such women are very few in numbers, and it is most likely that many boards may be appointing women who do not fit those profiles (Nielsen and Huse, 2010a). Our approach also differs from

the notion that boards should have at least three women directors in order to benefit from their talent, which is rooted in critical mass theory. Raising the number of women directors to a minimum of three could be extremely challenging, particularly with regard to corporate leaders' preferences in director selection (Withers et al., 2012). Even considering the recent wave of regulations on the presence of women on corporate boards, it is hard to imagine that boards with three women directors will be soon a common scenario (e.g., in Germany gender quota is 30%).

By suggesting chairperson leadership efficacy as a solution, our study also contributes to research on board leadership. Our results related to the positive moderating effect of chairperson leadership efficacy support the argument that chairperson leadership may have an important impact on creating engaged boards (Bailey and Peck, 2013), enhancing board members' participation (Machold et al., 2011), and particularly increasing women directors' contributions to board decision-making (Kakabadse et al., 2015). Therefore, our approach goes beyond the under-socialized view of the board, which downplays the importance of behavioral aspects of leadership, and moves closer to alternative approaches (Westphal and Zajac, 2013), for example, the team production perspective, which conceptualizes board leadership as a behavioral and process-based phenomenon (e.g., Machold et al., 2011). In addition, our results related to openness are in line with previous research, which shows that openness enables women directors to better use their knowledge and skills in board decision-making (Sun et al., 2015).

4.4.2. Implications for Practice and Policy

Taken together, these results show the importance of understanding (i) the social barriers women directors may face in the boardroom, which may limit their ability to reveal their true potential, and (ii) the role of a chairperson and board atmosphere in coping with these obstacles.

Thus, our study has implications for practitioners and policymakers. We consider the chairperson as the leader of the board who has the responsibility of being aware of possible obstacles that may hinder utilization of any board member's talent. Thus, we suggest that corporate leaders should be aware of potential social barriers in boardrooms that may limit the utilization of women talent. The chairperson should not only be aware of these obstacles but also work continuously to find solutions. By creating and securing women directors' engagement in board discussions through leadership efficacy, chairpersons facilitate the recategorization of women directors, which leads to increased utilization of their talent.

When the chairperson (i) leads other board members in order to develop their cooperative attitude, (ii) integrates women directors' knowledge in proposals formulated and/or conclusions made, and (iii) develops initiatives to engage each board member in board dynamics, out-group bias toward women directors can be avoided. In addition, board members can contribute to this process by being open to critical questions, accepting advice, and developing tolerance in regard to possible wrong considerations. In line with this, we invite policymakers to consider complementing regulations and 2020 EU targets on the number of women directors with guidelines and/or best practices for chairperson roles/responsibilities and the role of openness in the boardroom.

4.5. LIMITATIONS AND FUTURE RESEARCH

This study has limitations that may provide input for future research directions. We assumed that women on boards are different than their male counterparts in many aspects but similar in others. Therefore, we suggested recategorization as an approach to cope with out-group bias by revealing unobservable similarities among in-groups and out-groups. Previous studies have suggested that board members differ in some ways that allow for different perspectives, which in turn may benefit board decisions, but are also similar in other ways (Zhu et al., 2014), which

increases the homogeneity that helps minorities present their perspectives in board discussions (Westphal and Bednar, 2005; Zhu, 2013, 2014). Indeed, scholars have argued that diversity research in organizations needs multiple methodologies (Pringle and Strachan, 2015). Thus, future research could apply mixed method approaches (e.g., Bailey and Peck, 2013; Ravasi and Zattoni, 2006), combining qualitative and quantitative research designs to further increase the understanding of our findings and validity of the constructs.

It is possible that through the recategorization of women directors, the boundaries between potential subgroups among male directors that are based on major background characteristics and fault lines (Lau and Murnighan, 2005) may become blurred. A mixed method approach may shed more light on the formation of possible fault lines, a research topic that has been drawing increased attention. It may be interesting to see how recategorization may, on the one hand, enhance and, on the other hand, by influencing the formation and activation of board fault lines, hinder competent board work (Kaczmarek et al., 2012).

Moreover, related to positive influence of minority women on board decision-making, we cannot be sure that the positive association is due to women directors' backgrounds, experiences, and values. Theory and research have emphasized that interlinks to other boards and individual power are important factors determining women directors' influence on decision outcomes (Cook and Glass, 2015; Shropshire, 2010; Triana et al., 2013). Our data set does not let us control for these factors. Future research may consider whether and to what extent the solutions suggested in this study impact, for example, powerful or interlocked women directors' contribution to board decision-making and strategic decisions.

In addition, Eagly (2016: 208) highlights that to move diversity research forward, we should "foster the challenging and important task of uncovering the conditions under which demographic diversity has positive or negative effects." Eagly (2016: 208) specifies three areas of investigation, "(a) sex-related differences in styles of social interaction and leadership, (b)

the duration of interaction, and (c) diversity mindsets and climate for inclusion," that offer promise for discovering some of those conditions. In this study, we investigated conditions that might be considered in the first and the third areas, but our analysis also generated interesting results that might be considered in the second area of investigation. Indeed, we found a negative association between chairperson tenure (years of experience as chairperson) and women directors' influence on board decisions. One explanation may be related to the centralization of power, which may limit low-power individuals' degree of participation and influence in group decision-making (Bunderson and Reagans, 2011). The longer tenure a board leader (CEO or chairperson) has, the more power over directors he/she possesses (Finkelstein, 1992). Research demonstrated that powerful CEOs may limit positive effects of diversity on strategic change (e.g., Haynes and Hillman, 2010). It may be interesting to explore how power and status differences, not only between CEO and directors (Pearce and Zahra, 1991) but also between chairperson and directors, may impact diversity's potential on board decisions and strategic decisions.

The data used in this study were collected before the gender quota went into effect in Norway. The quota increased female representation by over 20% at the typical affected firm (publicly listed companies in Norway) (Matsa and Miller, 2013). In addition, considering that the Norwegian experience has been spreading to other countries in Europe (e.g., Spain and Italy), it is closely watched in Scandinavian countries, and acknowledging that 2020 EU targets for board diversity quotas have been relatively closer, it is clear that the gender diversity landscape is changing. It is natural to ask if the insights from our specific data are still relevant and generalizable to other contexts with or without quota restrictions.

Interpreting the findings of this study in light of introduction of quotas for women in Norway, it must be noted that (1) the minority status of women in corporate boards may still prevail for many years. Indeed, while the landscape is slightly changing, having women

directors representing less than 30% of the board is a long-term issue worldwide; (2) the general perception that women directors are appointed for affirmative action reasons may increase existing stereotyping or bias perceptions against women directors (Nielsen and Huse, 2010a). Furthermore, if the pool of available women directors is not large enough, this may lead to appointments of female directors who may lack the background and experience necessary for competent board work. In turn, this may strengthen the social barriers against women minorities, thus further reducing the potential of women directors to make valuable contributions to board decision-making. A recent study demonstrated that when comparing financial data for publicly listed firms in Norway with those of listed and unlisted firms elsewhere in Scandinavia, most corporate decisions were unaffected after women's board representation was increased by quota regulations (Matsa and Miller, 2013). Therefore, we believe the findings of our study, considering the changing gender diversity landscape, may still provide important insights about how to utilize women minorities' talent, despite their increased representation.

Related to generalizability of our findings, there are indications that women minorities may face similar bias perceptions and understandings from their male counterparts both in European and US boardrooms (Groysberg and Bell, 2013). Moreover, board leadership and openness are suggested by both European and American women directors as important options in coping with those social barriers (e.g., Huse and Solberg, 2006; Groysberg and Bell, 2013). In addition, our findings resonate with studies elsewhere, including those from European countries (Roberts et al., 2005), Anglo-American countries (Leblanc, 2005; Westphal and Milton, 2000; Zhu et al., 2014), and Asian countries (Sun et al., 2015). Moreover, it must be noted that the Norwegian governance context has many similarities to other countries (Nielsen and Huse, 2010a; Zhang, 2010). However, there are also differences, most notably regulatory

framework, supporting gender equality, the prevalence of active boards, and concentrated ownership (Randoy and Goel, 2003).

Therefore, there is a need for future research in different empirical settings to generalize our results. As mentioned before, the survey from which the data were drawn includes comparable data from at least three other countries (Italy, the Netherlands, and Belgium). These countries may provide potential empirical settings. In addition, a fruitful avenue for future research would be a comparative analysis of the country-level conditions (e.g., external governance mechanisms) (Aguilera et al., 2015) under which women directors exercise influence over boards (Post and Byron, 2015). An information-processing theory (Boivie et al., 2016; Khanna et al., 2014) may be a novel theoretical approach to consider the effects of such factors on board behavior.

Despite the above limitations, this study has made contributions to the field of corporate governance. The number of women on corporate boards is increasing, but the minority status of women directors and hence social barriers faced in the boardrooms appear to be a long-term practical issue with important implications. This issue requires the attention of policymakers, corporate leaders, and board members. Barriers should be avoided to fully benefit from women's talent and, in turn, board diversity's potential on decision outcomes. In this study, we showed that one of the main social barriers can be avoided through factors that boards can influence, and we believe more studies offering other potential solutions will follow.

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CHAPTER 5:

CONCLUSIONS AND IMPLICATIONS

5.1 MAIN FINDINGS

In this dissertation, we have focused on the relationship between board diversity and strategic decision making. We have applied an Input-Process-Output (IPO) model of board behavior, used a micro-level analysis, and adopted a behavioral perspective. This dissertation research generate three clear research outcomes which has important theoretical and practical implications. 1) Diversity as variety in directors knowledge, skills, and professional experience contribute to firms' strategic decision making processes and strategic decisions, 2) board processes play a vital role for the utilization of such potential, and 3) solutions should be generated to cope with obstacles that might limit directors' sharing unique information and communicating different perspectives during board discussions.

The three main chapters contribute to these outcomes from different perspectives. Whether and how directors' different skills, knowledge, and professional experience (job-related diversity) may impact speed and comprehensiveness of board decision- making processes, was explored in Chapter 2. Particularly, the role of a core board process, directors' use of their knowledge and skills, was investigated. Built on upper echelons theory, we used a sample consisting of valid answers from 377 CEOs to test our hypotheses. The three hypotheses received support from the Norwegian survey database. Job-related diversity is significantly and positively associated with use of knowledge and skills (H1). At the same time, the use of knowledge and skills mediates the positive and significant relationship between job-related diversity and decision comprehensiveness (H2, partial mediation) as well as between job-related diversity and decision speed (H3, full mediation).

In Chapter 3, the main purpose was to investigate the link between gender diversity and firm organizational innovation. Drawing upon behavioral theory, we also explored the influence of board processes on gender-diverse boards' contribution to innovativeness of firms. We generated three hypotheses and tested these hypotheses by using a sample of 341

Norwegian firms. We provided empirical evidence that the positive relationship between women directors and the level of organizational innovation (H1) is mediated by some decision-making culture dimensions: the degree of cognitive conflict (H2) and the degree of preparation and involvement (H3) during board meetings.

In Chapter 4, we considered one of the obstacles which limit women directors' influence on board decisions: women directors' categorization as out-group members in male dominated boards. Stemming from recategorization theory, we examined whether and to what extent board chairperson leadership efficacy and board openness (as mechanisms to avoid out-group bias) enhance the influence of women when they are in the minority on board decision-making. In a sample of 146 Norwegian firms, we found a positive relationship between women minorities and women directors' contribution to board decision-making (H1). Moreover, we found that this positive impact increases when the board chairperson exercises leadership (H2) and the board operates in an atmosphere of openness (H3).

5.2 ACADEMIC IMPLICATIONS

This dissertation primarily makes a number of contributions to the strategic management and corporate governance literatures.

5.2.1 Contributions to Strategic Management Literature

One clear message of this dissertation is that strategic decision-making is no longer only top management's land. Boards' involvement in strategy process has become a topic drawing increasing research attention (Bailey and Peck, 2013; Forbes and Milliken, 1999; Pugliese et al., 2009; Rindova, 1999; Stiles, 2001), scholars calling for more research on board diversity-strategic decisions link (Adams et al., 2015; Hillman, 2015). The current dissertation seeks to contribute to the conversation from two directions. While Chapter 2 demonstrates an indirect

impact of diverse boards on strategic decision-making processes, in Chapter 3; a direct impact of board diversity on strategic decisions, board gender diversity enhances volume of organizational innovation, is revealed.

Implications for Innovation and Strategic Decision-making Processes Literatures

Previous studies on board diversity-strategic decisions link have mainly investigated effects of gender diversity (Triana et al., 2013) and job-related diversity on strategic change (Golden and Zajac, 2001; Haynes and Hillman, 2010). Others have investigated also how gender diversity may impact innovation inputs (Midavaine, Dolfsma, and Aalbers, 2016; Miller and Triana, 2009) innovation outputs (Torchia et al., 2011), investment decision (Sun et al., 2015). In line with previous studies (Miller and Triana, 2009; Torchia et al., 2011), we hypothesize and demonstrate the positive impact of female directors on innovativeness of a firm (volume of organizational innovation). Differently, following scholars' call (Byron and Post, 2015), we have explored the important role board processes may play in transmitting the effects of diversity on strategic decisions.

We apply a behavioral theory perspective, which draws attention to bounded rationality of decision makers and, hence, decision-making biases they may face. Different perspectives and unique information directors bring along may work against such biases (e.g. group think), contributing to quality as well as creativity of decision outcomes (Terjesen et al., 2016; Zhang, 2010). However, use of such potential during board discussions is a must. Women directors may act as catalyzers to this end. Sharing unique relevant-information and communicating different perspectives, women directors may trigger task-related disagreements (cognitive conflict) during board discussions (Torchia et al. 2015). Huse and Solberg (2006) suggest that women directors being less experienced in board work may spend more time preparing for board meetings, trying to understand the nature and logic of board work. Such level of

preparation to board discussions may in turn impact other directors' level of preparation and participation to board discussions. Al in all, whether by triggering task-related disagreements or increasing overall board's preparation and involvement, women directors may help boards cope with cognitive biases and make decisions with better quality and creativity.

Therefore, in addition to introducing behavioral theory as a novel approach, Chapter 3 shifts the focus from presence of women directors on boards to important contributions women make on boards through board processes (e.g. Eagly, 2016; Kakabadse et al., 2015; Kim and Starks, 2016; Nielsen and Huse, 2010b; Perrault, 2015). In line with previous studies, we highlight the importance of other board characteristics (other than usual suspects) (e.g. Golden and Zajac, 2001; Haynes and Hillman, 2010; Hillman and Dalziel, 2003) and board processes (e.g. Gabrielsson and Huse, 2004; Huse, 2007; Huse et al., 2009; Minichilli et al., 2009; 2012; Zhang, 2010; Zona and Zattoni, 2007), in better understanding and explaining important role boards may play in strategic decision making.

In addition to demonstrating the direct impact of board diversity on strategic decisions, this dissertation research draws attention to an indirect influence of boards on strategic decision making processes which affect quality as well as creativity of strategic decision (Forbes, 2007). In Chapter 2, we disentangle an understanding that board diversity is a double-edged sword when its effects on decision-making processes is considered. A general understanding of top management teams research on diversity-strategic decision making states that diversity in top managers' knowledge, skills, and professional experience will enhance comprehensiveness of strategic decision-making processes. However, this will come with a price of being slow in reaching a consensus on a final decision choice (Hambrick et al., 1996). This understanding has been imported to board context without being put to empirical testing (e.g. Forbes and Milliken, 1999; Rindova, 1999), and has been highlighted in several studies on board diversity (e.g. Carter et al., 2010; Miller and Triana, 2009).

Applying an upper echelons approach, we hypothesize and demonstrate that this understanding might not be valid in board context, such that job-related diversity may enhance both comprehensiveness and speed of board decision-making processes. There is support in top management teams research (e.g. Eisenhardt, 1989; Kauer et al. 2007; Talaulicar et al. 2005) as well as board theory (Kim et al., 2009). Pettigrew (1992) argued that research on boards should be incorporated with studies on the TMT, given that these can be considered as a collective working together to reach a firm's full potential. These findings point out the important role, together with top management teams, boards play in strategic decision-making. In addition to introducing upper echelons perspective as a novel approach in investigating effects board diversity may have on decision making processes, the findings reported in Chapter 2 reveals once again the importance board processes. The positive effects of job-related diversity on speed of board decision-making processes is fully transmitted by a core board process: use of directors' use of their knowledge and skills.

Chapter 2 and Chapter 3 show:

1) Important role boards play, together with top management teams, in strategic management of firms,

2) Important effects job-related diversity and gender diversity may have on strategic decision making processes and strategic decisions,

3) Vital role board processes play in realization of board diversity's potential, and

4) Importance of application of a behavioral perspective in better understanding and explaining strategic management of firms.

Additionally, the joint focus on the outcomes of the three main Chapters of this dissertation may further advance our knowledge in strategic management field. Such that a chairperson may become the most important actor who could leverage but also manage

influence of boards in strategic decision making. Previous studies have theoretically argued for the important leadership of a chairperson but mainly in relation to effective functioning of a board (Eagly, 2016; Leblanc, 2005; Machold et al., 2011). Rather, research that explores effects of board diversity on strategic decisions mainly targeted investigating influence of CEOs (e.g. Golden and Zajac, 2001; Haynes and Hillman, 2010). The outcomes of three main chapters point out that a chairperson may leverage use of directors' different knowledge, skills, and professional experience which might positively impact not only strategic decision making processes but also strategic decisions.

However, while utilizing variety in directors' knowledge and perspectives, a chairperson should be also aware of the pitfalls, such as social barriers against minorities and the risk that cognitive conflict among directors may intensify. A chairperson could play a vital role in managing negative consequences of such obstacles (Chapter 4) as well as level of task-related disagreements during board discussions (De Dreu and Weingart, 2003). For example, a chairperson may facilitate communications of different perspectives on the decision issues at hand and encourage open debates which would trigger cognitive conflict among directors. However, should the conflict intensifies this may clearly have negative consequences on speed of making decisions due to long rounds on resolution of conflict (Rindova, 1999). In this regard, positive effects of task conflict may be realized on strategic decisions (Chapter 3) but not on firm performance, particularly, if the firm is operating in a high-velocity environment (Eisenhardt, 1989).

5.2.2 Contributions to Corporate Governance Literature

Previous studies have demonstrated important effects of board diversity on board task performance (e.g. Huse and Nielsen, 2009; Minichilli et al., 2009; Zhang, 2010; Nielsen and Huse, 2010a), board decisions (e.g. Nielsen and Huse, 2010b; Westphal and Milton, 2000; Zhu

2013; 2014; Zhu and Shen, 2016; Zhu and Westphal, 2014) as well as strategic decisions (e.g. Chen et al., 2016; Triana et al,. 2013; Sun et al., 2015). This research, mainly focusing on gender diversity, is a step forward.

However, equally important is to understand how board diversity may impact comprehensiveness and speed of board decision making which, in turn, would impact overall comprehensiveness and speed of strategic decision making processes. Following scholars' call for more research on other types of board diversity (Hillman, 2015; Kirsch, 2017), in Chapter 2 we explored whether and how job-related diversity may influence comprehensiveness and speed of board decision making processes. Contrary to the understanding that diversity in directors' knowledge, skills, and experience (job-related diversity) will enhance comprehensiveness but hinder speed of board decision-making processes (Forbes and Milliken, 1999; Rindova, 1999), we demonstrated that job-related diversity enhances both. Therefore, this dissertation research contributes to research on board diversity-board decisions link and enriches the academic conversation that centers on "double-edged sword" or "mixed blessing" nature of board diversity (Milliken and martins, 1996; Harrison and Klein, 2007).

In line with previous studies (Byron and Post, 2015; Eagly, 2016; Gabrielsson and Huse, 200), findings reported in Chapter 2 also indicate the important role board processes play in better understanding and explaining effects board diversity may have. A core board process, use of directors' knowledge and skills, transmits the positive effects of job-related diversity to comprehensiveness and speed (full mediation) of board decision making processes. On the other hand, these results contradict theory (e.g. Forbes and Milliken, 1999; Boivie et al., 2016) and research (e.g. Zhu, 2013; 2014) that suggest negative consequences of job-related diversity on board processes, such that unique information may not be shared and/or different perspectives may not be communicated in diverse boards.

One explanation might be related to use of different theoretical lenses in explaining effects board diversity may have. Aforementioned studies have been built on cognitive decision making perspective which posits a positive association between board diversity and cognitive conflict which might have adverse effects on competent board functioning (Forbes and Milliken, 1999). Differently, an upper echelons perspective value such task-related disagreements, arguing that task-related conflicts might reveal different perspectives and a broad range of unique information and, accordingly, might work against cognitive biases surrendering decision making. As a matter of fact, results of positive effects of job-related diversity on use of knowledge and skills is in line with previous studies that adopts an information processing perspective (Zhang, 2010). According to this perspective, moderate levels of cognitive conflict can be even beneficial, enhancing quality of decision outcomes (De Dreu, 2006). From this perspective, this dissertation supports the idea that different theoretical lenses might reveal greater insights about board behavior (Dalton and Dalton, 2011; Van Ees et al., 2009).

Chapter 3 further supports our suggestions that board diversity influence strategic decision making and board processes play an important role in better understanding and explaining effects board diversity may have. In line with previous studies (Midavaine et al., 2016; Miller and Triana, 2009; Torchia et al., 2011), Chapter 3 demonstrates positive impact of women talent on innovativeness of a firm. We enrich this research by showing that favorable effects of gender diversity are transmitted by cognitive conflict and preparation and involvement.

While discussing findings of Chapter 2, positive impact of job-related diversity is mediated by use of directors' knowledge and skills, we have argued that applying different perspectives may reveal greater insights about effects board diversity may have. We further argued that job-related diversity may lead to cognitive conflict but contrary to the cognitive

decision making perspective (Forbes and Milliken, 1999), such task related-disagreements may benefit board decision making. Results reported in Chapter 3 support this.

In Chapter 3, the mediation analysis demonstrates effect of cognitive conflict in transmitting positive effects of gender diversity on organizational innovation. One explanation may related to application of a behavioral theory as a novel approach in explaining effects board diversity may have on strategic decisions. Behavioral theory perspective posits favorable effects of conflict such that in resolution of conflict board may play a critical role in searching for more information, knowledge, and presentation of alternative perspectives (Van Ees et al., 2009). One other explanation of our contradictory results might be related to level of task conflict rather than solely occurrence of it in boardrooms. As mentioned in above discussions, moderate levels of task related disagreements may enhance quality and creativity of decision outcomes (e.g. De Dreu 2006).

On one hand, previous studies have indicated negative effects of board diversity on board decisions as well as strategic decisions (e.g. Abdullah et al., 2016; Chen et al., 2016; Zhu, 2013; 2014). On the other hand, this dissertation research show positive effects of board diversity on board decision making and strategic decisions. Therefore, it is an important and challenging task to explore certain conditions under which board diversity may have positive or negative effects (Eagly, 2016).

In the light of Chapter 2 and Chapter 3, we have argued for important effects board diversity on strategic decision making processes as well as strategic decisions. Additionally, through upper echelons and behavioral theory perspectives we have suggested that in better understanding and explaining effects of diversity, theory and research should consider board processes. Such that realization of positive effects of both job-related diversity and gender diversity requires directors' sharing unique information and communicating different perspectives. From this perspective, it is clear that any obstacle that would limit use of

directors' knowledge, skills, and professional experience would limit utilization of board diversity' potential on decision making. As a matter of fact, failing to cope with those obstacles, might be one reason that explain mixed effects of board diversity on board decisions as well as strategic decisions.

This dissertation have focused on one such obstacle in Chapter 4 and show greater contribution of women talent on board decision making when certain solutions to come with that obstacle are in place In line with previous studies (Nielsen and Huse, 2010a; Westphal and Milton, 2000), we demonstrate women directors' influence on board decision making. However, we argue that such influence may be limited in male dominated boards where women are minority, facing negative consequences of out-group categorization (Harrison and Klein, 2007; Milliken and Martins, 1996).

Following Eagly's (2016) call, we examined and indicated positive effects of chairperson, with a leadership efficacy, on active participation of women directors to board discussions. These results are in line with previous studies that demonstrate the important role chairperson may play on directors' participation and contribution to board tasks (e.g. Kakabadse et al., 2015; Machold et al., 2011). However, it should be also noted that research has demonstrated negative effects of another high-power individual in the boardrooms, a CEO, on board diversity-strategic decisions link (Golden and Zajac, 2001; Haynes and Hillman, 2010). One explanation might be related to power orientation of these high-power individuals, meaning whether they use their power for self-interest or collective accomplishment of board tasks and goals (Bunderson, and Reagans, 2011). In chapter 4, we also demonstrate that under a board atmosphere of openness women directors' influence on board decisions is enhanced which is in line with previous studies (Sun et al., 2015).

Additionally, the joint focus on the outcomes of the three main Chapters of this dissertation may further advance our knowledge in corporate governance field. Long before

scholars have recognized that a great leap from board inputs to firm performance may result in misleading findings in board research (Gabrielsson and Huse, 2004; Pettigrew, 1992). However, surprisingly, board diversity research has long followed the same path and research on gender diversity-firm performance link has provided mixed results (Gabaldon et al., 2016; Eagly, 2016). It should be noted that increasing number of studies have started to investigate effects of board diversity on mediating variables (board tasks, board decisions, strategic decisions), with a particular emphasis on behavioral factors (e.g. Nielsen and Huse, 2010a; 2010b; Sun et al., 2015; Westphal and Zajac, 2013; Zhu, 2013; 2014; Zhu et al., 2014). Our findings of the main chapters can be interpreted as one answer to the question of whether and through which mechanisms variety in directors' skills, knowledge, and skills may impact strategic decisions. We support the arguments that behavioral factors and contingencies play vital roles in realizing board diversity's potential on strategic decisions (Eagly, 2016). Considering this joint positive effect, can we conclude that board diversity would be desirable for firms, positively impacting firm performance?

Interestingly, research that actually validates these favorable effects on firm performance has stayed greatly limited. We are aware of only one study that investigate the mediation effect of innovation in relation to gender diversity and firm performance (Miller and Triana, 2009). Miller and Triana (2009) demonstrate positive effects of gender diversity on innovation but report no positive effect of innovation on firm performance. From this perspective, it may be important to shift research attention on whether and how positive effects of board diversity on board decisions or strategic decisions are transmitted to organizational outcomes. Investigating contingencies surrendering such potential will be key (Miller and Triana, 2009) which is greatly neglected in board diversity up to date.

5.3 PRACTICAL IMPLICATIONS

In this section, we discuss the implications of the dissertation for corporate leaders and board members. Additionally, our research is also relevant for policy makers.

First, this doctoral research calls for increased attention to the formation of boards since directors (female and male) have the potential to participate and contribute to strategy process. In addition, not only selection of directors but also chairperson is vital. Boards cannot be seen only as control mechanisms but rather strategic decision making groups whose diversity add value to strategic management of firms. Corporate leaders acquire a valuable resource, hard to imitate, by establishing a board characterized by variety in directors' skills, knowledge, and professional experience. Such a resource benefit strategic decision making by making comprehensive evaluations of strategic issues at hand quickly and, eventually, enhancing innovativeness of a focal firm.

We suggest corporate leaders take any necessary action to create a board atmosphere under which each director will not hesitate to reveal his/her cognitive resources. This might be achieved through establishing board norms and/or selection of a chairperson with certain leadership attributes. Voluntarily or to comply with the spreading regulation of women quota, particularly in continental Europe, corporate leaders are reforming their boards; replacing some of male directors with female directors. We suggest them to pursue the search for women talent, with skills, knowledge, and professional experience, should they want to benefit from these new comers on strategic actions of their firms. Because, only such women directors may overcome the social barriers, which still exist in male dominated boardrooms, with the help of a competent chairperson and/or under a board atmosphere of openness.

Second, to board members (directors and chairperson), we suggest that each have a responsibility in maintaining and sustaining competent board work so as to effectively

participate and contribute to strategic decision making. This is also what corporate leaders expect from their boards. Accomplishment of such complex and highly cognitive task requires utilization of each director's skills, knowledge, professional experience such that variety in these cognitive resources clearly enhance a board's contribution to strategic decision making. Therefore, male directors, being still the members of majority group in the boardrooms, should acknowledge the bias understanding and/or stereotyping that might exist in their boardrooms against female directors. Equally important, a chairperson should be aware of the possible social barriers and take immediate action in board meetings to fight against negative consequences. Being the leader of a board, it might be first a chairperson's responsibility to encourage women directors' active participation to board discussions.

Finally, this dissertation offers insights to policy makers in their efforts to guide the board of directors in demonstrating good governance practices. Due to governmental regulations corporate leaders have been complying with the legal obligations and increasing number of women on their boards. Our doctoral research provides support to this on a business case for women directors. However, while increasing number of women may be a necessary condition, it is hardly sufficient to utilize the expected benefit from women talent. Policy makers should be aware of two important issues: one before the issue of quota law, one after the law comes in force. It is important to make a detailed analysis of labor market for women candidates who might be appointed to boards. If the number of competent women candidates might be scarce, adding more women by replacing male directors might not lead to favorable business outcomes. Equally important, policy makers should take additional actions to cope with social barriers waiting in male dominated boards, so that increasing number of competent women on boards add value their firms. We suggest policy makers to consider issuing for example best practices of governance focusing on the selection of a chairperson (Leblanc,

2005). Such recommendations might also target establishment of a board atmosphere of openness.

5.4 AVENUE FOR FURTHER RESEARCH

This dissertation has investigated a relatively understudied area within the domain of corporate governance in public firms, namely the link between board diversity and strategic decision making. While the results of this research provides new insights to strategic management and corporate governance by demonstrating importance of benefiting from board processes and coping with social barriers in better understanding and exploring diversity' influence on strategic decision making, this dissertation is not without limitations. Following, we elaborate on main limitations and discuss some avenues for future research.

A first limitation may be related to generalizability of the results to other settings. Our findings of 3 main Chapters build on a sample from a data set, which is still the most richest and comprehensive one on board processes and tasks, that is collected on Norwegian companies. Although we acknowledge the importance of governance experience of Norway in the eye of many European countries, it has the disadvantage that the results could be more difficult to generalize to other countries; particularly to those where different regulations and best practices of governance related to board composition and functioning may apply (e.g. US). This survey has been used in other countries which may be differentiated from one another on cultural bases as well as external contingencies surrendering governance practices (e.g. Belgium, Italy, Turkey). Future studies could therefore one hand analyze the extent to which our results hold in other national settings and on the other hand draw more attention to external contingencies (Aguilera et al., 2008; 2015; Minichilli et al., 2012).

Second, the data used in this study were collected before the gender quota went into effect in Norway. The quota increased female representation by over 20% at the typical affected

firm (publicly listed companies in Norway) (Matsa and Miller, 2013). In addition, considering that the Norwegian experience has been spreading to other countries in Europe (e.g., Spain and Italy), it is closely watched in Scandinavian countries, and acknowledging that 2020 EU targets for board diversity quotas have been relatively closer, it is clear that the gender diversity landscape is changing. It is natural to ask if the insights from our specific data are still relevant for other contexts with or without quota restrictions.

It must be noted that the minority status of women in corporate boards may still prevail for many years. While the landscape is slightly changing, having women directors representing less than 30% of the board is a long-term issue worldwide (MSCI Women on Boards Report, 2015). One main explanation is the ongoing difficulties women executives have been still experiencing in breaking the glass ceiling (e.g. Dang, Nguyen, and Vo, 2014; Wolfers, 2015). This also implies that it is highly likely that the labor markets for women directors are not enlarging in countries with or without quota regulations.

If the pool of available women directors is not large enough, first, this may lead to, whether due to compliance with the quota regulation or as a result of pressures from business influentials, appointments of female directors who may lack the background and experience necessary for competent board work. The general perception that women directors are appointed for affirmative action reasons may increase existing stereotyping or bias perceptions against women directors (Nielsen and Huse, 2010a). In turn, this may strengthen the social barriers against women minorities, thus further reducing the potential of women directors to make valuable contributions to board decision-making. A recent study demonstrated that when comparing financial data for publicly listed firms in Norway with those of listed and unlisted firms elsewhere in Scandinavia, most corporate decisions were unaffected after women's board representation was increased by quota regulations (Matsa and Miller, 2013).

If the pool of available women directors is not large enough, second, this may lead to appointment of limited number of women directors to multiple boards. Applying an information-processing perspective (Boivie et al., 2016), previous studies have demonstrated that information-processing overload (information processing demands exceed information processing capacity) can limit boards in their ability to benefit from board members' information, perspectives, and knowledge (Khanna et al., 2014). Support also comes from research on busy board hypothesis perspective (Kaczmarek et al. 2014). Being appointed to multiple boards and facing with information overload, women directors may reach a point which they are unable to process additional information, in other words use their knowledge, skills, and experience. In turn, this may negatively affect not only strategic decisions but also strategic decision making processes. Therefore, we believe the findings of our study, considering the changing gender diversity landscape, may still provide important insights about how to utilize women minorities' talent and why women representation may not benefit firms equally, despite their increased representation.

Third, this dissertation demonstrate the importance of considering board processes in order to better explain effects board diversity may have on decision making processes and outcomes. We acknowledge the difficulty in accessing upper echelons for face to face interviews and boardrooms for type recordings which might generate more nuanced information about boardroom dynamics (Kakabadse et al., 2015). Still, scholars have argued that diversity research in organizations needs multiple methodologies (Pringle & Strachan, 2015). Thus, future research could apply mixed method approaches (e.g., Bailey & Peck, 2013; Ravasi & Zattoni, 2006), combining qualitative and quantitative research designs to further increase the understanding of our findings and validity of the constructs.

For example, it is unrealistic to neglect the occurrence and important effects of cognitive conflict in diverse boards. Board research on cognitive conflict-board task

performance link has demonstrated mixed effects (e.g. Minichilli et al., 2012; Minichilli et al., 2009; Nielsen & Huse, 2010; Zona & Zattoni, 2007). One reason for mixed results might be the application of quantitative research design in all those studies which may not fully capture the level of task conflict and its association with relational conflict. It is interesting to see that while trying to better understand the influence of board diversity on decision making, research on cognitive conflict has not moving forward. It is highly likely that board diversity brings disagreements in an active board (Torchia et al., 2015). More research is required on different types of conflict (task, process, relational) as well as conflict management (Kellermanns and Eddleston, 2006). Particularly, a qualitative research design could provide greater insights on the link between task conflict and relational conflict.

Forth, relatedly, this dissertation research has focused on investigating medium and large size, public firms in a developed country, Norway. Future research may explore our research questions in emerging market countries or frontier market countries with weak institutions (see for example Abdullah et al., 2016). While there is no consensus in the academic literature about the term "family firm", there is an agreement that family firms are distinct from non-family firms (Karra et al., 2006). Research on boards-strategic decisions link in family firm context is considered as an emerging field, scholars putting great emphasis on benefiting from accumulated knowledge in general corporate governance literature. It is, therefore, not surprising that scholars are calling for more research on board diversity and behavioral factors to better understand and explain boards' influence on family firms' strategic actions (Vandebeek et al., 2016; Zattoni et al., 2015; Zona, 2016). Innovetiveness of family firms is a main topic of interest for family firms researchers (e.g. De Massis et al., 2013; Duran et al., 2016; Ingram et al., 2016). Therefore, it may be really interesting to see how board diversity may impact speed of making decisions in family firms as well as impact of conflicts on decision making of boards and their influence on innovativeness in family firm context.

Fifth, most importantly, we would like to draw scholars´ attention to several other obstacles that may limit utilization of board diversity's potential and that are not considered in this dissertation. In line with previous studies (Zhang, 2010; Kakabadse et al., 2015), our findings indicate the importance of use of directors' knowledge, skills, and professional experience should utilization of board diversity on board decision making as well as strategic decision making is desired. That is why we have mentioned several times before it is important to understand how and through which mechanisms board diversity transmits its impact on board decision making and strategic decision outcomes. Building on this result, several other obstacles can be systematically identified and, in turn, solutions to cope with those obstacles can be examined. This dissertation focuses only on one of the social barriers, out-group categorization, against utilization of gender diversity. We suggest some other obstacles for the attention of scholars, namely power relationships, symbolic management, board interlocks, and diversity faultlines.

Power asymmetry in a boardroom might be one other challenge that should be coped with to utilize directors' different skills, knowledge, and professional experience. The effects of power differences inside the boardrooms have been recognized and are theoretically argued to have negative effects on use of directors' knowledge and skills (Pearce and Zahra, 1991). Research, although very limited, supports this (e.g. Haynes and Hillman, 2010; Triana et al., 2013). However, our body of knowledge about how negative effects of power differences inside the boardrooms could be reduced or avoided so that directors' might reveal their true talent has remained greatly limited.

Another factor might be *symbolic management* that might limit use of directors' different perspectives on strategic issues. Symbolic management explains how CEOs might manipulate certain developments/changes in their firms so that, instead of the expected benefits for the firm, such developments favor CEOs' personal interests (Fiss and Zajac, 2006; Joseph

et al., 2014; Westphal and Graebner, 2010). How do CEOs react to the increasing pressure from government, institutional investors, and NGOs to increase diversity (e.g., by increasing representation of women directors) in their boardrooms? Do newly appointed women directors are selected from a CEO's personal and/or professional network? How might this selection influence those women directors' participation as well as contribution? Can a CEO use the obligation of appointing more women directors as a mechanism to replace some directors who are actively participating board discussions by challenging the proposals from management? Symbolic management, while an important issue, is presently neglected in the board literature. Solutions to this interfirm problem, to utilize board diversity, might draw scholars' attention to topics such as "co-CEO," "board committees," "regular board evaluations" and "CEO-chairperson relationships."

Board interlocks might be one other topic that might appear as an obstacle to utilization of board diversity and, hence, requires solutions. A board interlock occurs when a board member of a focal firm also sits on the board of another firm. (Mizruchi, 1996:271). It is not difficult to imagine benefits of such links: networking activities, bringing in information about new practices, processes adopted in other firms, providing decision-making experience on similar issues at hand, etc. Directors are reputed, skilled decision-making experts, but are not superheroes with unlimited cognitive capacities. Multiple board appointments may limit directors' contribution to board decision-making and/or tasks related to strategic decision making (Khanna et al., 2014; Kaczmarek, Kimino, & Pye, 2014; Ruigrok, Peck, and Keller, 2006). Busy board hypothesis supports this (Fich and Shivdasani 2006; Harris and Shimizu 2004). Gender diversity is vital in this context, because it will not be surprising to recognize that recently women directors have started to serve on increased number of boards. Because, there are not enough female candidates in the labor market, but corporate leaders should comply with gender quota regulations applicable to the EU member countries. "Multiple board

appointments of directors" is a topic with enormous practical implications not only for corporate leaders but also policy makers. However, research is scarce.

Finally, as the last factor that might limit board diversity's potential, it is unrealistic to think that gender is the only source of separation inside the boardrooms. When different dimensions of diversity converge, so-called *diversity faultlines* emerge. For instance, such convergence might be based on gender, women directors vs. male directors, but also on other salient features that are not observable, such as beliefs, functional background, educational background, etc. Both research on boards as well as work groups demonstrates negative effects of faultlines on diverse board/group's performance (e.g. Homan et al., 2007; Kaczmarek et al., 2012; Minichilli et al., 2010). However, our body of knowledge is greatly limited when it comes to understanding and explaining how faultlines might impact board diversity's potential. This also limits our ability to offer solutions for possible negative consequences.

5.5 CONCLUDING THOUGHTS

Board diversity is inevitable in corporate boards. We support corporate leaders' and policy makers' decisions in generating diverse boards. Still, we highlight that diversity is a necessary but not a sufficient condition. Variety in knowledge, skills, and professional experience of directors adds value to firms only when complementary actions are also taken to utilize such potential. Use of these cognitive resources by directors during board discussions should not be taken for granted. It requires leadership in the boardrooms as well as an open and free board atmosphere.

Providing these insights, this dissertation can be seen as the first important step in guiding collective efforts of scholars, corporate leaders, and policy makers in making board diversity work. A systematic investigation of several other obstacles that might limit utilization of board diversity is required. Accordingly, we believe that solutions at individual, board, firm,

and even society level to cope with those obstacles will follow. We hope particularly to this end, this dissertation will make contributions to theory as well as practice.

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