HAL
open science

Does Board Structure Matter for Innovation?

Meriam Attia, Ouidad Yousfi, Abdelwahed Omri

To cite this version:

Meriam Attia, Ouidad Yousfi, Abdelwahed Omri. Does Board Structure Matter for Innovation?. World Scientific Publishing Company. Financial and Economic Systems: Transformations & New Challenges, 2021. hal-03144970

HAL Id: hal-03144970

https://hal.science/hal-03144970

Submitted on 18 Feb 2021

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

© 2021 World Scientific Publishing Company
https://doi.org/10.1142/9781786349507_0014

Chapter 14

Does Board Structure Matter for Innovation?

Meriam Attia[*,†,¶], **Ouidad Yousfi**[‡,‖], **and Abdelwahed Omri**[§,**]

[*] *University of Montpellier, France*
[†] *University of Tunis, GEF2A Lab, High Institute of Management, Tunisia*
[‡] *Montpellier Research in Management MRM, University of Montpellier, France*
[§] *University of Tunis, Tunisia*
[¶] *meriam.attia@etu.umontpellier.fr*
[‖] *ouidad.yousfi@umontpellier.fr*
[**] *Abdelomri@gmail.com*

14.1 Introduction

Innovation is defined as a creative and complex activity that needs human capacities such as imagination, ingenuity, and creativity (Torchia *et al.*, 2011). However, to face the increasingly tough competition and maintain a sustainable competitive advantage, firms are forced to innovate and increase their capacity to integrate individuals displaying diverse types of knowledge, abilities, and networking. In recent years, policymakers have shown that innovation performance varies according to market regulation and governance mechanisms. Several initiatives and programs have been introduced in order to increase diversity in the board, such as gender quota laws and the presence of minorities in top management positions. These laws are intended to push companies to renew the composition of

their board of directors, to select new profiles, and to detect the profiles of women, make them visible. Moreover, many decisions have been introduced to foster innovation and R&D activities (The EU agency for disruptive innovation, 2017). For instance, OECD countries, the United States (Paff, 2005; Wu, 2005), Japan (Kobayashi, 2014), China, (Chen *et al.*, 2019), and Canada (Czarnitzki *et al.*, 2011) tend to rely on tax incentives to promote R&D spending in the business sector. In order to facilitate access to financial resources and stimulate innovation activities, the government provides public R&D funding as public subsidies or R&D tax credit to innovative firms. The R&D tax credits and subsidies are two of the most popular instruments for governments to support R&D activities (Hall and Van Reenen, 2000).

Over the last fifteen years, a significant number of studies have analyzed the influence of corporate governance on innovation (Lodh *et al.*, 2014; George and Lin, 2016; Lu *et al.*, 2018; Wang *et al.*, 2017). Innovation literature has investigated several aspects of innovation such as how innovation affects firm performance (Hitt *et al.*, 1996), how leaders affect employees' innovativeness (Scott and Bruce, 1994), and how CEO (chief executive officer) and top management characteristics could lead to more innovations (Hirshleifer *et al.*, 2012; Chemmanur *et al.*, 2014). Moreover, several studies have focused, especially, on the impact of ownership structure on innovation decisions (Chang *et al.*, 2006; Belloc, 2012; Choi *et al.*, 2012; Shapiro *et al.*, 2013; Lodh *et al.*, 2014; Diéguez-Soto *et al.*, 2016). For instance, Choi *et al.* (2012), Shapiro *et al.* (2013) show that the ownership structure is a critical factor in helping companies realize innovative projects. Belloc (2012) shows that concentrated ownership is important for innovation activities because it provides effective monitoring mechanisms. Chang *et al.* (2006) confirm that the majority of shareholders have positive effects on firms' innovation performance, while Chen *et al.* (2011), Lodh *et al.* (2014), and Shapiro *et al.* (2013) argue that foreign ownership has a positive influence on innovation performance.

Furthermore, innovation literature has strongly shown how directors could have a positive impact on innovation (Torchia *et al.*, 2011 and Pathan and Faff, 2013). Empirical evidence has largely supported the idea that the board involvement is a key factor in innovation projects (Torchia *et al.*, 2011; Pathan and Faff, 2013; Galia

and Zenou, 2013; Galia *et al.*, 2015). Beyond its role of ensuring the alignment of interests between shareholders and managers, dominated by agency theory and focusing on the monitoring and controlling role of boards (Daily *et al.*, 2003), research brings evidence that another crucial role of the board of directors is to provide strategic advice, knowledge, resources and networking to the company (Hillman *et al.*, 2000; Huse, 2007), which could be value-enhancing for innovation (Talke *et al.*, 2010). In fact, according to resource dependence theory (Pfeffer and Salancik, 1978), the personal characteristics of CEOs and directors affect a firm's innovation investment and value. Specifically, the educational background is an important cognitive variable for a firm to undertake complex corporate strategies. Moreover, drawing on upper-echelons and the human capital theories (Westphal and Zajac, 1995), directors may bring to the board different backgrounds, experiences, and opinions which may lead to better performance. Consequently, corporate governance mechanisms, particularly board member attributes [demographic characteristics, culture, experiences], influence and increase managerial risk-taking. So, innovation strategies can be influenced by the personal traits of directors (Barker and Mueller, 2002; Kor, 2006).

However, several areas in innovation literature are not yet fully explored: First, beyond the traditional role of monitoring and control (Ruigrok *et al.*, 2006) and the alignment of shareholders and managers' interests, mostly explained by agency theory (Daily *et al.*, 2003), studies did not focus on the analysis of the directors' characteristics and their influence on the decision-making process. Actually, few studies have examined the relationship between demographic characteristics of directors and innovation. Most of them confirm the fact that independent directors could influence innovation strategies. The literature has taken into account the influence of independent directors but has neglected the influence that foreign directors might have on innovation strategies due to their different nationalities and cultures. Moreover, some papers provide evidence that the educational level of board members is positively associated with innovation (Kuo *et al.*, 2018); however, previous studies have ignored the influence of academic degree type and the professional background of directors on innovation. Another group of studies has analyzed the impact of female directors on innovation these studies have focused on one specific pattern of diversity (Gender) (see among others

Torchia *et al.*, 2011; Østergaard *et al.*, 2011; Díaz-García *et al.*, 2013; Galia and Zenou, 2013; Pathan and Faff, 2013; Galia *et al.*, 2015). Focusing on the existing finding, we notice that literature marginalizes several forms of diversity in boards, such as age, nationality, academic background, and professional experience. There is not enough evidence on the effects of different board characteristics of innovative firms.

Then, despite the central role of boards in corporate governance, there is relatively little understanding of how the internal organization of boards, specifically the structure of board committees, could shape strategic decisions such as innovation. In fact, governance literature has strongly underlined the importance of committees in the functioning of the board (Adams, 2003; Adams *et al.*, 2010; Guo and Masulis, 2015). The composition and functions of committees have a strong influence on the board's composition as well as committee's activities. Turning to studies which discuss the composition of board committees, the literature focuses, especially, on audit committee: it shows how composition of audit committees could influence the quality of financial disclosure, internet reporting, earnings management, and financial performance (Karamanou and Vafeas, 2005; Mangena and Pike, 2005, Kelton and Yang, 2008; Bédard *et al.*, 2004; Klein, 2002; Zhou *et al.*, 2018). Moreover, most of papers have studied the effect of appointing independent members in committees (Deli and Gillan, 2000; Klein, 2002; Zhang *et al.*, 2007; Krishnan, 2005; Choi *et al.*, 2007). We point out that the literature neglects several forms of directors' attributes in key committees and their influence on the firm's activities. To the best of our knowledge, the effects of diversity on committees have not been fully established.

To fulfill this gap in the literature, this contribution aims to investigate how diverse attributes could influence corporate innovation. In the first section, we focus on individual characteristics and their influence on innovation effort and performance. Then, we examine how the internal organization of boards, specifically the committees' roles and their composition and to what extent they could be meaningful to innovation processes. Specially, we discuss the influence of the committee size, the frequency of meetings, and the presence of independent and female members. Finally, the chapter sheds light on the effectiveness of initiatives and programs introduced to increase diversity on boards.

14.2 Do Directors' Attributes in Boards Influence Innovation?

14.2.1 *Board diversity: Theoretical perspectives*

The most commented functions of the board in the literature are monitoring the senior management to protect the company against opportunistic behavior and advising the management on strategic decisions (Agency theory, Fama and Jensen, 1983). However, beyond these functions, the board provides necessary resources, competencies, and networking to the firms (Hillman *et al.*, 2000; Huse, 2007). According to the resource-dependence theory (Pfeffer and Salancik, 1978), members of the board constitute a source of knowledge, expertise, and skills, and therefore a source of a better performance. In fact, personal cognition and knowledge are important corporate governance variables for a firm to perform complex investments. Therefore, the personal characteristics of CEOs and directors could affect a firm's innovation investment.

Moreover, based on the theory of human capital (Westphal and Zajac, 1995), directors with different experiences and sets of educational backgrounds may lead to more diverse boards, and thus benefit the overall performance of the firms (Terjesen *et al.*, 2009). In addition, boards with varied skills and perspectives may lead a better quality of management, and hence better innovation performance (Torchia *et al.*, 2011; Pathan and Faff, 2013; Galia and Zenou, 2013; Galia *et al.*, 2015). In the same vein, many studies highlight that diversity on the board has been associated with positive cognitive effects such as creativity, new ideas, and insights, which could influence the ideas and types of innovation in the firm (Torchia *et al.*, 2011; Pathan and Faff, 2013; Galia and Zenou, 2013; Galia *et al.*, 2015). Therefore, human capital theory brings new insights supported also by the resource dependence theory: under specific conditions, board diversity is a valuable mechanism to improve innovation performance (Torchia *et al.*, 2011).

However, the social-psychological concept of minority status, which is derived from social impact theory (Latané, 1981), states that majority status groups are powerful and more influential over the decision-making process (Carter *et al.*, 2010). Therefore, females,

being usually considered as minorities on diverse boards, may not have the power to influence the board as the result of the internal group dynamics of the board (Westphal and Milton, 2000). Moreover, more diverse boards may lead to more conflict and divergent opinions, which make the decision-making process time-consuming and less effective (Campbell and Vera, 2008, and Carter *et al.*, 2010).

14.2.2 *Board composition and innovation*

Early research on board diversity focused on task-related director attributes such as educational and functional background, as well as organizational and board tenure factors (Goodstein *et al.*, 1994; Westphal and Zajac, 1995). However, with the wider acceptance of the value in diversity proposition and the greater pressures to increase diversity on corporate boards (Daily and Dalton, 2003), new dimensions of diversity in board composition are emerging. For instance, in North America, attention is increasingly paid to race, ethnicity, and gender of corporate directors (Carter *et al.*, 2003; Daily *et al.*, 1999; Erhardt *et al.*, 2003), while in Europe, nationality (Ruigrok *et al.*, 2007) and gender (Singh and Vinnicombe, 2004; Singh *et al.*, 2001) appear to be important dimensions of board diversity. In fact, research based on the European context confirms that the introduction of gender and / or nationality diversity on boards has important implications for board dynamics (Galia and Zenou, 2013; Galia *et al.*, 2015).

Indeed, diversity as well as board composition vary according to the country, market regulation such as gender quota laws, and governance mechanisms (Hoskisson *et al.*, 2002).

For instance, referring to the (Table 14.1), which shows the descriptive statistics of the boards composition of companies listed on the SBF120 index between 2002 and 2016[1,2,3] the average board size is almost 12, which is larger than boards in other countries: Torchia *et al.* (2011) find an average board size of 7 in Norwegian companies,

[1]Board structure datasets are hand-collected from annual reports available on the firms' websites.

[2]This work supported by a partnership between the University of Montpellier and CASD [reference: ANR-10-EQPX-17 - Center d' secure data access - CASD].

[3]

Table 14.1. Board composition: French context.

Variables	Obs	Mean	Std, Dev	Min	Max
B-Gen	1468	17.45547	14.15293	0	63.6363
B-Ind	1466	49.03985	22.28997	0	100
B-For	1470	20.32871	20.43091	0	100
B-Size	1502	12.37617	3.568168	3	24
B-Age	1470	59.87434	5.4997	21	81
B-Edu	1470	64.0529	22.29494	0	100
B-Bus	1470	63.29881	18.45479	0	100

Note: B-Gen: Percentage of female directors on board. B-Ind: Percentage of independent directors on board. B-For: Percentage of foreign directors on board. B-Size: Total number of directors on board. B-Age: Average age of directors. B-Edu: Percentage of directors who have Master, MBA or PhD degree. B-Bus: Percentage of directors who have a business/management/corporate law education.

Kang (2007) find an average board size of 8 in Australian companies, and Godard and Schatt (2005) also notice a higher average board size on French firms [more than 11] in 2002. These differences can vary significantly among countries.

Moreover, despite the introduction of gender quota law, very few women are in board positions; the percentage of female directors on boards almost is 17.5%, since, most often, males are appointed to director positions (82.5%). This low level is consistent with other countries: Kang *et al.* (2007) showed a percentage of 10% on Australian firms, and Mahadeo *et al.* (2012) showed it as only 3% on Mauritanian firms.

In addition, in line with Godard and Schatt (2005), half of the board (49%) are independent and two of them (20%) have a foreign nationality. The percentages of independent and foreign directors significantly vary among firms, particularly in multinational companies [between 0 and 100%]. However, Lu *et al.* (2018), using panel data on United States public firms, found that almost 70% of the board are independent directors. Regarding the academic background, 64% of the directors are highly educated (Master, MBA, or PhD degree), and 63% of directors are business or management educated. In fact, France is well known for its elitist world based on prestigious education (Ecole Nationale de l'Administration, engineer's schools: Mines, Ponts, Centrale, ENSAE, Télécoms. . ., and business schools: HEC,

ESSEC, ESCP, and INSEAD). People who graduated from these schools run the biggest French firms and accumulate directorships in large public and private firms. Most of them had governmental functions or worked in ministries for several years.

Turning to innovation, only 15.38% of firms have introduced a new or a significantly improved product or service, and 14.46% have implemented a new or a significantly improved process. For patents, there are on average, 27.48 patents filed. Regarding the R&D team structure, almost 80 hours on average is dedicated to R&D projects.[4,5]

Regarding studies that have examined the relationship between board composition and innovation, most of them confirm the fact that independent directors could influence innovation strategies. Based on panel data on the largest German companies, Balsmeier *et al.* (2014) show a positive influence of external executives on the performance of innovative firms, measured by patent applications. Using panel data on U.S. public firms, Lu *et al.* (2018) found a positive effect of board independence on corporate innovation, whereas Sena *et al.* (2018), based on a sample of manufacturing subsidiaries controlled by British multinationals, tested the hypothesis that independent boards can insulate a company from the detrimental impact of corruption on innovation. The literature has taken into account the influence of independent directors but has neglected the influence that foreign directors might have on innovation strategies due to their different nationalities and culture.

Also, some papers provide evidence that the educational level of board members is positively associated with innovation in the Taiwanese context (Lin *et al.*, 2011). Moreover, Kuo *et al.* (2018), based on a sample of 437 Taiwanese listed firms, concluded that the directors' education does affect R&D firm investment and suggested that highly educated directors lead the firm to invest more in R&D

[4]Statistics of innovation are provided by the surveys on Innovation conducted by the INSEE [Project Governance and Innovation in France 2016]. This work is supported by a public grant overseen by the French National Research Agency [ANR] as part of the " Investissements d'avenir " program, specifically Governance and Innovation in France GOUINFR, 2016.

[5]https://www.insee.fr/en/metadonnees/source/serie/s1001.

projects. However, previous studies have ignored the influence of academic degree type and the professional background of directors on innovation: to the best of our knowledge, drawn on Asian data, Lin *et al.* (2011); Kuo *et al.* (2018) are among the rare papers to address this question.

Another group of studies has analyzed the impact of female directors on innovation in Spain (Diaz-Garcia *et al.*, 2013). It improves interaction and dynamics in R&D teams (Teruel *et al.*, 2015), and specifically fosters the firm's ability to introduce organizational innovations (Torchia *et al.*, 2011). All these studies, however, have focused on one specific pattern of diversity (gender) and one specific form of innovation (organizational innovation). Very few studies have investigated the effect of gender diversity on innovation (Miller and Triana, 2009). In fact, the existing literature marginalizes other forms of diversity in boards and the impact of directors' attributes on different forms of innovations

14.2.2.1 *Presence of outside directors on board and innovation: Independent, foreign directors*

In the past few years, many studies have examined how outside board members could impact innovation performance (see among others Chen and Hsu, 2009; Choi and Lee, 2011; Choi *et al.*, 2012; Shapiro *et al.*, 2013; Chen 2013, Lodh *et al.*, 2014; Balsmeier *et al.*, 2014). Drawing on agency theory, a higher proportion of independence may lead to a better monitoring function of the board. Therefore, boards should include the appropriate mix of experience and backgrounds to better exercise their monitoring role and to evaluate management and assess business strategies (Hillman and Dalziel, 2003 and Adams and Ferreira, 2009). In fact, independent directors increase monitoring, which helps companies to effectively allocate their R&D budget and to provide access to resources for technological innovation activities (Shapiro *et al.*, 2013). They have a wide range of resources that could boost innovation activities (Choi *et al.*, 2012). Based on a sample of Taiwanese business, Chen (2013) found that the presence of independent directors has a positive moderating effect on the director's contribution to innovation. One explanation could be that independent directors exercise better monitoring of managers and facilitate access to the resources needed for innovation. In the same

vein, recent results support that external knowledge and expertise on boards are especially valuable resources when complex operations are considered (Chen and Hsu, 2009). External directors on boards can provide specific monitoring and advising competencies needed to improve innovative performance because of their own proven leadership skills and market experiences.

Furthermore, the management literature points out that the monitoring and advising competences of outside directors, or generally the human capital they bring to the board, strongly depend on their specific professional experiences (see among others Kor and Sundaramurthy, 2009; Kor and Misangyi, 2008). Hence, in terms of innovation, firms might benefit particularly from having an external director who is experienced in similar technological areas (Carpenter and Westphal, 2001). Directors might also bring valuable organizational capital to the board by providing insights on suitable ways of organizing innovative activities. Nevertheless, the negative influence of outside directors is still conceivable. In fact, the financial economics literature provides evidence suggesting that outside board members might be more concerned about their private benefits than about the performance of the firms they are supposed to monitor and advise (Fahlenbrach *et al.*, 2010a). Independent directors are not the only outside directors that could be appointed to boardrooms. For instance, more foreign members are sitting on boards, specifically in large corporations.

On the one hand, in line with dependence resource theory (Pfeffer and Salancik, 1979), foreign directors may provide diverse perspectives, valuable ideas, and problem-solving abilities and may facilitate the achievement of optimal and creative solutions. They may stimulate a firm to improve or develop new products sold abroad as they also possess knowledge about global markets and customers' tastes (Kerr and Lincoln, 2010). In fact, the heterogeneity of people is likely to be a necessary driver for the creation of new ideas (Barker and Mueller, 2002) and to stimulate innovation (Berliant and Fujita, 2011). In addition, foreign directors of the same educational level are imperfectly substitutable groups because of cultural differences. Fujita and Weber (2004) argue that cultural diversity of the labor force might be a key determinant for R&D activity. In fact, the generation of new products and ideas heavily relies on individual talents and skills from diverse educational and cultural environments.

Fujita and Weber (2004) note also that knowledge production relies heavily on the talents and skills of members coming from a wide range of cultural backgrounds. The nature of R&D activity calls for interaction between different individuals and the pooling of different ideas and abilities. Likewise, Alesina and La Ferrara (2005) argue that ethical and cultural diversity may lead to innovation and creativity since it involves a variety of abilities and knowledge. Berliant and Fujita (2008) also refer to the significance of cultural diversity for knowledge creation and transfer. The heterogeneity of people is important for the creation of new ideas. On the other hand, ethnic diversity could provide diverse perspectives, but not automatically valuable for innovation and solving problems (Berliant and Fujita, 2011). Even though ethnic diverse directors know global markets and customer tastes, they may not lead the firm to develop new products sold abroad as they (Kerr and Lincoln, 2010).

14.2.2.2 *How does directors' education influence innovation?*

Directors' education levels have been the subject of a number of researches; most of them concluded that a high educational level is positively correlated with managerial capabilities and innovation (see among others Lin *et al.*, 2011; Kuo *et al.*, 2018). In fact, board members with postgraduate degrees have the ability to better analyze complex information (Escriba-Esteve *et al.*, 2009), to efficiently solve problems, and to adopt new technologies (Dalziel *et al.*, 2011). In the same order of ideas, Wincent *et al.* (2010) show that the number of directors who have degrees from elite institutions and who have a rich academic background[6] positively impact innovation. Similarly, Lundvall *et al.* (2002) show that educational level reflects personality traits, cognitive styles, and values. Therefore, a firm where directors have a higher educational level is more likely to invest in innovation projects.

[6]Wincent *et al.* (2010) show that the degree of board diversity and interlocking directorates primarily influence incremental innovation, whereas education level influences radical innovation. They find that a network board's diversity of expertise and education level are important for improving all components of innovative performance [total, radical and incremental].

However, the diversity of educational degrees leads to exposure to different knowledge and may lead to different and divergent ways of thinking so that making a decision becomes time-consuming and communication less effective and slower than in a more homogenous groups. This could decrease investments in R&D projects, resulting in a negative impact on innovation. Unlike Daellenbach *et al.* (1999) and Barker and Mueller (2002), who did not find any significant association between director's education level and R&D investment, Dahlin *et al.* (2005) argue that educational diversity will enhance the information use, while too much diversity will reduce the ability to diffuse the information between members.

Turning to the type of academic degree, science, engineering, or technology degree holders will have a better ability to understand technology and innovation and are more likely to support a higher level of R&D spending (Tyler and Steensma, 1998). In fact, directors with science and engineering degrees have better skills when they have to use new technologies or to adopt new ideas. They could increase the probability of accepting and introducing new changes. However, management and business-educated directors have business skills, specifically in finance and on accounting areas (Nekhili and Gatfaoui, 2013; Gendron and Bedard, 2006). In fact, MBA programs attract more conservative and risk-averse students who acquire analytic skills to avoid losses (Finkelstein and Hambrick, 1996). Consequently, management and business-educated directors have better skills to handle risks but prefer short-term profitable investments at the expense of risky and long-term investments such as innovative projects.

14.2.3 *Gender diversity on board*

In the fields of management and economics, the number of studies on gender has increased in the last few years (Kang, 2007; Mahadeo *et al.*, 2012; Østergaard *et al.*, 2011; Torchia *et al.*, 2011; Galia and Zenou, 2013; Pathan and Faff, 2013; Galia *et al.*, 2015). For instance, studies have discussed how the presence of women on boards could influence a firm's financial and social performance (see among others: Carter *et al.*, 2010; Carter *et al.*, 2003; Belghiti Mahut *et al.,* 2010), corporate governance (Carter *et al.*, 2003; Adams and Ferreira, 2009), identifying resource dependency (Hillman *et al.*, 2000), and network

ties (Hillman *et al.*, 2007). According to the resource dependence theory, the appointment of women directors brings new skills and qualifications to the firm. The presence of female directors helps to better understand the marketplace, particularly customers and employees, as they are themselves gender diverse. It could improve the firm's image in the market, particularly for stakeholders, and potential and current employees, customers, and investors (Hillman *et al.*, 2007).

Moreover, many studies provide evidence that appointing women to board positions changes the decision-making dynamics of the board (Elstad and Ladegard, 2012). In fact, women on boards bring different perspectives, expertise, and working styles from their male counterparts (Daily *et al.*, 2003; Hillman *et al.*, 2002). Moreover, Nielsen and Huse (2010) identify another aspect, that the presence of women on board contributes to reducing the level of interest conflicts and ensures a high quality of development activities.

Turning to innovation, 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). For instance, Torchia *et al.* (2018) show that women directors contribute positively and significantly to organizational innovation. They notice that some decision-making culture dimensions mediate the positive relationship between women directors and the level of organizational innovation: among these dimensions, there are the degree of cognitive conflict and the degree of preparation, and involvement during board meetings. As organizational innovation is related to cognitive and learning processes (Nonaka and Takeuchi, 1995) and is the output of various intervening mental processes (Hodgkinson, 2003), gender diversity boosts all these aspects and could be positively related to the organizational innovation.

In addition, gender diversity influences a firm's risk-taking; female directors are labelled as more risk-averse than men (Croson and Gneezy, 2009). Therefore, they invest less in risky projects such as innovation. In the same vein, Niederle and Vesterlund (2007) conclude that women are less competitively inclined and less overconfident than men. Consequently, women avoid risky and challenging situations. However, Nählinder (2010) shows that men and women have different approach when they innovate: For instance, women conduct innovations that are largely inspired by local needs to achieve

social ends. Therefore, women have specific knowledge of consumer markets, consumer behavior, and customer needs (Kang *et al.*, 2007; Torchia *et al.*, 2011; Díaz-García *et al.*, 2013; Teruel *et al.*, 2015). Their presence on the board can contribute to broadening the range of new products and services.

14.2.4 *Directors' age*

Social and professional experiences of directors are closely related to their age. The age will change the individual's vision, beliefs, attitudes, and interpersonal networks. In fact, director's career comes with age, and it can influence corporate governance (Jackling and Johl, 2009). For example, young directors are more concerned about their reputation and have shorter prior professional experience while old directors are more skillful in business decision-making. Moreover, Mahadeo *et al.* (2012) show that age diversity improves learning abilities and helps to develop new and innovative ideas. Therefore, age diversity among board members can help the board to consider a variety of perspectives and to better target consumers' needs in different age groups, with a greater variety of products and services (Kang *et al.*, 2007). In addition, age could influence risk-taking. Old groups are less risk-tolerant (Bucciol and Miniaci, 2011). They invest in more routine and less risky investments than young directors, particularly when they are entrenched. However, based on their experience, their knowledge, and their background, old directors can detect and identify the most profitable projects and are more prone to introduce successful innovations, despite their risk aversion (Mahadeo *et al.*, 2012). However, unlike stated by Kang *et al.* (2007), age diversity can lead to a lack of cohesion in decision-making, worsen the communication process, and decrease trust among board members (Mahadeo *et al.*, 2012). Torchia *et al.* (2011) provide evidence that there is a negative relationship between age diversity and organizational innovation.

Finally, we notice that diversity in boardrooms is a booming area of research. In fact, governance literature has strongly shown how the board of directors could provide large and diverse resources to the firm, such as strategic advice, knowledge, and networking, which could be value-enhancing for innovation (Talke *et al.*, 2010; Torchia *et al.*, 2011; Pathan and Faff, 2013; Galia and Zenou, 2013; Galia *et al.*, 2015). These studies conclude that the composition of board

is a determinant for innovation strategy. However, despite a large number of studies on board committees, the question of diversity in committees is not yet fully explored. Hereafter, we analyze how board committees could influence innovation and to what extent.

14.3 Does Diversity in Board Committees Favor Innovation?

14.3.1 *Role of board committees and innovation*

Governance literature has strongly underlined the importance of committees in the functioning of the board (Adams, 2003; Adams *et al.*, 2010; Guo and Masulis, 2015). It provides a means and structure for effective governance by facilitating special tasks and addressing important corporate concerns (Adams, 2003). In fact, the most influential board decisions are taken at the committee level (Kesner, 1988; Klein, 1998; Adams, 2003; Guo and Masulis, 2015). For instance, the audit committee oversees the integrity and compliance of the firm's financial reporting. The compensation committee focuses on human resource policies and procedures, most notably the compensation of top executives. The governance committee recommends new candidates for the board and other top executive positions and sets general governance procedures; directors are usually assigned to committees at the recommendation of the governance committee (Adams, 2003). Klein (1998) considers committee membership to be a proxy for the duties and functions of a director on the board. Directors have a stronger and more direct impact on executive compensation, director selection, and other important actions that significantly affect corporate performance; under specific conditions, such committees members have to serve on board committees with primary responsibility for these functions.

Moreover, committees are important mechanisms to monitor corporate activities and play a valuable role in the protection of shareholders' wealth (Kesner, 1988). From an agency perspective, committees can allow directors to better perform their control role. The specialization of committees and the large amount of information that directors can share during meetings increase the potential to monitor executives and protect shareholders' wealth. Furthermore, from a resource-based-perspective, committees can enhance

the involvement of directors in innovation activities (Harrison, 1987). They can better inform the whole board about the resources they can provide for firm growth (Gabrielsson and Winlund, 2000). They can also provide advice on how to use the resources required for innovation opportunities, which could lead to an increase in shareholders' wealth.

Board committees offer knowledge specialization, task-division efficiency, and accountability. The nature of the monitoring and advising tasks of boards are complex and require significant firm-specific knowledge; its accumulation requires personal investment from directors. In fact, committee members could provide large and diverse resources to the firm, such as strategic advice and networking, which could be value-enhancing for innovation (Talke *et al.*, 2010). Accordingly, in order to perform their role effectively, board committees should have adequate resources and authority to discharge their increasing responsibilities and stimulate innovative' activities (see among others FRC, 2008; Mangena and Pike, 2005).

14.3.2 *Committee composition and innovation*

Board committees have become more regulated and formal components of the board of directors over time. Beginning in 1940, the Securities and Exchange Commission (SEC) recommended that outside directors should be appointed to audit committees. In the 1970s, SEC adopted rules requiring firms to disclose audit committee composition (Reeb and Upadhyay, 2010). In 2002, the major stock exchanges NYSE and NASDAQ mandated that firms have compensation and governance committees. In fact, the last accounting and executive pay scandals had shed light on the role and effects of committees on financial performance (Klein, 2002; Kelton and Yang, 2008; Sun *et al.*, 2009). Governance literature has, first, focused on audit committee and how its composition could influence governance quality. For instance, Deli and Gillan (2000), Klein (2002), Krishnan (2005), and Zhang *et al.* (2007) have examined the impact of audit committee characteristics such as the audit committee independence, the financial expertise of audit committee members, and the committee's size (Deli and Gillan, 2000; Klein, 2002, Zhang *et al.*, 2007; Krishnan, 2005). Some studies have also examined how the composition of audit committee could influence the quality of financial

disclosure (Karamanou and Vafeas, 2005; Mangena and Pike, 2005), internet reporting (Kelton and Yang, 2008), earnings management (Bédard *et al.*, 2004; Klein, 2002), and financial performance (Zhou *et al.*, 2018).

Moreover, turning to the composition of board committees shows that most studies have covered the effect of appointing independent members (Deli and Gillan, 2000; Klein, 2002; Zhang *et al.*, 2007; Krishnan 2005; Choi *et al.*, 2007). In fact, independent committees help to improve managerial monitoring (Xie *et al.*, 2003). They could also improve financial performance (Choi *et al.*, 2007). Ruigroki *et al.* (2006) find that firms with nomination committees are more likely to have a higher number of independent and foreign directors and a lower number of female members. When the CEO is on the nomination committee, firms appoint fewer independent directors (Shivdasani and Yermack, 1999). Moreover, Guo and Masulis (2015) conclude that greater board independence and full independence of nominating committees lead to more rigorous CEO monitoring and discipline. However, the literature neglects several forms of directors' attributes in committees and their influence on the firm's activities. Despite this booming number of studies on committees, to the best of our knowledge, the effects of diversity on board committees have not been considered, yet.

14.3.2.1 *What do women bring to committees?*

Prior research has pointed out several reasons to hire more women on corporate boards as well as on board committees. For instance, Daily and Dalton (2003) state that boards are increasingly appointing female members. In fact, the absence of gender diversity on board may result in a negative market image. Moreover, Kesner (1988) argued that firms are prone to elect the most powerful and influential women in their committees. Most often, they are concerned about the firm image, without consideration of the women's potential contributions (Tokenism, Kanter, 1977).

However, Elstad and Ladegard (2012) show that the presence of female directors changes the decision-making dynamics inside the board. In fact, in line with the dependence resource theory, women have different experiences and qualifications from their male counterparts; they could, therefore, have different values and analysis

perspectives. This leads to more interactive dynamics in boardrooms (Peterson and Philpot, 2007). They have, most often, more connections to external sources, which make them highly sought after in boards and on specific board committees, such as audit, governance, ethics, and environment committees (Singh and Vinnicombe, 2004; Adams and Ferreira, 2009).

Despite the introduction of gender quota law, female directors are not appointed to strategic committees on the board, such as development and remuneration committees. In fact, very few women are in committee board positions, particularly in male-dominated companies. Female directors are still prevented from moving up into management and leadership positions and are facing significant barriers (glass ceiling theory, ILO, 2001).[7] Moreover, the complexity of the board selection process (Peterson and Philpot, 2007), in addition to many gender stereotypes, still makes it more difficult for a woman to be nominated on boards as well as on committees (Singh and Terjesen, 2008; Brière and Rinfret, 2010).

Besides, female directors display greater diligence in monitoring and are most often appointed to corporate governance committees (Adams and Ferreira, 2009). Gender-diverse committees can provide better advice, legitimacy, effective communication, and resources (Hillman *et al.*, 2007) than male-dominated committees. Female directors exhibit more independent thinking (Adams *et al.*, 2010), which facilitates decision-making and increases transparency (Adams *et al.*, 2010; Srinidhi *et al.*, 2011). Thus, the appointment of female directors to committees can be a source of competitive advantage.

Moreover, many studies have strongly supported that their presence on board can contribute to broadening the range of new products and services (Østergaard *et al.*, 2011; Teruel *et al.*, 2015) as women have specific knowledge of consumer markets, consumer behavior, and customer needs (see among others Kang *et al.*, 2007; Torchia *et al.*, 2011; Díaz-García *et al.*, 2013; Teruel *et al.*, 2015); thus, they are likely to identify the most successful innovations.

[7]The glass ceiling was identified in the 1980s by the International Labor Organization and Catalyst4. The glass ceiling theory is about "those artificial barriers based on an attitudinal or organisational bias that prevents qualified individuals from advancing upward into management level positions" (ILO, 2001).

For instance, when female directors are appointed to the strategic committees, they can contribute to broadening the range of new products and services.

However, turning to nomination committees, female members will be inclined to prefer and encourage the nomination of other female candidates. They may recommend more female candidates to increase their feelings of security, identity, and self-esteem (Singh and Vinnicombe, 2004). Therefore, by appointing more female directors, women seem to select members who share similar demographic characteristics and not necessarily skillful directors who have the necessary qualifications to fulfil their responsibilities. Furthermore, there is consensus in the literature arguing that women are risk-averse (Faccio *et al.*, 2016; Crosen and Gneezy, 2009). Female directors are labelled as more risk-averse than men (Croson and Gneezy, 2009), which could drastically decrease long-term profitable and uncertain activities, such as innovation projects. Therefore, women in strategic committees avoid challenging situations, which could marginalize investments with unknown outcomes, such as R&D activities.

14.3.2.2 *Why should more independent directors be appointed to committees?*

In the 1990s, the Cadbury Report (Cadbury Committee, 1992) and several studies recommended the appointment of more independent directors to corporate boards and to their key committees (i.e. audit, compensation, and nomination committees) to improve the boards' and the committees' effectiveness (Klein, 1998). In fact, board's independence could enhance board's effectiveness and improve, therefore, the firm's performance (Choi *et al.*, 2007), as well as innovation performance (Chen and Hsu, 2009; Choi and Lee, 2011; Lodh *et al.*, 2014; Shapiro *et al.*, 2013; Balsmeier *et al.*, 2014; Sena *et al.*, 2018).

Most of the papers confirm that independent committees provide more effective monitoring of managerial decisions and activities (Xie *et al.*, 2003; Guo and Masulis, 2015). Independent directors are prone to reduce agency conflicts and to ensure management. In fact, the high attendance rate among independent members can be explained by their essential role in complying with the good practices of governance (Adams and Ferreira, 2009). Furthermore, in line with resource-based theory, outsiders can be seen as providers of access to

scarce or strategic resources (Lynall *et al.*, 2003; Tuggle *et al.*, 2010). Independent members can also increase the awareness of implementing new projects and bring new opportunities from their industries (Hillman and Dalziel, 2003; Tuggle *et al.*, 2010). They have outside contacts and typically bring a broader range of experience due to their address book (Chen, 2013). They have a good knowledge of many businesses, and they are more concerned about the firm's internal development (Choi *et al.*, 2012). Therefore, independent directors in strategic committees are likely to have enough knowledge and skills to offer different perspectives on innovative investments and growth opportunities. They could also mobilize new resources coming from their networks. Also, independent directors in nomination committees are likely to have enough knowledge and skills to appoint new members, who have the required qualifications for innovative activities.

Finally, we conclude that the positive outcomes of board diversity help to relate board diversity to innovation (Miller and Triana 2009). Board diversity provides the firm with human and social capital resources that help the board to generate ideas, allocate resources, and find opportunities, thereby increasing innovation (Østergaard *et al.*, 2011; Talke *et al.*, 2010; Carter *et al.*, 2010). In fact, in order to push companies to renew the composition of their board of directors and to select diverse profiles, several initiatives and recommendations have been introduced as laws on gender quotas and the presence of minorities in leadership positions.

14.3.3 *Committees size*

Large committees could provide the necessary and diversity of views to ensure effective monitoring (Bédard *et al.*, 2004). They could lead to more successful innovations due to the members' multiple resources (Zona *et al.*, 2013). However, they could suffer interest conflicts, leading to unnecessary debate and delay in making decisions. Consequently, they slow down communication and decision-making processes (Linck *et al.*, 2008); this environment can inhibit creativity and innovation opportunities (Jensen, 1993). In the same vein, Linck *et al.* (2008) stress that large boards may have more resources and knowledge, which positively contributes to firm performance and agility; however, they could delay communication inside the board

(Jensen, 1993). Committee size could, therefore, inhibit creativity and innovation. In addition, large committees are prone to suffer from process losses and diffusion of responsibilities, specifically in long-term and uncertain projects, such as R&D projects (Karamanou and Vafeas, 2005; Yang and Krishnan, 2005; Cornett *et al.*, 2009).

14.3.4 *Committees functioning and innovation*

Committee meetings represent the place where directors can discuss the firm's opportunities and management's operations in more detail (Demb and Neubauer, 1992). Committee meetings are quite useful to disclose information and to discuss views. They are also a proxy for the members' involvement (Tuggle *et al.*, 2010). For instance, audit committees that meet more often would have more time to perform the role of monitoring (Karamanou and Vafeas, 2005) and are more likely to be well informed, more diligent, and more knowledgeable about the current problems (Raghunandan *et al.*, 2001). The frequency of meetings has a positive influence on the strategic role of board committees, specifically on how they perform their roles. It improves, therefore, the quality of control (Demb and Neubauer, 1992). From a resource-based perspective, frequent meetings can help outside directors interact with insiders and to be well informed about firm activities. A large frequency of meetings can stimulate entrepreneurial thinking; particularly, outside directors could suggest innovative initiatives when they are given the opportunity in committees meetings.

14.4 Board Quota: Gender Quota Laws

The literature on board members' selection is growing (Boulouta, 2013; Nekhili and Gatfaoui, 2013). The most visible illustration of diversity pressure on board members' selection criteria is on gender diversity. In fact, there are several reasons why increasing the quota of women directors might be associated with better performance (see among others: Carter *et al.*, 2003; Belghiti-Mahut *et al.*, 2010). First, women have a positive impact on the board's ability to engage in cognitive conflict counterparts (Nielsen and Huse, 2010). Second, they tend to bring diverse viewpoints to the boardroom and encourage

greater discussions and arguments over board decisions (Daily *et al.*, 2003, Hillman *et al.*, 2002; Elstad and Ladegard, 2012). In addition, they possess unique skill sets such as greater familiarity with consumer products or a better understanding of stakeholder issues (Kang *et al.*, 2007; Torchia *et al.*, 2011; Díaz-García *et al.*, 2013; Teruel *et al.*, 2015). Finally, female directors can contribute to the creativity or innovativeness of board discussions and solutions considered in the board meetings (Torchia *et al.*, 2018). Accordingly, increasing the number of women on boards can improve board decision-making through the unique contributions women can make to the board.

However, women's talents are being underutilized at decision-making levels, in particular at the top level. Very few women are in leading positions, particularly in male-dominated companies. Women have failed to attain equal representation on corporate boards of directors (Torchia *et al.*, 2011; European Commission, 2012). Women are still prevented from moving up into management and leadership positions and are facing significant barriers. These barriers are discussed in the "glass ceiling" theory (ILO, 2001). Moreover, women might be subject to discrimination before being appointed to boards; board roles are different for men and women (Bilimoria and Piderit, 1994; Kesner, 1988; Peterson and Philpot, 2007), and the board selection process is often analyzed as a 'male club' or "old boy's network". The complexity of the board selection process (Peterson and Philpot, 2007), in addition to many gender stereotypes, still makes it more difficult for a woman to be nominated on boards (Brière and Rinfret, 2010).

Over the last few years, several initiatives and programs have been introduced, to increase diversity in the board, such as gender quota laws and the presence of minorities in top management positions. In fact, gender quota legislation constrained companies to rethink their board composition and select new profiles, which needed also to be able to detect women profiles and make them visible. Moreover, board-level mandatory gender quotas, as enacted over the last decade by several countries, have, to a large extent, succeeded in breaking the glass ceiling at the top of listed companies (ILO, 2001). They have done so by forcing companies to open their board to a new population of female directors, with no prior board experience. Hence, gender quotas force firms to respond quickly to identify, develop, promote,

and retain suitable female talent for the corporate board leadership structure.

Across countries, enacted legislation takes a variety of forms but generally consists of setting gender quotas, usually 33–50%, (European Commission, 2012). In 2003, Norway became the first country to implement a quota law. Following this, other countries, such as Spain, Iceland, France, Italy, Belgium, the Netherlands, and Germany, have implemented some kind of quota laws for board positions. However, what is apparent is that, over time, each country has adopted and introduced an individualized and distinct approach.

The different quota laws vary according to the country's practices, contexts, and realities. For instance: Some of the national quota laws refer to supervisory boards only (Norway, Iceland, France, and Germany), while others prescribe a quota for both supervisory and executive boards (the Netherlands, Belgium, Italy, and Spain). The first countries to implement these regulations aimed to achieve more gender-balanced boards with at least of 40% women members (Norway, Spain, Iceland, and France). Other countries have lower gender percentages: in Italy and Belgium, the gender quota is specified at 33%, while in the Netherlands and Germany, quotas are set to at least 30%. In fact, gender quotas have dealt with women underrepresentation in board seats; however, they did not attempt to regulate the distribution of positions and fees across gender, (European Commission, 2012).

Studies on the boards' committees show that women directors most often serve on specific committees: they face a second ceiling barrier in boardrooms while they are supposed to achieve high top management positions: the glass cliff (Smith and Parrotta, 2018, and Ryan and Haslam, 2005). For instance, they can easily join audit, CSR, and corporate governance committees while they are unlikely to be appointed to the strategic, nominating, and compensation committees (Adams and Ferreira, 2009). In a recent study, Bugeja *et al.* (2016) highlight that when women sit on these committees, CEO salaries, bonuses, and total compensation are decreased. Their presence on these committees could lead to an increase in transparency.

Another limit of gender quota laws is that they substantially increased female multiple directorships. Hillman *et al.* (2007) provide evidence that firms that have strong business relationships with other

firms that have already appointed women to their boards are likely to increase women representation on their boards. In France, the gender quota law, specifically the urgent need to achieve the quota of 40% by 2017, the limited pool of talent, and the strong connection between family-controlled/owned firms in France, has increased female multiple directorships.

In family-controlled firms, most often, women directors are recruited within families, without carrying out an external and neutral selection process (Campbell and Minguez-Vera, 2008). In fact, being a member of the founding family helps women to overcome barriers they usually face to achieve higher positions. In that sense, family firms could offer better career opportunities (Curimbaba, 2002). Consequently, highly qualified women who are able to sit on boards suffer from a lack of visibility because of weak networking and social circles. Indeed, firms make-believe that they have a limited pool of talents (Sheridan and Milgate, 2005). Hence, social ties and contacts, specifically family connections, are critical to the appointment of women to the director's positions. This could increase the risk of recruiting unqualified female directors (Claessens *et al.*, 2000).

Finally, we notice that only gender diversity has been fostered through quota law. To the best of our knowledge, there are only some recommendations to promote other forms of diversity, such as ethnic and minority diversity. The Securities and Exchange Commission (SEC), and New York Stock Exchange (NYSE)[8] recommend the appointment of independent directors on corporate boards and key corporate committees [e.g. audit, compensation, and nomination committees]. Moreover, the German Corporate Governance Code (DCGK)[9] recommends appointing an adequate number of outside board members, taking into account the specific requirements of the firm. It recommends that supervisory boards should "possess the knowledge, ability and expert experience required to properly complete its tasks". The importance of sufficient professional

[8]NYSE requires an independent nominating committee. NASDAQ requires director nominees selected or recommended for board's selection by an independent nominating committee or by a majority of the independent directors.

[9]the German Corporate Governance Code as amended on May 13, 2013, Articles 5.4.1, 5.4.2.

qualifications and leadership experience of non-executive board members, emphasized by the European Commission,[10] point to a similar direction.

14.5 Discussion and Conclusion

The influence of board structure on the performance of a company is one of the most active research areas in corporate finance (Black and Khanna, 2007). In fact, beyond its role of ensuring the alignment of interests between shareholders and managers, and monitoring and controlling (Daily *et al.*, 2003), the board could provide valuable resources to the firm, dole out strategic advice, and help the firm to develop knowledge and networks (Goodstein *et al.*, 1994; Ruigrok *et al.*, 2007; Kang *et al.*, 2007; Miller and Triana, 2009).

As R&D and innovation activities are typically associated with new technology or new products, we highlight that better-educated directors tend to have better cognitive ability to absorb new ideas, which therefore could increase the probability of introducing innovations (Barker and Mueller, 2002, Dalziel *et al.*, 2011; Lin *et al.*, 2011; Kuo *et al.*, 2018), while the education level of diversity caused by exposure to different knowledge may lead to different ways of thinking, resulting in a negative impact on innovation. In addition, we underline in this contribution that the type of academic degree can have a different influence on innovation activities. For instance, business-educated directors are more conservative and risk-averse, and they seem to marginalize innovation investments as they are more likely to focus on activities with short-term financial returns; however, directors with science and engineering degrees have better skills when they have to take risky decisions. They could increase the probability of accepting and introducing new changes.

On the other hand, we notice that outside directors on board have good knowledge of the business and valuable social network and resources in innovation activities. They are more prone to encourage innovative projects that could lead to the implementation of new

[10]European Commission, Green Paper: The EU corporate governance framework, COM [2011] 164 final, April 5, 2011, Article 1.1.7.

products and processes. However, directors who have different cultural backgrounds could provide diverse perspectives, though not automatically valuable for innovation and solving problems. Even though ethnically diverse directors know global markets and customers' tastes, they may not lead the firm to develop new products that are sold abroad as they. Furthermore, we show that the presence of independent directors in decision-making committees could have a positive contribution on innovation: They could provide more effective monitoring of managerial decisions and activities in committees, and they are likely to have enough knowledge and skills to offer different perspectives on innovative investments and growth opportunities.

Turning to committee functioning, we show that when committees meet often, board committees seem to have more information about the current problems and are more concerned about R&D investments. Frequent meetings can help outside directors interacting with insiders. Therefore, they could be better informed about firm activities. When it comes to committee structures, we notice that large committees are prone to have a valuable diversity of views, which increases innovation investments. However, large committees could suffer interest conflicts and lead to unnecessary debate and delay in making decisions. We notice also that large committees are prone to suffer from process losses and diffusion of responsibilities, specifically in long-term and uncertain projects, such as R&D projects (Karamanou and Vafeas, 2005; Yang and Krishnan, 2005; and Cornett *et al.*, 2009). Consequently, it could influence negatively the communication and decision-making processes.

The complexity of the board selection process (Peterson and Philpot, 2007), in addition to many gender stereotypes, still makes it more difficult for a woman to be nominated on boards (Brière and Rinfret, 2010). The absence of females in corporate boards has become the focus of legislators and regulators in many countries, especially with women being more risk-averse and adopting a trust-building approach than men, as proven in prior research (Daily and Dalton, 2003). Women's talents are still being underutilized at decision-making levels. However, through this chapter, we try to show how the presence of females could change the dynamics of the board as well as the various board committees, which could influence innovative activities. We notice that gender diversity in board seems to help firms to diversify knowledge and to improve

discussion, which generates new ideas. They can contribute to broadening the range of new products (Østergaard *et al.*, 2011; Torchia *et al.*, 2011; Díaz-García *et al.*, 2013; Teruel *et al.*, 2013), and introduce more organizational innovation. However, due to the feature of risk-aversion, women on board as well as on committees tend to avoid challenging situations, which could marginalize investments with unknown outcomes, such as innovation projects.

By looking at the impact of various types of directors' characteristics on innovation and by taking into account various types of innovation, this chapter brings practical insights on board structure issues. We highlight the urgent need to increase the firms' capacity to appoint, on the board as well as on board committees, individuals displaying diverse types of knowledge, abilities, skills, and networking that could drive more innovations. This chapter contributes to the current debate on how boards should be organized. It shows that boards should pay attention to the committee features as they could undermine innovation projects, specifically in innovation-sensitive industries.

The state of art provided by the current chapter has investigated how boards' characteristics could influence innovation project. It shows, however, that many areas in boardrooms and how they could influence innovation have not yet been explored. For instance, to the best of our knowledge, most of studies have focused on CEO remuneration and how it could influence CEO's incentives to get involved in innovative project, but there are no studies on board members' remuneration. Moreover, in our analysis, we have neglected the market characteristics such as competitiveness or sector affiliation, which provide significant incentive to serve as innovation projects. These issues are left for future papers.

References

Adams, J. (2003). Statement of the Public Affairs Committee of the Teratology Society on the importance of smoking cessation during pregnancy. *Birth Defects Research Part A: Clinical and Molecular Teratology*, **67**(11): 895–899.

Adams, R. B., Hermalin, B. E., and Weisbach, M. S. (2010). The role of boards of directors in corporate governance: A conceptual framework and survey. *Journal of Economic Literature*, **48**(1), 58–107.

Adams, R. B. and Ferreira, D. (2009). Women in the Boardroom and Their Impact on Governance and Performance. *Journal of Financial Economics*, **94**(2): 291–309.

Anderson, R. C., Duru, A., and Reeb, D. M. (2009). Founders, heirs, and corporate opacity in the United States. *Journal of Financial Economics*, **92**(2), 205–222.

Alesina, A. and La Ferrara, E. (2005). Ethnic diversity and economic performance. *Journal of Economic Literature*, **43**(3): 762–800.

Arregle, J. L., Hitt, M. A., Sirmon, D. G., and Very, P. (2007). The development of organizational social capital: Attributes of family firm. *Journal of Management Studies*, **44**(1): 73–95.

Arzubiage, U., Kotlar, J., De Massis, A., Maseda, A., and Iturralde, T. (2018). Entrepreneurial orientation and innovation in family SMEs: Unveiling the (actual) impact of the Board of Directors. *Journal of Business Venturing*, **33**(4): 455–469.

Ballot, G., Fakhfakh, F., Galia, F., and Salter, A. (2015). The Fateful Triangle: Complementarities between Product, Process and Organizational Innovation in the UK and France. *Research Policy*, **44**(1): 217–232.

Balsmeier, B., Buchwald, A., and Stiebale, (2014). Outside directors on the board and innovative firm performance. *Research Policy*, **43**(10): 1800–1815.

Balsmeier, B., Fleming, L., and Manso, G. (2017). Independent boards and innovation. *Journal of Financial Economics*, **123**(3): 536–557.

Barker, V. L. and Mueller, G. (2002). CEO Characteristics and Firm R&D Spending. *Management Science*, **48**(6): 711–820.

Bedard, J., Chtourou, S. M., and Courteau, L. (2004). The effect of audit committee expertise, Independence, and Activity on Aggressive Earnings Management. *Auditing: A Journal of Practice & Theory*, **23**(2): 13–35.

Belghiti-Mahut, S. and Lafont, A.-L. (2010). Lien entre présence des femmes dans le top manage — ment et performance financière des entreprises en France. *Gestion 2000*, **27**: 131–146.

Belloc, F. (2012). Corporate governance and innovation: a survey. *Journal of Economic Surveys*, **26**(5): 835–864.

Bennouri, M., Chtioui, T., Nagati, H., and Nekhili, M. (2018). Female board directorship and firm performance: What really matters? *Journal of Banking & Finance*, **88**: 267–291.

Berliant, M. and Fujita, M. (2008). Knowledge creation as a square Dance on the Hilbert cube. *International Economic Review*, **49**(4): 1251–1295.

Berliant, M. and Fujita, M. (2011). The dynamics of knowledge diversity and economic growth. *Southern Economic Journal*, **77**(4): 856–884.

Bilimoria, D. and Piderit, S. K. (1994). Board committee membership: Effects of sex-board bias. *Academy of Management Journal*, **37**(6): 1453–1477.

Black, B. S. and Khanna, V. S. (2007). Can Corporate Governance Reforms Increase Firm Market Values? Event Study Evidence from India. *Journal of Empirical Legal Studies*, **4**(4): 749–796.

Blibech, N. and Berraies. S. (2018). The impact of CEO' duality and board's size and independence on firms' innovation and financial performance. *Journal of Business Management and Economics*, **9**(1): 022–029.

Block, J. (2012). R&D investments in family and founder firms: An agency perspective. *Journal of Business Venturing*, **27**(6): 248–265.

Block, J., Mille, D., Jaskiewicz, P., and Spiegel, F. (2013). Economic and technological importance of innovations in large family and founder firms: An analysis of patent data. *Family Business Review*, **26**(2): 180–199.

Blundell, R. and Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, **87**(1): 115–143.

Boubaker, S. and Labegorre, F. (2008). Ownership structure, corporate governance and analyst following: A study of French listed firms. *Journal of Banking & Finance,* **32**(6): 961–976.

Boulouta, I. (2013). Hidden Connections: The link between board gender diversity and corporate social performance. *Journal of Business Ethics*, **113**(2): 185–197.

Briere, S. and Rinfret, N. (2010). La réalité des femmes aux conseils d'administration suite à l'adoption de la loi québécoise sur la gouvernance des sociétés d'État: obstacles et accès. *Revue Innovation. Sect. Public*, **15**(1): article 18.

Brockmann, E. N. and Simmond, O. G. (1997). Strategic decision making: The influence of CEO Experience and Use of Tacit Knowledge. *Journal of Managerial*, **9**: 454–468.

Bucciol, A. and Miniaci, R. (2011). Household portfolios and implicit risk preference. *Review of Economics and Statistics*, **93**(4): 1235–1250.

Byrd, J. W. and Hickman, K. A. (1992). Do outside directors monitor managers? *Journal of Financial Economics*, **32**(2): 195–221.

Cadbury Committee, (1992). *Report on the Financial Aspects of Corporate Governance.* Gee, London.

Campbell, K. and Minguez-Vera, A. (2008). Gender diversity in the boardroom and firm financial performance. *Journal of Business Ethics*, **83**: 435–451.

Carney, M. (2005). Corporate governance and competitive advantage in family-controlled firms. *Entrepreneurship Theory and Practice*, **29**(3): 249–265.

Carter, D. A., Simkins, B. J., and Simpson, W. G. (2010). The gender and ethnic diversity of US boards and board committees and firm financial performance. *Corporate Governance: An International Review*, **18**(5): 396–414.

Carter, D. A., D'souza, F. P., Simkins, B. J., and Simpson, W. G. (2003). The diversity of corporate board committees and firm financial performance. *SSRN Electronic Journal*. doi:10.2139/ssrn.972763.

Carpenter, M. A. and Westphal, J. D. (2001). The strategic context of external network ties: Examining the impact of director appointments on board involvement in strategic decision making. *Academy of Management Journal*, **44**: 639–660.

Chang, S. J., Chung, C., and Mahmood, I. P. (2006). When and how does business group affiliation promote firm innovation? A tale of two emerging economies. *Organization Science*, **17**: 637–656.

Chemmanur, T. J., Elena, L., and Xuan, T. (2014). Corporate venture capital, value creation, and innovation. *Review of Financial Studies*, **27**: 2434–2473.

Chen, C. and Bou-Wen, L. (2016). Ownership structure, independent board members and innovation performance: A contingency perspective. *Journal of Business Research*, **69**(9): 3371–3379.

Chen, H. L. and Hsu, W. T. (2009). Family ownership, board independence, and R&D investment. *Family Business Review*, **22**(4): 347–362.

Chen, H. L. (2013). CEO tenure, independent directors and corporate innovation. *Journal of Applied Finance and Banking*, **3**: 187–197.

Chen, J., Leung, W. S., and Evans, K. P. (2018). Female board representation, corporate innovation and firm performance. *Journal of Empirical Finance*, **48**: 236–254.

Chen, L. and Yang, W. (2019). R&D tax credits and firm innovation: Evidence from China. *Technological Forecasting and Social Change*, **146**: 233–241.

Chen, V. Y. S., Tsao, S-M., and Chen, G-Z. (2013). Founding family ownership and innovation. *Asia-Pacific Journal of Accounting & Economics*, **20**: 429–456.

Cho, S. and Kim, S. (2017). Horizon problem and firm innovation: The influence of CEO career horizon, exploitation and exploration on breakthrough innovations. *Research Policy*, **46**(10): 1801–1809.

Choi, J. J., Park, S. W., and Yoo, S. S. (2007). The value of outside directors: Evidence from corporate governance reform in Korea. *Journal of Financial and Quantitative Analysis*, **42**: 941– 962.

Choi, S, B., Lee, S., and Wiliams, C. (2011). Ownership and firm innovation in a transition economy: Evidence from China. *Research Policy*, **40**(3): 441–452.

Choi, S, B., Park, B., and Hong, P. (2012). Does ownership structure matter for firm technological innovation performance? The case of Korean firms. *Corporate Governance: An International Review*, **20**(3): 267–288.

Chrisman, J. and Patel, P. (2012). Variations in R&D investments of family and nonfamily firms: Behavioral agency and myopic loss aversion perspectives. *Academy of Management Journal*, **55**(4): 976–997.

Claessens, S., Djankov, S., and Lang, L. H. (2000). The separation of ownership and control in East Asian Corporations. *Journal of Financial Economics*, **58**: 81–112.

Corett, M. M., Mcnutt, J. J., and Tehranian, H. (2009). Corporate governance and earnings management at large U.S. bank holding companies. *Journal of Corporate Finance*, **15**(4): 412–430.

Cox, T, H., Lobel, S, A., and Mcleod, P. (1991). Effects of Ethnic Group Cultural Differences on Cooperative and Competitive Behavior a Group Task. *Academy of Management Journal*, **34**(4): 827–847.

Croson, R. and Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic Literature*, **47**(2): 448–74.

Curimbaba, F. (2002). The Dynamics of Women's Roles as Family Business Managers. *Family Business Review*, **15**(3), 239–252.

Czarnitzki, D., Hanel, P., and Rosa, J. M. (2011). Evaluating the impact of R&D tax credits on innovation: A microeconometric study on Canadian firms. *Research Policy*, **40**(2): 217–229.

Daellenbach, U. D., Mccarthy, A. M., and Schoenecker, T. S. (1999). Commitment to innovation: The impact of top management team characteristics. *R&D Management*, **29**(3): 199–208.

Daily, C. M., Dalton, D. R., and Cannella, A. A. (2003). Corporate Governance: Decades of Dialogue and Data. *Academy of Management Review*, **28**(3): 371–382.

Dalziel, T., Gentry, R. J., and Bowerman, M. (2011). An integrated agency–resource dependence view of the influence of directors' human and relational capital on firms' R&D spending. *Journal of Management Studies*, **48**(6): 1217–1242.

De Massis, A., Frattini, F., and Lichtenthaler, U. (2013). Research on technological innovation in family firms: Present debates and future directions. *Family Business Review*, **26**(1): 10–3.

Deli, D. N. and Gillan, S. L. (2000). On the Demand for Independent and Active Audit Committees. *Journal of Corporate Finance*, **6**(4): 427–445.

Demb, A. and Neubauer, F.-F. (1992). The corporate board: Confronting the paradoxes. *Long Range Planning*, **25**(3): 9–20.

Deutsch, Y. (2005). The impact of board composition on firms' critical decisions: A Meta-Analytic Review. *Journal of Management*, **31**(3): 424–444.

Diaz-Garcia, C., Gonzalez-Moreno, A., and Saez-Martinez, F. (2013). Gender Diversity within R&D Teams: Its Impact on Radicalness of Innovation. *Innovations: Management, Policy & Practice*, **15**(2): 149–160.

Dieguez-Soto, J., Manzaneque, M., and Rojo-Ramirezojo-Ramirez, A. (2016). Technological Innovation Inputs, Outputs, and Performance: The Moderating Role of Family Involvement in Management. *Family Business Review*, **29**(3): 327–346.

Duran, P., Kammerlander, N., Van Essen, M., and Zellweger, T. (2015). Doing more with less: Innovation input and output in family firms. *Academy of Management Journal*, **59**(4): 1224–1264.

Elstad, B. and Ladegard, G. (2012). Women on corporate boards: Key influencers or tokens? *Journal of Management & Governance*, **16**(4): 595–615.

Esctiba-Esteve, A., Sanchez-Peinadoã, L., and Sãnchez-Peinado, E. (2009). The influence of top management teams in the strategic orientation and performance of small and medium-sized enterprises. *British Journal of Management*, **20**(4): 581–597.

European Commission (2011). Green Paper: The EU corporate governance framework, 164 final, April 5, 2011, article 1.1.7.

European Commission (2012). Proposal for a directive of the european parliament and of the council on improving the gender balance among Non-executive directors of companies listed on stock exchanges and related measures. https://eur-lex.europa.eu/legalcontent/EN/TXT/?uri$=$CELEX%3A52012PC0614 (Accessed May 16, 2019).

European Commission (2014). Report on equality between women and men. Retrieved from http://ec.europa.eu/justice/gender-equality/files/annualreports/150324_annual_report_2014_web_en.pdf. (Accessed 1 Mar 2017).

Faccio, M., Marchica, M. T., and Mura, R. (2016). CEO Gender, Corporate Risk-Taking, and the Efficiency of Capital Allocation. *Journal of Corporate Finance*, **39**: 193–209.

Fahlenbrach, R., Low, A., and Stulz, R. M. (2010). Why Do Firms Appoint CEOs as Outside Directors? *Journal of Financial Economics*, **97**(1): 12–32.

Faleye, O., Hoitash R., and Hoitash, U. (2011). The Costs of Intense Board Monitoring. *Journal of Financial Economics*, **101**(1): 160–181.

Fama, E. F. and Jensen, M. C. (1983). Separation of ownership and control. *Journal of Law and Economics*, **26**: 301–325.

Finkelstein, S., Reeger, R., and Hambrick, D. C. (1996). Strategic Leadership: Top Executives and Their Effects on Organizations. *The Academy of Management Review*, **22**(3): 802–805.

Fujita, M., and Weber, S. (2004). Strategic immigration policies and welfare in heterogeneous countries. FEEM Working Paper No. 2.

Gabrielsson, J. and Winlund, H. (2000). Boards of directors in small and medium-sized industrial firms: Examining the effects of the board's working style on board task performance. *Entrepreneurship & Regional Development*, **12**(4): 311–330.

Galia, F. and Zenou, E. (2013). La diversité du conseil d'administration influence-t-elle l'innovation? L'impact de la diversité de genre et d'âge sur les différents types d'innovation. *Management & Avenir*, **66**(8): 152.

Galia, F., Zenou, E., and Ingham, M. (2015). Board composition and environmental innovation: Does gender diversity matter? *International Journal of Entrepreneurship and Small Business*, **24**(1); 117.

Gendron, Y. and Bedard, J. (2006). On the constitution of audit committee effectiveness. *Accounting, Organizations and Society*, **31**(3): 211–239.

George, G. and Lin, Y. (2016). Analytics, Innovation and Organizational Adaptation. *Innovation*, **19**(1): 16–22.

Godard, L. and Schatt A. (2005). Characteristics and operation of the French boards of directors. An inventory survey. *Revue Française de Gestion*, **158**: 69–87.

Goodstein, J., Gautam, K., and Boeker, W. (1994). The effects of board size and diversity on strategic change. *Strategic Management Journal*, **15**: 241–250.

Greenbury, R. (1995). *Directors' Remuneration: Report of A Study Group*. Gee Publishing, London.

Gregory-Smith, I., Main, B. G. M., and O'reilly, C. A. (2014). Appointments, Pay and Performance in UK Boardrooms by Gender. *The Economic Journal*, **124**(574): F109–F128.

Guo, L. and Masulis, R. W. (2015). Board structure and monitoring: New evidence from CEO turnovers. *Review of Financial Studies*, **28**(10): 2770–2811.

Hall, B. H. and Van Reenen, J. (2000). How effective are fiscal incentives for R&D? A review of the evidence. *Research Policy*, **29**: 449–469.

Hampel, R. (1998). *Committee on corporate governance: Final Report*. Gee, London.

Harrison, J. R. (1987). The strategic use of corporate board committees. *California Management Review*, **30**(1): 109–125.

Hauck, J. and Prugl, R. (2015). Innovation activities during intra-family leadership succession in family firms: An empirical study from a socioemotional wealth perspective. *Journal of Family Business Strategy*, **6**(2): 104–118.

Hillman, A. J., Shropshire, C., and Cannella, A. A. (2007). Organizational predictors of women on corporate boards. *Academy of Management Journal*, **50**(4): 941–952.

Hillman, A. J., Cannella, A. A., and Harris, I. C. (2002). Women and racial minorities in boardroom: How do directors differ? *Journal of Management*, **28**(6): 747–763.

Hillman, A. J. and Dalziel, T. (2003). Boards of directors and firm performance: Integrating Agency and Resource Dependence Perspectives. *Academy of Management Review*, **28**(3): 383–396.

Hirshleifer, D., Angie, L., and Siew, H. T. (2012). Are overconfident CEOs better innovators? *Journal of Finance*, **67**: 1457–1498.

Hitt, M. A., Hoskisson, R. E., Johnson, R. A. and Moesel, D. D. (1996). The market for corporate control and firm innovation. *Academy of Management Journal*, **39**(5): 1084–1119.

Hodgkinson, G. P. (2003). The interface of cognitive and industrial, work and organizational psychology. *Journal of Occupational and Organizational Psychology*, **76**(1): 1–25.

Hoskisson, R. E., Hitt, M. A., Johnson, R. A., and Grossman, W. (2002). Conflicting voices, the effects of institutional ownership heterogeneity and internal governance on corporate innovation strategies. *Academy of Management Journal*, **45**(4): 697–716.

Hsu, P.-H., Huang, S., Massa, M., and Zhang, H. (2014). The new lyrics of the old folks: The role of family ownership in corporate innovation. INSEAD Faculty & Research Working Paper.

Huse, M. (2007). *Boards, governance and value creation: The human side of corporate governance*. Cambridge University Press, 392.

ILO (2001). *Breaking through the Glass Ceiling: Women in Management*, International Labour Office, Geneva, Switzerland.

Jackling, B. and Johl, S. (2009). Board Structure and Firm Performance: Evidence from India's Top Companies. *Corporate Governance: An International Review*, **17**(4): 492–509.

Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure of internal control systems. *Journal of Finance*, **48**(3): 831–880.

Jermias, J. (2007). The effects of corporate governance on the relationship between innovative efforts and performance1. *European Accounting Review*, **16**(4): 827–854.

Jia, N. (2016). Should Directors Have Term Limits? Evidence from corporate innovation. *European Accounting Review*, **26**(4): 755–785.

Jiang, Y. and Zhang, L. (2015). Top management characteristics and sustainable growth of small and medium sized enterprises: From the Perspective of Managerial Entrenchment Theory. *Journal Economic Review*, **5**: 69–77.

Jiao, H., Koo, C. K., and Cui, Y. (2015). Legal environment, government effectiveness and firms' innovation in China: Examining the moderating influence of government ownership. *Technological Forecasting and Social Change*, **96**: 15–24.

Jiraporn, P., Singh, M., and Lee, C. I. (2009). Ineffective corporate governance: Director Business and board committee memberships. *Journal of Banking & Finance*, **33**(5): 819–828.

Kaczmarek, S., Kimino, S., and Pye, A. (2012). Antecedents of board composition: The role of nomination committees. *Corporate Governance: An International Review*, **20**(5): 474–489.

Kang, H., Cheng, M., and Gray, S. J. (2007). Corporate governance and board composition: Diversity and independence of Australian boards. *Corporate Governance: An International Review*, **15**(2): 194–207.

Kanter, R. M. (1977). *Men and women of the corporation.* New York: Basic Books.

Karamanou, I. and Vafeas, N. (2005). The association between corporate boards, audit committees, and management earnings forecasts: An empirical analysis. *Journal of Accounting*, **43**(3).

Kaymak, T. and Bektas, E. (2008). East Meets West? Board characteristics in an emerging market: Evidence from Turkish Banks. *Corporate Governance: An International Review*, **16**(6): 550–561.

Kelton, A. S. and Yang, Y. (2008). The impact of corporate governance on Internet financial reporting. *Journal of Accounting and Public Policy*, **27**(1): 62–87.

Kerr, W. and Lincoln, W. (2010). The supply side of innovation: H-1B Visa Reforms and U.S. Ethnic Invention. *Journal of Labor Economics*, **28**: 3.

Kesner, I. F. (1988). Directors' characteristics and committee membership: An investigation of type, occupation, tenure, and gender. *Academy of Management Journal*, **31**(1): 66–84.

Khaled, S., Hichem, K., and Khaled, H. (2015). The impact of board and audit committee characteristics on voluntary disclosure: A meta-analysis. *Journal of International Accounting, Auditing and Taxation*, (24): 13–28.

Klein, A. (1998). Firm performance and board committee structure. *The Journal of Law and Economics*, **41**(1): 275–304.

Klein, A. (2002). Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics*, **33**(3): 375–400.

Kobayashi, Y. (2013). Effect of R&D tax credits for SMEs in Japan: A microeconometric analysis focused on liquidity constraints. *Small Business Economics*, **42**(2): 311–327.

Konig, A., Kammerlander, N., and Enders, A. (2013). The family innovator's dilemma: How family influence affects the adoption of discontinuous technologies by incumbent firms. *Academy of Management Review*, **38**: 418–441.

Kor, Y. Y. (2006). Direct and interaction effects of top management team and board compositions on R&D investment strategy. *Strategic Management Journal*, **27**(11): 1081–1099.

Kor, Y. Y. and Misangyi, V. F. (2008). Outside directors' industry-specific experience and firms' liability of newness. *Strategic Management Journal*, **29**: 1345–1355.

Kor, Y. Y. and Sundaramurthy, C. (2008). Experience-based human capital and social capital of outside directors. *Journal of Management*, **35**(4): 981–1006.

Krishnan, J. (2005). Audit committee quality and internal control: An empirical analysis. *The Accounting Review*, **80**: 649–675.

Kubota, K. and Takehara, H. (2018). Firm-level innovation by Japanese family firms: Empirical analysis using multidimensional innovation measures. *Pacific-Basin Finance Journal*, doi:10.1016/j.pacfin.2018.05.012.

Kuo, H. C., Wang, L. H., and Yeh, L. J. (2018). The role of education of directors in influencing firm R&D investment. *Asia Pacific Management Review*, **23**(3): 108–120.

Latane, B. (1981). The psychology of social impact. *American Psychologist*, **36**: 343–356.

Lee, P. M. and O'neill, H. M. (2003). Ownership structures and R&D investments of U.S. and Japanese firms, agency and stewardship perspectives. *Academy of Management Journal*, **46**(2): 212–225.

Leung, S., Richardson, G., and Jaggi, B. (2014). Corporate board and board committee independence, firm performance, and family ownership concentration: An analysis based on Hong Kong firms. *Journal of Contemporary Accounting & Economics*, **10**(1): 16–31.

Lin, C., Lin, P., Song, F. M., and Li, C. (2011). Managerial incentives, CEO characteristics and corporate innovation in China's private sector. *Journal of Comparative Economics*, **39**(2): 176–190.

Lin, P., Hutchinson, M. R., and Percy, M. (2009). The role of the audit committee and institutional investors in constraining earnings management: evidence from Chinese firms listed in Hong Kong. *Proceedings of Accounting & Finance Association of Australia & New Zealand Annual Conference 2009*, 5–7 July 2009.

Linck, J., Netter, M., and Yang, T. (2008). The determinants of board structure. *Journal of Financial Economics*, **2**: 308–328.

Lodh, S., Nandy, M., and Chen, J. (2014). Innovation and family ownership: Empirical evidence from India. *Corporate Governance: An International Review*, **22**(1): 4–23.

Loukil, N. and Yousfi, O. (2015). Does Gender Diversity on Board Lead to Risk-Taking? Empirical Evidence from Tunisia. *Canadian Journal of Administrative Sciences*, doi:10.1002/cjas.1326.

Lu, J. and Wang, W. (2018). Managerial conservatism, board independence and corporate innovation. *Journal of Corporate Finance*, **48**: 1–16.

Lundvall, B. A, Johnson, B., Andersen, E. S., and Dalum, B. (2002). National systems of production, innovation and competence building. *Research Policy*, **31**(2): 213–231.

Lynall, M. D., Golden, B. R., and Hillman, A. J. (2003). Board composition from adolescence to maturity: A multitheoretic view. *The Academy of Management Review*, **28**(3): 416.

Ali, M., Lu, Y., and Kulik, C. (2014). Board age and gender diversity: A test of competing linear and curvilinear predictions. *Journal of Business Ethics*, **125**(3): 497–512.

Mahadeo, J.-D., Soobaroyen, T., and Hanuman, V. (2012). Board composition and financial performance: Uncovering the effects of diversity in an emerging economy. *Journal of Business Ethics*, **105**(3): 375–388.

Mairesse, J. and Mohnen, P. (2005). The importance of R&D for innovation: A reassessment using French survey data. *Journal of Technology Transfer*, **30**(1/2): 183–197.

Mangena, M. and Pike, R. (2005). The effect of audit committee shareholding, financial expertise and size on interim financial disclosures. *Accounting and Business Research*, **35**(4): 327–349.

Manso, G. (2011). Motivating innovation. *The Journal of Finance: The American Finance Association*, **66**(5): 51823–1860.

Menon, K. and Williams, Jd. (1994). The use of audit committees for monitoring. *Journal of Accounting and Public Policy*, **13**(2): 121–139.

Miller, T. and Del Carmen Triana, M. (2009). Demographic diversity in the boardroom: Mediators of the board diversity-firm performance relationship. *Journal of Management Studies*, **46**(5): 755–786.

Nahlinder, J. (2010). Where are all the female innovators? Nurses as innovators in a public sector innovation project. *Journal of Technology Management & Innovation*, **5**(1).

Nekhili, M. and Gatfaoui, H. (2013). Are demographic attributes and firm characteristics drivers of gender diversity? Investigating women's positions on french boards of directors. *Journal of Business Ethics*, **118**(2): 227–249.

Niederle, M., Vesterlund, L. (2007). Do women shy away from competition? Do men compete too much? *Quarterly Journal of Economics*, **122**(3): 1067–1101.

Nielsen, S. and Huse, M. (2010). The contribution of women on boards of directors: Going beyond the Surface. *Corporate Governance: An International Review*, **18**(2): 136–148.

Nonaka, I. and Takeuchi, H. (1995). *The knowledge-creating company: How japanese companies create the dynamics of innovation.* Oxford University Press, New York.

Østergaard, C., Timmermans, B., and Kristinsson, K. (2011). Does a different view create something new? The effect of employee diversity on innovation. *Research Policy*, **40**(3): 500–509.

Paff, L. A. (2005). State-level R&D tax credit: A firm-level analysis, *Topics in Economic Analysis & Policy*, **5**, Article 17.

Pathan, S. and Faff, R. (2013). Does board structure in banks really affect their performance? *Journal of Banking and Finance*, **37**(5): 1573–1589.

Peterson, C. A. and Philpot, J. (2007). Women's roles on U. S. Fortune 500 boards: Director expertise and committee memberships. *Journal of Business Ethics*, **72**: 177–196.

Pfeffer, J. and Salancik, G. R. (1979). The external control of organizations: A resource dependence perspective. *The Academy of Management Review*, **4**(2): 309.

Post, C. and Byron, K. (2015). Women on boards and firm financial performance: A Meta-Analysis. *Academy of Management Journal*, **58**(5): 1546–1571.

Powell, G. N. (1988). *Women and men in management.* Newbury, CA: Sage.

Prencipe, A. (2016). Board composition and innovation in university. Spin-offs. Evidence from the Italian Context. *Journal of Technology Management and Innovation*, **11**(3): 33–39.

Raghunandan, K. Dasaratha, V. Rama, William J. Read. (2001). Audit committee composition, "Gray Directors," and interaction with internal auditing. *Accounting Horizons,* **15**(2): 105–118.

Reeb, A. and Upadhyay, A. (2010). Subordinate board structures. *Journal of Corporate Finance*, **16**(4): 469–486.

Rod, I. (2016). Disentangling the family firm's innovation process: A systematic review. *Journal of Family Business Strategy*, **7**(3): 185–201.

Ronald, C., Anderson, D. M., Reed Arun, U., and Wanli, Z. (2011). The economics of director heterogeneity. *Financial Management*, **40**(1): 5–38.

Rosenstein, S. and Wyatt, J. G. (1990). Outside directors, board independence, and shareholder wealth. *Journal of Financial Economics*, **26**(2): 175–191.

Ruigrok, W., Peck, S. Tacheva, S Greve, P., and Hu, Y. (2006). The determinants and effects of board nomination committees. *Journal of Management & Governance*, **10**(2): 119–148.

Ruigrok, W., Peck, S., and Tacheva, S. (2007). Nationality and gender diversity on swiss corporate boards. *Corporate Governance: An International Review*, **15**: 546–557.

Ruigrok, W., Peck, S. I., and Keller, H. (2006). Board characteristics and involvement in strategic decision making: Evidence from Swiss companies. *Journal of Management Studies*, **43**(5): 1201–1226.

Ruiqi, W., Wang, F, Xu, L., and Yuan, C. (2017). R&D expenditures, ultimate ownership and future performance: Evidence from China. *Journal of Business Research*, **71**: 47–54.

Ruiz-Jime Nez, J. M., Fuentes, M. D., and Ruiz Arroyo, M. (2016). Knowledge combination capability and innovation: The effects of gender diversity on top management teams in technology-based firms. *Journal of Business Ethics*, **135**(3): 503–515.

Kobayashi, Y. (2013). Effect of R&D tax credits for SMEs in Japan: A microeconometric analysis focused on liquidity constraints. *Small Business Economics*, **42**(2): 311–327.

Krishnan, J. (2005). Audit committee quality and internal control: An empirical analysis. *The Accounting Review*, **80**: 649–675.

Ryan, M. K., and Haslam, S. A. (2005). The glass cliff: Evidence that women are over-represented in precarious leadership positions. *British Journal of Management*, **16**(2): 81–90.

Sariol, A. M. and Abebe, M. A. (2017). The influence of CEO power on explorative and exploitative organizational innovation. *Journal of Business Research*, **73**: 38–45.

Sastre, J. F. (2015). The impact of R&D teams' gender diversity on innovation outputs. *International Journal of Entrepreneurship and Small Business*, **24**(1): 142.

Scott, S. G. and Bruce, R. A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal*, **37**: 580–607.

Sena, V., Duygun, M., Lubrano, G., Marra, M., and Shaban, M. (2018). Board independence, corruption and innovation. Some evidence on UK subsidiaries. *Journal of Corporate Finance*, **50**: 22–43.

Shapiro, D., Tang, Y., Wang, M., and Zhang, W. (2013). The effects of corporate governance on the innovation performance of Chinese SMEs. *European Economic Review*, **50**: 155–183.

Sharma, Z. (2016). Board composition and innovation. *Applied Finance Letters*, **5**(2): 12–31.

Sheikh, S. (2018). The impact of market competition on the relation between CEO Power and firm innovation. *Journal of Multinational Financial Management*, **44**: 36–50.

Shivdasani, A. and Yermack, D. (1999). CEO involvement in the selection of new board members: An empirical analysis. *The Journal of Finance*, **54**(5): 1829–1853.

Shleifer, A. and Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance*, **52**(2): 737–782.

Sheridanh, A. and Milgate, G. (2005). Accessing board positions: A comparison of female and male board members' views. *Corporate Governance: An International Review*, **13**(6): 847–855.

Silvio, B. M., Antonio, C., and Alessandra, R. (2012). Board diversity and structure: What implications for investments in innovation? Empirical evidence from Italian context. *Corporate Ownership and Control*, **10**(1): 9–25.

Singh, V. and Vinnicombe, S. (2004). Why so few women directors in top UK boardrooms? Evidence and theoretical explanations. *Corporate Governance*, **12**(4): 479–488.

Singh, V. and Vinnicombe, S. (2008). Newly appointed directors in the boardroom: How do women and men differ? *European Management Journal*, **26**(1): 48–58.

Smith, N. and Parrotta, P. (2015). Why so few women on boards of directors? Empirical evidence from danish companies in 1998–2010. *Journal of Business Ethics*, **147**(2): 445–467.

Sraer, D. and Thesmar, D. (2007). Performance and behaviour of family firms: Evidence from the French stock market. *Journal of the European Economic Association*, **5**(4): 709–751.

Srinidhi, B., Gul, F. A., and Tsui, J. (2011). Female directors and earnings quality. *Contemporary Accounting Research*, **28**(5): 1610–1644.

Stiles, P. (1992). The corporate board: Confronting the paradoxes. *Long Range Planning*, **25**(6): 113–114.

Sun, J., Cahan, S. F., and Emanuel, D. (2009). Compensation committee governance quality, chief executive officer stock option grants, and future firm performance. *Journal of Banking & Finance*, **33**(8): 1507–1519.

Talke, K., Salomo, S., and Rost, K. (2010). How top management team diversity affects innovativeness and performance via the strategic choice to focus on innovation fields. *Research Policy*, **39**(7): 907–918.

Terjesen, S., Sealy, R., and Singh, V. (2009). Women directors on corporate boards: A review and research agenda. *Corporate Governance: An International Review*, **17**(3): 320–337.

Teruel, M., Parra, M. D., and Segarra, A. (2015). Gender diversity and innovation in manufacturing and service firms. Working Papers 2072/249234, Universitat Rovira i Virgili, Department of Economics.

Torchia, M., Calabro, A., and Huse, M. (2011). Women directors on corporate boards: From tokenism to critical mass. *Journal of Business Ethics*, **102**(2): 299–317.

Torchia, M., Calabro, A., Gabldon, P., and Kanadli, S. B. (2018). Women directors contribution to organizational innovation: A behavioral approach. *Scandinavian Journal of Management*, **34**(2): 215–224

Tuggle, C. S., Schnatterly, K., Johnson, R. A. (2010). Attention patterns in the boardroom: How board composition and processes affect discussion of entrepreneurial issues. *Academy of Management Journal*, **53**(3): 550–571.

Turner, L. (2009). Gender diversity and innovative performance. *International Journal Innovation and Sustainable Development*, **4**(2/3): 123–134.

Tyler, B. and Steensma, H. (1998). The effects of executives' experiences and perceptions on their assessment of potential technological alliances. *Strategic Management Journal*, **19**(10): 939–965.

Upadhyay, A. D., Bhargava, R., and Faircloth, S. D. (2014). Board structure and role of monitoring committees. *Journal of Business Research*, **67**(7): 1486–1492.

Van Den Berghe, L. A. A., and Levrau, A. (2004). Evaluating boards of directors: What constitutes a good corporate board? *Corporate Governance*, **12**(4): 461–478.

Verbeke, A. and Kano, L. (2012). The transaction cost economics theory of the family firm: FamilyBased human asset specificity and the bifurcation bias. *Entrepreneurship Theory and Practice*, **36**(6): 1183–1205.

Villalonga, B. and Amit, R. H. (2006). How Do Family Ownership, Control, and Management Affect Firm Value? *Journal of Financial Economics*, **80**(2): 385–417.

Vincent, B. and George, M. (2002). CEO characteristics and Firm R&D Spending. *Management Science*, **48**: 782–801.

Voordeckers, W., Van Gils, A., and Van Den Heuvel, J. (2007). Board composition in small and medium-sized family firms. *Journal of Small Business Management*, **45**(1): 137–156.

Wang, S., Zhang, S., Li, and Bobo, (2017). Effect of diversity on top management team to the bank's innovation ability-based on the nature of ownership perspective. *Procedia Engineering*, **174**: 240–245.

Wei, L. Q. and Ling G. (2015). CEO characteristics and corporate entrepreneurship in transitions economies: Evidence from China. *Journal of Business Research*, **68**(6): 1157–1165.

Westhead, P. and Cowling, M. (1998). Family firm research: The need for a methodological rethink. *Entrepreneurship: Theory and Practice*, **23**(1): 31–57.

Westphal, J. D. and Milton, L. P. (2000). How experience and network ties affect the influence of demographic minorities on corporate boards. *Administrative Science Quarterly*, **45**(2): 366.

Westphal, J. D. and Zajac, E. J. (1995). Who shall govern? CEO/board power, demographic similarity, and new director selection. *Administrative Science Quarterly*, 60–83.

Wincent, J., Anokhin, S., and Ortqvist, D. (2010). Does network board capital matter? A study of innovative performance in strategic SME network. *Journal of Business Research*, **63**(3): 265–275.

Wu, Y. (2005). The effects of state R&D tax credits in stimulating private R&D expenditure: A cross-state empirical analysis. *Journal of Policy Analysis and Management*, **24**(4): 785–802.

Xie, B., Davidson, W. N., and Dadalt, P. J. (2003). Earnings management and corporate governance: The role of the board and the audit committee. *Journal of Corporate Finance*, **9**(3): 295–316.

Xu, X. and Wang, Y. (1999). Ownership structure and corporate governance in chinese stock companies. *China Economic Review*, **10**(1): 75–98.

Yang, J. S., and Krishnan, J. (2005). Audit committees and quarterly earnings management. *International Journal of Auditing*, **9**(3): 201–219.

Yi, J., Hong, J., Hsu, W. Chung., and Wang, C. (2017). The role of state ownership and institutions in the innovation performance of emerging market enterprises: Evidence from China. *Technovation*, 62–63, 4–13.

Yuan, R., and Wen, W. (2017). Managerial foreign experience and corporate innovation. *Journal of Corporate Finance*, **48**: 752–770.

Zalata A. M., Tauringana, V., and Tingbani, I. (2018). Audit committee financial expertise, gender, and earnings management: Does gender of the financial expert matter? *International Review of Financial Analysis*, **55**: 170–183.

Zhang, Y., Zhou, J., and Zhou, N. (2007). Audit committee quality, auditor independence, and internal control weaknesses. *Journal of Accounting and Public Policy*, **26**(3): 300–327.

Zhou, H., Owusu-Ansah, S., and Maggina, A. (2018). Board of directors, audit committee, and firm performance: Evidence from Greece. *Journal of International Accounting, Auditing and Taxation*, **31**: 20–36.

Zona, F., Zattoni, A., and Minichilli, A. (2013). A contingency model of boards of directors and firm innovation: The moderating role of firm size. *British Journal of Management*, **24**(3): 299–31.