1 © 2021 World Scientific Publishing Company
 2 https://doi.org/10.1142/9781786349507_0014

Chapter 14

Does Board Structure Matter for Innovation?

4 Meriam Attia^{*,†,¶}, Ouidad Yousfi^{‡,||}, and
 5 Abdelwahed Omri^{§,**}

6 ^{*}*University of Montpellier, France*

7 [†]*University of Tunis, GEF2A Lab, High Institute of
 8 Management, Tunisia*

9 [‡]*Montpellier Research in Management MRM,
 10 University of Montpellier, France*

11 [§]*University of Tunis, Tunisia*

12 [¶]*meriam.attia@etu.umontpellier.fr*

13 ^{||}*ouidad.yousfi@umontpellier.fr*

14 ^{**}*Abdelomri@gmail.com*

14.1 Introduction

16 Innovation is defined as a creative and complex activity that needs
 17 human capacities such as imagination, ingenuity, and creativity
 18 (Torchia *et al.*, 2011). However, to face the increasingly tough com-
 19 petition and maintain a sustainable competitive advantage, firms are
 20 forced to innovate and increase their capacity to integrate individu-
 21 als displaying diverse types of knowledge, abilities, and networking.
 22 In recent years, policymakers have shown that innovation perfor-
 23 mance varies according to market regulation and governance mech-
 24 anisms. Several initiatives and programs have been introduced in
 25 order to increase diversity in the board, such as gender quota laws
 26 and the presence of minorities in top management positions. These
 laws are intended to push companies to renew the composition of

2 *Financial and Economic Systems: Transformations & New Challenges*

1 their board of directors, to select new profiles, and to detect the pro-
 2 files of women, make them visible. Moreover, many decisions have
 3 been introduced to foster innovation and R&D activities (The EU
 4 agency for disruptive innovation, 2017). For instance, OECD coun-
 5 tries, the United States (Paff, 2005; Wu, 2005), Japan (Kobayashi,
 6 2014), China, (Chen *et al.*, 2019), and Canada (Czarnitzki *et al.*,
 7 2011) tend to rely on tax incentives to promote R&D spending in
 8 the business sector. In order to facilitate access to financial resources
 9 and stimulate innovation activities, the government provides public
 10 R&D funding as public subsidies or R&D tax credit to innovative
 11 firms. The R&D tax credits and subsidies are two of the most popu-
 12 lar instruments for governments to support R&D activities (Hall and
 13 Van Reenen, 2000).

14 Over the last fifteen years, a significant number of studies have
 15 analyzed the influence of corporate governance on innovation (Lodh
 16 *et al.*, 2014; George and Lin, 2016; Lu *et al.*, 2018; Wang *et al.*, 2017).
 17 Innovation literature has investigated several aspects of innovation
 18 such as how innovation affects firm performance (Hitt *et al.*, 1996),
 19 how leaders affect employees' innovativeness (Scott and Bruce, 1994),
 20 and how CEO (chief executive officer) and top management char-
 21 acteristics could lead to more innovations (Hirshleifer *et al.*, 2012;
 22 Chemmanur *et al.*, 2014). Moreover, several studies have focused,
 23 especially, on the impact of ownership structure on innovation deci-
 24 sions (Chang *et al.*, 2006; Belloc, 2012; Choi *et al.*, 2012; Shapiro
 25 *et al.*, 2013; Lodh *et al.*, 2014; Diéguez-Soto *et al.*, 2016). For
 26 instance, Choi *et al.* (2012), Shapiro *et al.* (2013) show that the own-
 27 ership structure is a critical factor in helping companies realize inno-
 28 vative projects. Belloc (2012) shows that concentrated ownership is
 29 important for innovation activities because it provides effective mon-
 30 itoring mechanisms. Chang *et al.* (2006) confirm that the majority of
 31 shareholders have positive effects on firms' innovation performance,
 32 while Chen *et al.* (2011), Lodh *et al.* (2014), and Shapiro *et al.* (2013)
 33 argue that foreign ownership has a positive influence on innovation
 34 performance.

35 Furthermore, innovation literature has strongly shown how direc-
 36 tors could have a positive impact on innovation (Torchia *et al.*, 2011
 37 and Pathan and Faff, 2013). Empirical evidence has largely sup-
 38 ported the idea that the board involvement is a key factor in inno-
 39 vation 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

4 *Financial and Economic Systems: Transformations & New Challenges*

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

8 Then, despite the central role of boards in corporate governance,
 9 there is relatively little understanding of how the internal organiza-
 10 tion of boards, specifically the structure of board committees, could
 11 shape strategic decisions such as innovation. In fact, governance lit-
 12 erature has strongly underlined the importance of committees in the
 13 functioning of the board (Adams, 2003; Adams *et al.*, 2010; Guo and
 14 Masulis, 2015). The composition and functions of committees have
 15 a strong influence on the board's composition as well as committee's
 16 activities. Turning to studies which discuss the composition of board
 17 committees, the literature focuses, especially, on audit committee: it
 18 shows how composition of audit committees could influence the qual-
 19 ity of financial disclosure, internet reporting, earnings management,
 20 and financial performance (Karamanou and Vafeas, 2005; Mangena
 21 and Pike, 2005; Kelton and Yang, 2008; Bédard *et al.*, 2004; Klein,
 22 2002; Zhou *et al.*, 2018). Moreover, most of papers have studied the
 23 effect of appointing independent members in committees (Deli and
 24 Gillan, 2000; Klein, 2002; Zhang *et al.*, 2007; Krishnan, 2005; Choi
 25 *et al.*, 2007). We point out that the literature neglects several forms
 26 of directors' attributes in key committees and their influence on the
 27 firm's activities. To the best of our knowledge, the effects of diversity
 28 on committees have not been fully established.

29 To fulfill this gap in the literature, this contribution aims to inves-
 30 tigate how diverse attributes could influence corporate innovation.
 31 In the first section, we focus on individual characteristics and their
 32 influence on innovation effort and performance. Then, we examine
 33 how the internal organization of boards, specifically the committees'
 34 roles and their composition and to what extent they could be mean-
 35 ingful to innovation processes. Specially, we discuss the influence of
 36 the committee size, the frequency of meetings, and the presence of
 37 independent and female members. Finally, the chapter sheds light on
 38 the effectiveness of initiatives and programs introduced to increase
 39 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,

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

7 **14.2.2 Board composition and innovation**

8 Early research on board diversity focused on task-related director
 9 attributes such as educational and functional background, as well
 10 as organizational and board tenure factors (Goodstein *et al.*, 1994;
 11 Westphal and Zajac, 1995). However, with the wider acceptance
 12 of the value in diversity proposition and the greater pressures to
 13 increase diversity on corporate boards (Daily and Dalton, 2003),
 14 new dimensions of diversity in board composition are emerging. For
 15 instance, in North America, attention is increasingly paid to race,
 16 ethnicity, and gender of corporate directors (Carter *et al.*, 2003;
 17 Daily *et al.*, 1999; Erhardt *et al.*, 2003), while in Europe, national-
 18 ity (Ruigrok *et al.*, 2007) and gender (Singh and Vinnicombe, 2004;
 19 Singh *et al.*, 2001) appear to be important dimensions of board diver-
 20 sity. In fact, research based on the European context confirms that
 21 the introduction of gender and / or nationality diversity on boards
 22 has important implications for board dynamics (Galia and Zenou,
 23 2013; Galia *et al.*, 2015).

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

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

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

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

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,

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

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

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

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

⁴Statistics 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>.

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

6 Another group of studies has analyzed the impact of female direc-
 7 tors on innovation in Spain (Diaz-Garcia *et al.*, 2013). It improves
 8 interaction and dynamics in R&D teams (Teruel *et al.*, 2015), and
 9 specifically fosters the firm's ability to introduce organizational inno-
 10 vations (Torchia *et al.*, 2011). All these studies, however, have focused
 11 on one specific pattern of diversity (gender) and one specific form of
 12 innovation (organizational innovation). Very few studies have investi-
 13 gated the effect of gender diversity on innovation (Miller and Triana,
 14 2009). In fact, the existing literature marginalizes other forms of
 15 diversity in boards and the impact of directors' attributes on different
 16 forms of innovations

17 14.2.2.1 *Presence of outside directors on board and* 18 *innovation: Independent, foreign directors*

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

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

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

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

1 Fujita and Weber (2004) note also that knowledge production relies
 2 heavily on the talents and skills of members coming from a wide
 3 range of cultural backgrounds. The nature of R&D activity calls for
 4 interaction between different individuals and the pooling of different
 5 ideas and abilities. Likewise, Alesina and La Ferrara (2005) argue
 6 that ethical and cultural diversity may lead to innovation and cre-
 7 ativity since it involves a variety of abilities and knowledge. Berliant
 8 and Fujita (2008) also refer to the significance of cultural diversity
 9 for knowledge creation and transfer. The heterogeneity of people is
 10 important for the creation of new ideas. On the other hand, ethnic
 11 diversity could provide diverse perspectives, but not automatically
 12 valuable for innovation and solving problems (Berliant and Fujita,
 13 2011). Even though ethnic diverse directors know global markets and
 14 customer tastes, they may not lead the firm to develop new products
 15 sold abroad as they (Kerr and Lincoln, 2010).

16 14.2.2.2 *How does directors' education influence innovation?*

17 Directors' education levels have been the subject of a number of
 18 researches; most of them concluded that a high educational level
 19 is positively correlated with managerial capabilities and innovation
 20 (see among others Lin *et al.*, 2011; Kuo *et al.*, 2018). In fact, board
 21 members with postgraduate degrees have the ability to better analyze
 22 complex information (Escriba-Esteve *et al.*, 2009), to efficiently solve
 23 problems, and to adopt new technologies (Dalziel *et al.*, 2011). In the
 24 same order of ideas, Wincent *et al.* (2010) show that the number of
 25 directors who have degrees from elite institutions and who have a
 26 rich academic background⁶ positively impact innovation. Similarly,
 27 Lundvall *et al.* (2002) show that educational level reflects personality
 28 traits, cognitive styles, and values. Therefore, a firm where directors
 29 have a higher educational level is more likely to invest in innovation
 30 projects.

⁶Wincent *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 exper-
 tise and education level are important for improving all components of innovative
 performance [total, radical and incremental].

12 *Financial and Economic Systems: Transformations & New Challenges*

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

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

28 **14.2.3 Gender diversity on board**

29 In the fields of management and economics, the number of studies
 30 on gender has increased in the last few years (Kang, 2007; Mahadeo
 31 *et al.*, 2012; Østergaard *et al.*, 2011; Torchia *et al.*, 2011; Galia and
 32 Zenou, 2013; Pathan and Faff, 2013; Galia *et al.*, 2015). For instance,
 33 studies have discussed how the presence of women on boards could
 34 influence a firm's financial and social performance (see among others:
 35 Carter *et al.*, 2010; Carter *et al.*, 2003; Belghiti Mahut *et al.*, 2010),
 36 corporate governance (Carter *et al.*, 2003; Adams and Ferreira, 2009),
 37 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

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

6 **14.2.4 Directors' age**

7 Social and professional experiences of directors are closely related to
 8 their age. The age will change the individual's vision, beliefs, atti-
 9 tudes, and interpersonal networks. In fact, director's career comes
 10 with age, and it can influence corporate governance (Jackling and
 11 Johl, 2009). For example, young directors are more concerned about
 12 their reputation and have shorter prior professional experience while
 13 old directors are more skillful in business decision-making. Moreover,
 14 Mahadeo *et al.* (2012) show that age diversity improves learning abil-
 15 ities and helps to develop new and innovative ideas. Therefore, age
 16 diversity among board members can help the board to consider a vari-
 17 ety of perspectives and to better target consumers' needs in different
 18 age groups, with a greater variety of products and services (Kang
 19 *et al.*, 2007). In addition, age could influence risk-taking. Old groups
 20 are less risk-tolerant (Buccioli and Miniaci, 2011). They invest in more
 21 routine and less risky investments than young directors, particularly
 22 when they are entrenched. However, based on their experience, their
 23 knowledge, and their background, old directors can detect and iden-
 24 tify the most profitable projects and are more prone to introduce suc-
 25 cessful innovations, despite their risk aversion (Mahadeo *et al.*, 2012).
 26 However, unlike stated by Kang *et al.* (2007), age diversity can lead
 27 to a lack of cohesion in decision-making, worsen the communication
 28 process, and decrease trust among board members (Mahadeo *et al.*,
 29 2012). Torchia *et al.* (2011) provide evidence that there is a negative
 30 relationship between age diversity and organizational innovation.

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

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

5 **14.3 Does Diversity in Board Committees Favor** 6 **Innovation?**

7 **14.3.1 *Role of board committees and innovation***

8 Governance literature has strongly underlined the importance of
 9 committees in the functioning of the board (Adams, 2003; Adams
 10 *et al.*, 2010; Guo and Masulis, 2015). It provides a means and
 11 structure for effective governance by facilitating special tasks and
 12 addressing important corporate concerns (Adams, 2003). In fact, the
 13 most influential board decisions are taken at the committee level
 14 (Kesner, 1988; Klein, 1998; Adams, 2003; Guo and Masulis, 2015).
 15 For instance, the audit committee oversees the integrity and compli-
 16 ance of the firm's financial reporting. The compensation committee
 17 focuses on human resource policies and procedures, most notably the
 18 compensation of top executives. The governance committee recom-
 19 mends new candidates for the board and other top executive posi-
 20 tions and sets general governance procedures; directors are usually
 21 assigned to committees at the recommendation of the governance
 22 committee (Adams, 2003). Klein (1998) considers committee mem-
 23 bership to be a proxy for the duties and functions of a director on the
 24 board. Directors have a stronger and more direct impact on executive
 25 compensation, director selection, and other important actions that
 26 significantly affect corporate performance; under specific conditions,
 27 such committees members have to serve on board committees with
 28 primary responsibility for these functions.

29 Moreover, committees are important mechanisms to monitor
 30 corporate activities and play a valuable role in the protection of
 31 shareholders' wealth (Kesner, 1988). From an agency perspective,
 32 committees can allow directors to better perform their control role.
 33 The specialization of committees and the large amount of informa-
 34 tion that directors can share during meetings increase the potential
 35 to monitor executives and protect shareholders' wealth. Further-
 36 more, 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

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

7 Despite the introduction of gender quota law, female directors are
 8 not appointed to strategic committees on the board, such as develop-
 9 ment and remuneration committees. In fact, very few women are in
 10 committee board positions, particularly in male-dominated compa-
 11 nies. Female directors are still prevented from moving up into man-
 12 agement and leadership positions and are facing significant barriers
 13 (glass ceiling theory, ILO, 2001).⁷ Moreover, the complexity of the
 14 board selection process (Peterson and Philpot, 2007), in addition to
 15 many gender stereotypes, still makes it more difficult for a woman
 16 to be nominated on boards as well as on committees (Singh and
 17 Terjesen, 2008; Brière and Rinfret, 2010).

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

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

⁷The glass ceiling was identified in the 1980s by the International Labor Orga-
 nization 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).

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

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

19 14.3.2.2 *Why should more independent directors be appointed* 20 *to committees?*

21 In the 1990s, the Cadbury Report (Cadbury Committee, 1992) and
 22 several studies recommended the appointment of more independent
 23 directors to corporate boards and to their key committees (i.e. audit,
 24 compensation, and nomination committees) to improve the boards'
 25 and the committees' effectiveness (Klein, 1998). In fact, board's inde-
 26 pendence could enhance board's effectiveness and improve, therefore,
 27 the firm's performance (Choi *et al.*, 2007), as well as innovation per-
 28 formance (Chen and Hsu, 2009; Choi and Lee, 2011; Lodh *et al.*,
 29 2014; Shapiro *et al.*, 2013; Balsmeier *et al.*, 2014; Sena *et al.*, 2018).

30 Most of the papers confirm that independent committees pro-
 31 vide more effective monitoring of managerial decisions and activities
 32 (Xie *et al.*, 2003; Guo and Masulis, 2015). Independent directors
 33 are prone to reduce agency conflicts and to ensure management. In
 34 fact, the high attendance rate among independent members can be
 35 explained by their essential role in complying with the good practices
 36 of governance (Adams and Ferreira, 2009). Furthermore, in line with
 37 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,

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

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

11 The different quota laws vary according to the country's prac-
12 tices, contexts, and realities. For instance: Some of the national
13 quota laws refer to supervisory boards only (Norway, Iceland, France,
14 and Germany), while others prescribe a quota for both supervisory
15 and executive boards (the Netherlands, Belgium, Italy, and Spain).
16 The first countries to implement these regulations aimed to achieve
17 more gender-balanced boards with at least of 40% women members
18 (Norway, Spain, Iceland, and France). Other countries have lower
19 gender percentages: in Italy and Belgium, the gender quota is spec-
20 ified at 33%, while in the Netherlands and Germany, quotas are set
21 to at least 30%. In fact, gender quotas have dealt with women under-
22 representation in board seats; however, they did not attempt to reg-
23 ulate the distribution of positions and fees across gender, (European
24 Commission, 2012).

25 Studies on the boards' committees show that women directors
26 most often serve on specific committees: they face a second ceiling
27 barrier in boardrooms while they are supposed to achieve high top
28 management positions: the glass cliff (Smith and Parrotta, 2018, and
29 Ryan and Haslam, 2005). For instance, they can easily join audit,
30 CSR, and corporate governance committees while they are unlikely
31 to be appointed to the strategic, nominating, and compensation com-
32 mittees (Adams and Ferreira, 2009). In a recent study, Bugeja *et al.*
33 (2016) highlight that when women sit on these committees, CEO
34 salaries, bonuses, and total compensation are decreased. Their pres-
35 ence on these committees could lead to an increase in transparency.

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

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

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

20 Finally, we notice that only gender diversity has been fostered
 21 through quota law. To the best of our knowledge, there are only
 22 some recommendations to promote other forms of diversity, such as
 23 ethnic and minority diversity. The Securities and Exchange Com-
 24 mission (SEC), and New York Stock Exchange (NYSE)⁸ recom-
 25 mend the appointment of independent directors on corporate boards
 26 and key corporate committees [e.g. audit, compensation, and nom-
 27 ination committees]. Moreover, the German Corporate Governance
 28 Code (DCGK)⁹ recommends appointing an adequate number of out-
 29 side board members, taking into account the specific requirements
 30 of the firm. It recommends that supervisory boards should "pos-
 31 sess the knowledge, ability and expert experience required to prop-
 32 erly complete its tasks". The importance of sufficient professional

⁸NYSE 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.

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

1 qualifications and leadership experience of non-executive board mem-
 2 bers, emphasized by the European Commission,¹⁰ point to a similar
 3 direction.

4 14.5 Discussion and Conclusion

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

13 As R&D and innovation activities are typically associated with
 14 new technology or new products, we highlight that better-educated
 15 directors tend to have better cognitive ability to absorb new ideas,
 16 which therefore could increase the probability of introducing inno-
 17 vations (Barker and Mueller, 2002, Dalziel *et al.*, 2011; Lin *et al.*,
 18 2011; Kuo *et al.*, 2018), while the education level of diversity caused
 19 by exposure to different knowledge may lead to different ways of
 20 thinking, resulting in a negative impact on innovation. In addition,
 21 we underline in this contribution that the type of academic degree
 22 can have a different influence on innovation activities. For instance,
 23 business-educated directors are more conservative and risk-averse,
 24 and they seem to marginalize innovation investments as they are
 25 more likely to focus on activities with short-term financial returns;
 26 however, directors with science and engineering degrees have better
 27 skills when they have to take risky decisions. They could increase the
 28 probability of accepting and introducing new changes.

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

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

1 products and processes. However, directors who have different cul-
 2 tural backgrounds could provide diverse perspectives, though not
 3 automatically valuable for innovation and solving problems. Even
 4 though ethnically diverse directors know global markets and cus-
 5 tomers' tastes, they may not lead the firm to develop new products
 6 that are sold abroad as they. Furthermore, we show that the pres-
 7 ence of independent directors in decision-making committees could
 8 have a positive contribution on innovation: They could provide more
 9 effective monitoring of managerial decisions and activities in com-
 10 mittees, and they are likely to have enough knowledge and skills
 11 to offer different perspectives on innovative investments and growth
 12 opportunities.

13 Turning to committee functioning, we show that when committees
 14 meet often, board committees seem to have more information about
 15 the current problems and are more concerned about R&D invest-
 16 ments. Frequent meetings can help outside directors interacting with
 17 insiders. Therefore, they could be better informed about firm activ-
 18 ities. When it comes to committee structures, we notice that large
 19 committees are prone to have a valuable diversity of views, which
 20 increases innovation investments. However, large committees could
 21 suffer interest conflicts and lead to unnecessary debate and delay in
 22 making decisions. We notice also that large committees are prone
 23 to suffer from process losses and diffusion of responsibilities, specif-
 24 ically in long-term and uncertain projects, such as R&D projects
 25 (Karamanou and Vafeas, 2005; Yang and Krishnan, 2005; and Cor-
 26 netti *et al.*, 2009). Consequently, it could influence negatively the
 27 communication and decision-making processes.

28 The complexity of the board selection process (Peterson and
 29 Philpot, 2007), in addition to many gender stereotypes, still makes
 30 it more difficult for a woman to be nominated on boards (Brière
 31 and Rinfret, 2010). The absence of females in corporate boards
 32 has become the focus of legislators and regulators in many coun-
 33 tries, especially with women being more risk-averse and adopting
 34 a trust-building approach than men, as proven in prior research
 35 (Daily and Dalton, 2003). Women's talents are still being under-
 36 utilized at decision-making levels. However, through this chapter, we
 37 try to show how the presence of females could change the dynamics
 38 of the board as well as the various board committees, which could
 39 influence innovative activities. We notice that gender diversity in
 40 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.

- 1 Adams, R. B. and Ferreira, D. (2009). Women in the Boardroom and
2 Their Impact on Governance and Performance. *Journal of Financial*
3 *Economics*, **94**(2): 291–309.
- 4 Anderson, R. C., Duru, A., and Reeb, D. M. (2009). Founders, heirs,
5 and corporate opacity in the United States. *Journal of Financial*
6 *Economics*, **92**(2), 205–222.
- 7 Alesina, A. and La Ferrara, E. (2005). Ethnic diversity and economic per-
8 formance. *Journal of Economic Literature*, **43**(3): 762–800.
- 9 Arregle, J. L., Hitt, M. A., Sirmon, D. G., and Very, P. (2007). The develop-
10 ment of organizational social capital: Attributes of family firm. *Journal*
11 *of Management Studies*, **44**(1): 73–95.
- 12 Arzubiage, U., Kotlar, J., De Massis, A., Maseda, A., and Iturralde, T.
13 (2018). Entrepreneurial orientation and innovation in family SMEs:
14 Unveiling the (actual) impact of the Board of Directors. *Journal of*
15 *Business Venturing*, **33**(4): 455–469.
- 16 Ballot, G., Fakhfakh, F., Galia, F., and Salter, A. (2015). The Fateful Tri-
17 angle: Complementarities between Product, Process and Organizational
18 Innovation in the UK and France. *Research Policy*, **44**(1): 217–232.
- 19 Balsmeier, B., Buchwald, A., and Stiebale, (2014). Outside directors on
20 the board and innovative firm performance. *Research Policy*, **43**(10):
21 1800–1815.
- 22 Balsmeier, B., Fleming, L., and Manso, G. (2017). Independent boards and
23 innovation. *Journal of Financial Economics*, **123**(3): 536–557.
- 24 Barker, V. L. and Mueller, G. (2002). CEO Characteristics and Firm R&D
25 Spending. *Management Science*, **48**(6): 711–820.
- 26 Bedard, J., Chtourou, S. M., and Courteau, L. (2004). The effect of audit
27 committee expertise, Independence, and Activity on Aggressive Earn-
28 ings Management. *Auditing: A Journal of Practice & Theory*, **23**(2):
29 13–35.
- 30 Belghiti-Mahut, S. and Lafont, A.-L. (2010). Lien entre présence des femmes
31 dans le top manage — ment et performance financière des entreprises
32 en France. *Gestion 2000*, **27**: 131–146.
- 33 Belloc, F. (2012). Corporate governance and innovation: a survey. *Journal*
34 *of Economic Surveys*, **26**(5): 835–864.
- 35 Bennouri, M., Chtioui, T., Nagati, H., and Nekhili, M. (2018). Female board
36 directorship and firm performance: What really matters? *Journal of*
37 *Banking & Finance*, **88**: 267–291.
- 38 Berliant, M. and Fujita, M. (2008). Knowledge creation as a square Dance
39 on the Hilbert cube. *International Economic Review*, **49**(4): 1251–1295.
- 40 Berliant, M. and Fujita, M. (2011). The dynamics of knowledge diver-
41 sity and economic growth. *Southern Economic Journal*, **77**(4):
42 856–884.

- 1 Bilimoria, D. and Piderit, S. K. (1994). Board committee membership:
2 Effects of sex-board bias. *Academy of Management Journal*, **37**(6):
3 1453–1477.
- 4 Black, B. S. and Khanna, V. S. (2007). Can Corporate Governance Reforms
5 Increase Firm Market Values? Event Study Evidence from India.
6 *Journal of Empirical Legal Studies*, **4**(4): 749–796.
- 7 Blibech, N. and Berraies, S. (2018). The impact of CEO' duality and board's
8 size and independence on firms' innovation and financial performance.
9 *Journal of Business Management and Economics*, **9**(1): 022–029.
- 10 Block, J. (2012). R&D investments in family and founder firms: An agency
11 perspective. *Journal of Business Venturing*, **27**(6): 248–265.
- 12 Block, J., Mille, D., Jaskiewicz, P., and Spiegel, F. (2013). Economic and
13 technological importance of innovations in large family and founder
14 firms: An analysis of patent data. *Family Business Review*, **26**(2):
15 180–199.
- 16 Blundell, R. and Bond, S. (1998). Initial conditions and moment restric-
17 tions in dynamic panel data models. *Journal of Econometrics*, **87**(1):
18 115–143.
- 19 Boubaker, S. and Labégorre, F. (2008). Ownership structure, corporate gov-
20 ernance and analyst following: A study of French listed firms. *Journal*
21 *of Banking & Finance*, **32**(6): 961–976.
- 22 Boulouta, I. (2013). Hidden Connections: The link between board gender
23 diversity and corporate social performance. *Journal of Business Ethics*,
24 **113**(2): 185–197.
- 25 Briere, S. and Rinfret, N. (2010). La réalité des femmes aux conseils
26 d'administration suite à l'adoption de la loi québécoise sur la gouver-
27 nance des sociétés d'État: obstacles et accès. *Revue Innovation. Sect.*
28 *Public*, **15**(1): article 18.
- 29 Brockmann, E. N. and Simmond, O. G. (1997). Strategic decision making:
30 The influence of CEO Experience and Use of Tacit Knowledge. *Journal*
31 *of Managerial*, **9**: 454–468.
- 32 Bucciol, A. and Miniaci, R. (2011). Household portfolios and implicit risk
33 preference. *Review of Economics and Statistics*, **93**(4): 1235–1250.
- 34 Byrd, J. W. and Hickman, K. A. (1992). Do outside directors monitor
35 managers? *Journal of Financial Economics*, **32**(2): 195–221.
- 36 Cadbury Committee, (1992). *Report on the Financial Aspects of Corporate*
37 *Governance*. Gee, London.
- 38 Campbell, K. and Minguez-Vera, A. (2008). Gender diversity in the board-
39 room and firm financial performance. *Journal of Business Ethics*, **83**:
40 435–451.
- 41 Carney, M. (2005). Corporate governance and competitive advantage in
42 family-controlled firms. *Entrepreneurship Theory and Practice*, **29**(3):
43 249–265.

- 1 Carter, D. A., Simkins, B. J., and Simpson, W. G. (2010). The gender and
2 ethnic diversity of US boards and board committees and firm financial
3 performance. *Corporate Governance: An International Review*, **18**(5):
4 396–414.
- 5 Carter, D. A., D’souza, F. P., Simkins, B. J., and Simpson, W. G. (2003).
6 The diversity of corporate board committees and firm financial perfor-
7 mance. *SSRN Electronic Journal*. doi:10.2139/ssrn.972763.
- 8 Carpenter, M. A. and Westphal, J. D. (2001). The strategic context of
9 external network ties: Examining the impact of director appointments
10 on board involvement in strategic decision making. *Academy of Man-
11 agement Journal*, **44**: 639–660.
- 12 Chang, S. J., Chung, C., and Mahmood, I. P. (2006). When and how does
13 business group affiliation promote firm innovation? A tale of two emerg-
14 ing economies. *Organization Science*, **17**: 637–656.
- 15 Chemmanur, T. J., Elena, L., and Xuan, T. (2014). Corporate venture
16 capital, value creation, and innovation. *Review of Financial Studies*,
17 **27**: 2434–2473.
- 18 Chen, C. and Bou-Wen, L. (2016). Ownership structure, independent
19 board members and innovation performance: A contingency perspec-
20 tive. *Journal of Business Research*, **69**(9): 3371–3379.
- 21 Chen, H. L. and Hsu, W. T. (2009). Family ownership, board independence,
22 and R&D investment. *Family Business Review*, **22**(4): 347–362.
- 23 Chen, H. L. (2013). CEO tenure, independent directors and corporate inno-
24 vation. *Journal of Applied Finance and Banking*, **3**: 187–197.
- 25 Chen, J., Leung, W. S., and Evans, K. P. (2018). Female board representa-
26 tion, corporate innovation and firm performance. *Journal of Empirical
27 Finance*, **48**: 236–254.
- 28 Chen, L. and Yang, W. (2019). R&D tax credits and firm innovation: Evi-
29 dence from China. *Technological Forecasting and Social Change*, **146**:
30 233–241.
- 31 Chen, V. Y. S., Tsao, S-M., and Chen, G-Z. (2013). Founding family owner-
32 ship and innovation. *Asia-Pacific Journal of Accounting & Economics*,
33 **20**: 429–456.
- 34 Cho, S. and Kim, S. (2017). Horizon problem and firm innovation: The
35 influence of CEO career horizon, exploitation and exploration on break-
36 through innovations. *Research Policy*, **46**(10): 1801–1809.
- 37 Choi, J. J., Park, S. W., and Yoo, S. S. (2007). The value of outside direc-
38 tors: Evidence from corporate governance reform in Korea. *Journal of
39 Financial and Quantitative Analysis*, **42**: 941– 962.
- 40 Choi, S. B., Lee, S., and Williams, C. (2011). Ownership and firm innovation
41 in a transition economy: Evidence from China. *Research Policy*, **40**(3):
42 441–452.

- 1 Choi, S. B., Park, B., and Hong, P. (2012). Does ownership structure mat-
2 ter for firm technological innovation performance? The case of Korean
3 firms. *Corporate Governance: An International Review*, **20**(3): 267–288.
- 4 Chrisman, J. and Patel, P. (2012). Variations in R&D investments of fam-
5 ily and nonfamily firms: Behavioral agency and myopic loss aversion
6 perspectives. *Academy of Management Journal*, **55**(4): 976–997.
- 7 Claessens, S., Djankov, S., and Lang, L. H. (2000). The separation of own-
8 ership and control in East Asian Corporations. *Journal of Financial*
9 *Economics*, **58**: 81–112.
- 10 Corett, M. M., McNutt, J. J., and Tehranian, H. (2009). Corporate gover-
11 nance and earnings management at large U.S. bank holding companies.
12 *Journal of Corporate Finance*, **15**(4): 412–430.
- 13 Cox, T. H., Lobel, S. A., and Mcleod, P. (1991). Effects of Ethnic Group
14 Cultural Differences on Cooperative and Competitive Behavior a Group
15 Task. *Academy of Management Journal*, **34**(4): 827–847.
- 16 Croson, R. and Gneezy, U. (2009). Gender differences in preferences.
17 *Journal of Economic Literature*, **47**(2): 448–74.
- 18 Curimbaba, F. (2002). The Dynamics of Women’s Roles as Family Business
19 Managers. *Family Business Review*, **15**(3), 239–252.
- 20 Czarnitzki, D., Hanel, P., and Rosa, J. M. (2011). Evaluating the impact of
21 R&D tax credits on innovation: A microeconomic study on Canadian
22 firms. *Research Policy*, **40**(2): 217–229.
- 23 Daellenbach, U. D., McCarthy, A. M., and Schoenecker, T. S. (1999). Com-
24 mitment to innovation: The impact of top management team charac-
25 teristics. *R&D Management*, **29**(3): 199–208.
- 26 Daily, C. M., Dalton, D. R., and Cannella, A. A. (2003). Corporate Gover-
27 nance: Decades of Dialogue and Data. *Academy of Management Review*,
28 **28**(3): 371–382.
- 29 Dalziel, T., Gentry, R. J., and Bowerman, M. (2011). An integrated agency–
30 resource dependence view of the influence of directors’ human and rela-
31 tional capital on firms’ R&D spending. *Journal of Management Studies*,
32 **48**(6): 1217–1242.
- 33 De Massis, A., Frattini, F., and Lichtenthaler, U. (2013). Research on tech-
34 nological innovation in family firms: Present debates and future direc-
35 tions. *Family Business Review*, **26**(1): 10–3.
- 36 Deli, D. N. and Gillan, S. L. (2000). On the Demand for Independent
37 and Active Audit Committees. *Journal of Corporate Finance*, **6**(4):
38 427–445.
- 39 Demb, A. and Neubauer, F.-F. (1992). The corporate board: Confronting
40 the paradoxes. *Long Range Planning*, **25**(3): 9–20.
- 41 Deutsch, Y. (2005). The impact of board composition on firms’ critical
42 decisions: A Meta-Analytic Review. *Journal of Management*, **31**(3):
43 424–444.

- 1 Diaz-Garcia, C., Gonzalez-Moreno, A., and Saez-Martinez, F. (2013). Gen-
2 der Diversity within R&D Teams: Its Impact on Radicalness of Inno-
3 vation. *Innovations: Management, Policy & Practice*, **15**(2): 149–160.
- 4 Dieguez-Soto, J., Manzanegue, M., and Rojo-Ramirezjojo-Ramirez, A.
5 (2016). Technological Innovation Inputs, Outputs, and Performance:
6 The Moderating Role of Family Involvement in Management. *Family*
7 *Business Review*, **29**(3): 327–346.
- 8 Duran, P., Kammerlander, N., Van Essen, M., and Zellweger, T. (2015).
9 Doing more with less: Innovation input and output in family firms.
10 *Academy of Management Journal*, **59**(4): 1224–1264.
- 11 Elstad, B. and Ladegard, G. (2012). Women on corporate boards: Key
12 influencers or tokens? *Journal of Management & Governance*, **16**(4):
13 595–615.
- 14 Escriba-Esteve, A., Sanchez-Peinado, L., and Sánchez-Peinado, E. (2009).
15 The influence of top management teams in the strategic orientation and
16 performance of small and medium-sized enterprises. *British Journal of*
17 *Management*, **20**(4): 581–597.
- 18 European Commission (2011). Green Paper: The EU corporate governance
19 framework, 164 final, April 5, 2011, article 1.1.7.
- 20 European Commission (2012). Proposal for a directive of the european par-
21 liament and of the council on improving the gender balance among
22 Non-executive directors of companies listed on stock exchanges and
23 related measures. [https://eur-lex.europa.eu/legalcontent/EN/TXT/?](https://eur-lex.europa.eu/legalcontent/EN/TXT/?uri=$CELEX%3A52012PC0614)
24 [uri=\\$CELEX%3A52012PC0614](https://eur-lex.europa.eu/legalcontent/EN/TXT/?uri=$CELEX%3A52012PC0614) (Accessed May 16, 2019).
- 25 European Commission (2014). Report on equality between women
26 and men. Retrieved from [http://ec.europa.eu/justice/gender-equality/](http://ec.europa.eu/justice/gender-equality/files/annualreports/150324.annual_report_2014_web_en.pdf)
27 [files/annualreports/150324.annual_report_2014_web_en.pdf](http://ec.europa.eu/justice/gender-equality/files/annualreports/150324.annual_report_2014_web_en.pdf). (Accessed
28 1 Mar 2017).
- 29 Faccio, M., Marchica, M. T., and Mura, R. (2016). CEO Gender, Corpo-
30 rate Risk-Taking, and the Efficiency of Capital Allocation. *Journal of*
31 *Corporate Finance*, **39**: 193–209.
- 32 Fahlenbrach, R., Low, A., and Stulz, R. M. (2010). Why Do Firms Appoint
33 CEOs as Outside Directors? *Journal of Financial Economics*, **97**(1):
34 12–32.
- 35 Faleye, O., Hoitash R., and Hoitash, U. (2011). The Costs of Intense Board
36 Monitoring. *Journal of Financial Economics*, **101**(1): 160–181.
- 37 Fama, E. F. and Jensen, M. C. (1983). Separation of ownership and control.
38 *Journal of Law and Economics*, **26**: 301–325.
- 39 Finkelstein, S., Reeger, R., and Hambrick, D. C. (1996). Strategic Leader-
40 ship: Top Executives and Their Effects on Organizations. *The Academy*
41 *of Management Review*, **22**(3): 802–805.

- 1 Fujita, M., and Weber, S. (2004). Strategic immigration policies and welfare
2 in heterogeneous countries. FEEM Working Paper No. 2.
- 3 Gabriëlsso, J. and Winlund, H. (2000). Boards of directors in small and
4 medium-sized industrial firms: Examining the effects of the board's
5 working style on board task performance. *Entrepreneurship & Regional
6 Development*, **12**(4): 311–330.
- 7 Galia, F. and Zenou, E. (2013). La diversité du conseil d'administration
8 influence-t-elle l'innovation? L'impact de la diversité de genre et d'âge
9 sur les différents types d'innovation. *Management & Avenir*, **66**(8):
10 152.
- 11 Galia, F., Zenou, E., and Ingham, M. (2015). Board composition and
12 environmental innovation: Does gender diversity matter? *International
13 Journal of Entrepreneurship and Small Business*, **24**(1); 117.
- 14 Gendron, Y. and Bedard, J. (2006). On the constitution of audit committee
15 effectiveness. *Accounting, Organizations and Society*, **31**(3): 211–239.
- 16 George, G. and Lin, Y. (2016). Analytics, Innovation and Organizational
17 Adaptation. *Innovation*, **19**(1): 16–22.
- 18 Godard, L. and Schatt A. (2005). Characteristics and operation of the
19 French boards of directors. An inventory survey. *Revue Française de
20 Gestion*, **158**: 69–87.
- 21 Goodstein, J., Gautam, K., and Boeker, W. (1994). The effects of board
22 size and diversity on strategic change. *Strategic Management Journal*,
23 **15**: 241–250.
- 24 Greenbury, R. (1995). *Directors' Remuneration: Report of A Study Group*.
25 Gee Publishing, London.
- 26 Gregory-Smith, I., Main, B. G. M., and O'reilly, C. A. (2014). Appoint-
27 ments, Pay and Performance in UK Boardrooms by Gender. *The Eco-
28 nomic Journal*, **124**(574): F109–F128.
- 29 Guo, L. and Masulis, R. W. (2015). Board structure and monitoring: New
30 evidence from CEO turnovers. *Review of Financial Studies*, **28**(10):
31 2770–2811.
- 32 Hall, B. H. and Van Reenen, J. (2000). How effective are fiscal incentives
33 for R&D? A review of the evidence. *Research Policy*, **29**: 449–469.
- 34 Hampel, R. (1998). *Committee on corporate governance: Final Report*. Gee,
35 London.
- 36 Harrison, J. R. (1987). The strategic use of corporate board committees.
37 *California Management Review*, **30**(1): 109–125.
- 38 Hauck, J. and Prugl, R. (2015). Innovation activities during intra-family
39 leadership succession in family firms: An empirical study from a socioe-
40 motional wealth perspective. *Journal of Family Business Strategy*, **6**(2):
41 104–118.

- 1 Hillman, A. J., Shropshire, C., and Cannella, A. A. (2007). Organizational
2 predictors of women on corporate boards. *Academy of Management*
3 *Journal*, **50**(4): 941–952.
- 4 Hillman, A. J., Cannella, A. A., and Harris, I. C. (2002). Women and racial
5 minorities in boardroom: How do directors differ? *Journal of Manage-*
6 *ment*, **28**(6): 747–763.
- 7 Hillman, A. J. and Dalziel, T. (2003). Boards of directors and firm per-
8 formance: Integrating Agency and Resource Dependence Perspectives.
9 *Academy of Management Review*, **28**(3): 383–396.
- 10 Hirshleifer, D., Angie, L., and Siew, H. T. (2012). Are overconfident CEOs
11 better innovators? *Journal of Finance*, **67**: 1457–1498.
- 12 Hitt, M. A., Hoskisson, R. E., Johnson, R. A. and Moesel, D. D. (1996). The
13 market for corporate control and firm innovation. *Academy of Manage-*
14 *ment Journal*, **39**(5): 1084–1119.
- 15 Hodgkinson, G. P. (2003). The interface of cognitive and industrial, work
16 and organizational psychology. *Journal of Occupational and Organiza-*
17 *tional Psychology*, **76**(1): 1–25.
- 18 Hoskisson, R. E., Hitt, M. A., Johnson, R. A., and Grossman, W. (2002).
19 Conflicting voices, the effects of institutional ownership heterogeneity
20 and internal governance on corporate innovation strategies. *Academy*
21 *of Management Journal*, **45**(4): 697–716.
- 22 Hsu, P.-H., Huang, S., Massa, M., and Zhang, H. (2014). The new lyrics
23 of the old folks: The role of family ownership in corporate innovation.
24 INSEAD Faculty & Research Working Paper.
- 25 Huse, M. (2007). *Boards, governance and value creation: The human side*
26 *of corporate governance*. Cambridge University Press, 392.
- 27 ILO (2001). *Breaking through the Glass Ceiling: Women in Management*,
28 International Labour Office, Geneva, Switzerland.
- 29 Jackling, B. and Johl, S. (2009). Board Structure and Firm Performance:
30 Evidence from India's Top Companies. *Corporate Governance: An*
31 *International Review*, **17**(4): 492–509.
- 32 Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure
33 of internal control systems. *Journal of Finance*, **48**(3): 831–880.
- 34 Jermias, J. (2007). The effects of corporate governance on the relation-
35 ship between innovative efforts and performance¹. *European Accounting*
36 *Review*, **16**(4): 827–854.
- 37 Jia, N. (2016). Should Directors Have Term Limits? Evidence from corpo-
38 rate innovation. *European Accounting Review*, **26**(4): 755–785.
- 39 Jiang, Y. and Zhang, L. (2015). Top management characteristics and
40 sustainable growth of small and medium sized enterprises: From the
41 Perspective of Managerial Entrenchment Theory. *Journal Economic*
42 *Review*, **5**: 69–77.

- 1 Jiao, H., Koo, C. K., and Cui, Y. (2015). Legal environment, government
2 effectiveness and firms' innovation in China: Examining the moderat-
3 ing influence of government ownership. *Technological Forecasting and*
4 *Social Change*, **96**: 15–24.
- 5 Jiraporn, P., Singh, M., and Lee, C. I. (2009). Ineffective corporate gover-
6 nance: Director Business and board committee memberships. *Journal*
7 *of Banking & Finance*, **33**(5): 819–828.
- 8 Kaczmarek, S., Kimino, S., and Pye, A. (2012). Antecedents of board com-
9 position: The role of nomination committees. *Corporate Governance: An*
10 *International Review*, **20**(5): 474–489.
- 11 Kang, H., Cheng, M., and Gray, S. J. (2007). Corporate governance and
12 board composition: Diversity and independence of Australian boards.
13 *Corporate Governance: An International Review*, **15**(2): 194–207.
- 14 Kanter, R. M. (1977). *Men and women of the corporation*. New York: Basic
15 Books.
- 16 Karamanou, I. and Vafeas, N. (2005). The association between corpo-
17 rate boards, audit committees, and management earnings forecasts: An
18 empirical analysis. *Journal of Accounting*, **43**(3).
- 19 Kaymak, T. and Bektas, E. (2008). East Meets West? Board characteris-
20 tics in an emerging market: Evidence from Turkish Banks. *Corporate*
21 *Governance: An International Review*, **16**(6): 550–561.
- 22 Kelton, A. S. and Yang, Y. (2008). The impact of corporate governance on
23 Internet financial reporting. *Journal of Accounting and Public Policy*,
24 **27**(1): 62–87.
- 25 Kerr, W. and Lincoln, W. (2010). The supply side of innovation: H-1B Visa
26 Reforms and U.S. Ethnic Invention. *Journal of Labor Economics*, **28**: 3.
- 27 Kesner, I. F. (1988). Directors' characteristics and committee membership:
28 An investigation of type, occupation, tenure, and gender. *Academy of*
29 *Management Journal*, **31**(1): 66–84.
- 30 Khaled, S., Hichem, K., and Khaled, H. (2015). The impact of board
31 and audit committee characteristics on voluntary disclosure: A meta-
32 analysis. *Journal of International Accounting, Auditing and Taxation*,
33 (24): 13–28.
- 34 Klein, A. (1998). Firm performance and board committee structure. *The*
35 *Journal of Law and Economics*, **41**(1): 275–304.
- 36 Klein, A. (2002). Audit committee, board of director characteristics, and
37 earnings management. *Journal of Accounting and Economics*, **33**(3):
38 375–400.
- 39 Kobayashi, Y. (2013). Effect of R&D tax credits for SMEs in Japan: A
40 microeconomic analysis focused on liquidity constraints. *Small Busi-*
41 *ness Economics*, **42**(2): 311–327.

- 1 Konig, A., Kammerlander, N., and Enders, A. (2013). The family innova-
2 tor's dilemma: How family influence affects the adoption of discontinu-
3 ous technologies by incumbent firms. *Academy of Management Review*,
4 **38**: 418–441.
- 5 Kor, Y. Y. (2006). Direct and interaction effects of top management team
6 and board compositions on R&D investment strategy. *Strategic Man-
7 agement Journal*, **27**(11): 1081–1099.
- 8 Kor, Y. Y. and Misangyi, V. F. (2008). Outside directors' industry-
9 specific experience and firms' liability of newness. *Strategic Manage-
10 ment Journal*, **29**: 1345–1355.
- 11 Kor, Y. Y. and Sundaramurthy, C. (2008). Experience-based human capital
12 and social capital of outside directors. *Journal of Management*, **35**(4):
13 981–1006.
- 14 Krishnan, J. (2005). Audit committee quality and internal control: An
15 empirical analysis. *The Accounting Review*, **80**: 649–675.
- 16 Kubota, K. and Takehara, H. (2018). Firm-level innovation by
17 Japanese family firms: Empirical analysis using multidimensional
18 innovation measures. *Pacific-Basin Finance Journal*, doi:10.1016/
19 j.pacfin.2018.05.012.
- 20 Kuo, H. C., Wang, L. H., and Yeh, L. J. (2018). The role of education of
21 directors in influencing firm R&D investment. *Asia Pacific Manage-
22 ment Review*, **23**(3): 108–120.
- 23 Latane, B. (1981). The psychology of social impact. *American Psychologist*,
24 **36**: 343–356.
- 25 Lee, P. M. and O'Neill, H. M. (2003). Ownership structures and R&D invest-
26 ments of U.S. and Japanese firms, agency and stewardship perspectives.
27 *Academy of Management Journal*, **46**(2): 212–225.
- 28 Leung, S., Richardson, G., and Jaggi, B. (2014). Corporate board and board
29 committee independence, firm performance, and family ownership con-
30 centration: An analysis based on Hong Kong firms. *Journal of Contem-
31 porary Accounting & Economics*, **10**(1): 16–31.
- 32 Lin, C., Lin, P., Song, F. M., and Li, C. (2011). Managerial incentives,
33 CEO characteristics and corporate innovation in China's private sector.
34 *Journal of Comparative Economics*, **39**(2): 176–190.
- 35 Lin, P., Hutchinson, M. R., and Percy, M. (2009). The role of the audit
36 committee and institutional investors in constraining earnings manage-
37 ment: evidence from Chinese firms listed in Hong Kong. *Proceedings of
38 Accounting & Finance Association of Australia & New Zealand Annual
39 Conference 2009*, 5–7 July 2009.
- 40 Linck, J., Netter, M., and Yang, T. (2008). The determinants of board
41 structure. *Journal of Financial Economics*, **2**: 308–328.

- 1 Lodh, S., Nandy, M., and Chen, J. (2014). Innovation and family own-
2 ership: Empirical evidence from India. *Corporate Governance: An*
3 *International Review*, **22**(1): 4–23.
- 4 Loukil, N. and Yousfi, O. (2015). Does Gender Diversity on Board Lead to
5 Risk-Taking? Empirical Evidence from Tunisia. *Canadian Journal of*
6 *Administrative Sciences*, doi:10.1002/cjas.1326.
- 7 Lu, J. and Wang, W. (2018). Managerial conservatism, board independence
8 and corporate innovation. *Journal of Corporate Finance*, **48**: 1–16.
- 9 Lundvall, B. A., Johnson, B., Andersen, E. S., and Dalum, B. (2002).
10 National systems of production, innovation and competence building.
11 *Research Policy*, **31**(2): 213–231.
- 12 Lynall, M. D., Golden, B. R., and Hillman, A. J. (2003). Board composition
13 from adolescence to maturity: A multitheoretic view. *The Academy of*
14 *Management Review*, **28**(3): 416.
- 15 Ali, M., Lu, Y., and Kulik, C. (2014). Board age and gender diversity: A
16 test of competing linear and curvilinear predictions. *Journal of Business*
17 *Ethics*, **125**(3): 497–512.
- 18 Mahadeo, J.-D., Soobaroyen, T., and Hanuman, V. (2012). Board compo-
19 sition and financial performance: Uncovering the effects of diversity in
20 an emerging economy. *Journal of Business Ethics*, **105**(3): 375–388.
- 21 Mairesse, J. and Mohnen, P. (2005). The importance of R&D for innova-
22 tion: A reassessment using French survey data. *Journal of Technology*
23 *Transfer*, **30**(1/2): 183–197.
- 24 Mangena, M. and Pike, R. (2005). The effect of audit committee share-
25 holding, financial expertise and size on interim financial disclosures.
26 *Accounting and Business Research*, **35**(4): 327–349.
- 27 Manso, G. (2011). Motivating innovation. *The Journal of Finance: The*
28 *American Finance Association*, **66**(5): 1823–1860.
- 29 Menon, K. and Williams, Jd. (1994). The use of audit committees
30 for monitoring. *Journal of Accounting and Public Policy*, **13**(2):
31 121–139.
- 32 Miller, T. and Del Carmen Triana, M. (2009). Demographic diversity in the
33 boardroom: Mediators of the board diversity-firm performance relation-
34 ship. *Journal of Management Studies*, **46**(5): 755–786.
- 35 Nahlinder, J. (2010). Where are all the female innovators? Nurses as inno-
36 vators in a public sector innovation project. *Journal of Technology*
37 *Management & Innovation*, **5**(1).
- 38 Nekhili, M. and Gatfaoui, H. (2013). Are demographic attributes and firm
39 characteristics drivers of gender diversity? Investigating women’s posi-
40 tions on french boards of directors. *Journal of Business Ethics*, **118**(2):
41 227–249.

- 1 Niederle, M., Vesterlund, L. (2007). Do women shy away from competition?
2 Do men compete too much? *Quarterly Journal of Economics*, **122**(3):
3 1067–1101.
- 4 Nielsen, S. and Huse, M. (2010). The contribution of women on boards of
5 directors: Going beyond the Surface. *Corporate Governance: An Inter-*
6 *national Review*, **18**(2): 136–148.
- 7 Nonaka, I. and Takeuchi, H. (1995). *The knowledge-creating company:*
8 *How japanese companies create the dynamics of innovation*. Oxford
9 University Press, New York.
- 10 Østergaard, C., Timmermans, B., and Kristinsson, K. (2011). Does a dif-
11 ferent view create something new? The effect of employee diversity on
12 innovation. *Research Policy*, **40**(3): 500–509.
- 13 Paff, L. A. (2005). State-level R&D tax credit: A firm-level analysis, *Topics*
14 *in Economic Analysis & Policy*, **5**, Article 17.
- 15 Pathan, S. and Faff, R. (2013). Does board structure in banks really affect
16 their performance? *Journal of Banking and Finance*, **37**(5): 1573–1589.
- 17 Peterson, C. A. and Philpot, J. (2007). Women’s roles on U. S. Fortune
18 500 boards: Director expertise and committee memberships. *Journal of*
19 *Business Ethics*, **72**: 177–196.
- 20 Pfeffer, J. and Salancik, G. R. (1979). The external control of organiza-
21 tions: A resource dependence perspective. *The Academy of Manage-*
22 *ment Review*, **4**(2): 309.
- 23 Post, C. and Byron, K. (2015). Women on boards and firm financial per-
24 formance: A Meta-Analysis. *Academy of Management Journal*, **58**(5):
25 1546–1571.
- 26 Powell, G. N. (1988). *Women and men in management*. Newbury, CA: Sage.
- 27 Prencipe, A. (2016). Board composition and innovation in university. Spin-
28 offs. Evidence from the Italian Context. *Journal of Technology Man-*
29 *agement and Innovation*, **11**(3): 33–39.
- 30 Raghunandan, K. Dasaratha, V. Rama, William J. Read. (2001). Audit
31 committee composition, “Gray Directors,” and interaction with internal
32 auditing. *Accounting Horizons*, **15**(2): 105–118.
- 33 Reeb, A. and Upadhyay, A. (2010). Subordinate board structures. *Journal*
34 *of Corporate Finance*, **16**(4): 469–486.
- 35 Rod, I. (2016). Disentangling the family firm’s innovation process: A sys-
36 tematic review. *Journal of Family Business Strategy*, **7**(3): 185–201.
- 37 Ronald, C., Anderson, D. M., Reed Arun, U., and Wanli, Z. (2011). The
38 economics of director heterogeneity. *Financial Management*, **40**(1):
39 5–38.
- 40 Rosenstein, S. and Wyatt, J. G. (1990). Outside directors, board indepen-
41 dence, and shareholder wealth. *Journal of Financial Economics*, **26**(2):
42 175–191.

- 1 Ruigrok, W., Peck, S. Tacheva, S Greve, P., and Hu, Y. (2006). The
2 determinants and effects of board nomination committees. *Journal of*
3 *Management & Governance*, **10**(2): 119–148.
- 4 Ruigrok, W., Peck, S., and Tacheva, S. (2007). Nationality and gender
5 diversity on swiss corporate boards. *Corporate Governance: An Inter-*
6 *national Review*, **15**: 546–557.
- 7 Ruigrok, W., Peck, S. I., and Keller, H. (2006). Board characteristics and
8 involvement in strategic decision making: Evidence from Swiss compa-
9 nies. *Journal of Management Studies*, **43**(5): 1201–1226.
- 10 Ruiqi, W., Wang, F, Xu, L., and Yuan, C. (2017). R&D expenditures, ulti-
11 mate ownership and future performance: Evidence from China. *Journal*
12 *of Business Research*, **71**: 47–54.
- 13 Ruiz-Jime Nez, J. M., Fuentes, M. D., and Ruiz Arroyo, M. (2016). Knowl-
14 edge combination capability and innovation: The effects of gender diver-
15 sity on top management teams in technology-based firms. *Journal of*
16 *Business Ethics*, **135**(3): 503–515.
- 17 Kobayashi, Y. (2013). Effect of R&D tax credits for SMEs in Japan: A
18 microeconomic analysis focused on liquidity constraints. *Small Busi-*
19 *ness Economics*, **42**(2): 311–327.
- 20 Krishnan, J. (2005). Audit committee quality and internal control: An
21 empirical analysis. *The Accounting Review*, **80**: 649–675.
- 22 Ryan, M. K., and Haslam, S. A. (2005). The glass cliff: Evidence that
23 women are over-represented in precarious leadership positions. *British*
24 *Journal of Management*, **16**(2): 81–90.
- 25 Sariol, A. M. and Abebe, M. A. (2017). The influence of CEO power on
26 explorative and exploitative organizational innovation. *Journal of Busi-*
27 *ness Research*, **73**: 38–45.
- 28 Sastre, J. F. (2015). The impact of R&D teams' gender diversity on inno-
29 vation outputs. *International Journal of Entrepreneurship and Small*
30 *Business*, **24**(1): 142.
- 31 Scott, S. G. and Bruce, R. A. (1994). Determinants of innovative behavior:
32 A path model of individual innovation in the workplace. *Academy of*
33 *Management Journal*, **37**: 580–607.
- 34 Sena, V., Duygun, M., Lubrano, G., Marra, M., and Shaban, M. (2018).
35 Board independence, corruption and innovation. Some evidence on UK
36 subsidiaries. *Journal of Corporate Finance*, **50**: 22–43.
- 37 Shapiro, D., Tang, Y., Wang, M., and Zhang, W. (2013). The effects of
38 corporate governance on the innovation performance of Chinese SMEs.
39 *European Economic Review*, **50**: 155–183.
- 40 Sharma, Z. (2016). Board composition and innovation. *Applied Finance*
41 *Letters*, **5**(2): 12–31.

- 1 Sheikh, S. (2018). The impact of market competition on the relation
2 between CEO Power and firm innovation. *Journal of Multinational*
3 *Financial Management*, **44**: 36–50.
- 4 Shivdasani, A. and Yermack, D. (1999). CEO involvement in the selection
5 of new board members: An empirical analysis. *The Journal of Finance*,
6 **54**(5): 1829–1853.
- 7 Shleifer, A. and Vishny, R. W. (1997). A survey of corporate governance.
8 *The Journal of Finance*, **52**(2): 737–782.
- 9 Sheridan, A. and Milgate, G. (2005). Accessing board positions: A compar-
10 ison of female and male board members' views. *Corporate Governance: An International Review*, **13**(6): 847–855.
- 11 Silvio, B. M., Antonio, C., and Alessandra, R. (2012). Board diversity and
12 structure: What implications for investments in innovation? Empirical
13 evidence from Italian context. *Corporate Ownership and Control*, **10**(1):
14 9–25.
- 15 Singh, V. and Vinnicombe, S. (2004). Why so few women directors in
16 top UK boardrooms? Evidence and theoretical explanations. *Corpo-*
17 *rate Governance*, **12**(4): 479–488.
- 18 Singh, V. and Vinnicombe, S. (2008). Newly appointed directors in the
19 boardroom: How do women and men differ? *European Management*
20 *Journal*, **26**(1): 48–58.
- 21 Smith, N. and Parrotta, P. (2015). Why so few women on boards of direc-
22 tors? Empirical evidence from danish companies in 1998–2010. *Journal*
23 *of Business Ethics*, **147**(2): 445–467.
- 24 Sraer, D. and Thesmar, D. (2007). Performance and behaviour of family
25 firms: Evidence from the French stock market. *Journal of the European*
26 *Economic Association*, **5**(4): 709–751.
- 27 Srinidhi, B., Gul, F. A., and Tsui, J. (2011). Female directors and earnings
28 quality. *Contemporary Accounting Research*, **28**(5): 1610–1644.
- 29 Stiles, P. (1992). The corporate board: Confronting the paradoxes. *Long*
30 *Range Planning*, **25**(6): 113–114.
- 31 Sun, J., Cahan, S. F., and Emanuel, D. (2009). Compensation commit-
32 tee governance quality, chief executive officer stock option grants, and
33 future firm performance. *Journal of Banking & Finance*, **33**(8): 1507–
34 1519.
- 35 Talke, K., Salomo, S., and Rost, K. (2010). How top management team
36 diversity affects innovativeness and performance via the strategic choice
37 to focus on innovation fields. *Research Policy*, **39**(7): 907–918.
- 38 Terjesen, S., Sealy, R., and Singh, V. (2009). Women directors on corpo-
39 rate boards: A review and research agenda. *Corporate Governance: An*
40 *International Review*, **17**(3): 320–337.
- 41

- 1 Teruel, M., Parra, M. D., and Segarra, A. (2015). Gender diversity
2 and innovation in manufacturing and service firms. Working Papers
3 2072/249234, Universitat Rovira i Virgili, Department of Economics.
- 4 Torchia, M., Calabro, A., and Huse, M. (2011). Women directors on cor-
5 porate boards: From tokenism to critical mass. *Journal of Business*
6 *Ethics*, **102**(2): 299–317.
- 7 Torchia, M., Calabro, A., Gabldon, P., and Kanadli, S. B. (2018).
8 Women directors contribution to organizational innovation: A behav-
9 ior approach. *Scandinavian Journal of Management*, **34**(2): 215–224
- 10 Tuggle, C. S., Schnatterly, K., Johnson, R. A. (2010). Attention patterns
11 in the boardroom: How board composition and processes affect discus-
12 sion of entrepreneurial issues. *Academy of Management Journal*, **53**(3):
13 550–571.
- 14 Turner, L. (2009). Gender diversity and innovative performance. *Inter-
15 national Journal Innovation and Sustainable Development*, **4**(2/3):
16 123–134.
- 17 Tyler, B. and Steensma, H. (1998). The effects of executives’ experiences
18 and perceptions on their assessment of potential technological alliances.
19 *Strategic Management Journal*, **19**(10): 939–965.
- 20 Upadhyay, A. D., Bhargava, R., and Faircloth, S. D. (2014). Board struc-
21 ture and role of monitoring committees. *Journal of Business Research*,
22 **67**(7): 1486–1492.
- 23 Van Den Berghe, L. A. A., and Levrau, A. (2004). Evaluating boards of
24 directors: What constitutes a good corporate board? *Corporate Gover-
25 nance*, **12**(4): 461–478.
- 26 Verbeke, A. and Kano, L. (2012). The transaction cost economics theory of
27 the family firm: FamilyBased human asset specificity and the bifurca-
28 tion bias. *Entrepreneurship Theory and Practice*, **36**(6): 1183–1205.
- 29 Villalonga, B. and Amit, R. H. (2006). How Do Family Ownership, Control,
30 and Management Affect Firm Value? *Journal of Financial Economics*,
31 **80**(2): 385–417.
- 32 Vincent, B. and George, M. (2002). CEO characteristics and Firm R&D
33 Spending. *Management Science*, **48**: 782–801.
- 34 Voordeckers, W., Van Gils, A., and Van Den Heuvel, J. (2007). Board com-
35 position in small and medium-sized family firms. *Journal of Small Busi-
36 ness Management*, **45**(1): 137–156.
- 37 Wang, S., Zhang, S., Li, and Bobo, (2017). Effect of diversity on top man-
38 agement team to the bank’s innovation ability-based on the nature of
39 ownership perspective. *Procedia Engineering*, **174**: 240–245.
- 40 Wei, L. Q. and Ling G. (2015). CEO characteristics and corporate
41 entrepreneurship in transitions economies: Evidence from China. *Jour-
42 nal of Business Research*, **68**(6): 1157–1165.

- 1 Westhead, P. and Cowling, M. (1998). Family firm research: The need for a
2 methodological rethink. *Entrepreneurship: Theory and Practice*, **23**(1):
3 31–57.
- 4 Westphal, J. D. and Milton, L. P. (2000). How experience and network
5 ties affect the influence of demographic minorities on corporate boards.
6 *Administrative Science Quarterly*, **45**(2): 366.
- 7 Westphal, J. D. and Zajac, E. J. (1995). Who shall govern? CEO/board
8 power, demographic similarity, and new director selection. *Administra-*
9 *tive Science Quarterly*, 60–83.
- 10 Wincent, J., Anokhin, S., and Ortqvist, D. (2010). Does network board
11 capital matter? A study of innovative performance in strategic SME
12 network. *Journal of Business Research*, **63**(3): 265–275.
- 13 Wu, Y. (2005). The effects of state R&D tax credits in stimulating private
14 R&D expenditure: A cross-state empirical analysis. *Journal of Policy*
15 *Analysis and Management*, **24**(4): 785–802.
- 16 Xie, B., Davidson, W. N., and Dadalt, P. J. (2003). Earnings management
17 and corporate governance: The role of the board and the audit com-
18 mittee. *Journal of Corporate Finance*, **9**(3): 295–316.
- 19 Xu, X. and Wang, Y. (1999). Ownership structure and corporate governance
20 in chinese stock companies. *China Economic Review*, **10**(1): 75–98.
- 21 Yang, J. S., and Krishnan, J. (2005). Audit committees and quarterly earn-
22 ings management. *International Journal of Auditing*, **9**(3): 201–219.
- 23 Yi, J., Hong, J., Hsu, W. Chung., and Wang, C. (2017). The role of state
24 ownership and institutions in the innovation performance of emerging
25 market enterprises: Evidence from China. *Technovation*, 62–63, 4–13.
- 26 Yuan, R., and Wen, W. (2017). Managerial foreign experience and corporate
27 innovation. *Journal of Corporate Finance*, **48**: 752–770.
- 28 Zalata A. M., Taurigana, V., and Tingbani, I. (2018). Audit committee
29 financial expertise, gender, and earnings management: Does gender of
30 the financial expert matter? *International Review of Financial Analy-*
31 *sis*, **55**: 170–183.
- 32 Zhang, Y., Zhou, J., and Zhou, N. (2007). Audit committee quality, auditor
33 independence, and internal control weaknesses. *Journal of Accounting*
34 *and Public Policy*, **26**(3): 300–327.
- 35 Zhou, H., Owusu-Ansah, S., and Maggina, A. (2018). Board of directors,
36 audit committee, and firm performance: Evidence from Greece. *Journal*
37 *of International Accounting, Auditing and Taxation*, **31**: 20–36.
- 38 Zona, F., Zattoni, A., and Minichilli, A. (2013). A contingency model of
39 boards of directors and firm innovation: The moderating role of firm
40 size. *British Journal of Management*, **24**(3): 299–31.