

The contribution of board of directors' roles to ambidextrous innovation

Do board's gender diversity and independence matter?

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Abstract

Purpose – The purpose of this paper is to examine the link between board of directors' roles namely strategy, service and control roles and ambidextrous innovation. This study also aims to determine whether the independence and gender diversity of boards have mediating effects in this relationship.

Design/methodology/approach – On the basis of a quantitative approach, the authors conducted a survey on all Tunisian-listed firms. A partial least square method was used to analyze the quantitative data. The authors also conducted semi-structured interviews with a sample of boards' members of the surveyed firms followed by a thematic analysis of the discourses to discuss the results.

Findings – Results revealed that ambidextrous innovation is negatively linked to board's control role. The outcomes of this research show also that ambidextrous innovation is positively associated with board's service role and that the gender diversity moderates positively this link. Findings do not indicate a significant relationship between board's strategy role and ambidextrous innovation but show evidence that the relationship is negatively moderated by independent directors, while positively moderated by gender diversity.

Originality/value – This research sheds light on the effects of Boards' roles on ambidextrous innovation and the moderating effect of board's gender diversity and independence as well. This paper addresses the gap in the literature as this thematic has not been studied, offering key insights with regard to corporate governance of companies looking to achieve ambidextrous innovation.

Keywords Gender diversity, Exploration, Exploitation, Ambidextrous innovation, Board of directors' roles, Independent board

Paper type Research paper

1. Introduction

In an environment characterized by rough competition, rapid technological development and permanent changing customers' needs, firms need to innovate by exploiting their established knowledge while simultaneously renew their portfolio of knowledge and exploring new opportunities (Levinthal and March, 1993).

In this perspective, the board of directors is a key governing body and a central element of the firms' strategy that plays an important role in initiating and organizing innovation projects (Berraies and Ben Rejeb, 2019). Researchers emphasized that board's contribution to innovation is particularly linked to its characteristics including its different roles and composition. Indeed, through the different tasks realized by the board's members, namely,



tasks of control, service and strategy, the board provides resources, knowledge, strategic advice and networking, which promote innovation (Galia *et al.*, 2015; Van Ees *et al.*, 2003). It defines strategic priorities, assesses inherent risks, defines resources allocation, supports risky strategies and influences the implementation of novel business models (Abebe and Myint, 2018; Shapiro *et al.*, 2015). This governing body also supervises and assists the CEO in setting strategic objectives, reduces agency costs and offers special expertise when it comes to make decisions on diversified investments and to assess the risks related, as it is the case for innovation projects (Wu and Wu, 2014).

Beyond board's roles, directors' profile is also identified as a key factor for innovation. As stated by Østergaard *et al.* (2011), diversity among teams is likely to nurture the knowledge base of companies and to boost the interaction between diverse types of knowledge and competences. In particular, gender diversity is the most important diversity issues related to board composition (Galia *et al.*, 2015). Indeed, in recent years, many governments imposed quotas to firms to allocate board's seats to women to promote gender diversity (Terjesen *et al.*, 2015). Among board's diversity aspects, the gender diversity is the common element of codes of good governance of several countries. Also, in many emerging countries like Tunisia, the governments have taken measures to encourage women's entrepreneurship and to fight against the glass ceiling facing women, yet as educated and competent as men (Hachana *et al.*, 2018). In this perspective, the issue of gender diversity of board of directors is thus particularly important. Some studies suggested the existence of a positive link between directors' gender diversity and innovation (Galia and Zenou, 2013; Galia *et al.*, 2015). The presence of women directors may improve board's roles performance by bringing strategic knowledge and expertise, providing better counseling to managers and ensuring participative decision making and better monitoring (Bear *et al.*, 2010; Nielsen and Huse, 2010). The integration of independent directors is also a major principle recommended by codes of good governance in several countries. In the perspective of strengthening the rules of good governance, the Central Bank of Tunisia issued in 2011 instructing credit institutions to appoint at least two independent directors in their boards. In this line, appointing independent directors may be a key factor to improve board's roles performance and to achieve innovation (Hoskisson *et al.*, 2002). Independent directors are likely to prevent CEOs' power abuses with regard to allocating resources for innovation and long-term objectives (Wong *et al.*, 2017). They are assumed to be more objective and impartial and they can play an important role with regard to searching an optimal combination of exploratory and exploitative innovations (Hoskisson *et al.*, 2002).

While a wide range of researchers have examined the effect of board's characteristics on exploratory and exploitative innovations, there are still important an unanswered question in the literature that should be addressed concerning the link between board's characteristics and innovation ambidexterity. Indeed, the way to balance between the two types of innovations that compete for limited resources represents a key challenge for the firm's competitiveness in short and long-term perspectives (Amponsah and Adams, 2017; Chanal and Mothe, 2005; March, 1991).

Prior studies have examined the contribution of the top and middle management to ambidextrous innovation (Andriopoulos and Lewis, 2009; Berraies and Bchini, 2019; Cantarello *et al.*, 2012), the contribution of boards of directors in ensuring a balance between exploitative innovation and exploratory innovation has n'ot been sufficiently addressed in the literature (Oehmichen *et al.*, 2017; Wong *et al.*, 2017). To address the gap in the literature, the objective of this study is to determine the effect of board's roles on ambidextrous innovation and to investigate the moderating effect of gender diversity and independence. Indeed, the impact of female directors and independent board members on innovation ambidexterity may depend on the nature of the tasks carried out by boards.

This research intends to address the following research question:

RQ1. How roles, status and composition on board of directors impact the way to balance between exploration and exploitation?

On the basis of the literature review, we develop a conceptual model highlighting the links between the variables in order to test it empirically using a sample of Tunisian-listed firms. This paper proceeds as follows: Section 2 discusses the theoretical framework, Section 3 highlights the methodology, Section 4 describes the empirical findings and, finally, Section 5 outlines a discussion of the results, the conclusions, the limitations and the research perspectives.

2. Literature background

Ambidextrous innovation

Innovation is a topical thematic at the heart of theoretical and managerial discourses, often highlighted as a key source of survival, competitiveness and performance of organizations (Berraies and Bchini, 2019; Zuraik and Kelly, 2018). This concept is defined as an iterative and multi-stage process whereby firms successfully convert ideas into products, services or processes that are improved or new to the organization and successfully broadcasted to stakeholders (Baregheh *et al.*, 2009; Utterback, 1971; Wong *et al.*, 2017). In this line, innovation can be classified according to its intensity and depending on whether the company exploits existing knowledge or explores new one. In this perspective, scholars have sought to identify the mechanism through which companies can achieve an appropriate mix of exploitation and exploration activities (March, 1991; O'Reilly and Tushman, 2013). Indeed, innovation ambidexterity is a key dynamic capability that permits pursuing simultaneously short-term returns and long-term innovative capabilities and resulting in optimal performance (Oehmichen *et al.*, 2017; Wong *et al.*, 2017; Zuraik and Kelly, 2018). Exploitative innovation is an incremental innovation and refers to a process of improvement of products and processes through the refinement of existing knowledge and competencies to serve existing customers and markets (Berraies and Hamouda, 2018; Li *et al.*, 2010). Moreover, exploratory innovation reflects radical changes in products, services or processes, which are the fruit of the exploration of new skills and knowledge in order to meet up the emerging customers and markets' needs (Benner and Tushman, 2003; Berraies and Hamouda, 2018). Focusing on exploration at the expense of exploitation and vice versa could be detrimental to firms' performance. A striking example in this sense is the bankruptcy of the Eastman Kodak company due to a very slow renewal of knowledge and a loss of a strategic capacity of the firm (Ermine, 2003). This firm put emphasis on exploitation of its photography technology without integrating quickly the new digital technology, which led to a knowledge crash (Ermine, 2003; Wong *et al.*, 2017). Indeed, exploitative innovation may lead to positive and predictable short-term profits but does not permit to adapt to changes and may engender knowledge obsolescence (March, 1991). Moreover, Wong *et al.* (2017) cited the example of Ericsson; having overinvested in exploration, the company could not adapt to commoditized markets, dismissed a large part of employees and closed the majority of its technology centers. Indeed, while exploratory innovation allows firms questioning routines, responding to customers needs' changes and being perceived by the customer as innovative, this type of innovation engenders uncertain and often negative returns on the short term and is costly and risky project (March, 1991). However, as stressed by numerous researchers, firms face challenge to pursuit in the same time exploration and exploitation (March, 1991). These activities are not easy to align (O'Reilly and Tushman, 2013). Following March (1991) and O'Reilly and Tushman (2013), we build our research on the logic considering that exploratory and exploitative innovations complement each other and must be pursued simultaneously rather than being mutually exclusive. In the line of the new trend of literature, we focus in this research on the effect of board's roles on ambidextrous innovation.

Boards' roles as antecedents of ambidextrous innovation

The analysis of corporate governance literature shows that authors agree that board's effectiveness depends on the degree of fulfillment of its roles (Nicholson and Kiel, 2007).

In this respect, each corporate governance theory attributes to boards specific roles to achieve corporate governance mission and, therefore, to maximize companies' performance. In this sense, scholars grouped the tasks of board into three interrelated roles, namely, control role, strategy and service roles (Zahra and Pearce, 1989; Levrain and Van den Bergh, 2007). In this section, we review literature on the effects of board' roles on ambidextrous innovation.

Board's control role and ambidextrous innovation

Board's control role is part of the disciplinary view of corporate governance where board's primary mission is to limit managers' opportunism and to protect shareholders interests. The control role is advocated by the agency theory that considers that board's role is to appoint and dismiss top executives, evaluate their management effectiveness and its impact on firm performance, reward and remunerate managers, oversee operational activities and monitor strategy implementation to ensure that shareholders' interests are protected and aligned with those of managers (Zahra and Pearce, 1989; Wu and Wu, 2014). In this sense, the control role is focused on two important components: financial and operational control, and strategic control (Baysinger and Hoskisson, 1990; Stiles and Taylor, 2001).

Financial and operational control relates to the evaluation of the financial performance and the company's resources allocation. It is based on the use of objective and measurable evaluation criteria. According to Shadab (2007), financial control is not conducive to innovation in general and compromises in particular exploratory innovation in particular. In this regard, agency theorists believe that managers, who are anxious to maintain their reputations in the labor market, tend to favor short-term performance by opting for exploitative innovations which are less risky than exploratory innovations and, more importantly, whose effects on financial performance are more visible in the short term than those of exploration (Munari and Sobrero, 2003). As a result of financial control, CEOs tend to be inclined to undertake risks. This leads to an imbalance in innovation ambidexterity as a result of focusing on exploitative innovation to the detriment of exploratory innovation (Wong *et al.*, 2017). Indeed, the aversion toward the risks induced by exploratory innovation and the threat of being fired creates managerial myopia among managers that tend to focus on short-term performance by promoting exploitative innovation (Faleye *et al.*, 2011; Zhang *et al.*, 2017). In this line, Benner and Tushman (2002) noted that control may unbalance ambidextrous innovation with more emphasis on exploitative innovation rather than exploratory innovation. This latter requires idiosyncratic investments by managers which involve significant and long-term risk taking (Faleye *et al.*, 2011). This issue is more pronounced in publicly traded companies that must regularly disclose and report their short-term financial results to investors and regulators of the financial market (Shadab, 2007). In addition, the stewardship theory considers that, to engage in exploratory innovation, the CEO must perceive the board as a support rather than a constraint (Hendry, 2002). Board's support provides the manager with a trust testimony and implicit guarantees encouraging him to take strategic risks. In this sense, Faleye *et al.* (2011) suggested that boards can lead managers to focus on more routine projects rather than on risky innovation projects whose results are perceptible in the long term. Along with this idea, Robeson and O'Connor (2013) stress that a strong focus on monitoring is likely to be counterproductive regarding exploratory innovation, which necessitates instead a proactive approach and visionary thinking. In addition to financial control, board monitoring role includes strategic control tasks. In this regard, Munari and Sobrero (2003) suggest that strategic control helps fostering long-term innovation if managers know that they will not be evaluated solely on the basis of short-term results. Strategic control can motivate them to apply their tacit knowledge of internal entrepreneurial resources and to engage in long-term innovation projects (Munari and Sobrero, 2003). However, board composition influences the execution of financial control and strategic control tasks (Baysinger and Hoskisson, 1990). In this

sense, Baysinger and Hoskisson (1990) consider that a board dominated by outside and non-executive directors, as is generally the case in listed companies, will favor the use of financial control as part of the control role due to information asymmetry and lack of knowledge of the operational decision-making processes of the company. In this regard, Goold and Quinn (1990) note that few companies have strategic control systems preventing them from exercising effective strategic control.

Thus, we can conclude that board's control role promotes exploitative innovation to the detriment of exploratory innovation, which is not in favor of ambidextrous innovation:

H1. Board's control role is negatively linked to ambidextrous innovation.

Board's service role and ambidextrous innovation

Several corporate governance theories, such as the resources dependency theory, stewardship theory or stakeholder theory, assign to the board a service role. Through this role, the board carries out external service tasks by extending the organization's boundaries through networking to access external resources (Stiles and Taylor, 2001) and perform internal service tasks through advice, counseling, support and mentoring of the management team (Forbes and Milliken, 1999).

Since innovation requires significant resources and information to control risks, boards play a crucial role to get an access to critical resources for innovation through service role. In this respect, board exploits its human, social and relational capital by using directors' experience, expertise and relationships to link the company to its environment and obtain the resources it needs (Hillman and Dalziel, 2003). The board advises, counsels and assists the manager in strategic issues by analyzing the challenges and identifying possible alternatives (Zahra and Pearce, 1989). The role of service provides a different perspective to improve the quality of the company's operations, to assist CEO in managing innovation risks and to give legitimacy to innovation projects (Boyd, 1990).

Networking tasks carried out through boards' service role provide strategic information on market developments and technology as well as information on competitors' maneuvers and consumers' needs (Pfeffer, 1991). Such information is important for exploratory innovation but also for improving the company's positioning in the short term through exploitative innovation. According to Wincent *et al.* (2010), networks help companies acquire the knowledge they need to innovate, master the associated risks and minimize their costs, which enables them to perform better at developing new products and process and improving existing ones. According to the social capital theory, board's networking tasks, favored by interlocking directorates, provide access to a flow of information and resources. According to Dalziel *et al.* (2011), board's social capital is an important factor in companies' investments in R&D. In this regard, Chen (2014) reported a positive link between interlocking directorates and the level of R&D. In the same vein, Carpenter and Westphal (2001) found that boards having developed relationships with strategic partners provide better advice, which can also improve exploitative and exploratory innovations. Jaskyte (2017) also revealed that firms innovate by improving current products or by designing new products when their boards are successful in exploiting and building networks, and exploiting information they absorb from these networks. Furthermore, the study of Wincent *et al.* (2010) showed that boards' relational networks associated to a diversity of expertise, improve total, radical and incremental innovation. Besides, due to the complexity, uncertain and risky nature of innovation, managers tend to favor exploitative innovation to achieve short-term results that will allow them to sustain themselves and safeguard their reputation (Hoskisson *et al.*, 2016) but also because top executives might not have the mental and cognitive abilities required to handle complex information in order to have a full understanding of future trends and to manage the complexity and risks induced by exploratory innovation (Hendry, 2002). In this sense, we can expect that board's service role is

likely to allow managers to have a balanced attitude toward exploitative and exploratory innovation through directors' social and human capital which provide a link between the organization and critical information and external resources essential to innovation. In addition, directors' counseling and advice help the manager to have a better understanding of environmental changes, which reduces manager's risks aversion and cognitive complexity related to exploratory innovation (Carpenter and Westphal, 2001). Thus, we can conclude that board's service role is likely to promote ambidextrous innovation by supporting top executives to invest in exploratory innovation in addition to exploitative innovation:

H2. Board's service role is positively linked to ambidextrous innovation.

Board's strategy role and ambidextrous innovation

Literature review on corporate governance shows a significant and growing interest of researchers in issues related to board involvement in strategy (Judge and Talaulicar, 2017; Wu and Wu, 2014). Some authors consider strategy role as the most important role of the board because of its position within the strategic summit of the organization but also as it is responsible to align the company with the environment's requirements (Boyd, 1990; Carpenter and Westphal, 2001). The agency theory suggests that boards should be involved in firms' strategic choices to prevent opportunistic strategic options due to the manager's entrenchment strategy (Mizruchi, 1983). Moreover, the resources dependence theory considers that the board supports the manager in the strategic process by simplifying information using directors' human and social capital (Hillman and Dalziel, 2003; Haynes and Hillman, 2010). As a strategist, the board mobilizes its human capital and tacit knowledge to intervene at all levels of the strategic process, namely the definition of company's mission and vision, the strategy initiation, the strategic decision making, the identification of strategic options and changes, and the strategy formulation or ratification and its implementation (Hendry and Kiel, 2004; Haynes and Hillman, 2010; Oehmichen *et al.*, 2017). In this sense, innovation is closely linked to board's strategy role as it is a strategic decision that engages resources, involves risks and impact companies' performance and durability (Wu and Wu, 2014). In this regard, several studies have reported direct and indirect links between board strategic involvement and innovation (Torchia *et al.*, 2011; Hoskisson *et al.*, 2002; Wu and Wu, 2014). However, the strategic contribution of the board of directors to organizational ambidexterity is absent from the discussions (Oehmichen *et al.*, 2017).

According to Huse (2007), the board's strategy role refers to "the development, maintenance and monitoring of the firms' core competencies with the purpose of achieving long-term results and survival." Huse's (2007) definition of board strategy role is consistent with the view of innovation ambidexterity by putting an emphasis on the imperative of achieving long-term objectives, eventually through exploration and, at the same time, ensuring the organization survival in the short term which could be done via exploitative activities. In this line of thought, Oehmichen *et al.* (2017) focus on board's role in balancing between exploitation and exploration through its involvement in strategy and the directors' tacit knowledge and expertise.

This perspective is confirmed by contemporary views of strategy which put an emphasis on the need of boards' agility in strategic decision making. In a context of increasing complexity and changing environments, some authors using the concepts of corporate entrepreneurship and strategic leadership, consider that some conceptions of the strategy are no longer applicable and companies must combine, in their strategic choices and resources allocation, adaptability and sustainability, through adaptation tactics and commitments to long-term (Farjoun, 2007; Rowe, 2001; Wu *et al.*, 2007). In this respect, Spira (2001) considers that the focus on some short-term objectives goes hand-in-hand with the focus on strategy. Indeed, in order to meet particular short-term demands, boards should

address them through thinking strategically. In the same perspective, Eisenhardt and Martin (2000) suggest that decision makers perform their role by adjusting short-term strategic positions in order to develop long-term advantages for their organizations. Through fulfilling strategy tasks, boards should ensure the pursuit of long-term vision with strategy adjustment through short-term pro-action. In the same vein, Aberg *et al.* (2017) stress the importance for boards to act in favor of short-term strategizing in the digital era along with the pursuit of long-term opportunities.

To innovate, board of directors and top executives are responsible to shape the entrepreneurial orientation of their organization and the strategy related (Wu *et al.*, 2007). However, corporate entrepreneurship strategies are risky in nature (Tanțău, 2008). In this respect, Wu and Wu (2014) considered that boards play an important role in understanding different strategic risks associated with product innovation. In this line, the board is responsible for detecting strategic innovation opportunities, monitoring the implementation of strategic plans, directing management attention and allocating resources toward the balance between exploration of new alternatives and exploitation of current capabilities. Besides, Jaskyte (2017) outlined that firms having boards performing their strategy role well are likely to foster product innovations, either by improving existing products or by creating novel products.

In sum, these arguments suggest that boards' strategy role is likely to balance between exploratory and exploitative innovation and thus to promote ambidextrous innovation. Therefore, the following hypothesis is formulated:

H3. Board's strategy role is positively linked to ambidextrous innovation.

The moderating effect of board gender diversity

Despite a vast literature on innovation, the innovative behavior of women directors was ignored for a long time because of distorted and stereotyped ideas (Belghiti-Mahut *et al.*, 2016). Directors' gender diversity has attracted a great attention recently (Galia and Zenou, 2013; Pathan and Faff, 2013; Galia *et al.*, 2015) whether for practitioners, politicians and academics. Attention has particularly been given to the extent women have been able to pierce the "glass ceiling" and become members of boards of directors. In several countries (Spain, France, etc.), the government imposes to companies quotas to allocate the board's seats to women and define even penalties for non-compliance (Terjesen *et al.*, 2015). However, the number of women directors remains unsatisfactory to attain equal representation with their male counterparts (Terjesen *et al.*, 2015).

The empirical studies that have studied the link between gender diversity and innovation in general are scarce and provide inconclusive results. Some authors claimed that board's gender diversity does not influence significantly investment in innovation (Martini *et al.*, 2012), R&D teams and incremental innovation (Diaz-García *et al.*, 2013). Erkut *et al.* (2008) and Torchia *et al.* (2011) suggested also that boards must include at least three women in order to make a real contribution to board effectiveness. For other authors, the presence of women is a key factor for innovation (Arzubiaga *et al.*, 2018; Torchia *et al.*, 2018). In this research, we defend the idea that gender diversity may have a moderating effect on the link between board's roles and ambidextrous innovation.

Female directors are characterized by greater sensitivity and are concerned by the welfare of other people (Nielsen and Huse, 2010). They tend to accept others' positions and may try to reconcile CEO to shareholders (Lakhal *et al.*, 2015). In this line, women directors may improve the monitoring of CEOs and preventing them to focus on short-term performance. Thus, they are likely to promote a balance between exploratory innovation which is risk-high return strategy in the benefits of shareholders and exploitative innovation promoted by the CEO in order to generate short-term returns. Female directors

exhibit participative leadership, are expected to collaborate with managers rather than controlling them (Nielsen and Huse, 2010). Authors suggest that they are effective regarding strategic control tasks which could motivate managers to engage in long-term innovation projects (Munari and Sobrero, 2003). Thus, as we have stated that board's control role may be negatively linked to ambidextrous innovation, the presence of female directors may attenuate this negative effect by displaying collaborative and participative behavior and reducing conflicts arising between shareholders and managers (Nielsen and Huse, 2010):

H4a. Board's gender diversity negatively moderates the link between the board's control role and ambidextrous innovation.

Concerning the effect of women directors on the relationship between board's service role and ambidextrous innovation, female directors tend to be more supportive than their male counterparts, which may encourage managers' initiative and experimentation as well as their willingness to share information (Arzubiaga *et al.*, 2018; Gul *et al.*, 2011) and, in particular, preventing them to focus on exploitation to the detriment of exploration. Women complement men by providing specific values, different perceptions of things and a better atmosphere at work (Bilimoria and Huse, 1997; Galia and Zenou, 2013). Moreover, in the line of the resources-based view, gender diversity can bring new knowledge and values, generate a board range of perspectives, improve the quality of brainstormed ideas, encourage creativity and lead to effective decisions and innovation (Arzubiaga *et al.*, 2018; Campbell and Vera, 2010; Torchia *et al.*, 2018). Østergaard *et al.* (2011) stressed that, as innovation is an interactive process, the interaction of diverse and heterogeneous profiles boosts ideation and innovation. Arzubiaga *et al.* (2018) also stressed that men and women directors possess diverse networks. This may allow firms to have diversified information about customers and suppliers, which can be integrated into new products development (Ali *et al.*, 2014; Arzubiaga *et al.*, 2018). Thus, thanks to their networks, women are likely to provide strategic information and to provide counseling and advice helping managers to have a better understanding of external changes and trends, which can reduce their risk aversion and the cognitive complexity related to exploratory innovation.

Therefore, we expect that gender diversity may positively moderate the relationship between board's service role and ambidextrous innovation:

H4b. Board's gender diversity positively moderates the link between the board's strategy role and ambidextrous innovation.

To explain the moderating role of the women presence on the relationship between the board's strategy role and ambidextrous innovation, we base our analysis on the literature related to gender differences during the decision making. In an experimental study, Byrne and Worthy (2015) found distinctive styles of decision making between gender, where males are global, selective processors of information and exhibit a cognitive bias towards long-term decisions while females are more detailed, comprehensive processors of information and are able to maximize either immediate- and long-term benefits in different situations. Along with this idea, women may support both exploitative and exploratory innovations. Also regarding the information-processing view, the presence of women in the board of directors is likely to manage effectively divergent thinking and diverse preferences regarding strategic activities by creating an atmosphere of collaboration, encouraging more open conversations among board's members and embracing contradiction (Bear *et al.*, 2010). In this line, Nijstad *et al.* (2012) stressed that ambidextrous innovation requires conflicting types of information processing and is based on divergent and convergent activities. Indeed, innovation involves creativity and divergent thinking that promotes idea generation. Gender diversity may contribute to the convergence activities namely selecting and implementing best ideas, since women are often described as more socially skilled than male

counterpart (Bear *et al.*, 2010). Several studies found that gender diversity improves participative communication, coordination, cohesion and mutual support within a team (Diaz-García *et al.*, 2013) or even boards of directors (Bear *et al.*, 2010). Female directors are characterized by their capacity to bring strategic input and lead to better productive discourse (Nielsen and Huse, 2010).

In this line, we expect that gender diversity may positively moderate the link between board's strategy role and ambidextrous innovation:

H4c. Board's gender diversity positively moderates the link between the board's strategy role and ambidextrous innovation.

The moderating effect of independent directors

According to the agency theory, appointing independent directors in order to mitigate the conflicts of interests between shareholders and CEOs is of a paramount of importance (Wong *et al.*, 2017). Managers have myopic behavior and are constantly looking to reinforce their "empire building" in which status, power, security and outcome are the principal elements (Hoskisson *et al.*, 2002), while shareholders seek to maximize the firm's long-term profitability and the value of their investment. This divergence in agent/principal horizons and objectives leads to agency conflicts regarding strategic decisions (Baysinger *et al.*, 1991). In this study, we focus on the moderating effect of independent directors regarding the link between board's roles and ambidextrous innovation. The adoption of ambidextrous innovation may be considered of one of the important decisions and a subject to acute managers-shareholders agency conflicts (Baysinger *et al.*, 1991; Wong *et al.*, 2017).

Some researchers (Chen, 2013; Osmo, 2008) argued that independent directors may question managerial decisions and limit myopic R&D investment. Chen (2013) stressed that independent directors are more effective in managers monitoring by ensuring that they implement both risky and profitable innovation activities. Wong *et al.* (2017) also stated that independent directors play a key role in mitigating the abuse of power by overconfident CEOs concerning the allocation of resources for innovation. However, other authors reported mixed results showing that independent directors may create by their disciplinary and control role an unbalance toward exploratory innovation (Balsmeier *et al.*, 2017; Manso, 2011). Independent directors may strengthen managers monitoring as they aim to safeguard their reputation on directors market and tend to reprimand managers for poor performance (Balsmeier *et al.*, 2017; Pathan and Faff, 2013). Thus, the presence of independent directors may reinforce the negative effect of monitoring on ambidextrous innovation. Indeed, such directors may amplify managers' concerns about their career and push them to prefer exploitative projects and be averse to risky exploratory projects (Balsmeier *et al.*, 2017). In the same vein, Manso (2011) outlined that independent directors' disciplinary role leads managers to engage in activities that generate short-term returns, which may lead to an ambidextrous imbalance. Thus, in the light of theoretical analysis, we expect that independent directors are likely to positively moderate the relationship between board's service role and ambidextrous innovation as they bring new knowledge and expertise promoting both exploitative and exploratory innovations:

H5a. Board's independence positively moderates the link between the board's control role and ambidextrous innovation.

Concerning the effect of board's service role on ambidextrous innovation, we defend that the independent directors help organizations to access to key resources for innovation (Chen, 2013). Balsmeier *et al.* (2017) purported that independent directors nurture boards with new knowledge and offer advice to managers to better monitor complex and risky strategic activities such as innovation. In this line, Wong *et al.* (2017) reported that independent

directors offer assistance in the form of helping the firm finding adequate combination of exploratory and exploitative innovation strategies, and evaluating innovation strategies beyond the individual vision of top managers. Chen (2013) suggested that boards with a high proportion of independent directors may be more heterogeneous in terms of the background, experiences and of their members. Accordingly, the author concluded that board independence has a positive moderating effect on CEOs' contribution to innovation. Moreover, it has been shown that an effective board contributes to value creation by reducing agency costs, external supervision, assisting managers to make crucial decisions (Wu and Wu, 2014). In addition, independent directors may reinforce board's control role and accentuate the ambidexterity imbalance:

H5b. Board's independence positively moderates the link between the board's service role and ambidextrous innovation.

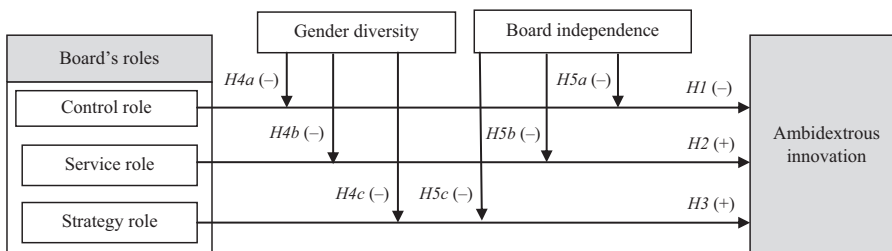
In the line of the agency theory, independent directors are supposed to manage effectively shareholders and managers' preferences for innovation strategies which differ in terms of incentives and time horizons (Hoskisson *et al.*, 2002). Hermalin and Weisbach (1991) purport that independent directors are incapable to decipher the complexity related to company's operations. In the same perspective, Blibech and Berraies (2018) found that board's independence does not contribute to innovation in Tunisian-listed firms and claimed that independent directors are unable to have information about firms' activities. In this sense, independent directors may put an emphasis on financial control because they lack information about the strategic and operational decision-making processes of the firm (Baysinger and Hoskisson, 1990). In addition, many researchers like Deutsch (2005), Gani and Jermias (2006) and Faleye *et al.* (2011) suggested that independent directors have a negative effect on board's strategic involvement. Accordingly, we expect that independent directors may have negative moderating effect on the link between the board's strategy role and ambidextrous innovation:

H5c. Board's independence negatively moderates the link between the board's strategy role and ambidextrous innovation (Figure 1).

3. Methodology

Sample and research design

We opted for a mixed approach for this study by combining quantitative and qualitative approaches. Regarding the quantitative survey, our questionnaire was administrated to a total of 81 respondents who consist of board members and board secretaries – who are either senior managers or management controllers. In this line, our sample is exhaustive consisting of all the 81 firms listed on Tunis Stock Exchange. We managed to have one respondent per company which allowed gathering 81 questionnaires. Hair *et al.* (2014)



Notes: +, positive effect; -, negative effect

Figure 1. Theoretical model

suggested a rule of thumb of ten questionnaires per independent variable in the model. As we have seven independent variables, the sample size in this research fulfils this rule.

Also, the data were collected using the companies' annual reports and the data published by the Tunisian Financial Market Council and Tunis Stock Exchange.

Many arguments make Tunisian-listed firms good settings for investigating the link between corporate governance and innovation. Indeed, few studies (Blibech and Berraies, 2018; Berraies and Ben Rejeb, 2019; Ben Rejeb, 2019) have focused on this relationship in the Maghreb region. Moreover, Tunisia established good governance principles drawn from codes and experiences and codes of developed countries but their implementation in Tunisia businesses is rather at an embryonic stage. Regarding board independence, a circular was issued in 2011 by the Tunisian Central Bank compelling Tunisian credit institutions to appoint at least two independent directors. The principal aim of this circular is to limit corruption and power abuse and to ensure better transparency and optimal governance of financial firms (Berraies and Ben Rejeb, 2019). Also, the Tunisian Government set up a program aiming to encourage and to fund women's entrepreneurship (Hachana *et al.*, 2018). In this respect, compared to Arab countries, Tunisian women are emancipated, educated and participate in society and political life (Hachana *et al.*, 2018).

In addition, listed companies offer rich settings for investigating the thematic of innovation because the stock market allows these firms to raise funds required to continuous innovation. Also, innovation plays a crucial role for listed companies as innovative firms have good brand image among national and international investors. Finally, we decided to investigate listed firms since their corporate governance information is accessible to the public.

The surveyed firms belong to the manufacturing sector (49.4 percent), financial sector (32.1 percent) and the trade and non-financial services sector (18.5 percent). Concerning gender diversity, 53 percent of these firms have at least one female director in their boards, whereas 19.8 percent of the companies have at least two women directors in their boards. Moreover, 27.2 percent of these firms have at least one independent board member. In addition, 44.44 percent of the surveyed firms are majority controlled and hold 46.8 percent of Tunisian financial market capitalization. Also, 49.4 percent of firms have families as controlling agent, which could create agency conflicts between minority and majority shareholders (Ben Rejeb, 2019). Tunisian-listed firms vary in size and age. The average size is 780.35 employees and the companies are 38.83 years old in average. In total, 62.96 percent of companies are large firms having more than 200 employees, whereas 37.14 percent of companies are small- and medium-sized enterprises.

Moreover, concerning qualitative approach, we conducted semi-directive interviews with eight women directors and ten male directors using an interview's guide to discuss the results. Indeed, the purpose of the interviews was to obtain more information to explain the findings provided by the quantitative survey and thus to expand and strengthen these results. The qualitative data generated by the interviews help to interpret the quantitative data from the questionnaires. In the perspective of Glaser and Strauss (1967), the number of respondents was not previously determined but was defined on the basis of the saturation of data collected. In this line, when we noticed that the interviews did not give us any adding value information, we stopped the collection of the data. We also attempted to diversify the respondents' profiles with regard to their age, gender and independence as well as the industries of the firms to which they belong in order to provide a diversified set of information that is required for a qualitative study (Touzani *et al.*, 2016).

Among respondents, four are independent directors and the majority of interviewees belong to the 40–50 age bracket. Prior to beginning the interviews, we introduced objectives of the study to each interviewee and assured them that we will keep the data confidential. The interviews focused on the key themes surrounding the study, i.e. board's roles, board's

contribution to innovation, the effect of women directorship and the effect of independent directors (4) on corporate boards regarding ambidextrous innovation. The interviews lasted about 1 h on average. The collected data were analyzed using the thematic analysis in order to discuss the findings. The interviews were tape-recorded and all discourses were transcribed to perform the thematic content analysis. We read the data following a floating reading and categorized significant extracts.

Measures

A survey was conducted using an exhaustive sample of Tunisian-listed firms to test the research model. In this perspective, a questionnaire was developed and pretested with two professors and two directors in order to assess the survey instrument's validity. A five-point Likert scale ranging from 1 (not at all important) to 5 (very important) was used for the items of the innovation and board's roles, which are listed in the Appendix.

Each type innovation (seven items each) was measured by seven items developed by Jansen *et al.* (2006). As for ambidextrous innovation, we calculate the product of exploitative innovation and exploratory innovation in the line of Brion *et al.* (2010). The control (four items), strategy (three items) and service (three items) roles were captured using items developed by Ben Rejeb (2012). Board independence was captured via the proportion of independent directors compared to the board's total size. Gender diversity was measured by the proportion of women directors in the board compared to its size. Moreover, we included board's size as a control variable that may potentially affect ambidextrous innovation. Indeed, this variable has been found to significantly influence companies' innovation (Adams and Mehran, 2012; Zahra *et al.*, 2000). Up to an optimal number of directors, Zahra *et al.* (2000) suggested that larger board may monitor managers more effectively and improve firm's innovativeness. They stressed that large boards are likely to incorporate directors with different skills, educational background and perspectives. We measured the board's size by the logarithm of the total number of directors.

In addition, to account for differences among companies, we integrated also firm size as a control variable. Firm size mirrors the company's capacity to attract the resources needed to innovate (Berraies and Ben Rejeb, 2019). We measured firm size by the logarithm of the total number of the employees of the firm.

Table I reports the descriptive statistics, namely the mean, median, standard deviation and the skewness and kurtosis coefficients. In this line, the values of skewness and kurtosis range between -2 and 2 , reflecting the normality of the data in the line of George and Mallery (2010).

We firstly performed an exploratory factor analysis (EFA) using SPSS 21.0. We conducted a principal component analysis (PCA) on the basis of Varimax rotation method. To conduct an EFA, a sample size consisting of 50 cases over the number of items or at least five

Constructs	Mean	Median	SD	Skewness	Kurtosis
IEL	3.57	3.50	1.03	-0.32	-0.63
IER	4.01	4.20	0.94	-1.10	0.31
CR	4.29	4.25	0.54	-0.39	-0.66
STR	3.98	4.01	0.79	-1.23	3.42
SVC	3.69	4.00	0.94	-0.94	0.61
IND	0.04	0.01	0.08	1.25	-0.14
GD	0.09	0.08	0.11	1.01	0.38
BDS	9.16	9	2.51	-0.96	-0.40
FS	5.88	5.70	1.34	0.24	-0.43

Notes: BDS, board size; CR, control role; IEL, exploitative innovation; IER, exploratory innovation; IND, board independence; SVC, service role; STR, strategy role; GD, gender diversity; FS, firm size

Table I.
Descriptive statistics

questionnaires per item in the instrument being used is required (Bryant and Yarnold, 1995; Hair *et al.*, 2006). The subjects-to-variables (STV) ratio of no lower than 5:1 (Bryant and Yarnold, 1995). Our sample fulfills these criteria. Indeed, the board's roles are measured by the largest number of items (ten items). Thus, the required size is 50 questionnaires and the STV is equal to 8.1:1 (> 5:1). For the scale of measurement of board's roles, the PCA highlights communalities greater than 0.6 without cross loadings (MacCallum *et al.*, 2001).

Also, we tested the Kaiser–Meyer–Olkin (KMO) which tests the sampling adequacy for each variable. In this line, the KMO of each variable was greater than 0.7, indicating that the sampling is adequate (Hair *et al.*, 2006). Under the PCA, we suppressed items with factor loadings under 0.5. Retained factors after the analysis have three items at least (Costello and Osborne, 2005).

The PCA revealed three dimensions of board's roles and one dimension of each type of innovation (Table II). The factor loadings of final items were larger than 0.60 (Hair *et al.*, 2006). The percentage of explained variance of each dimension is higher than 60 percent (Hair *et al.*, 2014). We assessed also constructs' reliability ensuring that the Cronbach's α is above 0.7 as recommended by Nunnally (1978). Table II shows that Cronbach's α scores range from 0.824 to 0.942, which demonstrates good reliability. We then performed a confirmatory factor analysis using SmartPLS 3. In this line, we assessed the convergent validity of constructs by verifying that the average variance extracted (AVE) exceeds 0.5 (Fornell and Larcker, 1981). All the constructs' AVE fall in the acceptable range (Table II).

In addition, we checked the discriminant validity of constructs in the perspective of the Fornell and Larcker's (1981) approach. In this line, the square roots AVE of constructs, reported in diagonal in Table III, are greater than the correlation between the other constructs.

Constructs	Items	Factor loading	Total variance explained (%)	Cronbach's α	AVE
Service role	Advise management team	0.922	81.293	0.922	0.864
	Assist and mentor management	0.866			
	Network and maintain relations with the environment	0.847			
Control role	Monitor management performance	0.851	78.560	0.824	0.610
	Increase shareholder value	0.826			
	Appoint new managers	0.714			
Strategy Role	Evaluate and reward Top management	0.685	85.341	0.880	0.806
	Formulate and/or approve strategy	0.893			
	Define business vision, mission statement and long-term objectives	0.885			
Exploitative innovation	Identify new strategic opportunities	0.784	78.560	0.908	0.784
	We frequently refine the provision of existing products and services	0.852			
	We regularly implement small adaptations to existing products and services	0.925			
	We introduce improved, but existing products and services for our local market	0.843			
Exploratory innovation	Our unit expands services for existing clients	0.922	85.341	0.942	0.853
	We experiment with new products and services in our local market	0.962			
	We commercialize products and services that are completely new to our unit	0.955			
	We invent new products and services	0.904			
	We experiment with new products and services in our local market	0.870			

Table II.
Dimensionality,
reliability and
convergent validity
of constructs

Constructs	BDS	CR	IEL	IER	IND	SVC	STG	GD	FS
BDS	1								
CR	0.229	0.781							
IEL	-0.103	-0.214	0.886						
IER	-0.108	-0.259	0.372	0.924					
IND	0.033	-0.138	0.110	-0.004	1				
SVC	-0.060	0.376	0.232	0.228	-0.184	0.930			
STG	0.158	0.159	0.267	0.024	-0.081	0.478	0.859		
GD	0.381	-0.042	0.069	0.041	0.102	-0.004	0.150	1	
FS	0.189	-0.208	0.071	0.095	0.318	-0.176	0.106	0.043	1

Notes: BDS, board size; CR, control role; IEL, exploitative innovation; IER, exploratory innovation; IND, board independence; SVC, service role; STG, strategy role; GD, gender diversity; FS, firm size

Table III. Discriminant validity

4. Results

To test links between variables, we used the method of partial least square that we performed via SmartPLS 3. We have chosen this method regarding its robustness and capacity to test relationships between many variables and also because it is suitable for small sample size (Hair *et al.*, 2014). We assessed the quality of the structural model quality via the R^2 coefficient (Fernandes, 2012). Findings revealed that R^2 is equal to 0.330. Table IV and Figure 2 highlight the results of hypotheses testing.

Results show that the firms' ambidextrous innovation is positively associated to service role ($\beta = 0.594$, $p < 0.01$). $H1$ is thus confirmed. However, the strategy role is not significantly linked to ambidextrous innovation ($p > 0.05$). Consequently, $H2$ is rejected. Moreover, data analysis revealed that control role has a negative effect on ambidextrous innovation ($\beta = -0.653$, $p < 0.01$), which supports $H1$. Nevertheless, results highlight that our control variables, namely, board size and firm size have no significant effects on ambidextrous innovation ($p > 0.05$).

In addition, the moderating roles of board independence and gender diversity were tested via SmartPLS 3 path modeling. In this line, the two-stage approach was used and consists of calculating the latent variable scores of the latent moderator variable and the latent independent variable from the model (Hair *et al.*, 2014). These scores are used to calculate the product indicator that materializes the interaction between the independent variable and the moderator variable. In this line, findings show that board independence and gender diversity are not significantly linked to ambidextrous innovation ($p > 0.05$). In addition, Table V highlights the results of the moderating effect of these variables on the link between board's roles and ambidextrous innovation. In this line, findings show that gender diversity moderates the relationship between board's service role ($\beta = 0.491$, $p < 0.01$) and strategy role ($\beta = 0.315$, $p < 0.05$) and ambidextrous innovation. Therefore, $H4b$ and $H4c$ are confirmed. However, gender diversity does not moderate the link between board's control role and

Hypotheses	Independent/control variables	Ambidextrous innovation ($R^2 = 0.483$)			Results
		β	CR	p	
$H1$	Control role	-0.653	3.476	0.001	Confirmed
$H2$	Service role	0.594	3.020	0.003	Confirmed
$H3$	Strategy role	0.200	1.466	0.143	Infirmed
-	Board size	-0.003	0.031	0.976	-
-	Firm size	0.155	1.264	0.207	-

Notes: β , standardized regression coefficient; CR, critical ratio; p , significance level

Table IV. Results of direct links

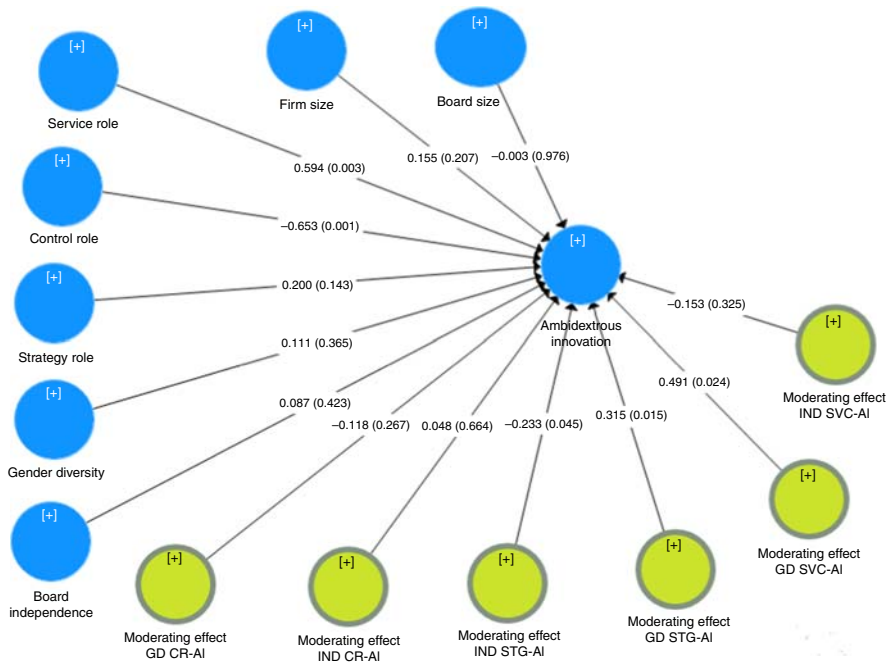


Figure 2. Results of model tested

Table V. Moderating effects of board independence and gender diversity

Hypotheses	Links	Moderator variable	B	t-statistics	p-value	Results
H4a	CR-AI	GD	-0.118	1.111	0.267	Infirm
H4b	SVC-AI		0.491	2.257	0.024	Confirmed
H4c	STG-AI		0.315	2.431	0.015	Confirmed
H5a	CR-AI	IND	0.048	0.435	0.664	Infirm
H5b	SVC-AI		-0.153	0.985	0.325	Infirm
H5c	STG-AI		-0.233	2.012	0.045	Confirmed

Notes: CR, control role; SVC, service role; STG, strategy role; GD, gender diversity; IND, board independence

ambidextrous innovation ($p > 0.05$). Thus, *H4a* is rejected. Moreover, results revealed that board independence moderates the link between board's strategy role ($\beta = -0.233, p < 0.01$) and ambidextrous innovation. Therefore, *H5c* is confirmed. Nevertheless, the proportion of independent directors does not moderate the relationship between board's control and service role and ambidextrous innovation ($p > 0.05$). Thus, *H5a* and *H5b* are rejected.

5. Discussion

This study aims to shed light on board of directors' contribution to ambidextrous innovation. By doing so, this research pioneers the investigation of the effect of board's roles on innovation ambidexterity and the moderating role of board's independence and gender that have never been explored.

The results reveal a negative effect of board's control role on ambidextrous innovation and concur with studies showing evidence that directors' emphasis on monitoring encourages managers to focus on achieving short-term results through exploitative innovation at the expense of exploratory innovation (Faleye *et al.*, 2011). The monitoring

exercised by Tunisian-listed companies' boards of directors may push managers to avoid risk taking to show their compliance with the rules of diligent management of resources and to achieve short-term returns which create an ambidexterity imbalance in favor of exploitative innovation. Our findings converge toward the precepts of the corporate governance cognitive view, stewardship theory and positive entrenchment theory, suggesting that boards need to put less emphasis on control and to give managers more discretion to engage in long-term innovation projects. In this regard, for most respondents, financial control tasks are very important within board's monitoring role: "The main important role performed by the board is financial control. We are responsible of controlling financial reporting and managing the financial risks that we consider as important." This is due to the requirements of the Financial Market Council for periodic financial information disclosure: "We perform financial control to detect, correct and prevent errors in the financial reporting, especially because of the reporting obligations and transparency requirements imposed to listed companies like ours." Some interviewed directors stated also that control tasks ensure that the manager uses organization's resources diligently and that annual performance objectives are on the right track: "Control tasks monopolize most of our time at board meetings," "As directors representing the state in our state-owned company, it is necessary to ensure that the CEO manages company's resources with fairness and diligence and complies with the regulations and procedures of public procurement."

Also, some interviewees consider that the current evaluation system of managers' performance does not encourage them to focus on exploratory innovation and ambidextrous innovation: "Listed companies must regularly publish their financial projections and disclose their financial results and financial data in compliance with the Financial Market Council's regulations and to inform current and potential stockholders about the company's financial situation. This can encourage managers to focus on the short term to stay in office and safeguard their reputation in the Tunisian managers market which is characterized by a significant Turnover rate." This idea is confirmed by Chouaibi *et al.* (2010), based on the study of a sample of Tunisian-listed companies, who found that prevailing remuneration systems favors short-term profitability over long-term objectives. In this respect, it should be noted that few companies offer stock options to their managers as a component of the remuneration package: "I do not know many companies in Tunisia that offer stock options to their managers. The compensation structure of Top Executives is often based on a mix of salaries, bonuses, allowances and other pecuniary benefits." In the same perspective, the majority of the respondents raised the issue of top management members' high turnover rate in non-family listed companies in Tunisia. For these respondents, managers tend to not engage in innovation projects whose results might be visible only after they leave the company: "The managers market is very active in Tunisia. With the exception of family companies where it is often a family member at the controls, in other companies the CEO remains on average 2 years before moving to another listed company."

Our findings spark debate on the appropriate level of control and how to achieve an adequate balance between monitoring and trust to avoid the negative effects of control on innovation and to foster manager's positive entrenchment and corporate entrepreneurship while controlling the inherent risks and promoting ambidextrous innovation (Bedford, 2015).

Moreover, our findings highlighted a positive effect of board's service role on ambidextrous innovation. This result converges toward the ideas of the resources dependence theory which considers that, through directors' relational network and networking tasks, the board's service role provides the company access to crucial information on the company's markets, tactics and maneuvering of competitors, consumers' needs, market and technology trends, changes in the macroeconomic environment, etc., but also allows the company to obtain tangible and intangible resources necessary for exploratory and exploitative innovations (Pfeffer, 1991; Wincent *et al.*, 2010).

Some interviewees said that, in the companies they serve in, they do not hesitate to put their networks to the benefit of the company and in particular in R&D projects. "I mobilize my expertise and networks to fund and initiate new projects including R&D."

Indeed, the business culture in Tunisia is strongly marked by the importance of personal relationships which constitutes a real social and relational asset that managers use to get access to the resources they need. In this sense, some interviewees also point out that some board members politically connected or even sitting in the parliament have access to information concerning the government economic policies and future economic projects, which allows them to have a better mix of short-term and long-term investment including innovation and R&D projects. "The Board's meeting agendas are the occasion to discuss the emerging trends in the market and products and the opportunity of value creation and to flush out blind spots of the company in order to achieve the desirable balance between short-term and long-term objectives." In addition, based on the idea that managers are rather risk-averse, preferring exploitative innovation given the visibility of its results and its moderate risk taking (Balsmeier *et al.*, 2017; Faleye *et al.*, 2011), the board's service role supports the manager in risk taking through the advice and counseling provided. This would help to create a relationship of trust between boards and managers which promotes strategic information exchange essential for exploratory innovation (Zhang *et al.*, 2017; Faleye *et al.*, 2011). This has thus the effect of balancing exploitative and exploratory innovations. In this perspective, some interviewees consider that when new ideas and perspectives are identified through directors-managers' interaction: "We interact and collaborate with the management team by criticizing in a constructive manner the managers' proposals, which allow us to identify new ideas to improve current projects and to initiate new projects." In this line, managers are more inclined to implement these projects and to exchange internal information with board members because they feel supported and guided. The counseling provided as a service task allows digging deeper into these ideas and transforming them into short-term and long-term innovation projects.

Our results do not indicate a significant effect of board's strategy role on ambidextrous innovation, which not concur with behavioral and cognitive theories of corporate governance that assign an important role to boards in strategic decision making (Stiles and Taylor, 2001). This raises the issue of board strategy role perception by Tunisian directors as well as its importance in board's activity. In this respect, board's strategic involvement is often limited to the ratification or approval of the strategy proposed by the management. "It is the executive committee's responsibility to prepare the strategy. We review it and we decide whether to approve it or to ask for changes. The CEO may also be called to attend the board meeting to provide clarification or information about the strategy and its implementation." In addition, strategic control tasks are often performed as part of board's control and service roles. In this regard, the interviewees stated that the issue of strategy is not regular and periodical in board's agenda but rather sporadic and context-dependent while the review of quarterly financial statements and financial performance occupies their time most during board meetings. "Strategic issues are not always on the board's agenda. We dealt with issues such as the choice of a new strategic partner, the internationalization of company, but this is not done on a regular basis but rather sporadically and intermittently." In this sense, our results are consistent with the passive view of the board as rubber-stamp body (Stiles and Taylor, 2001).

Regarding the moderation effects, results show a negative moderating effect of board independence on the relationship between board's strategy role and ambidextrous innovation. The findings are in line with several studies that have reported a negative effect of board independence on board's strategic involvement as well as on innovation and corporate entrepreneurship (Deutsch, 2005; Faleye *et al.*, 2011; Gani and Jermias, 2006). In this respect, independent directors are mainly appointed in Tunisian firms for control and monitoring

purposes, judging by the description of qualifications being sought in the terms of reference in the calls for application. Such directors may be encouraged to focus on controlling resources allocation and steering resources toward innovation projects in order to generate results that are visible during their mandates. In addition, the lack of strategic information, due to informational asymmetry between managers and independent directors, inhibits their ability to encourage the manager to move toward long-term innovation projects. This may create disequilibrium in favor of exploitative innovation. In this respect, Balsmeier *et al.* (2017) found that the presence of independent directors is positively related to the generation of patents related to improving the existing technology of the company rather than creating new technology. In this sense, all interviewed independent directors highlighted the issue of information asymmetry and the lack of leeway to have the last word on strategic decisions: "I asked for information that no one gives me," "I am not able to offer suggestions and alternative perspectives on strategy when I do not have perfect knowledge of the company's activities because I am not involved in the day-to-day operations of the company. The only times I'm in the company is to attend board meetings, that's why I devote more effort and energy in control." According to other respondents, it is not possible to exert strategic tasks and to initiate long-term innovation strategies without having a perfect knowledge of the company, its operation and processes. They added that strategic information asymmetry encourages independent directors to focus more on monitoring tasks at the expense of strategy tasks. "The independent director's lack of understanding leads to the fact that their contribution to the definition of strategies is negligible and they concentrate on control[...] These directors may be tempted to stay for remuneration and to develop their reputation."

In this respect, our results converge with those of Gani and Jermias (2006), who found that independent directors have more positive effects in companies pursuing cost-rationalization strategies than in those pursuing innovation strategies. The results do not show also significant moderating effects of board independence on the relationship between board's service and control roles and ambidextrous innovation. It should be noted that only Tunisian credit institutions have the obligation to appoint independent directors in their boards. The latter, although they must have qualifications in auditing, accounting and financial management, have different profiles and backgrounds: university professors, accountants, lawyers and consultants, retired politicians, etc. According to some respondents, "The fact of having given skills and past mandates as director in other companies does not presume that the independent board member is the best qualified for a director position."

Regarding the effect of gender diversity on the relationship between board's roles and ambidextrous innovation, the results reveal a positive moderating effect of the presence of female directors on the relationships between board's strategy and service roles and ambidextrous innovation. This result is in accordance with the ideas of the resource dependence theory and cognitive theories considering that female directors bring to boards social, cognitive and informational diversity beneficial to board tasks performance and group decision making that can, in turn, foster ambidextrous innovation (Dezsö and Ross, 2012; Oppong, 2014). In this line, some interviewed directors pointed out that female directors bring diversity and create synergy with their male counterparts helping to see the "whole picture" when it comes to making strategic decisions such as allocating resources between short-term and long-term projects: "In the board I set in, having women directors creates a healthy atmosphere of collaboration and constructive interaction between board members"; "Women attentive to the opinions of others, engage dialogue in board's meetings, have specific qualities... This exchange of diverse ideas and skills springs new ideas and projects and allows a better risk taking and change management."

In addition, studies have reported that women are more long-term oriented when it comes to formulating strategies (Reguera-Alvarado *et al.*, 2015). This has the effect of mitigating managerial myopia and manager's orientation toward short-term innovations and creating

equilibrium between exploitation and exploration. Besides, gender diversity has a positive moderating effect on the relationship between board's service role and ambidextrous innovation. In this sense, it has been reported that women in leadership positions tend to exercise their role by adopting a more participative style than their male counterparts by encouraging and supporting their collaborators and subordinates (Nielsen and Huse, 2010). This can have the effect of creating a relationship of trust with top executives, encouraging them to take risks and supporting them in exploratory innovation projects, which has the effect of favoring ambidextrous innovation. Although studies have highlighted women's abilities linked to effective monitoring (Nielsen and Huse, 2010), our results did not reveal significant moderating effect of gender diversity on the link between board's control role and ambidextrous innovation. It should be noted that in Tunisia, women directors are found mainly in family businesses and state-owned companies. Women sit on family businesses' boards of family businesses as family members or shareholders. Some respondents that are member of family business's boards mentioned that the ownership structure concentration makes board's monitoring tasks less pronounced than in other listed companies: "In family businesses, control does not have the same meaning and purpose as in non-family businesses. Of course we look at numbers and we review financial information but when it comes to controlling the CEO, it's rather to check appropriateness of decisions rather than a financial audit. No matter who sits on the board, you have to defend the interests of the family and the company." In state-owned companies, women directors are appointed in their capacity as officials and civil servants representing state's interests. In these companies, board's control role is rather important in order to monitor managers. A woman director of a state-owned company outlined that financial control tasks are very important to ensure that the CEO manages company's resources in a diligent manner and in accordance with the state's interests: "It does not matter if it is a man or a woman who sits on the council to represent the state, as civil servants we have to protect the interest of the state and make sure the CEO runs the business in accordance with the rules and procedures that govern public enterprises and especially in its management of corporate resources and public procurement." The difference in the position and attitude of women directors *vis-à-vis* board's control role may explain the absence of significant moderating effect of gender diversity on the link between board's control role and ambidextrous innovation.

6. Conclusion

The objective of this research was to study the link between board's roles and ambidextrous innovation. By doing so, this research tackled an issue that has never been explored and deepened the analysis by investigating the moderator roles of board's gender diversity and independence in these relationships. The majority of prior research investigated the effect of the board's roles on innovation or even on exploitative and exploratory innovations. The originality of this research compared to previous ones is that it investigated how boards, by performing different tasks, may contribute to balancing exploitative and exploratory innovations and how the status and gender diversity of boards' members could affect this relationship. In addition, compared with prior research on corporate governance opting mostly for a quantitative approach, our study offers a deeper understanding of the results by adopting a mixed approach, namely a quantitative study followed by a qualitative study. Empirical findings provide evidence of the contribution of board's service role to ambidextrous innovation which is strengthened thanks to the presence of female directors. Moreover, results have shown that board's control role is negatively linked with ambidextrous innovation. Even if the results do not show evidence of a significant effect of board's strategy role on ambidextrous innovation, it revealed that that relationship is reinforced by board's gender diversity, while weakened by the presence of independent directors.

This research offers several managerial implications. It provides insights for corporate decision makers in emerging economies helping them to determine the board's design in term of roles and composition that promotes ambidextrous innovation. First, since the board's service tasks in shaping ambidextrous innovation, are important, board should hire directors that have relational networks allowing them to gather key information and resources from the stakeholders in order to develop explorative and exploitative innovations.

Second, since the supply of evidence regarding the negative effects of excessive focus on board's control task on ambidextrous innovation, our study recommends ensuring a proper tradeoff between board's monitoring role and the discretion left to top executives to help to ensure short-term outcomes and promote manager's positive entrenchment which is indispensable for exploratory innovation. Third, firms need to integrate women in their board of directors who may contribute to board roles performance by adding value to service and strategy tasks to dynamically ensure a balance between exploitation and exploration. Women directorship brings alternative viewpoints and new strategic perspectives, promotes an atmosphere of collaboration and supports CEOs in engaging in exploratory projects rather than focusing only on exploitative projects. Fourth, companies looking to improve their board's task performance effectiveness should better recruit the adequate profiles of independent directors beyond just the requirements of neutrality and financial control and audit skills. Independent directors can add value to the firms they serve and increase the board's strategic involvement, if they are provided with timely and appropriate information about the companies. Fifth, the insights gained from this research are also useful for public bodies such as the financial market council and non-governmental organizations that are interested on publishing codes of good governance and guidelines of best corporate governance practices in Tunisia. Our study provides them with clues to better define the profiles of outside directors, the roles of the board and the board's composition favoring innovation and ambidexterity.

This research is subject to a number of limitations. First, our results are based on survey conducted on 81 Tunisian-listed firms. Even though our sample is exhaustive, its size and nature necessitate caution regarding the findings' generalization to non-listed Tunisian businesses. Second, as this study uses data based on respondents' perception collected using a questionnaire and semi-structured interviews, data might be affected by common method bias. Third, as our sample consists of firms of different sizes, future research may carry out a comparative study between firms according to their sizes because of the difficulty of the small- and medium-sized firms to obtain resource compared to large firms. Fourth, our research model includes two moderating variables namely gender diversity and board independence. Nevertheless, other variables may moderate the link between board's roles and ambidextrous innovation such as directors' age, culture, education and experience, CEO's age, CEO's ownership, etc. Besides, other variables can be incorporated also in future studies like board's processes and human and social capital. Also, future studies could investigate the various forms of ambidexterity, namely, structural and contextual ambidexterity that have not been studied by this research. Finally, future research could use a cross-cultural study to investigate the relationship between corporate governance and innovation ambidexterity in different national and institutional contexts.

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Further reading

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Appendix

A.1. Exploratory innovation

- (1) Our unit accepts demands that go beyond existing products and services.
- (2) We regularly search for and approach new clients in new markets.
- (3) We commercialize products and services that are completely new to our unit.
- (4) We experiment with new products and services in our local market.
- (5) We invent new products and services.
- (6) Our unit regularly uses new distribution channels.
- (7) We frequently utilize new opportunities in new markets.

A.2. Exploitative innovation

- (1) We frequently refine the provision of existing products and services.
- (2) We introduce improved, but existing products and services for our local market.

- (3) We regularly implement small adaptations to existing products and services.
- (4) We increase economies of scales in existing markets.
- (5) Lowering costs of internal processes is an important objective.
- (6) We improve our provisions efficiency of products and services.
- (7) Our unit expands services for existing clients.

A.3. Strategy role

- (1) Formulate and/or approve strategy.
- (2) Define business vision, mission statement and long-term objectives.
- (3) Identify new strategic opportunities.

A.4. Control role

- (1) Monitor management performance.
- (2) Increase shareholder value.
- (3) Evaluate and reward top management.
- (4) Appoint new managers.

A.5. Service role

- (1) Advise management team.
- (2) Network and maintain relations with the environment.
- (3) Assist and mentor management.

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