Governance and network: cross-national differences

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Managerial problems abound, but the key to solving them lies in the actions taken by the manager. The manager must be able to anticipate the future, plan for potential outcomes, and adjust strategies accordingly. This is where the concept of managerial decision-making comes into play. It is the process by which managers identify problems, gather information, evaluate options, and make choices to address these problems. This essay will explore the nature of managerial decision-making and its significance in today’s business environment.

The Nature of Managerial Decision-Making

Managerial decision-making is a complex process that involves multiple steps. It begins with the recognition of a problem or an opportunity, followed by the formulation of a decision-making problem, the collection and analysis of information, the generation of alternative solutions, the evaluation of these alternatives, and the selection of the best course of action. This process is iterative, and decisions are constantly being revised as new information becomes available.

The Importance of Managerial Decision-Making

Effective managerial decision-making is crucial for the success of any organization. It enables managers to make informed choices that can impact the overall performance of the organization. Good decision-making skills can help managers avoid costly mistakes, reduce risks, and capitalize on opportunities. Moreover, it is essential for the development of the organization's competitive advantage and its ability to adapt to changing market conditions.

Conclusion

Managerial decision-making is a critical aspect of business management. It involves a series of steps that require careful consideration and analysis.skilful. It is through this process that managers can make informed choices that will ultimately lead to the success of their organizations.
Governance and network: cross-national differences

Introduction

Cross-national differences of networks of firms that share shareholders and directors is a topic of great interest for researchers of management and corporate governance (Caiazza et al., 2018).

It covers some aspects of strategy, management, corporate governance and embeddedness such as cross-national analysis of causes of networks, pyramidal structures and groups, interlocking directorates, effects of multiple-ties on firm strategies and performance.

Such kind of networks are prominent feature of the global economic landscape and can be found in both developed and emerging economies. However, work on them are highly fragmented, use partial perspective in evidencing only some aspects and underestimating the cross-national differences and the multiplexity issue.

At the aim to provide a general framework of existing research on this topic the paper starts from general literature on network. It evidences main theoretical perspective on network. Then we focus on a specific kind of network characterized by shareholders or directors as tie. This specific network combines previous literature on network with specific literature on corporate governance, evidencing the relevance of cross-national analysis. Then we resume literature on cross-national analysis of different systems of governance, evidencing how in each system the role of shareholders and directorates change. Consequently even the network of interlocked shareholding and directorates changes in their causes and effects. Thus, the paper focuses on each of these specific networks. Shareholding and directorates interlocks are thus analyzed considering cross-national differences and their reciprocal interactions. Finally, the paper introduces new studies aimed to evidence their limitations and future direction of research.

Inter-firms network

Network as set of nodes and ties representing some relationship between nodes can be classified at organizational level of analysis if firms are individual nodes. Inter-organizational ties among such nodes based on personal, capital or commercial ties are influenced by institutional context, embeddedness, firms’ strategies and decision-makers interest. They are realized for reducing external uncertainty facing social pressures (Granovetter, 1973), sharing strategic risks, improving resources (Powell et al., 1996) and reducing individual opportunistic behavior. Consequently, main perspectives that explain firms’ decision to tie with other firms are institutional theory, embeddedness, strategic choice, resource dependence and class hegemony.

Institutional theory suggests that institutional context imposes pressures on firms to conform on prevailing social norms. These pressures motivate firms to create ties with other one to be in agreement with the prevailing social rules. Moreover, the propensity of firms to resemble to others that operate under similar environmental conditions, push them to tie at the aim to become more similar or achieve the same results. In other words, institutional isomorphism (Di Maggio and Powell, 1983) pushes firms to engage in inter-organizational relationships for emulating other successful firms.

According to strategic choice perspective firms pursue inter-organizational relationship to increase market power through the erection of entry barriers; to collude with other enterprises of the same sector; to increase political power and influence governing bodies; to maximize firm’s ability offering attractive products; to increase efficiency in research,
production, marketing or other value chain activities; to improve strategies that preserve competitive advantage.

From resource-based perspective, such competitive advantage has to be founded on rare resources. The need to acquire such resources creates dependencies from suppliers, competitors, creditors, governmental agencies and any other relevant actors in the firm’s environment. To successfully manage these dependencies, resource dependence theorists argue that organizations must acquire control over critical resources in an effort to decrease dependence from other organizations. Consequently, inter-organizational relationship as mechanism to access to critical resources and to increase firm’s power on other organizations is used to reduce external uncertainty (Pfeffer and Salancik, 1978). According to learning theory, firms create ties to capitalize opportunities for organizational learning. Inter-organizational relationships, facilitating the flow of information, are effective means of knowledge transfer across firms (Mariolis and Jones, 1982). Firms enhance their competitive position through superior knowledge whose source not reside exclusively inside them but can be found also in the relations with other firms, universities, research institutes, suppliers and customers.

When ties between firms involve shareholders or directors the network assumes great relevance for corporate governance. In such cases, class hegemony perspective evidences the specific interest of shareholders or directors in realizing ties (Useem, 1979). Class hegemony perspective evidences that shareholder or directors create ties among firms to reinforce their upper-class cohesion. Belonging to the same social clubs and private schools generate a common business elite that guides managerial behavior, socializes new individual into this culture and controls deviant managerial behavior (Koenig and Gogel, 1981).

Consequently, network of firms that share shareholders or directors can be analyzed according to a perspective that mutually considers institutional, strategic, embeddedness, resource-dependence and hegemony-class aspects. Such combined perspective has to consider main characteristics of corporate governance system in which tied firms operate, the specific role that shareholders and directors play in such systems and their reciprocal interaction (Figure 1):

P1. Can theoretical perspectives developed for networks in general be applied sic et simpliciter in studying specific network based on shareholders and directorates interlock?

Cross-national differences among corporate governance systems
Cross-national analysis of corporate governance systems helps to understand inter-firm network of interlocked shareholders and directors. Many authors point out that institutional elements (such as political, legal and cultural factors) tend to reinforce each other and lead countries to cluster along a few coherent types of corporate governance (Hall and Soskice, 2001). In terms of corporate governance, these cross-national differences have been quite extensively documented (Fukao, 1995; Charkham, 1994). Generally researchers on advanced economies compares two dichotomous models based on dispersed owners and concentrated owners (Becht and Roel, 1999; Berglof, 1991; Hall and Soskice, 2001; La Porta et al., 1998). They stylize the former in terms of dispersed ownership with directors that are not always

Cross-ownership
Common-ownership

Figure 1. Shareholders and directorates interlocks
independent from managers (mainly diffused in the Anglo-American context) and the latter in terms of concentrated ownership with directors not independent from shareholders (mainly diffused in the Continental-European and East-Asian context).

In the Anglo-American system (USA and the UK) the largest shareholder holds a modest stake in the company and the agency problem is about alleviating the conflict of interest between dispersed shareholders and controlling managers. In such system the directors are selected from other directors with the main task to monitor top management on behalf of shareholders (La Porta et al., 1999).

In the Euro-continental and East-Asia system the block-holder often belongs to a powerful family. In these systems, boards are bond with the family who has the ultimate power to select and remove their members (Table I).

In each systems of corporate governance interlocked shareholders and directors assumes a specific aim. Moreover, their combination can create a network among firms that have specific causes and effects:

P2. Can theoretical perspectives developed in a specific geographical context be applied sic et simpliciter to other ones in studying network based on shareholders and directorates interlock?

**Shareholders interlocks**

Interlocking shareholding is a network of firms that tied through common-ownership or cross-ownership become members of business groups. Firms of a business group remains distinct legal entities, rather than all being part of the same legal entity. Such phenomenon is not well developed in the Anglo-American context (USA and UK) where firms prefers to be organized as single legal entity that holds all other entities and business divisions. Typical organizational structure is the holding company that is a single juridical entity with many different business areas operating worldwide. Consequently, in the Anglo-American system directors make all the decisions and select new directors to appoint in their board.

In the Continental-Europe and East-Asian context, instead, more than two-thirds of listed companies have block-holders that control from 25 to 50 percent of shares. Such concentration leads to the interesting phenomenon of cross-shareholding and common-shareholding that creates pyramids and multiple control chains. A pyramid is defined as an ownership structure in which the controlling shareholder exercises control of one company through ownership of at least one other listed company (Simoni and Caiazza, 2012a). Through pyramidal ownership, shareholder agreements and dual classes of shares block-holders exercises control without

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**Table I.** Cross-national analysis
owning a large fraction of the cash flow rights (La Porta et al., 1999). Family control is a common way of holding control of the group in continental Europe. In Asia, 96 percent of loosely affiliated corporations have access to related party lending; of these, 87 percent belong to a corporate group that includes more than 50 companies. Such corporations can be manipulated using a web of control chains whose individual strands are weak, hence of low visibility. In Europe and Asia shareholders have a final say on a larger number of issues, such as share buy-backs, dividend payments and new issues. Concentrated shareholders also have much greater power to set shareholder meeting agenda.

This allocation of power backs up the prevailing ownership structures: in both cases, the law grants those in control (management in the USA, dominant shareholders in Europe and Asia) the right to exercise and retain it. While there are features common to the various Continental-Europe and East-Asia corporate governance systems, especially compared with the USA, each also has its own unique features.

The relationship of capital to the firm is also shaped by the structure of inter-firm networks, which influences firm behavior through access to critical resources and information (Burt, 1983; Davis and Mizruchi, 1999). While firms may establish many types of ties, an intriguing aspect for capital is differences in the overlap of networks of capital ties (ownership and credit) with other business ties a property known as network multiplexity. In USA and UK firms form loose networks and tend not to build as many multiplex relationships, in part because of antitrust regulation (Davis and Greve, 1997). In European and Asian countries with multiplex networks (i.e. Japan, Germany, Italy, etc.) ownership stakes often overlap with supplier relations, board representation, and the commingling of debt and equity claims (Aguilera, 1998). Multiplex ties reinforce the commitment of capital by making exit more costly, particularly given a high degree density of relationships between firms. Dense directorates interlocks may increase the propensity to cooperate (Mizruchi and Stearns, 1988) and to discover common strategic interests:

P3. Can theoretical perspectives developed for network based on shareholders be extended with theories on network in general, geographical specificity and multiplexity?

Directorates interlocks

Interlocking directorates is a networks based on common directors that serve on multiple firms' boards, interacting on a regular basis. When a director sits on board of two firms he not only represents both the organizations of which he is member but he also creates a tie. Individuals that sit on corporate boards share responsibility for selecting the most senior level of management and for ensuring that they advance long-term interests of stockholders. The board is also an instrument for dealing with the organization’s environment (Pfeffer, 1972), reducing uncertainty and providing valuable resources. Some reasons that have lead interlocking directorates to be diffused among Anglo-American firms are pressures coming from cultural, historical and institutional contexts (Podolny and Page, 1998). Single organizations observe others and attempt to match their actions to the dominant behavior of the overall population. For example, an organization might mimic the behavior of a partner that has interlocking directorship with a third firm if it benefits from a direct access to the same knowledge stream. This could minimize transaction costs and optimize inter-organizational competitive advantage (Simoni and Caiazza 2012b). Firms can identify dominant choice of other firms and consequently they tend to imitate relationships with greater advantages. Institutional theorists argue that board composition is affected largely by prevailing institutionalized norms in the organizational field. Theories of institutional isomorphism (DiMaggio and Powell, 1983) suggest that boards of organizations in the same institutional set will tend to be more similar to each other than to the board of organizations outside their set. The basic theme of the majority of articles about interlocking directorates in
the Anglo-American system, leading back these ties to resource dependency theory, tend to see them as mechanism of cooptation (Selznick, 1949; Pfeffer and Salancik, 1978) that provide a firm with access to resource, markets and technologies (Doz and Hamel, 1998) ensuring their own stability and existence. This perspective sees the firm as a bundle of resources that act as a firms' main source of sustainable competitive advantage that, in turn, highlights the importance of tacit knowledge (Simoni and Caiazza, 2013). Learning theorists have point out that interlocking directorates, through sharing of knowledge, serve as mechanism for diffusion of innovations. Director interlocks have been found to play an important role in disseminating information across firms (Burt, 1980; Useem, 1984) and in securing preferential access to critical resources (Boeker and Goodstein, 1991; Mizruchi and Stearns, 1994; Selznick, 1949). As O'Hagan and Green (2002) explain these directors are important boundary spanners that link across organizations. These interlocks can aid tacit knowledge transfer, with directors providing some key aspects of collective tacit knowledge (Koenig Gogel, 1981; Boyd, 1990). Au et al. (2000) point out that in uncertain economic environments those firms that utilize interlocking directorates to achieve more information and coordination tend to reduce their levels of operating uncertainty. On the other hands interlocking directorates between strategically interdependent firms belonging to the same industry are seen as collusive mechanism of strategic management of environment, able to reduce uncertainty, share risks, increase power and influence. Horizontally interlocked firms in fact can gain advantages through communication regarding pricing, advertising and research (Pfeffer, 1972).

The class hegemony theory pint out that formation of interlocks are attributed to personal characteristic such as the esteem of the individuals involved, rather than to the characteristics of the organizations they link (Dooley, 1969; Mariolis, 1975), thus interlock are seen as social ties among members of upper class (Mills, 1956). Following Mills (1956), several theorists, including Domhoff (1967) and Useem (1984), viewed interlocks as elements of capitalistic class integration. For Koenig et al. (1979), Ornstein (1980) and Palmer (1983), the frequency with which accidentally broken interlocks between firms were reconstituted was an indicator of extent to which such ties represented significant links between the firm in question (Caiazza, 2016). The fact that the majority of broken ties were not reconstituted with the same firm suggested to these authors that interlocks were not primarily organizational phenomena. They inferred from this that the majority of interlocks reflected intra-class social ties rather than inter-organizational resource dependence or control ties.

In countries where the corporate ownership of listed firms has traditionally been concentrated in the hands of families are characterized by an historical overlap of ownership and interlocking networks (Corbetta and Tomaselli, 1996). In Continental-European and East-Asian context (i.e. Italy, Japan and Germany) ownership concentration and the limited role of the stock market have created a stable system in which few hostile takeovers occur and a market for (hostile) corporate control is muted. The high ownership concentration combined with the widespread existence of pyramidal groups (Italy, Japan, Korea and Hong Kong) has given individuals with limited assets disproportionate control over a wide range of activities via a chain of proprietary relationships (Aguilera and Jackson, 2003):

P4. Can theoretical perspectives developed for studying network based on directorates be extended with theories on network in general, geographical specificity and multiplexity?

What we need to know

Network of firms that share shareholders or directors can be analyzed according to a perspective that mutually considers institutional, strategic, resource and class aspects (Caiazza and Simoni, 2015). Such perspective has to consider main characteristics of corporate governance system in which tied firms operates and the specific roles that play
shareholders and directors in such systems. Institutional theory suggests that institutional context imposes pressures on firms to conform on prevailing social norms. According to strategic choice perspective firms pursue inter-organizational relationship to improve competitive advantage. From resource-based perspective, inter-organizational relationship as mechanism to access to critical resources and to increase firm’s power on other organizations. Class hegemony perspective evidences that shareholder or directors create a tie among firms to reinforce their upper-class cohesion.

The purpose of Zona, Boyd and Takacs Haynes paper on “Coordination, control or charade? The role of board interlocks among business group members” is to explore how board interlocks between members serve as control and coordination mechanisms within business groups. It proposes that centrality of groups’ affiliates in the group network of interlocking directorates is shaped by agency and resource dependence forces.

The purpose of Blanco-Alcántara, Díez-Esteban, Romero-Merino paper on “Board networks as source of intellectual capital for the companies: Empirical evidence from a panel of Spanish firms” is to explain the effect of board interlocks on firm performance. It evidences that the influence of board interlocks depends on their ability to contribute to strategic decision making. As a result, their effect is subject to the business context in which they occur and the different role of the interconnected directors.

The purpose of Gonçalves, Rossoni and Mendes-da-Silva paper on “Board social capital reduces implied cost of capital for private companies but not of state-owned companies” is to analyze how the type of property moderates the effect of board social capital on the cost of capital. Specifically it shows that the board relational resources reduce the impact of cost of capital for private but not for state-owned companies.

The purpose of Ramaswamy paper on “Director interlocks and cross cultural impact on strategies affecting shareholder-creditor conflicts: A conceptual analysis” is to evidence cross-cultural effects of interlocks on corporate strategies that affect this essential agency relationship. It evidences that director interlocks have the potential to increase or worsen shareholder-creditor conflicts by magnifying strategic practices like short termism, earnings management or through its effects on CEO compensation.

The purpose of Sandhu, Orlitzky and Louche paper on “How national level background governance conditions shape the economic payoffs of corporate environmental performance” is to study how the background governance conditions of legal systems, economic policies and national culture enable or impede the relationship between corporate environmental performance (CEP) and lagged corporate financial performance (CFP). It shows that common-law systems and high economic freedom in a company’s home country tend to strengthen the CEP-CFP link. In addition, the home-country cultural variables of uncertainty avoidance, long-term orientation, and masculinity may impede the deployment of CEP for maximum financial gain at the organizational level.

The purpose of Chakraborty, Gao and Sheikh paper on “Corporate governance and risk in cross-listed and Canadian only companies” is to investigate if there is a differential effect of corporate governance mechanisms on firm risk in Canadian companies cross-listed on US markets and Canadian companies not cross-listed. It evidences that the effect of board characteristics like size, independence and proportion of female directors remains the same in both cross-listed and not cross-listed firms.

The purpose of Biswas, Roberts and Whiting’s paper on “The Impact of Family versus Non-Family Governance Contingencies on CSR Reporting in Bangladesh” is to investigates the impact of the introduction of the Corporate Governance Guidelines in 2006 and family governance on the level of corporate social responsibility (CSR) reporting of non-financial companies in Bangladesh. The study evidences that Corporate Governance quality significantly increases the level of CSR disclosure and this relationship is stronger prior to the new Corporate Governance Guidelines.
The purpose of Al-Dah paper on “Director interlocks and the strategic pacing of CSR Activities” is to evidence the role of interlocking directorates in engaging in CSR activities to maximize firm value. It evidences that firms with interlocked directors benefit from their directors’ social network and experience positive returns when engaging in CSR activities at a fast pace.

The purpose of Hernández-Lara and Gonzales-Bustos paper on “The impact of interlocking directorates on innovation: The effects of business and social ties” is to identify the effect of different type of shared directors on innovation. It suggests that independent and extra-industry multiple directorships have positive effect on innovation while intra-industry and women interlocks have negative effect on innovation.

Based on resource dependence theory, the paper of Galvão, Marques, Franco, Mascarenhas, on “The role of start-up incubators in cooperation networks from the perspective of resource dependence and interlocking directorates” aims to understand the importance of networks for start-ups and the role that incubators play in these companies’ networking processes.

The purpose of Caiazza and Simoni, paper on “Directorate ties: A bibliometric analysis” is to provide a bibliometric analysis of articles on interlocking directorates to identify the evolutionary patterns that characterize the studies on board interlocks. It identifies four different periods that characterize board interlocks studies: the emerging debate, the earliest modern era, the modern era, the post-modern era.

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References


Further reading

About the Guest Editor
Rosa Caiazza is PhD and Professor of Management at Parthenope University of Naples. She was visiting Professor at Wharton University of Philadelphia (USA). She is Editor-in-Chief of *Journal of Developing Management*. She has also served as an advisory Board Member to a number of top-tier academic journals, including *Academy of Management Perspective*, *Small Business Economics*, *Management Decision*, *Journal of Management Development*, *Trends in Food Science & Technology*, *Corporate Governance*. Much of her research focuses on international strategy, corporate governance and innovation. Her research has also focused on the links between innovation, entrepreneurship and local competitiveness. She was Chairman of many EIASM Conferences. She is Author of many articles on strategy, corporate governance, entrepreneurship, innovation published on top-tier academic journals such as *Journal of Technology Transfer*, *Technology Analysis & Strategic Management*, *Business Process Management Journal* and *Journal of Management Development*. She was awarded the “Literati Network Awards for Excellence” by Emerald for several years. Rosa Caiazza can be contacted at: rosa.caiazza@uniparthenope.it
Coordination, control, or charade? The role of board interlocks among business group members

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Abstract

Purpose – How do business groups manage their internal processes? The purpose of this paper is to explore how board interlocks between members serve as control and coordination mechanisms within business groups. The authors propose that centrality of groups’ affiliates in the group network of interlocking directorates is shaped by agency and resource dependence forces. In particular, the authors examine the role of international board ties as a resource and information conduit.

Design/methodology/approach – This study leverages proprietary information on firm-to-firm transaction ties among all 155 affiliates belonging to a large Italian business group. The authors use network analysis to develop multiple measures of the centrality of each group member, and link these to resource transactions, ownership patterns and geographic distributions. The authors test the hypotheses in a structural equation model using LISREL.

Findings – The results demonstrate that both resource exchanges and the presence of cross-national relations increase an affiliate’s central position in the group’s network of board ties. In contrast, ownership ties between members were unrelated to affiliate centrality.

Originality/value – Internal governance mechanisms of business groups are rarely studied. While groups are often portrayed as inefficient or value-destroying, the analysis of proprietary firm data suggests a very different scenario: inter-unit ties are much more supportive of a model of business groups as strategic portfolios, using internal ties to share information and resources.

Keywords Network analysis, Boards of directors, Interlocking directorates, Ownership, Business groups

Paper type Research paper

Business groups, also known as pyramidal organizations, are collections of firms that are bound together, despite being legally separate entities (Granovetter, 2005). Business groups are a prominent feature of the global economic landscape, and can be found in both developed and emerging economies (Denis and McConnell, 2003). However, business groups are studied less frequently than other ownership forms, such as family firms or institutional investors (Boyd and Solarino, 2016). Additionally, work on business groups has been characterized as “highly fragmented” (Yiu et al., 2007, p. 1551). Further, due to data limitations, most analyses of business groups are from an external perspective, with a limited focus on their inner organization (Caimelli and Iacobucci, 2011). We aim to provide a unique perspective on business groups through examination of how they manage their internal processes.

Examination of business group processes is significant for several reasons. First, there is an ongoing debate about whether business groups are inherently helpful or harmful: do
groups create or expropriate value (Chang and Hong, 2000)? Empirical evidence is highly mixed, as prior studies have reported a mix of positive, null and negative links between business group affiliation and firm performance (Boyd and Solarino, 2016). To explore this question more fully, DiCarlo (2014) suggested that researchers try to infer whether decision-making mechanisms in a group are more aligned with opportunistic vs efficiency-oriented viewpoints. Consequently, we propose to develop new predictions regarding the internal operations of business groups. By studying internal coordination activities, we hope to lay the groundwork for a better understanding of what drives the performance of business groups.

Second, we contribute to the research stream on governance and coordination among group affiliates. Board interlocks arise when the same individual sits on the board of two different firms (Mizruchi, 1996). Prior work has noted that interlocking directorates are a relevant aspect of business groups (e.g. Khanna and Rivkin, 2006); however, the way that these inter-firm ties serve as coordination or control devices within a group is largely unexplored. We draw on the theoretical framework developed by Yiu et al. (2007), which uses resource dependence theory to suggest that board ties may be useful to coordinate activities among transacting affiliates. Yet, a test of this proposition has been limited by difficulties in collecting data on firm-to-firm transactions, leaving this idea in need of an in-depth empirical validation. Additionally, a number of management scholars draw from alternative perspectives, such as agency theory, to suggest that – in independently-managed firms – board ties reflect equity ties and control rather than coordination purposes (Fich and White, 2003; Zona et al., 2018). By adopting a dual theory approach, we can compare the relative importance of each perspective in explaining connections between group members. Additionally, this approach allows us to extend widely used theories to an organizational form, such as business groups, which are relatively less explored by management scholars (Cainelli and Iacobucci, 2011).

Third, a relatively unexplored area in business group research is the role of geography. It is noteworthy that the detailed literature review by Yiu et al. (2007) does not mention any work on geography or cross-national ties. In fact, the role of geography has been mostly examined in the domain of multinational corporations. Nevertheless, there is evidence that business groups do develop internationally (Gaur and Kumar, 2009). Given the complexity inherent in exchanging information across different countries (Caiazza and Simoni, 2015), cross-national relations may represent core nodes in coordinating business groups’ activities, and may be reflected in the network of interlocks among group members.

In order to address these issues, we were able to overcome a notable limitation of previous research. Micro-level research on coordination within business groups has long been impeded by lack of data on firm-to-firm ties. Data on transaction ties among firms are not generally available to scholars (Khanna and Rivkin, 2006), because these data are price and competition sensitive (e.g. they involve profit/resource transfer among group members). To overcome such an obstacle, we involved in the research project the top management of a large Italian business group, and obtained access to a valuable data set on 155 group members, involving data on ownership, firm-to-firm transaction ties and geographic location of group members. These data provide a unique opportunity to test control/coordination mechanisms and activities in business group. We constructed multiple measures of network centrality in the group using UCINET. Using a structural equation model, we determined that a firm’s position in the corporate network is driven heavily by resource and coordination roles and cross-national ties. Ownership has no significant effect on patterns of board ties.

Through this study, we make several contributions to the strategic management literature. We test the boundary conditions of resource dependence theory, and extend its relevance beyond standard contexts of competitive markets. As far as we know, this study
is the first empirical test of the interlocking/resource dependence hypotheses to use data on firm-to-firm transaction ties. Additionally, by examining cross-national ties, we extend resource dependence to geography, to encompass dependence on information from foreign ties. Finally, we contribute to research on business groups, by showing how coordination, rather than control, shapes the inner network structure of intra-group board ties.

Literature review
Business group research has been characterized as having “incurred both frustrating confusion as well as heated discussion regarding their organizational nature and economic contributions (Colpan and Hikino, 2010, p. 16).” In part, this stems from the breadth of the topic, and the ensuing variability in the foci of individual studies. For example, while the bulk of research examines economic performance of groups (Chang and Hong, 2000; Khanna and Palepu, 2000), other work explores issues in the definition and identification of groups (e.g. Khanna and Rivkin, 2006), while a third stream uses a case study approach or focuses on identifying descriptive characteristics of groups (e.g. Zattoni, 1999). In an effort to create an integrative framework for business group research, Yiu et al. (2007) developed a model that classified business groups along two dimensions. The first dimension, vertical linkages, taps the degree of ownership among member firms. For instance, Italian and Korean groups have equity relationships between group members, while groups in other regions might have minimal or no equity ties. The second dimension involves horizontal linkages, and is defined by the degree of interaction or interdependence between group members. For example, a group that shares resources across members would have high levels of horizontal interdependence. Given the variability between business groups, there are multiple configurations of these dimensions. For example, there may be high levels of either equity or resource ties, high levels of both, or low levels of each type. For purposes of theory development, we focus on what Yiu et al., describe as the M-form business group, which has both equity and resource connections between group members.

Despite the extensive and comprehensive review of published business-group research, the framework by Yiu et al. (2007) suffers from two core limitations. First, it does emphasize role of interlocks in business groups; yet, based on a resource dependence emphasis, it conceives of board ties solely as a coordination mechanism reflecting transaction ties, to the exclusion of board’s role as an agency alignment tool Yiu et al. (2007, p. 1568). Second, it does not emphasize geography as a core dimension of business group functioning. Yet, the extant research recognizes that internationalization constitutes a core dimension of business group functioning (Gaur and Kumar, 2009). This dimension is especially salient for coordination: given country level differences in market and institutions, cross-national relations increase the information needs, possibly shaping information flows and board interlocks (Caiazza and Simoni, 2015).

In this paper, we address both limitations, exploring the determinants of board interlocks among business group affiliates, as emerging from ownership considerations, transacting issues and geographic concerns.

Hypothesis development
The purpose of this paper is to study interlocks as a control/coordination device for a business group as a whole. Consequently, our focus is on the centrality of an affiliate in the group’s network of interlocking directorates as our dependent variable. Centrality refers to a firm’s relative position in a broader network of firms (Faust, 1997). “Centrality is a structural attribute of nodes in a network, not an attribute of actors themselves, but of their structural position in the network” (Hossain and Wu, 2009, p. 796). Network researchers conceive centrality as the degree of importance, influence and prominence of an actor in a network (Borgatti et al., 2002; Freeman, 1979). Central nodes in a network
“can exert more influence by virtue of being linked with a large number of actors in the network” (Hossain and Wu, 2009, p. 796); further, central actors are more likely to potentially receive information of higher quality (Ahuja et al., 2003). Centrality has been used to explore both control and coordination issues in organizations (Ove, 2002). For instance, it has been shown that actors more centrally positioned in a network exhibit more coordination activity (Hossain and Wu, 2009). Chen and Jaw (2014) found network variables to be significant predictors of strategic outcomes (diversification and innovation activities) for a sample of Taiwanese business groups.

Anecdotally, members of a given business group are often linked via common directors on their respective boards; however, such ties have rarely been the focus of research (Boyd and Hoskisson, 2010). Similarly, Chen and Jaw (2014) concluded that the network structure of a business group is an important element, which is in need of more detailed assessment. The first step in that assessment is the choice of theoretical perspectives to assess the centrality of business group members.

Although business groups are primarily studied with an agency theory lens (Boyd and Solarino, 2016), multiple theoretical perspectives can be applied to the governance of these organizations (Boyd and Hoskisson, 2010). Additionally, multi-theoretic approaches often have superior explanatory benefits when studying governance phenomena (Boyd et al., 2011). Consequently, as we develop below, we will predict that agency and resource dependence factors shape an affiliate’s centrality in that network.

Board interlocks in business groups: an agency perspective

Board interlocks are common in business groups across a variety of contexts. They are found in regions that typically have strong equity ties, as well as in both emerging and mature economies (LeFort, 2009; Fracchia et al., 2009; Kosenko and Yafeh, 2009; Bianco and Pagnoni, 1997; Khanna and Rivkin, 2006). According to Yiu et al. (2007, p. 1561), the vertical chain of ownership "functions as a command chain along the hierarchy from the dominant owner to individual firm management." Along this vertical chain of ownership, the focal firm receives commands from the top and allocates sub-orders to the affiliates it controls (Cainelli and Iacobucci, 2011). Once orders have been assigned to lower levels, the focal firm is in charge of ensuring that the controlled affiliates behave as ordered.

We contend that, in the context of business groups, board interlocks can serve as a control-mechanism along the vertical chain of ownership, linking the business-group apex and the affiliates. Agency theory represents the most suitable framework to inquire into this issue. In the standard agency framework, agency costs arise from the separation of ownership and control (Berle and Means, 1932) and the board monitors the CEO on behalf of shareholders (Jensen and Meckling, 1976). Two core drivers are especially salient for the emergence of agency problems: information asymmetries and individual’s opportunistic behaviors (Dalton et al., 2007). These two drivers characterize equity ties among business groups’ affiliates, giving rise to monitoring needs and the adoption of interlocking directorates.

As regards information asymmetries; group’s affiliates are significantly involved in joint cooperation, particularly in a M-form group characterized by strong strategic interdependence. In such a context, group’s affiliates exchange business-related information, which involves far greater complexity and ambiguity compared to the financial information needed by investors in public companies (Eisenhardt, 1989). Particularly, affiliated firms hold firm-specific knowledge that is paramount for strategy making, including information on work processes (Gong, 2003), required resources (Mirchandani and Lederer, 2004) and local markets (Fey and Furu, 2008). This information is hard to access externally (Steinberg and Kunisch, 2016), giving rise to information asymmetries between an affiliated firm and its equity-holding company.
Regarding utility maximization and opportunistic behaviors, the personal interests of an affiliate’s CEO may not necessarily align with the needs of the group as a whole. As loosely coupled systems (Orton and Weick, 1990), business groups involve separateness and identity of individual group affiliates (Yiu et al., 2007, p. 1559). Thus, while expected to cooperate dutifully and execute orders, group affiliates also exhibit distinct goals and local interests. They compete with each other for resources (Holmes et al., 2018; Birkinshaw and Hood, 1998), fostering the potential for opportunistic behaviors and the pursuit of private goals. In this regard, the CEO of an affiliated firm is relatively more entrenched compared to a manager of a corporate sub-unit. For example, whereas a division manager might be easily transferred to other business units at any time, the CEO of an affiliated firm often has a multiyear appointment, and may be more difficult to remove. As a result, the agency theory’s assumption about individuals’ tendency to pursue their private interests can hold for CEOs of a group’s affiliates, given strong information asymmetries and goal conflicts. Under such conditions, close monitoring through the boards of directors may serve to align CEO behaviors, detect early signals of misalignment and remind the CEO of the power and interests of the controlling owner.

Control needs outlined above are exacerbated as the number of equity ties of an affiliate increases. Multilateral agency relations – involving multiple agents/principals – magnify agency problems, given they involve “controlling strategic behaviors of several parties interacting with each other” (Bolton and Dewatripont, 2005, p. 25). For example, the presence of multiple agents may lead to collusion among themselves at the expense of the principal (Hoener and Kostova, 2015, p. 107), magnifying the need of establishing interlocking directorates as monitoring devices. Moreover, the presence of multiple principals may lead the dominant actor to expropriate other minority shareholders (i.e. the principal-principal problem, Young et al., 2008), increasing the monitoring needs. As the number of equity-linked affiliates increases, the focal firm increasingly plays the role of a “core node” for transferring orders along the vertical chain of ownership (i.e. functioning as a sub-holding for other affiliates) through interlocking directorates. Therefore, we hypothesize that as the number of ownership ties increases, so does the number of ties to other boards and a firm’s centrality within the network of board ties. Stated formally:

**H1.** The number of an affiliate’s equity ties is positively related to centrality in the network of interlocking directorates within business group.

**Board interlocks in business groups: a resource dependence perspective**

Resource dependence theory was developed to explain behaviors of independently managed, stand-alone (i.e. non-affiliate) firms, that exchange resources under competitive market forces. Given their dependency on resource providers for critical resources, these organizations set up linkages (such as board interlocks) with external actors, to the benefit of both the firm and the economy as a whole (Simoni and Caiazza, 2013). These connections help to attenuate resource constraints (Pfeffer, 1987; Pfeffer and Salancik, 1978) and to acquire critical resources, such as legitimacy (Selznick, 1949), advice and counsel (Kim and Kim, 2015; Lorsch and MacIver, 1989) and financial resources (Mizruchi and Stearns, 1988).

It has been emphasized that “despite the obvious application and relevance of resource dependence theory to business groups, there have been surprisingly very few studies on this subject” (Sambharya and Banerji, 2006, p. 12; see also Brouthers et al., 2014; Kim et al., 2004). We submit that, when applied to business groups, this theory suggests that interlocks among business group members serve to gather information from other affiliates and coordinate business activities within the broader group context.

Firms affiliated to a business group constantly exchange resources among themselves under a “quasi market” (Yiu et al., 2007), and are thus relatively less exposed to market
pressures and expropriation by competitive actors. Yet, affiliated firms are also called to make common efforts for the realization of the group’s global purpose. Common goals and joint actions foster interdependence, raising uncertainty and coordination needs (Thompson, 1967).

In this regard, it has been documented that “affiliated firms emphasize close cooperation between themselves to coordinate actions” (Sambharya and Banerji, 2006, p. 10). Dependencies generated by resource exchanges are usually reciprocal, “enabling the exchange partners to influence each other’s behaviors and profitability” (Sambharya and Banerji, 2006, p. 11), calling for the need of information exchanges. Needs for information exchanges are also magnified, given most affiliates specialize either by products or by processes, working together for the realization of a unitary output (Odaka et al., 1988). Further, assets specificity of cooperating affiliates leads to even more interdependencies, fostering the need for close coordination and information exchanges among business group members (Dyer, 1996).

In sum, transacting affiliates must coordinate their activities in order to accomplish higher-order ends. Board ties may have a potentially important role to play in managing transaction-based uncertainty, by serving as a connection to other members of the same group (Kim et al., 2004; Boyd and Hoskisson, 2010). Specifically, we submit that those affiliated units that exchange resources with a larger number of other group’s affiliates will play a significant role in coordinating the group’s business activities, and will, thus, be more centrally positioned in the network of board interlocks. Indeed, transacting with a larger number of actors increases coordination uncertainty for the focal firm, both in resource in-flow and in resource out-flow. As for resource in-flow, the focal firm acquires resources from a larger number of counterparts, raising to need to coordinate strategic plans, operations and, hence, the many flows of incoming resources in terms of timing, quality, quantity, etc. As for resource out-flow, the focal firm provides resources to other group affiliates: organizing resource-outflows toward a larger number of counterparts requires a close coordination and timely information relative to their potentially conflicting needs and demands.

Anecdotal evidence supports this view. As the number of transacting partners increases, the focal firm becomes the “hub” through which resources and information flows are channeled to various members of the business group (Fruin, 1992; Miyashita and Russel, 1994): the focal firm “is in a position to influence the flow of information and resources both between itself and its suppliers, and between the suppliers themselves” (Sambharya and Banerji, 2006, p. 15). It thus develops a high level of network centrality and acts as a focal coordinator for the group as a whole, by bridging information across multiple affiliates (Sambharya and Banerji, 2006, p. 13).

Board ties may be particularly effective as a mechanism to convey information. Board ties can be conceived as weak inter-unit ties, characterized as a focused and relatively inexpensive channel to convey high-quality information (Granovetter, 1973; Haunschild and Beckman, 1998). Board ties may thus function as a useful mechanism for inter-unit information exchange: through the establishment of board ties, connecting directors possess and share unique information specific to the firms, facilitating coordinated planning and organizing of business activities. The benefit of board ties would be particularly important as the number of group transacting partners increases, and the risk of coordination problems for the overall business group becomes more severe. Therefore, we hypothesize the following:

H2. The number of an affiliate’s transacting partners is positively related to centrality in the network of interlocking directorates within business group.

Resource and coordination needs of geographically dispersed group members
An important contextual aspect of these mechanisms is geography. The notion of geographic distance is a fundamental and practical challenge in management. One of the earliest frameworks dealing with the issues surrounding geography and internationalization is
Dunning’s (1977) “ownership – location – internationalization” paradigm. Yet, even though the importance of geographic distance in the world of business was recognized over 40 years ago, there is significant work to be done on this aspect of management. Much of the research related to geographic distance and location advantages and disadvantages was done in the realm of the multinational enterprise. Indeed, Zaheer et al. (2012, p. 19) characterize international management as “the management of distance” (Williams and Grégoire, 2015).

Geographic distance has been studied in relation to regional multinationals (Rugman and Oh, 2013), the location of foreign direct investment (Yang et al., 2013), foreign acquisition activity by US firms (Ragozzino, 2009) and acquisition vs alliance decisions (McCann et al., 2016). Further, Boeh and Beamish (2012) summarize additional contributions to the literature on distance metrics to include the cost of separation (Rosenkopf and Almeida, 2003), borders (Davidson and McFetridge, 1985) and even distance measured in air miles (Hansen and Lovas, 2004), while noting that the most relevant aspect of distance is physical separation, which “inhibits the ability to monitor and control resources” (Boeh and Beamish, 2012, p. 526). This is significant, because physical separation increases costs and puts strain on managerial time and resources (Boeh and Beamish, 2012). In response to the strain, organizations might choose to treat proximal and distant entities differently (Mingo et al., 2018).

Geographic distance is an important factor in business groups whose members might be located in multiple countries or even continents and have varying resource needs. For example, in business groups, the uncertainty surrounding resource exchanges among interdependent actors partially depends on the distance among the actors. Geographic proximity and distance from headquarters for example, might influence the resources a unit has access to through its linkages. All other aspects equal, a more distal group is likely less visible than a more proximal one, leading to differences in assessing resource needs. Therefore, geographic distance is a relevant aspect of the relationship between the provider of access to a particular resource and the business group member in need of the resource.

Thus, our final hypothesis concerns the role of cross-national factors as a determinant of board ties, and is a second test of resource dependence perspective. Many business groups have operations that span multiple countries and continents (Gaur and Kumar, 2009). A recent literature review on business groups and international strategy, points out that little is known about business group boards, and particularly how they relate to business group strategy such as business internationalization (Holmes et al., 2018). We expect that the boards of more distant group members will be more densely connected than members located closer to the parent organization. Our rationale for this effect is based on both the information advantages of such ties, and also the greater coordination and cohesion needs of more distant members.

When a group operates in multiple regions, the complexity of decision making increases substantially and dependency on valuable information rises. Dubbed the “liability of foreignness” (e.g. Zaheer, 1995), a firm that ventures beyond national borders must overcome many barriers, including gaps in knowledge and securing access to resources. Geographic complexity is consequently linked to a need for greater interlocks (Kono et al., 1998). Using a resource dependence argument, we propose that business group members can draw on counterparts in other countries as a tool to overcome problems such as insufficient market information, or access to local suppliers and customers. In support of this rationale, Belderbos and Sleuwen (1996, p. 216) noted that “important barriers to foreign investment can be overcome by information sharing” among business group members. Similarly, Rauch (2001) concluded that transnational networks can provide market information, access to distribution channels, supplier contacts and local sources of capital. In a related vein, Ragozzino and Reuer (2011) found that geographic distance hampered the effectiveness of venture capital firms when investing in public offerings,
as distance limited the extent of information available to investors. In accord with resource dependence theory, interlocking directorates may help manage dependencies on a critical resource such as information and linkages to valuable actors (Hillman and Dalziel, 2003). Thus, foreign board ties could serve as a strategically useful source of information for other group members.

The utility of foreign interlocks is consistent with related arguments originating in a variety of complementary theoretical perspectives. Drawing on network models, board ties to a more distant group member will provide more unique sources of information than closer members. For example, consider four directors: two from Milan, one from Berlin and the other from Buenos Aires. The extended networks of the Milanese directors have greater potential to overlap due to geographic proximity, which can reduce the unique information and resources provided by each director. In comparison, the extended network of the German director is less likely to have such redundancy, and the Argentinian director even less likely to contain overlap. Ahuja (2000, p. 425) argued that networks with a diverse set of indirect ties “may be an effective way for actors to enjoy the benefits of network size without paying the costs of network maintenance associated with direct ties.”

Similarly, research on organizational demography underscores the utility of foreign directors. A key challenge for a geographically dispersed business is that competencies may have different utility from one region to the next (Rangan and Drummond, 2004). Exposure to different international contexts is an important tool to promote organization learning (Yli-Renko et al., 2001; Zahra et al., 2000), which in turn can help a firm maximize the return to its competencies. While foreign ties have the potential to be cumbersome (Gupta and Govindarajan, 2000), they also offer great utility. For example, one study found that, in the long run, highly heterogeneous teams were as effective as highly homogeneous ones (Earley and Mosakowski, 2000). Similarly, a study of multinational project teams found that ties across subsidiaries can offset any negative effects of spatial distance (Hansen and Lovas, 2004). Finally, an analysis of subsidiary executives found that cultural heterogeneity of team members was positively associated with the quality of decision making and overall team performance; additionally, diversity of team members did not have any negative effects on social cohesion (Elron, 1997). Given the many advantages of foreign ties, we propose that the boards of foreign group members will make for more prominent interlock partners. Therefore:

\[ H3. \] Distance from the corporate parent is positively related to centrality in the network of interlocking directorates within business group.

\section*{Methods}
\textbf{Sample}

Data on business groups are normally difficult to collect (Cainelli and Iacobucci, 2011). Our hypotheses required access to within-group transactions. Such data are proprietary, and not subject to disclosure requirements. The parent firm of the business group used for our sample agreed to provide internal data in exchange for feedback regarding our results. We collected data from 155 firms, which represent the membership of a large, Italian business group. Italian groups fall into Yiu et al.’s (2007) M-form category, which would make it an optimum setting for testing both agency and resource dependence hypotheses. Stated differently, Italian groups are known to have high levels of resource exchange between units, as well as strong ownership ties. In Italian business groups, the controlling shareholder – i.e., the parent firm – controls the board of directors. The Italian Civil Code also delegates coordination among group members to the parent – specifically including any links between affiliates (DiCarlo, 2014). Consequently, the parent firm has the ability to design each of the subsidiary boards, and the ensuing network structure.
In 2005, the group had revenues of approximately Euro 30bn, and assets of roughly Euro 100bn. Approximately one-third of member firms of which were headquartered in Italy, with the remainder being located worldwide. Given our focus on geography, our sample is consistent with large-sized Italian business groups, whereby the geography dimension is most relevant. Italy’s multinational business groups, such as ours, represent the vast majority (73.1 percent) of Italian large-sized groups (Istat, 2015).

The chief legal officer was our liaison for the project, and both the financial and legal affair offices were involved in data collection. Data for year 2005 were collected and cross-checked internally upon our request. We also cross-checked the data with available external sources when available. Research in leading management journals often relies on data from a single corporation, in a cross-section design, when the study involves an in-depth analysis of intra-organizational relations that are not accessible at a large scale (e.g. Hult et al., 2004; Tsai, 2002; Hansen, 1999; Gresov and Carrol, 1993). Additionally, network research accepts that reliance on data from one single corporation is often the only viable option, given complexity of network design and boundaries (see Halinen and Tornroos, 2005, p. 1291). Thus, this study aligns with these standard for research design.

**Measurement**

**Network centrality.** Many studies of interlock centrality utilize a measure of degree centrality, which is a simple count of interlocks with other firms (e.g. Davis, 1991; Haunschild, 1993). Through the study of an entire population – in this case, all members of a common group – we are able to construct indicators of each firm’s centrality relative to other group members. Relational data based on a full census of firms (Marsden, 2005) allows creation of centrality variables that are richer and more nuanced than a simple count of interlocks (Scott, 2007).

Using detailed lists of directors for each firm, we created an inventory of board ties among group members. On average, each board had roughly four directors and seven ties with other group members. Based on these data, we used UCINET 6.0 (Borgatti et al., 1999) to create three measures of centrality: betweenness, power and reach. Betweenness taps a firm’s position as an intermediary between other firms. As such, this variable measures a firm’s ability to grant or deny access to information and resources. Power is an advanced and refined variation of “degree centrality”: degree centrality is a measure of direct ties that are held by a firm. In comparison to degree centrality, power factors in the position of the direct ties in the overall network. For example, consider two firms, each with five direct ties. Firm A is tied to companies that are well connected, while firm B’s ties are on the periphery. These firms would have the same levels of degree centrality, while firm A would be considered more powerful. Finally, indirect ties are thought to serve an important, but qualitatively different role than direct ties. Reach measures the scope of a firm’s indirect connections (Ahuja, 2000; Brass and Burkhardt, 1992; Freeman, 1979). These variables were expected to load significantly on a multi-indicator factor model. Appendix 1 illustrates and explains our measures in more detail.

**Resource dependence.** We received a list of all economic and financial firm-to-firm ties between group members. We created a summary measure of the number of other firms a given company had engaged in transactions with. A total of 32 of our sample firms reported no transactions at all with any other members of the group. At the other extreme, one firm reported having financial transactions with over half of group members. On average, a typical firm reported having financial transactions with approximately five other group members.

**Ownership.** The group’s financial office provided data on ownership ties for all of the 155 firms. To test our hypotheses, we created a variable Own-All, which represented the
sum of the number of other group members a firm had an equity stake in, plus the number of other group members that had an equity position in that firm. On other words, Own-All was a count of the number of inward and outward equity ties for any given firm with other group members. To test for possible directionality effects, we ran supplementary models based separately on the count of inward and outward ties. These supplementary variables are included in the Table I descriptive statistics.

Geographic distance. The bulk of studies examining geographic effects have utilized dummy variables (Doh and Hahn, 2008). Over 60 percent of group members were headquartered outside Italy. We created a dummy variable for nationality that was coded as “1” for firms located in Italy, and “0” for firms located elsewhere.

Firm size was measured by the logarithm of sales.

Analyses. Our hypotheses were tested in a structural model using LISREL, using maximum likelihood estimation. A graphic model of our analysis is shown in Figure 1.

Results
Descriptive statistics for sample variables are shown in Table I. Summary fit measures indicate that our model is a good fit to the data: Overall $\chi^2$ is 36.84 (8df), with an adjusted $\chi^2$/df of 4.6. Goodness of fit (GFI) was 0.94 and the root mean square residual (RMSR) was 0.07. Our factor model for board centrality also reported a strong fit to the data. The factor loading for power was set to 1.0 as the referent indicator. Factor loadings were 0.56 for betweenness, and 0.86 for reach, both significant at $p = 0.001$. Our hypothesized model explained substantial amounts of variance in the three dependent variables: The mean $R^2$ for centrality indicators was 0.62.

$H1$ stated that ownership would be positively related to firm network centrality. While the coefficient was in the expected direction ($\gamma = 0.09$), it was not statistically significant. Since the direction of ownership might affect results, we ran supplementary versions of the Figure 1 model. One version substituted counts of external owners (Own-In) as the ownership indicator, while an alternate version used counts of ownership stakes (Own-Out). The path coefficient for ownership was non-significant in each of these models. Other path coefficients and factor loadings showed only minor fluctuations with these substitutions, and the results of other hypothesis tests were unaffected. Thus, $H1$ was not supported, despite multiple analyses.

$H2$ stated that resource dependence would be positively related to firm network centrality. This hypothesis was supported, with a coefficient of 0.25 ($p = 0.01$). Thus, firms with more intra-group transactions were more centrally positioned within the group network.

| 1. Betweenness | 1.00 |
| 2. Power | 0.51 1.00 |
| 3. Reach | 0.38 0.78 1.00 |
| 4. Resource dependence | 0.37 0.34 0.36 1.00 |
| 5. Own-in | −0.04 −0.10 −0.07 −0.15 1.00 |
| 6. Own-out | 0.45 0.33 0.30 0.47 −0.04 1.00 |
| 7. Own-all | 0.43 0.28 0.27 0.42 0.24 0.96 1.00 |
| 8. Same nationality | 0.08 −0.19 −0.07 0.25 −0.10 −0.09 −0.12 1.00 |
| 9. Size | 0.30 0.35 0.29 0.54 −0.23 0.29 0.31 0.21 1.00 |
| Mean | 0.91 6.78 31.31 1.00 0.12 0.95 1.35 0.49 8.26 |
| SD | 2.76 6.27 16.69 0.99 0.29 0.50 0.41 0.50 3.27 |

Notes: Log transforms used for financial ties, all ownership measures and firm size; all correlations greater than 0.15 significant at $p = 0.05$

Table I. Descriptive statistics
H3 stated that foreign headquartered firms would be positively related to firm network centrality. The dummy variable for nationality was coded as "1" for Italy headquarters, and "0" for foreign headquarters. Consequently, the negative coefficient of \( -0.27 (p = 0.01) \) indicates that foreign firms are more central in the corporate network. Thus, H3 was supported.

Finally, firm size had a positive, significant link with firm network centrality (\( \gamma = 0.28 \)). This finding is consistent with other studies that have linked firm size with information and resource needs.

**Robustness checks**

We ran a number of supplementary analyses to help validate our hypothesis tests. These included possible bias due to estimation method, concerns regarding causality and post hoc models that examined whether results varied for high and low performing business group affiliates. In the interest of parsimony, we will briefly summarize each of these findings.

Our first analysis concerned possible bias due to data issues. Maximum likelihood is the most common form of estimation used for structural equation modeling, but can be sensitive to data non-normality issues. Consequently, we re-ran the Figure 1 model using generalized least squares, which is less sensitive to such problems. The ensuing model reported comparable results, with only minor changes in coefficient estimates and fit measures.

Second, because our data were cross-sectional, we ran two supplementary models to assess the causal structure implied by our hypotheses. The first scenario is that we have an omitted variable problem, and that all of the variables in our model are the consequence of some unobserved phenomenon. If so, we would expect that all study variables would load on a common dimension. Therefore, we ran a baseline single-factor model, which reported a \( \chi^2 \) of 117.17 (14 df). The highly significant reduction in \( \chi^2 \) enables us to reject a null hypothesis that study variables represented a common factor, and provides further support
for our hypothesized model. Second, it is possible that board interlocks might actually be a predictor of the other study variables, instead of a consequence. For example, the centrality of board ties could direct resource exchange between group members, an opposite direction than predicted in H2. Similarly, board interlocks could be used as an information tool to help groups decide on potential acquisitions. To test this scenario, we reversed the structure of the Figure 1 model: interlocks were the sole predictor, and the four remaining variables were modeled as endogenous. This model reported a significantly worse fit on $\chi^2$, and poorer fit scores on both GFI and RMSR 1[1]. Together, the results of these two supplementary tests provide additional support for our hypothesized model.

Finally, it is possible that high and low performing group members might have some variability in results. For example, a devil’s advocate could argue that low performing affiliates could alternately be more or less central in the network – e.g., more central because of greater need for oversight, or less central because of the reduced value of their connections. Thus, although we did not hypothesize different results for high performers, we ran a supplementary model in the hopes of yielding normative information. To develop this model, we rank ordered each firm on both return on equity and return on assets. Using the combined ranks of both measures, we broke the sample into comparably sized high and low performing subgroups. We then replicated the Figure 1 model using data for the high performers. The magnitude of the path coefficients were largely the same as for the full sample results. For example, the high-performer coefficient for firm ties was 0.23, and ownership was 0.11; the respective coefficients for the full sample model were 0.25 and 0.09. However, neither of these subset coefficients were significant, reflecting the weaker power of the smaller sample used for this secondary analysis.

Discussion

The general contribution of our study rests on testing the boundaries of established and consolidated theories of the firm. By analyzing board ties among affiliated firms, we test the generalizability of agency theory and resource dependence theories to business groups (Ridder et al., 2009; Edmondson and McManus, 2007; Snow, 2004).

Agency theory predicts that, because of information asymmetries and goal conflict, CEOs may pursue their private interests at the expense of shareholders; boards of directors – and interlocking directorates in particular (Zona et al., 2018; Fich and White, 2003) – can function as a monitoring device to keep managerial opportunism in check. While scholars have assessed the validity of this perspective under varying conditions of ownership concentration (Dalton et al., 2007), we extend the analysis to business groups.

Contrary to our expectations, the empirical test does not provide evidence that interlocking directorates play a monitoring role in business groups: along the vertical chain of ownership, a larger number of equity ties does not associate with a more central position in the business group network of board ties. Ownership appears to play a relatively minor role in shaping the interlock network structure.

This finding places a boundary to the generalizability of agency theory, regarding the role of equity ties and board interlocks. In recent decades, agency theory has been proved to powerfully explain behaviors in contexts other than public companies, such as family firms (e.g. Schulze et al., 2001; Chrisman et al., 2018), joint ventures (e.g. Lai et al., 2017; NyoNyO Aung and Theingi, 2009; Hou et al., 2013) and alliances (e.g. Rivera-Santos et al., 2017; Villalonga and McGahan, 2005). This body of research aimed at exploring the validity of agency claims independently of ownership power. Along this line of research, our paper suggests that beliefs of a generalized validity of agency theory, independently of ownership power, may be misleading. In business groups, the agency view plays a relatively minor role to explain board control among business group members. Thus, this study constrains the explanatory power of agency theory, imposing limitations to the generalizability of its propositions regarding equity and board monitoring.
A second contribution regards the role of interlocking directorates as a reflection of resource dependencies among transacting partners. Resource dependence theory has long been the dominant perspective in the study of board interlocks (Hillman et al., 2009). The theory conceives board ties as a mechanism to govern inter-firm uncertainty arising from business transactions among independently-managed corporations (Caiazza and Simoni, 2015). Thus, according to Pfeffer and Salancik (1978), board interlocks are devices to govern market-derived uncertainty. Within business groups, such market forces are attenuated. Thus, the original source of interlocking directorates, as outlined by Pfeffer and Salancik (1978) is substituted by firms operating in a “quasi market,” whose transactions are motivated by the pursuit of a common goal.

Despite lack of market competitive forces, we predict and find that resource dependence theory does powerfully predict board ties among transacting partners. This finding extends resource dependence theory to encompass an additional source of uncertainty beyond market-power, that is, the uncertainty associated with coordinating business activities of complementary assets in an administrative setting (Thompson, 1967). In sum, by testing resource dependence theory within business group, we extend its validity to encompass a different source of uncertainty, and in a context of “quasi market” such as the business group, whereby competitive market forces are attenuated (Yiu et al., 2007; Granovetter, 1995).

It is worth noting that the examination of the resource dependence hypothesis has a more general value in the interest of resource dependence theory. Lack of data on firm-to-firm transactions has long constituted a severe limitation of previous test of this theory: “because the authors lacked data on direct business transactions between firms, they were forced to measure resource dependence at the industry level and then either restrict themselves to industry-level conclusions (as in Burt’s, 1980 work) or infer back to the firm level from the industry-level data” (Mizruchi, 1996, p. 274). As for our knowledge, our study is the first study on resource dependence, which is based on information at the firm level of analysis, as we build on transactions between specific firms (firm A delivers resources to firm B). Therefore, our research represents the first study on how patterns of resource exchanges between specific firms affect board ties.

Finally, our study also applies resource dependence theory to the geographical domain of business groups. Drawing on resource dependence theory, we posit that internationalization elevates the need for valuable information and resources (Kono et al., 1998). Hence, cross-national ties should influence the network of interlocking (Caiazza and Simoni, 2015). We find evidence supporting this hypothesis, challenging some existing view on cross-national management and relations. Specifically, contrary to our resource dependence hypothesis, a legalistic perspective would suggest that boards are set up with no other means than the satisfying of legal requirements of the host country (Kriger, 1988; Leskell and Lindgren, 1982). Such reasoning would suggest no impact of foreignness on patterns of board ties: directors would likely be chosen in the local business community, as local directors would have a better knowledge of the local systems of law and administrative rules; moreover, accomplishment of legal requirements per se does not call for the establishment of linkages among boards of different affiliates. Our findings tell a different story. We do find that foreignness is a key variable, which explains the centrality of affiliated firms in the network of board ties. Such result reinforces the idea that board ties do function as a mechanism for information transfer among group’s member, as foreign affiliated firms operate in a different institutional context and, as such, deal with the problem of matching adaptation to local environment and expectations from the group holding company (Caiazza et al., in press).

Our study also contributes to the literature on business groups. Scholars have devoted relatively limited attention to business groups, and their research efforts have mostly focused on business groups as “a financial device for corporate governance rather than an
organizational form” (Cainelli and Iacobucci, 2011, p. 1551). In their comprehensive literature review, Yiu et al. (2007, p. 1570) examine previously published studies in business groups, and conclude that—while coordination and control represent a core source of organizing and performance in business groups—little is known about how affiliated firms ensure coordinated action for the pursuit of common goals. “How do affiliates coordinate with each other to achieve objectives with mutual interests?” Our findings suggest that board interlocks play a key role in the coordination and exchange of information among board affiliates. Board ties among affiliated firms do exist, and such ties are more than vestigial appendages; rather, they mirror patterns of resource exchanges and areas of business criticality such as management of distant, foreign affiliated firms. Overall, this study contributes to the clarification of board roles under differing organizational settings (Sánchez et al., 2017; Zona et al., 2013). Additionally, our paper adds to the work by Yiu et al. (2007, p. 1559), suggesting that the geographical dispersion of group affiliates represent an important consideration for the inner functioning and coordination of business group activities. Thus, our study contributes to research on business groups across borders. Scholars are placing an increasing attention to internationalization strategies of business groups (e.g. Choi et al., 2014; Holmes et al., 2018). In their extensive and recent literature review on international strategy and business groups, Holmes et al. (2018, p. 143) emphasize that “we still know little about the functioning of business groups boards across geographic markets,” calling for new research on this topic. Our paper contributes to this line of inquiry, outlining how affiliated firms located in geographically distant areas increase resource dependence and coordination needs, placing those firms in a more central position in the network of board ties. Thus, our study documents how interlocking directors are a core mechanism to manage complexity associated with internationalization strategies in business groups.

Our study also offers some practical implications. A common view of business groups in management research is that they emerged because of local market imperfections (Granovetter, 1995). By extension, the need for business groups would decline as markets evolve. However, groups in many regions—such as Argentina and Korea—have adapted successfully to fundamental shifts in their market conditions. Groups can also be found in a number of mature economies, including Belgium, France, Italy, Japan, Spain and Sweden. Studying the inner functioning of business group in a mature economy, such as the Italian economy, may not only advance theory regarding within-group processes, but also provide some guidance for groups in economies that are becoming more mature. Particularly, the evidence from this study suggests that business group management in emerging economies should pay attention to the design of board ties, in order to tap coordination and information needs among transacting partners and foreign relations.

**Limitations and suggestions for future research**

Our data were collected from one of the larger Italian business groups: the sample is a prominent component of the MIB30, the 30 top firms traded on the Boursa Italia. Our business group and affiliated firms are representative of Italian large-sized groups (Istat, 2015). Further, our sample is consistent with previous research on business groups in Italy. For example, Zattoni (2002) conducts an in-depth analysis of a selected sample of five large-sized business groups: the average number of employees of large-sized groups is 70,000 (80,000 in our sample); the average revenues is Euros 31bn (slightly less than 29 in our sample); the average number of affiliated firms in examined groups is 157 (155 in our sample). Further, Zattoni (2002, p. 65) emphasizes how distinct features and ownership structures are strongly uniform within the country.

Business groups are socially and institutionally embedded within specific and distinct country settings: thus, as outlined by Holmes et al. (2018), research on this topic is commonly
understood to be exposed to potential issues of generalizability. To mitigate this concern, we follow indications by Yiu et al. (2007) that recommend to situate business group research within a broader framework, formalizing business group types across national settings. Given our focus, our research can be representative and generalizable to other M-form business groups. While the sample selection and insights from Yiu et al.’s (2007) frameworks help mitigate concerns for generalizability, this issue does represent a limitation of our study, as in much published research on business groups (see Holmes et al., 2018). Cross-country research on business groups, comparing keiretsu, chaebol, Italian groups and the like, is certainly needed to push the forefront of business group research ahead. Thus, extending our analyses to other types of business groups is an important avenue for future studies.

A second limitation common to most board research is our use of archival data. While our analysis can track patterns of ownership and transactions, we still do not know how directors within a group perceive their roles, or what types of information flow between boards. Kriger’s (1988) analysis of subsidiary boards provides an exemplar for future studies on business group boards, as he collected survey data on how executives perceived the roles of boards, and whether perceptions varied across parent and divisions. Consequently, survey analysis of business group directors would offer a more fine-grained extension of our analysis.

Another opportunity for future research concerns the link between nationality and network position. We hypothesized that subsidiaries that are further from the parent would have more extensive board ties: such ties represent an important source of information, and also help the parent to create a cohesive organization. There are a number of empirical questions that emerge from our findings. The first is the relative importance of the two roles, information and cohesion, and whether parent and subordinate firms differ in the perception of these roles. Earlier work on subsidiary boards (Kriger, 1988) illustrated how perceptions of board roles differed across parent and subsidiaries. A second question is how a firm’s strategic orientation may affect these roles. For example, a firm that competes in multiple markets and regions – regardless of whether it is a group or MNC – will make choices that affect its structure, information processing, control and other organization design needs. In turn, these elements shape a firm’s internal network structure (Ghoshal and Bartlett, 1990). Consequently, it may be worthwhile to examine whether a firm’s strategic orientation affects the centrality of foreign subsidiaries. Finally, there is some speculation that subsidiary boards with only partial control by an owner may be more active than the boards of wholly-owned subsidiaries (Leskell and Lindgren, 1982; Kriger, 1988). To test this argument, a future study could examine whether there is a difference in the prominence for foreign subsidiaries for wholly vs partially owned subsidiaries.

Future research could also consider alternate metrics of distance from the parent organization. While many studies have used dummy variables to capture proximity (e.g. Agrawal, 2006; Bell, 2005), an alternate approach is to create a continuous measure of distance – e.g., Ragozzino and Reuer (2011) used zip code data to measure the distance between IPO firms and their investors. This approach assumes that the effects of distance are purely linear. Alternately, metrics such as Hofstede’s dimensions or GLOBE indices could tap cultural dissimilarity.

Conclusion

Business groups and corporate governance are both prominent topics in the management and strategy literature. Despite the importance of these topics, however, there has been only limited work to date that looks at the intersection of these two streams. Our paper helps to fill this gap through identification of roles played by directors of a large Italian business groups. We hope that this work stimulates further research on the boards of directors in different types of business groups.
Note
1. We ran this alternate model two ways: first, keeping the disturbance terms of the dependent variables independent, and second, allowing them to covary. Both versions reported worse fit than our hypothesized model on all three fit measures.

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Further reading


Appendix 1. Illustration of different network measures

The three network measures used in our analysis – betweenness, power and reach – tap overlapping yet distinct aspects of a firm’s position in the group. This Appendix uses a simple network model to illustrate different types of centrality. The system shown has 17 members. There are three distinct groups within the network. The first, comprised of firms 1, 2, 3, 4 and 6, is a traditional hub-and-spoke model, reflecting one central member, and subordinate firms on the periphery. The second group, comprised of firms 7 through 10, resembles the former group, with the exception of slightly more lateral ties among members. The third group, made up of firms 13 through 17, is characteristic of a decentralized form, with extensive lateral ties. Two firms, 5 and 11 are isolates – i.e., they have no ties to any other firm in the network. Finally, firm 12 could be a member of either or both the second and third groups (Figure A1).

We used UCINET to calculate measures of betweenness, power and reach centrality for each firm in the network (Figure A2). Firm 8 scores highest on betweenness, as it is a key intermediary between members of all three groups. Firm 12, despite having only two direct ties, scores next highest on betweenness, as it is the only conduit between the second and third groups. Finally, firms 13 and 3 score next highest on this variable, reflecting their roles as intermediaries as well (Figure A3).

Scores for power reveal a very different pattern. The variable is dominated completely by the third group: firms 14 through 17 are tied for the second highest scores, while firm 13 is ranked first due to its extra tie to firm 12. Firm 12 would be consider the sixth most powerful member of the network (Figure A4).

Finally, scores for reach yield another set of rankings. Reach measures indirect ties, and the key firms are the three hubs of the respective groups: firm 3 has the highest score on this variable, followed by firms 8 and 13.

Figure A1. Basic network diagram

Figure A2. Top firms for betweenness

Role of board interlocks
Figure A3.
Top firms for power

Figure A4.
Top firms for reach

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Board networks as a source of intellectual capital for companies

Empirical evidence from a panel of Spanish firms

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Abstract

Purpose – The purpose of this paper is to use the dynamic capabilities framework to explain the effect of board networks, as a source of intellectual capital, on firm performance. The authors propose that the influence of board interlocks depends on their ability to contribute to strategic decision making. As a result, their effect is subject to the business context in which they occur and the different role of the interconnected directors involved.

Design/methodology/approach – The authors use social network analysis to make board connections and to calculate centrality measures. The authors also identify busy boards to analyze whether their effect differs from centrality. The authors estimate the theoretical model using the Generalized Method of Moments in order to take advantage of the panel database.

Findings – For a sample of Spanish firms from 1999 to 2015, the results show there is no direct significant effect of directors’ networks on firm performance. However, the authors find a positive and significant influence of intra-industry board connections, particularly when they are established among outsiders.

Research limitations/implications – The Spanish context of the study can limit the generalization of the paper’s results.

Practical implications – The results can be useful both for practitioners – since they can serve as a guide for companies to reformulate their boards in search of the optimal structure-, and when implementing good governance codes – establishing limits for director interlocking.

Originality/value – This study helps to offer a better understanding of how directors’ networks can add value to the firm depending on the kind of resources they provide (context) and the role of the director who is connected.

Keywords Network analysis, Boards of directors, Intellectual capital, Dynamic capabilities framework, Interlocking directorship, Intra-industry relationships

Paper type Research paper

1. Introduction

It is increasingly common for countries to publish lists of the busiest directors in the leading companies. Each year, this list of directors is updated and the connections between firms through their boards are considered relevant information both for investors and financial analysts alike. In Spain, according to the news published by Europapress in May 2017, Javier Echenique Landiribar was the busiest director of the firms in the IBEX 35 during that year. He was Vice Chairman of Banco Sabadell while also holding three other board positions (Telefónica, ACS and Repsol).

When faced with this kind of news, it is surprising to think about the enormous accumulation of responsibility in the hands of just a few people. One would think that companies obviously decide to hire this type of director for their ability to add value to the company (through their relationships, experience, knowledge, etc.). Yet at the same time, we cannot help wondering whether they will have enough time and energy to serve all the

JEL Classification — G3
companies to the best of their ability. These are the same contradictory arguments that have been found in academic literature since board connections – and their influence on firm performance – were first analyzed.

For decades, many researchers have used the agency and resource dependence arguments to explain the effect of board connectedness on firm performance. While under the resource dependence approach, boards’ networks were considered a beneficial source of resources and reputation for the firm, the agency theory has always alerted to the danger of directors possibly becoming swamped or to the possible conflicts of interest that might emerge between the companies they monitor or advise. These two sides of the same coin are reflected in the mixed outcomes to be found throughout board network literature. While some studies report a positive effect of board connectedness on firm performance (i.e. Field et al., 2013; Larcker et al., 2013; Li et al., 2013; Omer et al., 2014), other authors show a negative influence (i.e. Fich and Shivdasani, 2006; Andres et al., 2013), whilst others offer no support in either direction (Fliegstein and Brantley, 1992; Fernández Mendez et al., 2015).

In light of these contradictory results, and considering that directors continue to interlock and that firms continue to hire busy directors for their boards, there is a clear need to find an answer to some critical research questions concerning board networks that remain unanswered: is it possible to expect a general board interlocking effect on performance? If not, what kind of board networks creates value for companies? Does it depend on who establishes the networks? Or does it depend on the type of firms we connect with?

To find an answer to all these questions, we propose defining the board as a source of intellectual capital and we use the dynamic capabilities framework to explain how board networks (and busy directors) need to be configured in order to create firm value. Under this framework, board capital is not defined statically as a stock of intangible resources (knowledge, experience, skills, networks, etc.) but dynamically, as the boards’ ability to derive economic benefits from these resources (Berezinets et al., 2016). Following the dynamic capabilities approach, board networks are expected to have a different effect on performance depending on their ability to influence strategic decision making and help create a competitive advantage for the firm. Our arguments concerning board networks will not therefore focus on the mere accumulation of connections (number of board interlocks) but specifically on how such resources may generate economic resources – which we relate to the business context they occur in (intra-industry vs inter-industry networks) – and the ability of interlocked directors to use network resources effectively – which we relate to the different roles (insider vs outsider) that interconnected directors play.

As regards the context, we expect intra-industry networks to generate industry-specific social and human capital (competitors, industry opportunities, entry barriers, threat of substitutes, etc.) which will prove particularly useful for securing economic benefits since firms can use said capital to address environmental uncertainty, to respond more quickly to industry changes and, consequently, to be more ready to survive (Kor and Sundaramurthy, 2009; Haynes and Hillman, 2010; Wincent et al., 2010; Lai et al., 2014; Schiehll et al., 2017).

In addition, we study insiders’ and outsiders’ networks separately since a director’s contribution to monitoring and advising the firm not only depends on their skills but also on their incentives to monitor or advise (Hillman and Dalziel, 2003) and their availability time-wise to perform their duties and prepare board meetings (Fahlenbrach et al., 2010; Fernández Mendez et al., 2015). In this regard, outsiders are expected to have a greater incentive to monitor the executive team (Fama and Jensen, 1983). The problem concerning lack of time and energy is also expected to be more serious for insiders – who not only perform governance functions (as board members) but also management duties (as company executive) (Liu and Paul, 2015) – than for outsiders – whose role is confined to corporate governance.
Using a sample of 102 Spanish firms listed on the IGBM index from 1999 to 2015, we find empirical support for most of these expected effects. We build on methods derived from social network analysis to characterize board networks among 2,310 directors and we evaluate each firm’s position in the industry network. In addition, we examine the effect of having busy directors on the boards as a further measure to take into account when evaluating how networks impact on firm performance. Our results show no direct significant influence on firm performance deriving from its centrality in the network or the presence of too many busy directors on its board. However, when we include intra-industry networks in the model, we find a positive and significant effect on firm performance, particularly when it is derived from outsiders’ connections, supporting the notion that outsiders can use the resources from the network more effectively (they have more time, energy and incentives) than insiders.

Our contributions in this paper are both theoretical and practical. First, we propose a highly novel theoretical framework to explore the influence of board networks on firm performance. Many studies have focused on this relationship, yet as Berezinets et al. (2016, p. 635) point out, few “are devoted to the relationship between the board of directors, as a source of intellectual capital for the company, and corporate performance.” By using the dynamic capabilities framework, we offer a broader and more complex perspective of how director interlocks can generate economic benefits and value creation. Indeed, according to our results, interlocks are more valuable in some contexts than in others, and some interlock partners prove to be more effective than others. Second, this study allows us to offer some practical recommendations for firms who are seeking the best board configuration that will enable them to continue learning and building capabilities. Our arguments are in line with the concept and development of the learning organization provided by Senge (1990). Board networks allow directors to learn because they are an important source of information. However, according to our results, this information does not always translate into board intellectual capital since we find no evidence of a general positive effect on firm performance. Rather, it depends on the type of company that directors relate with and the people through whom connections are established.

The remainder of the paper is organized as follows. The next section reviews the related literature. We then describe the sample contextual factors, data and methodological issues, before discussing the empirical results. Finally, the last section presents a summary of results and our main conclusions.

2. Theory and hypotheses
According to Mizruchi (1996, p. 271), “an interlocking directorate occurs when a person affiliated with one organization sits on the board of directors of another organization.” In his paper, he also points out that there are many reasons for creating interlocks, including collusion, cooptation and monitoring, legitimacy, career advancement, or social cohesion. Since then, many authors have striven to find out not only why board networks are established, but also how they impact on performance. So far, the extensive literature on this subject has reported empirical evidence pointing in both a negative and a positive direction.

From a resource dependence view (Pfeffer, 1972; Pfeffer and Salancik, 1978), board networks increase corporate performance because they bring prestige, knowledge, experience and because they reduce their contextual dependence and uncertainty (Larcker et al., 2013; Li et al., 2013; Omer et al., 2014). These networks are considered part of the board’s social capital (Wincent et al., 2010) and their positive influence on performance has been supported by many authors (Certo, 2003; Stuart and Yim, 2010; Hillman et al., 2011).

However, using the agency theory (Jensen and Meckling, 1976; Fama, 1980), excessive use of board connections has been seen as problematic. When directors become over-committed, the likelihood of conflicts of interests increases (Li et al., 2013) and they
might also be unable to devote enough time and energy to monitoring managers (Kaczmarek et al., 2014). Many previous papers evidencing this harmful effect of excessive board interlocks on firm performance can also be found (Fich and Shivdasani, 2006; Andres et al., 2013).

In a quest for more consistent answers, some authors have advocated integrating both the agency and resource dependence arguments into a single unified theoretical framework (Kor and Sundaramurthy, 2009; Zona et al., 2018). This theoretical integration has led to a growing number of studies focusing on board (human and social) capital. The concept of board capital was introduced by Hillman and Dalziel (2003) as a proxy for the board’s ability to provide resources to the firm and monitor its executives. According to the authors, board member capital includes human capital and social capital. Thus, while the board’s human capital is defined by the individual knowledge, skills, expertise, experience and reputation of all its directors (Becker, 1964; Coleman, 1988), its social capital includes current and potential resources embedded within, available through, and derived from all the relationships established by each director (Nahapiet and Ghoshal, 1998; Haynes and Hillman, 2010).

More recently, the development of the resource-based view continued within the framework of dynamic capabilities (Teece et al., 1997; Teece, 2007), and the board’s capital became the board’s intellectual capital (Berezinets et al., 2016). It is here where our work is framed.

2.1 Board networks under the dynamic capabilities framework

In the dynamic capabilities framework, Berezinets et al. (2016, p. 637) define the intellectual capital of the board of directors as “the ability of the board to extract future economic benefit from the intangible resources possessed by members of the board (their knowledge, experience, skills, networking resources, etc.).” In this sense, board intellectual capital is not considered a static stock of intangible resources but rather the dynamic ability to derive benefits from it.

As regards boards’ connections, although they have always been related to the creation of social capital – since they involve influence, contacts and access to external critical resources –, we feel that they are not always a source of intellectual capital because they will only generate benefits when the resources they provide (contacts, influence, knowledge, skills, etc.) are strategically useful (e.g. when giving information about the context in which the firm operates or when providing access to the focal company industry’s specific resources) and when they are established through directors who can use them effectively (e.g. directors who are not over-stretched and can contribute to the decision-making of the firms they advise and monitor).

Following these arguments, we believe there to be no direct (broadly applicable) effect of board networks on firm performance, but rather that this will depend on the context in which they occur (intra-industry vs inter-industries) and on the role of the person establishing them (outsider vs insider). As some previous authors have done (Fernández Méndez et al., 2015), we keep our options open with regard to board networks and firm performance and we formulate our hypothesis in a null sense:

H1. There is no direct relationship between board networks and firm performance.

Our open options may begin to close when we specify the context in which board interlocks are established and the kind of directors who serve on other firms’ boards. Beginning with the context in which board connections are established, we feel it is particularly interesting to differentiate between intra-industry and inter-industry networks. In this sense, many authors highlight the importance of the networks established within the focal company industry because they generate resources which, in line with dynamic capabilities, are more suitable for transformation into economic benefits for the firm.
Director embeddedness in the firm’s primary industry through interlocking directorships, managerial positions, or previous occupational experience in the same industry has been called “board capital depth” (Haynes and Hillman, 2010; Schiehll et al., 2017). This concept, based on cognitive research, includes all of the intra-industry human and social capital, and conjectures that groups with experience and networks concentrated in a related domain, rather than dispersed across different industries, have highly developed knowledge structures for that specific industry (Carpenter and Westphal, 2001; Schiehll et al., 2017).

Intra-industry networks provide directors with access to valuable resources, including industry-specific information, tacit knowledge of the opportunities, potential partners, threats, competitive conditions, technology and specific regulations about that industry (Spender, 1989; Boeker, 1997; Kor, 2003; Lai et al., 2014; Schiehll et al., 2017). These board connections can help to directors understand the critical elements of the industry environment, pinpoint emerging opportunities in the industry, evaluate managers’ proposals for growth (Castanias and Helfat, 2001; Kor and Sundaramurthy, 2009), address environmental uncertainty by gaining superior knowledge of competitors and industry opportunities (Wu, 2008; Wincent et al., 2010; Schiehll et al., 2017), and can help the firm engage in new business relationships that are vital for growth (Pfeffer and Salancik, 1978; Hillman and Dalziel, 2003). Consequently, when board linkages are defined in a given industry (intra-industry networks), connections prove most beneficial for strategic management because the information they transfer is not available elsewhere (Haunschild and Beckman, 1998). For all of these reasons, we understand that intra-industry board connections improve the quality of the decisions taken by the board and ultimately have a positive effect on firm performance. We therefore hypothesize:

H2. Intra-industry board networks have a positive effect on firm performance.

Additionally, in this study we also posit possible differences that may exist in the previous arguments when we analyze the networks between outsiders or insiders. Despite all the benefits described related to gathering human and social capital by serving on other firms’ boards, there are also costs associated (Oh et al., 2006). If directors wish to perform their advisory and governance duties effectively, not only will they need an incentive to do so (Hillman and Dalziel, 2003) but will also have to dedicate their time, energy and attention to carefully studying a firm’s unique strategic and governance problems (Carter and Lorsch, 2004). Only if they have the motivation and dedicate the time will they be able to take advantage of their involvement in the boards. In other words, serving in several networks might be considered interesting under a resource dependency approach because it involves accumulating resources. Yet when thinking in broader terms, under a dynamic capabilities approach and when valuing the actual use of these accumulated resources, we realize they cannot be used effectively if there is a lack of incentives or commitment. When directors fail to attend board meetings regularly or fail to prepare for them, their contributions to the board are adversely affected because they do not immerse themselves sufficiently in each firm’s activities (Baysinger and Hoskisson, 1990; Conger et al., 2001; Kor and Sundaramurthy, 2009).

All of these arguments are usually put forward for board interlocks in general, without taking into account whether these directors maintain an executive relationship with the focal company or not. However, we understand that the lack of time or energy will be more pronounced when networks are established among insiders who, in addition to belonging to other boards, must devote their time to the executive management of the company. Furthermore, when networks are established between insiders, they will lack any incentive to monitor since they form part of the executive team they must supervise and, therefore, may face a conflict of interest when attempting to perform their duties effectively. Consequently, the difficulties (lack of time, energy, incentives, etc.) involved in holding
several board positions are more worrying when the director is, at the same time, an executive of the firm. This is because the potential distraction of multiple directorships is more challenging when directors are also executives of the firm (Ferris et al., 2003) since the lack of time or attention not only disturbs company governance (through their role as director) but also their managerial function (through their role as a company officer or executive) (Liu and Paul, 2015).

Therefore, although board networks can provide access to similar resources (human and social capital), regardless of whether they are established between insiders or outsiders, we understand that the associated costs or difficulties are higher in the case of insiders’ networks. In contrast, the benefits of accumulating resources through board interlocks would be more easily transferable to economic results when they are carried out through outsiders. In this line, we propose that:

**H3.** Board networks established among outsiders have a positive effect on firm performance.

Finally, we aim to explore the effect of board connections established in a context that generates information which proves particularly rich for the company (i.e. intra-industry networks) and how these relationships are established through directors who are less affected by lack of time or energy or even conflicts of interest when using the resources obtained (i.e. outsiders). In these cases, we expect the beneficial effect of networks to be even stronger:

**H4.** Intra-industry board networks established among outsiders have a positive effect on firm performance.

### 3. Sample, data and methodological issues

Here we present a longitudinal study of the networks formed by the main Spanish listed firms and their directors in the period 1999–2015. Our sample is comprised of all Spanish listed firms and their directors included in the BoardEx database with available economic data in Thompson One. Our final sample thus consists of 102 Spanish firms listed on the IGBM index for the period 1999–2015, and analyses their relationships through a total of 2,310 directors.

A descriptive analysis of the networks we found among the directors in the sample is presented in Table I. This analysis provides us with information on the changes in the number of firms and directors over the period 1999–2015, the average size of their boards of directors, the average number of directorships held by each director and the distribution of directors between insiders and outsiders.

As can be seen, the number of firms increased over the period 1999–2015, particularly between 2008 and 2009. As a result, the total number of board seats and directors also increased. However, average board size and the average number of directors per firm decreased each year. This is in line with the idea generally included in the codes of governance of avoiding overlarge boards of directors. It is important to underline the difference between the number of board seats and the number of directors, since the former is the result of adding up all firms’ board directorates (board size) during a year, and the latter – the number of directors – is the total amount of different individuals who work as directors. It should be noted that any given director may be a director in more than one firm at the same time, which is why the average number of directors per firm is always smaller than the average number of board seats by firm (board size). Average directorships represent the occupancy level of a director; that is, how many positions are held by each director. This figure is calculated by dividing the total number of board seats by the number of directors in the sample and, as can be seen in the table, is the basis of our interlocking relation since it shows that, on average, each director sits on more than one
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</tr>
</thead>
<tbody>
<tr>
<td>Number of firms</td>
<td>33</td>
<td>38</td>
<td>42</td>
<td>45</td>
<td>48</td>
<td>49</td>
<td>55</td>
<td>62</td>
<td>65</td>
<td>58</td>
<td>86</td>
<td>93</td>
<td>103</td>
<td>99</td>
<td>100</td>
<td>95</td>
<td>99</td>
</tr>
<tr>
<td>Number of board seats</td>
<td>466</td>
<td>563</td>
<td>610</td>
<td>635</td>
<td>712</td>
<td>683</td>
<td>752</td>
<td>844</td>
<td>847</td>
<td>767</td>
<td>1,057</td>
<td>1,113</td>
<td>1,152</td>
<td>1,117</td>
<td>1,052</td>
<td>1,074</td>
<td></td>
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<tr>
<td>Number of insiders</td>
<td>95</td>
<td>111</td>
<td>118</td>
<td>134</td>
<td>136</td>
<td>128</td>
<td>141</td>
<td>161</td>
<td>163</td>
<td>136</td>
<td>193</td>
<td>188</td>
<td>209</td>
<td>204</td>
<td>193</td>
<td>179</td>
<td></td>
</tr>
<tr>
<td>Number of outsiders</td>
<td>371</td>
<td>452</td>
<td>492</td>
<td>501</td>
<td>576</td>
<td>555</td>
<td>611</td>
<td>683</td>
<td>684</td>
<td>631</td>
<td>864</td>
<td>925</td>
<td>992</td>
<td>953</td>
<td>913</td>
<td>859</td>
<td>895</td>
</tr>
<tr>
<td>Average percentage of outsiders</td>
<td>79.61</td>
<td>80.28</td>
<td>80.56</td>
<td>78.90</td>
<td>80.90</td>
<td>81.26</td>
<td>81.25</td>
<td>80.92</td>
<td>80.76</td>
<td>82.27</td>
<td>81.74</td>
<td>83.11</td>
<td>82.60</td>
<td>82.73</td>
<td>81.74</td>
<td>81.65</td>
<td>83.33</td>
</tr>
<tr>
<td>Number of directors</td>
<td>406</td>
<td>472</td>
<td>510</td>
<td>534</td>
<td>577</td>
<td>553</td>
<td>625</td>
<td>705</td>
<td>700</td>
<td>650</td>
<td>895</td>
<td>956</td>
<td>1,038</td>
<td>1,000</td>
<td>974</td>
<td>929</td>
<td>949</td>
</tr>
<tr>
<td>Average directorships</td>
<td>1.15</td>
<td>1.19</td>
<td>1.20</td>
<td>1.19</td>
<td>1.23</td>
<td>1.24</td>
<td>1.20</td>
<td>1.20</td>
<td>1.21</td>
<td>1.18</td>
<td>1.18</td>
<td>1.16</td>
<td>1.15</td>
<td>1.15</td>
<td>1.13</td>
<td>1.13</td>
<td></td>
</tr>
</tbody>
</table>
board (from 1.15 in 1999 to 1.13 in 2015). These values evidence the fact that Spanish
directors hold a low occupancy level on average, although perhaps most of the relationships
in the network are sustained by a few directors who are very well-connected.

Table I also shows the distribution of directors by year according to their role as insider
or outsider. A predominance of outside directors is apparent, with values around 80 percent
throughout the period analyzed, a figure which is even seen to increase. This also means
they play a leading role in network composition. Again, this situation is supported by the
greater importance attached to the role of outsiders in recent years.

3.1 Measuring board networks through the social networks approach and busy boards
As other authors have done (e.g. Kaczmarek et al., 2014), in order to examine the effect of
board networks on performance, we decided to use two measures that are conceptually
opposed: firm centrality and busy boards.

As regards the firm centrality measurement, when counting the number of board
connections, we did not limit the variable, as other previous studies have done, but opted
rather to enrich this variable by using the social networks approach. The analysis of
network links is applied in order to evaluate links among individuals, links between
individuals and organizations, and links among organizations (Lee and Yang, 2014).
We focus here on links between individuals, specifically between board directors. The social
network approach allows us to draw the connections between the firms through their
director interlocking relations (see Figure 1). In this case, each firm is a node and
their relationships with other firms are shown by lines that run between them. Each line
represents the existence of at least one director with a seat on both boards of directors.

Some authors (Larcker et al., 2013; Li et al., 2013) have measured firm centrality by
considering each firm as a node (as shown in Figure 1). However, given that our aim is to
analyze the relationships between the different types of directors (insiders vs outsiders and
intra-industry vs inter-industries), we follow Ong et al. (2003) and Omer et al. (2014) by
considering each director as a node. This degree measure is built from a director’s rather
than from a company’s perspective. First, we calculate the degree held by each firm director,
then normalize the values and adjust them to the size of the board[1]. Finally, we calculate
the firm degree measure as an average of this adjusted normalized degree held by each of its
board directors.

We used the specific UCINET VI (Borgatti et al., 2002) social network analysis software
package to establish social networks, to calculate centrality measures and to prepare the
matrices. The centrality measure used as an independent variable is the degree. This is
the simplest and most intuitive centrality measure as it states that the greater the degree at
any one point (firm or director), the more central it is (Freeman, 1979).

In addition, as not only is merely generating relationships but also using them
appropriately considered to be important, we also measure the board networks in our
analysis through the figure of busy board directors. When studying this figure separately,
our aim is to ascertain whether the effect of these directors on firm performance
differs from the centrality measure, because we understand that busy directors are the
most likely to become overwhelmed or to face conflicts of interest that would prevent them
from efficiently applying the resources (knowledge, skills, experience, etc.) they are
extracting from the networks. Thus, if their ability to create value may be compromised,
the network would neither generate board intellectual capital nor the ability to benefit
from the firm’s performance.

3.2 Analytical model and variables
Having described the sample and the different measures for the board networks used in the
empirical analysis, we introduce the following analytical model to test the previously

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Figure 1. Graph of the Spanish firms network in 2015

Intellectual capital for companies
defined theoretical hypotheses:

\[
\text{PERFORMANCE}_{i,t} = \beta_0 + \beta_1 \text{BOARD NETWORKS}_{i,t} \\
+ \beta_2 \text{INDUSTRY CENTRALITY}_{i,t} \\
+ \beta_3 \text{FIRM CONTROL VARIABLES}_{i,t} \\
+ \beta_4 \text{BOARD CONTROL VARIABLES}_{i,t} \\
+ \beta_5 \text{INDUSTRY DUMMIES}_{i,t} + \beta_6 \text{YEAR DUMMIES}_{i,t} + \mu_{i,t},
\]

(1)

where \( i \) represents the firm (from 1 to 102) and \( t \) the temporal period (from 1999 to 2015).

A brief definition of all the variables included in the model and their main descriptive statistics is included in Table II.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>N. obs.</th>
<th>Mean</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DEPENDENT VARIABLE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MB</td>
<td>Market-to-book ratio</td>
<td>474</td>
<td>3.460</td>
<td>4.224</td>
<td>−0.235</td>
<td>45.279</td>
</tr>
<tr>
<td>ROA</td>
<td>Return on assets</td>
<td>474</td>
<td>0.141</td>
<td>0.175</td>
<td>−0.162</td>
<td>1.289</td>
</tr>
<tr>
<td><strong>CENTRALITY VARIABLES</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIRECTORS CENTRALITY</td>
<td>Normalized centrality degree held by firm directors (adjusted to board size)</td>
<td>474</td>
<td>1.001</td>
<td>0.760</td>
<td>0.000</td>
<td>4.511</td>
</tr>
<tr>
<td>INSIDERS CENTRALITY</td>
<td>Normalized centrality degree held by firm inside directors (adjusted to board size)</td>
<td>474</td>
<td>0.884</td>
<td>1.237</td>
<td>0.000</td>
<td>6.565</td>
</tr>
<tr>
<td>OUTSIDERS CENTRALITY</td>
<td>Normalized centrality degree held by firm outside directors (adjusted to board size)</td>
<td>474</td>
<td>1.018</td>
<td>0.818</td>
<td>0.000</td>
<td>5.464</td>
</tr>
<tr>
<td><strong>BUSINESS VARIABLES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BUSY DIRECTORS</td>
<td>Percentage of busy directors (serve on three or more boards simultaneously)</td>
<td>474</td>
<td>0.093</td>
<td>0.102</td>
<td>0.000</td>
<td>0.500</td>
</tr>
<tr>
<td>BUSY INSIDERS</td>
<td>Percentage of busy insiders</td>
<td>474</td>
<td>0.078</td>
<td>0.192</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>BUSY OUTSIDERS</td>
<td>Percentage of busy outsiders</td>
<td>474</td>
<td>0.094</td>
<td>0.108</td>
<td>0.000</td>
<td>0.600</td>
</tr>
<tr>
<td><strong>QUALITY VARIABLES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INDUSTRY CENTRALITY</td>
<td>Normalized centrality degree held by firm directors of the same industry (adjusted to board size)</td>
<td>474</td>
<td>0.015</td>
<td>0.024</td>
<td>0.000</td>
<td>0.226</td>
</tr>
<tr>
<td>INSIDERS CENTRALITY</td>
<td>Normalized centrality degree held by firm insiders of the same industry (adjusted to board size)</td>
<td>474</td>
<td>0.020</td>
<td>0.050</td>
<td>0.000</td>
<td>0.471</td>
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<tr>
<td>OUTSIDERS CENTRALITY</td>
<td>Normalized centrality degree held by firm outsiders of the same industry (adjusted to board size)</td>
<td>474</td>
<td>0.015</td>
<td>0.024</td>
<td>0.000</td>
<td>0.237</td>
</tr>
<tr>
<td><strong>CONTROL VARIABLES – FIRM</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASSETS (in logarithm)</td>
<td>Napierian logarithm (log) of total assets</td>
<td>474</td>
<td>8.669</td>
<td>1.801</td>
<td>2.869</td>
<td>13.850</td>
</tr>
<tr>
<td>DEBT</td>
<td>Ratio of the firm’s long-term debt-to-book assets</td>
<td>474</td>
<td>0.678</td>
<td>0.209</td>
<td>0.046</td>
<td>1.804</td>
</tr>
<tr>
<td>AGE</td>
<td>Number of years since the firm was established as an economic entity</td>
<td>474</td>
<td>3.859</td>
<td>0.846</td>
<td>0.000</td>
<td>5.017</td>
</tr>
<tr>
<td><strong>CONTROL VARIABLES – BOARD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOARD SIZE (in logarithm)</td>
<td>Napierian logarithm of the total number of directors in the board</td>
<td>474</td>
<td>2.585</td>
<td>0.331</td>
<td>1.386</td>
<td>3.526</td>
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<tr>
<td>BOARD</td>
<td>Proportion of non-executive directors in the board of directors</td>
<td>474</td>
<td>0.801</td>
<td>0.111</td>
<td>0.421</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Table II.
Variables and statistics
We use two different variables to measure firm PERFORMANCE in order to obtain more robust results in our analysis: one related to external performance (market to book value (MB)) and the other to internal performance (return on assets (ROA)). We measure the BOARD NETWORKS in the model as firm centrality calculated with UCINET IV software (DIRECTORS CENTRALITY). Although this is our key variable when measuring board networks, we also introduce the concept of busy directors into the empirical contrast of the model. To do so, we calculate the percentage of busy directors in a board (BUSY DIRECTORS). Following previous literature (i.e. Ferris et al., 2003; Fich and Shivdasani, 2006; Field et al., 2013), we define a busy director as one sitting on the board of three or more firms at the same time. INDUSTRY CENTRALITY measures the firm’s centrality inside its industry.

All of the previously defined variables were divided into two considering the role the director – insider vs outsider – played in the boards. Following previous literature (e.g. Singh, 2007; Andrés et al., 2017), we considered insiders to be directors that BoardEx recorded as “executive director (ED)” and outsiders to be others recorded as “supervisor director”. We find the following variables in the empirical tests: INSIDERS CENTRALITY vs OUTSIDERS CENTRALITY; BUSY INSIDERS vs BUSY OUTSIDERS; and INDUSTRY INSIDERS CENTRALITY vs INDUSTRY OUTSIDERS CENTRALITY.

Finally, we included both firm and board control variables in the model. As regards the firm control variable, we use: firm size, measured by the Napierian logarithm (log) of total assets (ASSETS); the ratio of the firm’s long-term debt-to-book assets as a measure of the firm’s leverage (DEBT); and the number of years since the firm was established as an economic entity (AGE). As regards board control variables, we use: the Napierian logarithm number of directors belonging to the board of directors of a firm (BOARD SIZE); and the proportion of outsiders in the board of directors (BOARD INDEPENDENCE).

3.3 Technical statistics
Following some of the most current papers about board networks (e.g. Zona et al., 2018), we apply to our dataset the panel data analysis as the most efficient tool to test the hypotheses when having a longitudinal sample. The panel structure allows us to consider the unobservable and constant heterogeneity of each firm and to examine the response processes over time (Arellano, 2003). This reduces the problem of omitted-variables (Hsiao, 2003). The STATA Version 10 econometric program allows us to address problems of unobserved heterogeneity and endogeneity among the variables by calculating estimators with specific methodologies such as the Generalized Method of Moments (GMM). The GMM system estimator developed by Arellano and Bond (1995) and Blundell and Bond (1998) is particularly appropriate when we have: a linear functional relationship; a dynamic left-hand side variable, depending on its own past realizations; non-strictly exogenous independent variables; fixed individual effects; and, heteroskedasticity and autocorrelation within individuals, but not across them (Roodman, 2009).

4. Results
The different model estimations are found in Tables III (MB) and IV (ROA). We controlled for multicollinearity problems by using the variance inflation factor (VIF). As none of the factors exceeds 2, we find no multicollinearity problems in any regression.

In order to obtain robust results, we included step by step the variables related to each of the different effects previously described. The first two columns of the tables show the results of the first hypothesis proposed, i.e., the inexistence of any direct effect of board networks (through firm centrality – DIRECTORS CENTRALITY – and busy directors – BUSY DIRECTORS – respectively) on firm performance. As expected, we obtain no significant results for any of the performance measures (MB in Table III and ROA in Table IV).
### Table III.
Model estimation for market to book (MB)

<table>
<thead>
<tr>
<th>Dependent variable: MB</th>
<th>BOARD NETWORKS</th>
<th>INDUSTRY CENTRALITY</th>
<th>GLOBAL MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIRECTORS CENTRALITY</td>
<td>−0.355 (0.555)</td>
<td>−0.177 (1.384)</td>
<td></td>
</tr>
<tr>
<td>BUSY DIRECTORS</td>
<td>−4.291 (3.556)</td>
<td>−8.558 (9.08)</td>
<td></td>
</tr>
<tr>
<td>INDUSTRY CENTRALITY</td>
<td>−0.678 (0.324)</td>
<td>−1.274 (0.332)</td>
<td></td>
</tr>
<tr>
<td>ASSETS</td>
<td>2.697 (4.193)</td>
<td>2.954 (5.758)</td>
<td></td>
</tr>
<tr>
<td>DEBT</td>
<td>0.572 (0.982)</td>
<td>1.579 (0.794)</td>
<td></td>
</tr>
<tr>
<td>BOARD SIZE</td>
<td>0.272 (1.225)</td>
<td>−2.041 (2.933)</td>
<td></td>
</tr>
<tr>
<td>BOARD INDEPENDENCE</td>
<td>7.131 (7.932)</td>
<td>3.421 (4.254)</td>
<td></td>
</tr>
<tr>
<td>MB (t−1)</td>
<td>0.668 (0.239)</td>
<td>0.727 (0.140)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>−3.512 (8.142)</td>
<td>7.875 (6.123)</td>
<td>8.618 (3.364)</td>
</tr>
<tr>
<td>Industry dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>No. observations</td>
<td>409</td>
<td>409</td>
<td>409</td>
</tr>
<tr>
<td>Wald test</td>
<td>301.08***</td>
<td>213.27***</td>
<td>290.73***</td>
</tr>
<tr>
<td>df</td>
<td>(18)</td>
<td>(18)</td>
<td>(20)</td>
</tr>
<tr>
<td>AR(1)</td>
<td>−1.70*</td>
<td>−2.39**</td>
<td>−2.35***</td>
</tr>
<tr>
<td>AR(2)</td>
<td>1.33</td>
<td>1.25</td>
<td>1.16</td>
</tr>
<tr>
<td>Hansen test</td>
<td>33.92</td>
<td>27.59</td>
<td>30.39</td>
</tr>
<tr>
<td>df</td>
<td>(30)</td>
<td>(30)</td>
<td>(30)</td>
</tr>
<tr>
<td>VIF</td>
<td>1.28</td>
<td>1.36</td>
<td>1.89</td>
</tr>
</tbody>
</table>

**Note:** *, **, ***Indicate significance at the 90, 95 and 99 percent confidence level, respectively.

### Table IV.
Model estimation for return on assets (ROA)

<table>
<thead>
<tr>
<th>Dependent variable: ROA</th>
<th>BOARD NETWORKS</th>
<th>INDUSTRY CENTRALITY</th>
<th>GLOBAL MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIRECTORS CENTRALITY</td>
<td>−0.019 (0.021)</td>
<td>−0.044 (0.039)</td>
<td></td>
</tr>
<tr>
<td>BUSY DIRECTORS</td>
<td>−0.190 (0.141)</td>
<td>−0.075 (0.219)</td>
<td></td>
</tr>
<tr>
<td>INDUSTRY CENTRALITY</td>
<td>−0.027 (0.015)</td>
<td>−0.006 (0.015)</td>
<td></td>
</tr>
<tr>
<td>ASSETS</td>
<td>0.091 (0.108)</td>
<td>0.009 (0.200)</td>
<td></td>
</tr>
<tr>
<td>DEBT</td>
<td>0.015 (0.013)</td>
<td>0.056 (0.075)</td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>0.037 (0.027)</td>
<td>0.044 (0.085)</td>
<td></td>
</tr>
<tr>
<td>BOARD SIZE</td>
<td>0.036 (0.067)</td>
<td>−0.001 (0.139)</td>
<td></td>
</tr>
<tr>
<td>BOARD INDEPENDENCE</td>
<td>0.938 (0.071)</td>
<td>0.656 (0.120)</td>
<td></td>
</tr>
<tr>
<td>ROA (t−1)</td>
<td>0.938 (0.065)</td>
<td>0.737 (0.112)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.090 (0.101)</td>
<td>0.285 (0.156)</td>
<td></td>
</tr>
<tr>
<td>Industry dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>No. observations</td>
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</tr>
<tr>
<td>Wald test</td>
<td>985.40***</td>
<td>256.65***</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>(18)</td>
<td>(20)</td>
<td></td>
</tr>
<tr>
<td>AR(1)</td>
<td>−3.20***</td>
<td>−3.04***</td>
<td></td>
</tr>
<tr>
<td>AR(2)</td>
<td>0.87</td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>Hansen test</td>
<td>28.91</td>
<td>31.45</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>(30)</td>
<td>(30)</td>
<td>(30)</td>
</tr>
<tr>
<td>VIF</td>
<td>1.33</td>
<td>1.91</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** *, **, ***Indicate significance at the 90, 95 and 99 percent confidence level, respectively.
Subsequently, in line with Fligstein and Brantley (1992) and Fernández Méndez et al. (2015), we find support for our $H1$ as we find no direct relationship (either positive or negative) between any of the variables used to measure board networks and firm performance.

Tables III and IV also show that the only variable that remains significant both when introduced alone (third column of Tables III and IV) and in the global model (fourth columns of Tables III and IV) is the measurement of directors’ intra-industry centrality (INDUSTRY CENTRALITY). When analyzing the effects of a well-connected board inside a given industry, we see a positive and significant effect of the degree on both the firms’ market to book ratio (MB) (Table III) and its ROA (Table IV). We can thus say that our $H2$ is confirmed. These results support the benefits of so-called “board capital depth,” as we find that networks focusing on the same industry increase corporate performance. In this sense, we understand, as Lai et al. (2014) or Schiehll et al. (2017) among others point out, that intra-industry connections give directors valuable specific resources that help them to carry out their monitoring and advisory roles more effectively.

After these general models, we divided each of the variables used to measure board networks (DIRECTORS CENTRALITY and BUSY DIRECTORS) into two others (insider vs outsider) to test the last hypotheses of the paper ($H3$ and $H4$). As can be seen in Tables V (MB) and VI (ROA), when analyzing firms’ centrality depending on the role played by the directors in the board (first and second columns in Tables V and VI) (INSIDERS CENTRALITY vs OUTSIDERS CENTRALITY), we still fail to find any significant effect either from insiders or outsiders. The same happens when studying the different effect of the proportion of busy insiders or outsiders (BUSY INSIDERS vs BUSY OUTSIDERS) on firm performance. None of the variables used has any significant impact on firm performance. We therefore

<table>
<thead>
<tr>
<th>Dependent variable: MB</th>
<th>BOARD NETWORKS</th>
<th>INDUSTRY CENTRALITY</th>
<th>GLOBAL MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>INSIDERS CENTRALITY</td>
<td>0.361 (0.553)</td>
<td></td>
<td>1.478 (1.481)</td>
</tr>
<tr>
<td>OUTSIDERS CENTRALITY</td>
<td>-0.508 (0.847)</td>
<td></td>
<td>-3.933 (2.615)</td>
</tr>
<tr>
<td>BUSY INSIDERS</td>
<td>-2.982 (2.817)</td>
<td></td>
<td>-6.258 (4.332)</td>
</tr>
<tr>
<td>BUSY OUTSIDERS</td>
<td>-3.984 (5.051)</td>
<td></td>
<td>15.267 (16.062)</td>
</tr>
<tr>
<td>INDUSTRY INSIDERS</td>
<td></td>
<td>1.205 (6.230)</td>
<td>-7.386 (18.724)</td>
</tr>
<tr>
<td>CENTRALITY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INDUSTRY OUTSIDERS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CENTRALITY</td>
<td></td>
<td>72.999* (42.637)</td>
<td>59.432* (34.710)</td>
</tr>
<tr>
<td>ASSETS</td>
<td>-1.138*** (0.419)</td>
<td>-1.1023*** (0.368)</td>
<td>-1.581 (1.021)</td>
</tr>
<tr>
<td>DEBT</td>
<td>0.544 (5.525)</td>
<td>2.447 (5.305)</td>
<td>-6.372 (8.700)</td>
</tr>
<tr>
<td>AGE</td>
<td>3.650* (2.123)</td>
<td>2.992 (2.327)</td>
<td>0.231 (2.793)</td>
</tr>
<tr>
<td>BOARD SIZE</td>
<td>2.138 (1.391)</td>
<td>1.287 (1.488)</td>
<td>2.167 (2.992)</td>
</tr>
<tr>
<td>Board independence</td>
<td>2.404 (3.344)</td>
<td>2.723 (4.002)</td>
<td>-11.682 (17.928)</td>
</tr>
<tr>
<td>MTB ($t-1$)</td>
<td>0.714*** (0.183)</td>
<td>0.788*** (0.234)</td>
<td>0.962*** (0.168)</td>
</tr>
<tr>
<td>Industry dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>No. observations</td>
<td>409</td>
<td>409</td>
<td>409</td>
</tr>
<tr>
<td>Wald</td>
<td>154.03***</td>
<td>128.43***</td>
<td>478.49***</td>
</tr>
<tr>
<td>df</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>AR(1)</td>
<td>-1.97**</td>
<td>-1.96**</td>
<td>-2.42**</td>
</tr>
<tr>
<td>AR(2)</td>
<td>1.21</td>
<td>1.95</td>
<td>0.52</td>
</tr>
<tr>
<td>Hansen test</td>
<td>38.96</td>
<td>39.85</td>
<td>32.52</td>
</tr>
<tr>
<td>df</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>VIP</td>
<td>1.27</td>
<td>1.28</td>
<td>1.43</td>
</tr>
</tbody>
</table>

Note: ***, **** indicate significance at the 90, 95 and 99 percent confidence level, respectively.

Table V. Model estimation for market to book (MB) when we split the networks into executive and non-executives.
reject our third H3 since the board networks established among outsiders have no positive (or negative) effect on firm performance.

However, as occurred with the general model of Tables III (MB) and IV (ROA), we observe a significant influence of intra-industry networks. In fact, when distinguishing between insiders and outsiders, we see that the positive effect stems only from outsiders’ connections. This result allows us to support our last hypothesis (H4) given that the intra-industry board networks established among outsiders have a positive effect on firm performance. As can be seen, although board intra-industry networks provide access to similar specific resources, the ability of the networks to create firm value depends on the kind of director establishing the connection. In line with Liu and Paul (2015) who find that directors’ busyness is more pervasive for inside directors (who are important both in the boardroom and day-to-day operations) than for outside ones, we find that firms obtain more benefits when knowledge and experience come to the board through its outside directors. This is because their lack of time (resulting from their multiple directorships) does not affect the firm’s managerial activities.

5. Discussion and conclusions

We use arguments from the dynamic capability theory to explain whether it is possible to expect a general board interlocking effect on performance or, should this not be the case, what kind of board networks might create more value for companies. Under this theoretical framework, merely accumulating resources (static stock of resources) is no longer sufficient to generate corporate value. These resources actually need to prove valuable to the company and to be used efficiently (dynamic ability) by directors. These arguments are in line with

<table>
<thead>
<tr>
<th>Dependent variable: ROA</th>
<th>BOARD NETWORKS</th>
<th>INDUSTRY CENTRALITY</th>
<th>GLOBAL MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>INSIDERS CENTRALITY</td>
<td>0.015 (0.015)</td>
<td>0.012 (0.031)</td>
<td></td>
</tr>
<tr>
<td>OUTSIDERS CENTRALITY</td>
<td>-0.023 (0.020)</td>
<td>-0.059 (0.036)</td>
<td></td>
</tr>
<tr>
<td>BUSY INSIDERS</td>
<td>0.076 (0.141)</td>
<td>-0.100 (0.164)</td>
<td></td>
</tr>
<tr>
<td>BUSY OUTSIDERS</td>
<td>-0.134 (0.116)</td>
<td>0.203 (0.312)</td>
<td></td>
</tr>
<tr>
<td>INDUSTRY CENTRALITY</td>
<td></td>
<td>0.033 (0.156)</td>
<td>-0.109 (0.616)</td>
</tr>
<tr>
<td>ASSETS</td>
<td>-0.022*** (0.008)</td>
<td>-0.021* (0.011)</td>
<td>-0.046*** (0.015)</td>
</tr>
<tr>
<td>DEBT</td>
<td>0.067 (0.114)</td>
<td>0.052 (0.108)</td>
<td>0.032 (0.110)</td>
</tr>
<tr>
<td>AGE</td>
<td>0.005 (0.013)</td>
<td>0.005 (0.013)</td>
<td>0.028 (0.018)</td>
</tr>
<tr>
<td>BOARD SIZE</td>
<td>0.040 (0.028)</td>
<td>0.033 (0.014)</td>
<td>0.009*** (0.029)</td>
</tr>
<tr>
<td>BOARD INDEPENDENCE</td>
<td>0.033 (0.070)</td>
<td>-0.068 (0.199)</td>
<td>-0.203 (0.178)</td>
</tr>
<tr>
<td>ROA (t−1)</td>
<td>0.968*** (0.078)</td>
<td>0.960*** (0.098)</td>
<td>0.898*** (0.066)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.045 (0.082)</td>
<td>0.152 (0.201)</td>
<td>0.252 (0.194)</td>
</tr>
<tr>
<td>Industry dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>No. observations</td>
<td>409</td>
<td>409</td>
<td>409</td>
</tr>
<tr>
<td>Wald</td>
<td>1,033.96***</td>
<td>985.16***</td>
<td>1,331.73***</td>
</tr>
<tr>
<td>df</td>
<td>(19)</td>
<td>(19)</td>
<td>(19)</td>
</tr>
<tr>
<td>AR(1)</td>
<td>-3.23***</td>
<td>-3.09***</td>
<td>-3.19***</td>
</tr>
<tr>
<td>AR(2)</td>
<td>0.84</td>
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<td>1.08</td>
</tr>
<tr>
<td>Hansen test</td>
<td>27.34</td>
<td>28.29</td>
<td>27.05</td>
</tr>
<tr>
<td>df</td>
<td>(30)</td>
<td>(30)</td>
<td>(30)</td>
</tr>
<tr>
<td>VIF</td>
<td>1.31</td>
<td>1.30</td>
<td>1.44</td>
</tr>
</tbody>
</table>

Table VI. Model estimation for return on assets (ROA) when we split the networks into executives and non-executives

Note: ***,***Indicate significance at the 90, 95 and 99 percent confidence level, respectively
Hillman and Dalziel (2003) who affirm that if directors are to fulfill the role of monitor and advisor efficiently they not only need the ability (which they relate to the accumulation of resources) to execute such roles but also the incentives to use their ability effectively. To analyze the validity of these theoretical arguments, we propose that the most advantageous board networks are those that provide specific strategic resources for the company (intra-industry interlocks) and that are established through directors who suffer fewer time or energy restrictions (outsiders).

Using a sample of Spanish firms from 1999 to 2015, we find no evidence of direct effects of board networks on performance. This result (or lack of it) confirms that the influence of these networks on firm performance cannot be studied alone but must be framed within a more concrete context if specific effects are to be pinpointed. Accordingly, our data show that directors’ connections only add value to a firm through the specific knowledge derived from the multiple directorships in a single industry – what we call intra-industry networks. Following Geletkanycz and Boyd (2011), we therefore maintain that the relationship between interlocking and firm performance is contextual and dependent upon the firm’s external context, in this case, the specific industry in which the focal company works, since the specific intangible resources derived from intra-industry networks are the only ones that are strategically valuable enough to help directors create firm value.

As regards the role of interlocked directors, contrary to our expectations, we find no evidence to support a different effect resulting from networks between insiders or outsiders. We therefore feel that directors’ ability (measured in terms of time and energy) to use network resources has no direct effect on firm performance. For this reason, if the resources provided by the network are not valuable enough (i.e. inter-industries ones), it does not matter whether the network is established among insiders or outsiders, since in no case will it generate value. Nevertheless, when exploring the differences between insiders’ and outsiders’ networks within a single industry (intra-industry networks), we see that the more beneficial networks are those established by outsiders inside the same industry. Therefore, although the quality of the networks directly influences firm performance, this effect is only maintained when the network is created by outsiders.

The results we present in this paper may prove useful for practitioners since they can serve as a guide for companies when reformulating their boards in search of the optimal structure. To this end, they must weigh up whether they are interested in incorporating busy directors depending on the sector in which they work, and whether they are willing to establish networks with other firms through their EDs (taking into account that the possible harmful effects of responsibility and work overload would affect both corporate governance and management).

Our study may also be considered when codes of good governance are updated or renewed. There are already some codes that recommend a different limit for the number of additional board mandates for insiders and outsiders (UK Corporate Governance Code, 2014; French Code de gouvernment d’entreprise des sociétés cotées, 2016). We suggest extending this type of recommendation to other countries, such as Spain, whose Spanish Good Governance Code of Listed Companies (2015) does not include such specifications. It would also be interesting to indicate in these codes the need to evaluate differently the setting up of intra-industry or inter-industry networks.

Despite its strengths, this research also evidences certain limitations. First, our study is based on data from a single country. Using only Spanish companies restricts our ability to generalize the results of the study. This limitation gives rise to a future line of research which might explore whether our results could differ depending on country and legal context (e.g. Anglo-American countries vs continental European ones). Extending this type of work on board networks to an international context might also prove enriching if elements related to the culture of the different countries were embraced. The cultural context
in which the links between directors are developed may shape the effect of these networks on corporate performance. Second, we identify only two types of board members: insiders and outsiders. However, depending on their connection to the firm, outsiders may be divided into affiliates – those with an existing or potential relationship with the firm (e.g. lawyers, financiers, etc.) – and independents – those lacking any kind of link, either to the company or to its owners. Though both are considered outsiders, these two types of directors might perform their role as advisors and monitors differently because affiliates might build strong ties with top management whereas independents would not (Anderson and Reeb, 2004; Samara and Berbegal-Mirabent, 2018). Future inquiry might incorporate this difference in order to gain an insight into whether there are any differences between the influence of independents’ and affiliates’ networks on firm performance. Were the positive effect of intra-industry board networks only to hold for independents, we would have evidence to suggest that only when directors have enough incentives will they use the information from networks to fulfill their (monitoring) role effectively.

Finally, in line with previous literature on board networks, we contend that board interlocks are valuable because they build social capital (relationships and contacts). However, many scholars have recognized the existence of interdependence between human and social capital (Coleman, 1988; Nahapiet and Ghoshal, 1998; Haynes and Hillman, 2010). While some authors support the notion that members’ knowledge, skills and expertise (human capital) can also give the firm access to other resources through the connections (social capital) they provide (Mizruchi and Stearns, 1994), other authors show that board links (social capital) also lead to exposure to novel information (human capital) (Geletkanycz and Hambrick, 1997; Kor and Sundaramurthy, 2009; Felicio et al., 2014). Consequently, we consider that an interesting future line of research would be to explore how these board networks help the firm to generate new human capital (e.g. knowledge, experience, etc.) in line with the concept of “learning organization” introduced by Senge (1990).

Note
1. Note that the relevant relations for the firm are those held with directors from other firms. Therefore, we remove from the measure those relationships held with directors who are part of the same board. Hence, the degree obtained for each director, taking into account the board of directors they belong to, is the adjusted normalized degree.

References


Further reading
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Board social capital reduces implied cost of capital for private companies but not of state-owned companies

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Graduate Program in Administration, Universidade do Grande Rio, Rio de Janeiro, Brazil, and  
Wesley Mendes-Da-Silva  
Department of Corporate Finance, Sao Paulo School of Business Administration of Fundacao Getulio Vargas, Sao Paulo, Brazil

Abstract

Purpose – The purpose of this paper is to analyze how the type of ownership and control moderates the effect of the board social capital on the implied cost of capital. To do so, the authors analyzed the effect of the board social capital by the relational resources present in its direct and heterogenous ties, considering the predictions of analysts about the implied cost of capital.

Design/methodology/approach – The data panel comprised 137 companies listed on the Brazilian stock exchange between the years of 2002 and 2015, generating a total of 535 observations. The authors check the robustness of the results through instrumental variables and systems of equations, as well as compete for the effect of board social capital both by the board and ownership structures.

Findings – Results show that the board relational resources, both in direct and heterogeneous ties, significantly reduce the implied cost of capital for private companies, but not for state-owned companies. Board social capital reduces the cost of capital even when the results compete with the board structure and concentration of ownership, being able to mitigate the discount in the cost of capital by the presence of dominant shareholders.

Originality/value – This study uses a more theoretically and empirically comprehensive measure of board social capital than the majority of studies that use only network position indicators. So, contrasting the effect of this measure on the implied cost of capital between private and state-owned companies, the authors also demonstrate that the board social capital can mitigate the discount by ownership concentration on the implied cost of capital.

Keywords Social capital, Stock exchange, Cost of capital, Board interlock, State-owned companies

Paper type Research paper

Introduction

In this paper, we empirically investigate how the material and symbolic resources available in the board of directors’ network can be a powerful mechanism to increase the board’s strength in properly monitoring executives and controlling the opportunism of stockholders. Consequently, the board’s greater strength and privileged position may mitigate agency problems and reduce information asymmetry between equity-holding companies and securities analysts (Ferris et al., 2017; Uzzi, 1999). Therefore, we have tested the hypothesis that boards with valuable relational resources, i.e. greater board social capital, are a relevant mechanism to mitigate firms’ cost of capital.

We define relational resources as those symbolic and material resources that do not belong to a company but that can potentially be mobilized through network relationships and by means of the board interlock (Rossoni et al., 2018). Board interlocks occur when a board
member of an “A” company acts simultaneously on the board of a “B” company, creating a bond for the exchange of benefits (Davis, 1996; Caiazza and Simoni, 2015; Mizruchi, 1996).

Relational resources, although they are one of the essential dimensions of social capital (Lin, 2001), are practically set aside in the board interlock literature (Johnson et al., 2013; Rossoni et al., 2018; Zona et al., 2018), since most studies consider as proxy of board social capital the number of ties, at most, specifying the type of actor you are relating to (An and Jin, 2004; Connelly et al., 2011; Ferris et al., 2017; Fracassi and Tate, 2012; Kim, 2007; Stuart and Yim, 2010).

Faced with the recurrent limitation in the literature on board social capital, based on Lin (2001), Rossoni et al. (2018) and Zona et al. (2018), we use a social capital proxy that captures at the same time the number of interlocks weighted by the relational resources. Indeed, we operationalize the board relational resources from the sum of the market value of all the companies that a firm has an interlock with. Therefore, firms that have ties with more valuable firms, in our proxy, have greater social capital.

We advocate that our board social capital proxy especially has two advantages. First, ties with higher-value firms should potentially provide access to most valuable material and symbolic resources that firms of lower value (Burt, 1992; Davis, 1996; Kim, 2007; Ferris et al., 2017; Rossoni et al., 2018). Second, we understand that directors from higher-value firms tend to have a higher reputation and prestige, which makes them stronger on the board. Stronger directors can act as more rigorous monitors, mitigating the opportunism of executives and controlling shareholders (Dahya et al., 2008), even because there is a greater moral charge in the boardroom for them to act professionally (Davis, 1996).

Additionally, because these board relational resources are means for obtaining privileged information and differentiated knowledge, we also consider the market value of relationships based on the heterogeneity of such ties, measured through structural holes. Structural holes are rich ties in non-redundant relationships, more likely to have new and valuable information (Burt, 1992).

According to these definitions, which are based on the premise that resources are unequally distributed in networks (Lin, 2001), we argue that board social capital allows effective access to financial capital by the companies with the most competitive costs (Ferris et al., 2017; Finegold et al., 2007; Hou et al., 2012; Pombo and Gutiérrez, 2011; Rossoni et al., 2018; Zona et al., 2018) To demonstrate our argument, we analyze 137 companies listed in the Brazilian stock exchange between the years of 2002 and 2015, showing the effect of the board social capital on predictions of analysts regarding the implied cost of capital.

We chose the cost of financial capital because it is fundamental to firm leverage since it is one of the most important resources for publicly traded companies, whose financing strategies are fundamental for their survival and growth (Uzzi, 1999). For that, we have chosen estimates of the implied (ex ante) cost of capital, which is based on the prediction of analysts (Espinosa and Trombetta, 2007; Souissi and Khelif, 2012). This is because Fama and French (2002) and Gebhardt et al. (2001) demonstrated the superiority of ex ante models over ex post models.

So, we contrast our results with public and privately controlled companies. Problems and peculiarities inherent in public management restrict, or sometimes render unfeasible, the performance of the board members as a source of external resources. Among these problems, we can highlight, for example: expropriation of the interests of minority shareholders by the state (Yoshikawa et al., 2014); management of antagonistic interests created by the state’s regulatory and regulatory function (Shleifer and Vishny, 2002); and misappropriation of public resources to attend to their own interests, partisans or votes (Shleifer and Vishny, 1997, 2002; Pedersen and Thomsen, 2003). These problems, which are inherent in state-owned companies, at least hypothetically, make it difficult for board members to freely exercise their role of monitoring executives and dominant shareholders and collecting external resources, which would lead to a lesser impact from board social capital on the implied capital cost of state-owned companies.
Our results pointed out that the board social capital reduces the implied cost of capital for private companies but not for state-owned companies. For these reasons, we checked whether our board social capital proxy was robust when we contrasted the effect on the implied cost of capital with other board structure variables: board size, number of interlocks and outsiders. Given the ability of dominant shareholders to mitigate the board effect (Dahya et al., 2008), we also check whether the board social capital was significant when contrasted with ownership concentration. Using instrumental variables and systems of equations, we have also demonstrated that the board social capital mitigates the discount of the ownership concentration on the implied cost of capital. Finally, we section the sample according to the level of corporate governance in the Brazilian stock market, demonstrating that the board social capital only operates at higher levels of governance quality.

Theory and hypotheses

The board of directors is a form of the collegiate body that constitutes one of the main tools of corporate governance (Davis, 1996; Mizruchi, 1996). When board members are part of different boards, they establish ties between boards. Studies show that board members with ties increase the possibility of business (Stuart and Yim, 2010), can influence decisions regarding international business expansion (Connelly et al., 2011) and engage in acquisitions (Haunschild, 1994). There is evidence that boards with the highest number of ties are associated with higher values for the companies (Bohren and Strom, 2010) and high sales rates (Kor and Sundaramurthy, 2008). Davis (1996) and Mizruchi (1996) argue that good board members tend to participate in a larger number of companies, their centrality in the network being a measure of their prestige. Well-positioned board members in the network have access to information and privileged resources since they have access to groups that are not connected to each other, thus acting as “bridges” (Davis, 1996). This access to resources and information constitutes the so-called social capital.

Burt (1992) argues that through social capital – namely, through various relationships and their potential benefits – companies find opportunities to convert human and financial capital into profit. Burt’s (1992) arguments are very close to the argument synthesized by Lin (2001), who postulates that social capital is the investment in social relations with expected returns in the market, that is, individuals engage in interactions and relationships to produce economic and social benefits. This is so relevant for the topic that Lin et al. (2001, p. 58) define social capital as “[…] resources immersed in a social structure accessed and/or through intentional actions […]” Ties and resources immersed in the network facilitate the flow of information, exert influence on agents who have critical roles in decisions, signal individual’s credentials and reinforce identity and recognition (Lin, 2001).

Agreeing with the authors, Flap (2002) also states that social capital has three elements: number of people in the social network; the strength or intensity of relationships; and the resources of these people. This idea is reinforced by Coleman (1994), who emphasizes that social capital is comprised of the real or potential resources obtained through relationships. In other words, social capital consists of resources embedded in social relations and social structures, which can be mobilized when actors want to increase the probability of success of a certain action (Burt, 1992; Lin et al., 2001).

Rossoni et al. (2018) argue that previous research on the board’s role (Ferris et al., 2017; Fracassi and Tate, 2012; Kor and Sundaramurthy, 2008; Kim, 2007; Pombo and Gutiérrez, 2011; Stuart and Yim, 2010) uses theories or metaphors of social capital focused on the influence of board position measures within the social network to determine boards and board members with more privileged positions within the network. They argue that previous studies did not consider the resources that board members bring to organizations, from their type, disposition and volume, thus disregarding one of the essential dimensions of social capital: relational resources. Seeing this gap in the empirical studies on board
interlock, the authors used as a measure of social capital the interaction between the number of interlocks between the board and the market value of the interconnected companies, finding a significant effect on the market performance of the Brazilian companies.

Relational resources are the symbolic and material resources that do not belong to a company but that can potentially be mobilized through network relationships and by means of the board interlock (Rossoni et al., 2018). Given the usefulness of considering the relational resources embedded in board interlocks, we sought to evaluate whether the board social capital, as outlined by Rossoni et al. (2018), can also influence market analysts’ predictions on the implied cost of capital. This is because the cost of capital is based on the role of ensuring sustainable growth of a company, given the scarcity of international resources and the high cost of domestic financing (Lee et al., 2009). To do so, in empirical terms, it is worth noting that there are two different approaches to measuring the cost of capital. One is called ex post and is based on the history of returns. The other is called the implied cost of capital, or ex ante, and is based on the prediction of market analysts (Espinosa and Trombetta, 2007; Souissi and Khlif, 2012). In this study, we follow the latter approach, since Fama and French (2002) and Gebhardt et al. (2001) consider ex ante models more precise than ex post models. Ex ante models aim to obtain the expected rate of return on equity, considering that these rates of return are impacted by current stock prices and future earnings (Easton, 2004). In this way, the value of the assets and the cash flows can be observed in the market, and through these variables, it is possible to estimate the cost of capital, define as the rate that makes the present value of the cash flow equal to the value of the capital of the asset in question (Espinosa and Trombetta, 2007).

We advocate that two mechanisms of board social capital are fundamental to mitigate the implied cost of capital: one informational, and the other based on power. The first, informational, is important because the implied cost of capital is based on the interpretation of analysts and tends to be more sensitive to signals emitted by the circulation of company board members, especially as they try to articulate the different companies that are part of the board to try to raise access to finance and resources with lower rates (Ferris et al., 2017; Uzzi, 1999). But this movement in attracting better rates to generate cash surpluses is clearly more successful for companies of higher value are involved, since these companies are expected to provide valuable knowledge and resources whose ambiguity is more easily disrupted through contacts and relationships directly (Rossoni et al., 2018). We understand that directors from higher-value firms tend to have a higher reputation and prestige, which makes them stronger on the board.

The second mechanism is based on the power or strength of the board. Stronger directors can act as more rigorous monitors, mitigating the opportunism of executives and controlling shareholders (Dahya et al., 2008), even because there is a greater moral charge in the boardroom for them to act professionally (Davis, 1996; Connelly and Van Slyke, 2012) assuming a commitment to higher levels of governance quality (Dahya et al., 2008). In our case, we have deliberately assumed that directors from higher-value companies are stronger and, at the same time, have more reason to engage in higher levels of governance, especially in countries such as Brazil, whose agency conflict occurs between controlling and minority shareholders; Hence, it shows the importance of considering the role of board interlock with the value of interconnected firms (Ferris et al., 2017). From those arguments, we propose that:

**H1.** The greater the amount of relational resources present in direct board relationships, the lower is the cost of capital for the company.

We also address the heterogeneity of board relational resources present in the structural holes of networks. The common sense thought is that the larger the size of the network, the greater the access to resources (Connelly and Van Slyke, 2012). However, maintaining relationships involves time, energy and money investments that can mitigate the positive
effects of the greater number of ties. In fact, Burt (1992) argues that what matters is the number of non-redundant contacts. Contacts are redundant as they lead to the same person through different intermediaries, and thus provide the same information benefits. According to Burt (1992), the solution would be to focus on non-redundant contacts, full of structural holes, which have unique resources and information.

Thus, relational resources are heterogeneous when they are not redundant (Rossoni et al., 2018). Hite and Hesterly (2001) argue that networks full of structural holes have access to more resources that lead to better company performance. Board members with more structural holes tend to be more valued since their presence in a company signals management legitimacy (Davis, 1996). In addition, as non-redundant knowledge, information and resources may be more valuable in companies whose board ties are poorly redundant, it is expected that the same mechanisms that make companies with higher board equity get better ratings by analysts about their cost of capital are amplified by the heterogeneity of the ties. Therefore, from the arguments presented, we propose:

H2. The greater the heterogeneity of the board’s relational resources, the lower is the cost of capital of the company.

Companies in which government is the dominant shareholder imply that bureaucrats and politicians might be eager to divert resources into their own interests (Dahya et al., 2008; Shleifer and Vishny, 1997). According to Yoshikawa et al. (2014), the main agency problem in state-owned companies is the expropriation of the interests of minority shareholders, since, in addition to the controlling role, government has a regulatory function, having to balance often antagonistic interests, such as pursuit of profit, social welfare and protection against external competition (Shleifer and Vishny, 2002). Because of the often abundant but poorly managed public resources and the search for power through corporate policies, state owners tend to pay little attention to outside board members, the latter being mere “rubber stampers” who are not supposed to monitor, nor do they provide resources (Yoshikawa et al., 2014).

External actors are also affected by social distancing since boards of state-owned companies are mostly composed by politicians or politically connected board members whose ideologies often dominate the board (Yoshikawa et al., 2014). This exclusion of external board members limits their role of monitoring and the seeking of resources. Pedersen and Thomsen (2003) also argue that inefficient governments favor interest groups and buy votes, thus reducing the value of companies, which may be related to limiting the role of board members as fund managers.

In countries with underdeveloped governance institutions, such as Brazil, the absence of well-developed investor protection regulations allows the state to easily rescue the company by providing subsidies, credit, information or other forms of protection at the expense of shareholders (Aharoni, 1986), which makes the role of fundraisers of external board members irrelevant. In this way, we expect that the influence of social capital on the reduction of companies’ cost of capital can be minimized by the negative influence of public ownership dominance on companies. Therefore, we propose that:

H3a. The influence of the board’s social capital in reducing the cost of capital is lower in publicly controlled companies than in those that are privately controlled.

H3b. The influence of the board’s social capital through the structural holes in the reduction of the cost of capital is lower in publicly controlled companies than in those that are privately controlled.

Method
Data
Our sample comprised 137 State and private Brazilian-owned companies listed on B3 (formerly BM&FBovespa) covered by securities analysts. Since the implied cost of capital is
composed precisely by the projections of such analysts, data collection between 2002 and 2015 generated a total of 535 observations, which is lower than the population (18.1 percent). For reasons of cost and relevance, rating agencies select companies with greater liquidity and market capitalization in the Brazilian stock market (see Figure 1). Despite the limited sample, because of the availability of implied cost of capital, companies covered by analysts accounted for 81 percent of market capitalization in the period; total assets are on average four times higher, whose shares have 3.6 more liquidity. We started collecting data in 2002 because that year began to operate the B3’s Novo Mercado, closing the collection in 2015, which was the last year that data were available from the Securities and Exchange Commission (CVM).

Variables
The operational definition of the variables is shown in Table I.

Econometric models and robustness checks
To test the hypotheses, we used panel data analysis. Panel data are indicated when we have several cases (N) with a few observations in time (T), generating N x T observations (Baltagi, 2005). Three econometric regression models were used: ordinary least squares pooled, fixed effects (EF) and random effects (GLS). The best fit for each model followed the Greene’s (2000) hypotheses. Thus, to test our H3a and H3b, we divided the sample into two subgroups: one of the private companies, another of public (state-owned) companies, generating a panel model for each one.

After specifying the most appropriate model for each of the analyses, we verified the consistency of the results through seven strategies. First, we evaluated the existence of co-linearity problems among the independent variables of the study. We separate the models of social capital from direct and heterogeneous relationships for these reasons. We also assessed whether the models had heteroscedasticity problems using the White test, using robust standard errors to correct them. Then, we checked whether the coefficients were consistent when we regressed the models without the non-significant variables, as well as if they had the same trend without the outliers. We also verified whether other functional forms of the independent variables had a significantly greater

Note: Sample formed by companies covered by analysts
Dependent variable: implied cost of capital

RPEG

Based on the model developed by Ohlson and Juettner-Nauroth (2000), Easton (2004) created an estimate of the cost of capital called the "Price Earnings to Growth model" (RPEG). Also called implicit or ex ante cost of capital, it determines that the value of the assets and their cash flows can be observed in the market and based on them it is possible to estimate the discount rate that makes the present value of the cash flow equal to the market value of the capital of the asset analyzed (Espinosa and Trombetta, 2007). Used in previous studies (Espinosa and Trombetta, 2007), the RPEG cost of capital can be defined as:

\[ P_t = \frac{(EPS_{t+2} - EPS_{t+1})}{R_{\text{PEG}}} \]

where RPEG is ex ante cost of capital on date \( t \), in which PEG refers to the price-earnings model of growth as per Ohlson and Juettner-Nauroth (2000) (price-earnings to growth ratio); \( EPS_{t+2} \) is (earnings per share) medium value of earnings predicted by analysts in \( t+2 \); \( EPS_{t+1} \) is (earnings per share) medium value of earnings predicted by analysts in \( t+1 \); \( P_t \) is price of stock in the last day of pricing for which the own cost of capital is being calculated in \( t_0 \).

MPEG

Alternative proxy obtained according to the modified price to earnings growth model. Used in previous studies (Easton, 2004), the MPEG cost of capital can be defined as:

\[ P_0 = \frac{(EPS_{t+2} + R_{\text{MPEG}} d_{t+1} - EPS_{t+1})}{(R_{\text{MPEG}})^2} \]

where \( R_{\text{MPEG}} \) is ex ante cost of capital on date \( t_0 \), in which MPEG refers to the modified price to earnings growth model (Easton, 2004); \( EPS_{t+2} \) is (earnings per share) medium value of earnings predicted by analysts in \( t+2 \); \( EPS_{t+1} \) is (earnings per share) medium value of earnings predicted by analysts in \( t+1 \); \( d_{t+1} \) is expected dividend per share in \( t+1 \); \( P_0 \) is price of stock in the last day of pricing for which the own cost of capital is being calculated in \( t_0 \).

Independent variables

Board social capital: direct relations

Following Rossoni et al. (2018), this variable was operationalized through the sum of the relational resources present in direct board ties with other companies listed on the Brazilian stock exchange. Thus, an \( ij \) tie was formed when two companies had a director in common. In equation below, for each company \( n_i \) in each year between 2002 and 2015, we added the relational resources \( X_{ij} \), where \( X_j \) is the market value of company \( j \) that is board interlocked with the company \( n_i \);

\[ \text{Board Social Capital}(n_i) = \sum_j X_{ij}, \text{were} \ i \neq j \]

Board social capital: heterogeneous relations

This variable was similarly operationalized as the board social capital. However, for each company \( n_i \) we added the interaction term relational resources \( X_{ij} \) by \((1-r_{ij})\), which indicates the heterogeneity of each tie \( ij \). Before this, we generated the redundancy value \( r_{ij} \) of each of the interlocks \( ij \) through the structural holes method (Burt, 1992). Companies with high redundancy ties have few structural holes. So, the rational is that the effect of the relational resources (market value of each interlocked company) is weighted by the structural holes. The equation below formalizes this argument, where we repeated the operation between the years 2002 and 2015 for each of the companies \( n_i \);

\[ \text{Heterogeneous Board Social Capital}(n_i) = \sum_j X_{ij} (1-r_{ij}), \text{were} \ i \neq j \]

Board structure variables

Board size Number of directors of a company participating in a board of directors in a year \( t \)

Board interlocks (degree) Number of adjacent ties a board has other boards by share the same director (Davis, 1996)

Outsiders

This variable was represented by the percentage share of the number of members of the board of directors of a company \( i \), in year \( t \), who did not accumulate executive functions in the same company (Rossoni et al., 2018)

Table I.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variable: implied cost of capital</strong></td>
<td></td>
</tr>
<tr>
<td><strong>RPEG</strong></td>
<td>Based on the model developed by Ohlson and Juettner-Nauroth (2000), Easton (2004) created an estimate of the cost of capital called the &quot;Price Earnings to Growth model&quot; (RPEG). Also called implicit or ex ante cost of capital, it determines that the value of the assets and their cash flows can be observed in the market and based on them it is possible to estimate the discount rate that makes the present value of the cash flow equal to the market value of the capital of the asset analyzed (Espinosa and Trombetta, 2007). Used in previous studies (Espinosa and Trombetta, 2007), the RPEG cost of capital can be defined as: $P_t = \frac{(EPS_{t+2} - EPS_{t+1})}{R_{\text{PEG}}}$, where RPEG is ex ante cost of capital on date $t$, in which PEG refers to the price-earnings model of growth as per Ohlson and Juettner-Nauroth (2000) (price-earnings to growth ratio); $EPS_{t+2}$ is (earnings per share) medium value of earnings predicted by analysts in $t+2$; $EPS_{t+1}$ is (earnings per share) medium value of earnings predicted by analysts in $t+1$; $P_t$ is price of stock in the last day of pricing for which the own cost of capital is being calculated in $t_0$.</td>
</tr>
</tbody>
</table>
effect. After, we evaluated if the coefficients were robust in the GLS models since all our models were shown of the type fixed effects like more robust. Finally, as the sample of state-owned companies was small, we checked whether the regression coefficients were robust, considering the power of the test (Faul et al., 2009). For a sample of 41 cases with seven variables, based on a 95 percent significance, on the correlation between the variables, and on the $R^2$ value of the models, the power of the exact test was 99.6 percent, of the coefficient estimate was 99.9 percent and the $F$-test was 98.7 percent, demonstrating that there is no detriment in the effect for the sample of state-owned companies, although the coefficients of the independent variable were not significant.

As our panel comprised the years 2002–2015, which permeate the 2008–2009 crisis, we tested the structural break in the models through the structural change regression based on the Chow test (Shehata, 2011), considering the pre-crisis (2002–2007) and post-crisis (2008–2015) periods. In addition, we check the effect of the 2008–2009 crisis on the structural

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td><strong>Ownership structure variables</strong></td>
<td></td>
</tr>
<tr>
<td>Dominant shareholder</td>
<td>That is represented by the biggest percentage of the shares with voting rights detained by an individual shareholder in a specific company (Dubya et al., 2008)</td>
</tr>
<tr>
<td>Sum 3 larger shareholders</td>
<td>That is represented by the sum of the percentage of the shares with voting rights detained by the three larger shareholders in a specific company</td>
</tr>
<tr>
<td>HHI 5 larger shareholder</td>
<td>We use an adaptation of the Herfindahl–Hirschman Index (HHI) to measure the ownership concentration. Their values vary between 0 and 1, in that the higher the index, the higher the concentration. It is calculated by summing the square of the individual shares owned by each of the five larger shareholders holding the ownership of a particular company (see the following equation): $\text{HHI} = \sum_{i=1}^{M} (\beta_i^2)$ where $M = 5$ (five larger shareholders); $\beta_i Q_i / \sum_{i=1}^{M} Q_i$. It is the individual ownership share from the owner i</td>
</tr>
<tr>
<td><strong>Control variables: finance and firm level</strong></td>
<td></td>
</tr>
<tr>
<td>Company size</td>
<td>Natural logarithm of the total assets volume in a given year, as did previous studies (Ferris et al., 2017)</td>
</tr>
<tr>
<td>Tobin’s $Q$</td>
<td>Sum of the market value of its shares, plus its debts, which is divided by the book value of its total assets (Bozec, Dia and Bozec, 2010; Chung and Pruitt, 1994). The calculation was operationalized according to the following equation, through information collected for each company in each of the years between 2002 and 2015, obtained through the Bloomberg database: $\text{Tobin’s } Q = \frac{\text{VMaO} + \text{VMaP} + \left(\text{VCPC} - \text{VCAC} + \text{VCE} + \text{VCDLP}\right)}{\text{VCAT}}$, in which VMaO is market value of ordinary shares; VMaP is market value of preferential shares; VCAT is book value of the organization’s total assets; VCPC is book value of current liabilities; VCAC is book value of current assets; VCE is book value of stock; and VCDLP is book value of long-term debt</td>
</tr>
<tr>
<td>Return on asset (ROA)</td>
<td>The index was collected for each company listed in B3 through annual consolidated data (2002 to 2015), with December as the reference month for each year</td>
</tr>
<tr>
<td>Stock volatility</td>
<td>The intensity and frequency of the oscillations in the price of an asset in a given period. We consider the series of daily quotations, in which the calculation of the annual volatility of stock returns of each company was based on the last 12 months, as per Fombrun and Shanley (1990) and Rossoni and Mendes-Da-Silva (2018)</td>
</tr>
<tr>
<td>Asset tangibility</td>
<td>Sum of the value of inventories with fixed assets, divided by the value of the company’s total assets (Pombo and Gutiérrez, 2011)</td>
</tr>
<tr>
<td>Sales growth</td>
<td>Percentage growth of one-year revenue compared to the previous year (Cao and Li, 2015), in which growth was operationalized according to: $\text{Sales growth}<em>{t} = \left(\frac{\text{Sales volume}</em>{t} - \text{Sales volume}<em>{t-1}}{\text{Sales volume}</em>{t-1}}\right)$</td>
</tr>
</tbody>
</table>

**Source:** Economatica®, Bloomberg® and CVM

Table I.
break using the Dufour (1980) model, which suggests performing the interaction of all the independent variables with the crisis period dummy. These analyses, as well as all additional analyses, were done only for private companies, since only in this sample the coefficients were significant.

To check the robustness of the results, we initially contrasted the independent variables with other board structure variables, since most studies are based on measures such as board size (Fracassi and Tate, 2012), outsiders (Dahya et al., 2008; Johnson et al., 2013) and number of interlocks (Ferris et al., 2017; Johnson et al., 2013). Afterward, we also evaluated whether our results were robust as controlled by the ownership concentration since there is a possibility that dominant shareholders could try to limit the influence of more powerful directors (Dahya et al., 2008). So, we used variables that captured the concentration of voting rights in the hands of the dominant shareholder, the three largest shareholders and the top five.

For how there is evidence in the literature on corporate governance about the problem of self-selection and endogeneity (Wintoki et al., 2012), we used instrumental variables by robust two-stage least square models (H2SLS) and simultaneous equations by robust three-stage least square models (H3SLS). Two-stage models have been widely used (Black and Kim 2012; Fracassi and Tate, 2012), but simultaneous equations models are more robust. In such models, at first, we evaluated whether the board social capital was robust when it was instrumentalized by ownership concentration. In a second moment, we analyzed whether the board social capital was able to mitigate the discount on the cost of capital caused by the ownership concentration.

We also used an alternative proxy of implied cost of capital (MPEG) to check if our results were still consistent. Finally, we checked whether the effect of board social capital on the cost of capital was still consistent when evaluated in three different samples according to the level of corporate governance.

**Results**

To illustrate the board interlock relationships between companies and their respective social capital, we present in Figure 2 the main component of the companies’ network in 2015. The larger nodes illustrate the companies that present greater sum of relational resources.

The main results of the econometric analysis can be seen in Table II. About control variables, in the full sample (models 1 and 2), the results indicate that companies with greater relative market value (Tobin’s Q) have a lower cost of capital ($\beta = -0.046, p < 0.05$). But he
<table>
<thead>
<tr>
<th></th>
<th>Full sample</th>
<th>Fixed models</th>
<th>State-owned</th>
<th>Private</th>
<th>Dutour dummy model$^2$</th>
<th>Private</th>
<th>Structural change model$^2$</th>
<th>Private</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social capital$^a$</strong></td>
<td>-0.167 (0.135)</td>
<td>-0.941 (1.370)</td>
<td>-0.146*** (0.056)</td>
<td>-0.157** (0.078)</td>
<td>-0.120** (0.056)</td>
<td>-0.130** (0.067)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Social capital hetero$^a$</strong></td>
<td>-0.180 (0.154)</td>
<td>-0.895 (1.373)</td>
<td>-0.159** (0.065)</td>
<td>-0.170** (0.082)</td>
<td>-0.130** (0.066)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008–2009 crisis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asset (ln)</td>
<td>-0.009 (0.035)</td>
<td>-0.010 (0.035)</td>
<td>-0.017 (0.033)</td>
<td>-0.041 (0.040)</td>
<td>-0.046*** (0.014)</td>
<td>-0.049*** (0.014)</td>
<td>-0.051*** (0.016)</td>
<td>-0.051*** (0.016)</td>
</tr>
<tr>
<td>ROA (ln)</td>
<td>0.006 (0.018)</td>
<td>0.006 (0.018)</td>
<td>0.273 (0.209)</td>
<td>0.275 (0.209)</td>
<td>-0.020*** (0.008)</td>
<td>-0.020*** (0.008)</td>
<td>-0.025*** (0.009)</td>
<td>-0.025*** (0.009)</td>
</tr>
<tr>
<td>Volatility</td>
<td>0.001 (0.001)</td>
<td>0.001 (0.001)</td>
<td>-0.021 (0.016)</td>
<td>-0.020 (0.016)</td>
<td>0.001*** (0.001)</td>
<td>0.001*** (0.001)</td>
<td>0.001 (0.001)</td>
<td>0.001 (0.001)</td>
</tr>
<tr>
<td>Tobin’s Q</td>
<td>-0.046*** (0.021)</td>
<td>-0.046*** (0.021)</td>
<td>-0.859 (0.680)</td>
<td>-0.848 (0.679)</td>
<td>-0.029*** (0.008)</td>
<td>-0.030*** (0.008)</td>
<td>-0.029*** (0.008)</td>
<td>-0.029*** (0.008)</td>
</tr>
<tr>
<td>Tangibility</td>
<td>0.428*** (0.085)</td>
<td>0.428*** (0.085)</td>
<td>2.12*** (0.623)</td>
<td>2.11*** (0.621)</td>
<td>0.035 (0.039)</td>
<td>0.035 (0.039)</td>
<td>0.049 (0.084)</td>
<td>0.049 (0.085)</td>
</tr>
<tr>
<td>Sales growth</td>
<td>0.002 (0.028)</td>
<td>0.002 (0.028)</td>
<td>0.306 (1.247)</td>
<td>0.286 (1.244)</td>
<td>0.002 (0.011)</td>
<td>0.002 (0.011)</td>
<td>0.013 (0.017)</td>
<td>0.014 (0.017)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.231 (0.602)</td>
<td>0.231 (0.598)</td>
<td>0.664 (10.963)</td>
<td>1.064 (11.011)</td>
<td>0.929*** (0.242)</td>
<td>0.955*** (0.241)</td>
<td>1.030*** (0.283)</td>
<td>1.033*** (0.283)</td>
</tr>
</tbody>
</table>

(continued)
Fixed models Dufour dummy models Structural change models

<table>
<thead>
<tr>
<th></th>
<th>Full sample</th>
<th>Fixed models</th>
<th>Private</th>
<th>Dufour dummy models</th>
<th>Structural change models</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>State-owned</td>
<td>Private</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td></td>
</tr>
<tr>
<td>Companies</td>
<td>137</td>
<td>137</td>
<td>7</td>
<td>7</td>
<td>130</td>
</tr>
<tr>
<td>Observations (N)</td>
<td>535</td>
<td>535</td>
<td>41</td>
<td>41</td>
<td>494</td>
</tr>
<tr>
<td>Chow structural change test</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>5.874**</td>
</tr>
<tr>
<td>F</td>
<td>4.68***</td>
<td>4.65***</td>
<td>2.24*</td>
<td>2.24*</td>
<td>9.53***</td>
</tr>
<tr>
<td>R²</td>
<td>0.077</td>
<td>0.077</td>
<td>0.367</td>
<td>0.366</td>
<td>0.157</td>
</tr>
</tbody>
</table>

Notes: aValue in billions (R$); b2008–2009 crisis interaction terms omitted; ccompanies dummies ommited. SE between parenthesis. *p < 0.1; **p < 0.05; ***p < 0.01
results remained significant only for private companies ($\hat{\beta} = -0.029, p < 0.01$, in model 5). Companies with greater asset tangibility tend to have a higher cost of capital in the full sample ($\hat{\beta} = 0.428, p < 0.01$). However, this result is persistent only in state-owned companies (models 3 and 4). Total assets, return on assets and stock volatility are only significantly among private companies (models 5 and 6).

Regarding the hypotheses, we could not corroborate $H1$ and $H2$ directly, since, in the complete sample, the coefficients of the board social capital in the direct and heterogeneous relations were not significant. However, among private companies, these coefficients were significant both for the social capital of the direct relations ($\hat{\beta} = -0.146, p < 0.01$) and for the heterogeneous relations ($\hat{\beta} = -0.155, p < 0.05$). As for the state-owned companies, the coefficients of these variables were not significant, we corroborate $H3a$ and $H3b$.

To make sure that the results were consistent considering the impact of the 2008–2009 crisis, we tested the effects of a structural break. In models 7 and 8, social capital reduces the cost of capital significantly both for direct relations ($\hat{\beta} = -0.157, p < 0.05$) and for heterogeneous relations ($\hat{\beta} = -0.170, p < 0.05$). From the Dufour dummy models, which check the effect of the structural break by interacting each variable by a crisis period dummy (2008–2009), the only variable with a significant coefficient change was Tobin’s $Q$ ($\hat{\beta} = -0.023, p < 0.05$), that this dummy coefficient was omitted in the models. The effect of social capital on the cost of capital also remained consistently significant when we used Chow structural change regressions (models 9 and 10). Since Chow’s tests pointed to structural change between the period before and after the crisis (5.874, and 6.516, $p < 0.05$), there was a slight drop in the social capital effect both for direct ($\hat{\beta} = -0.120, p < 0.05$) and heterogeneous relations ($\hat{\beta} = -0.130, p < 0.05$).

**Further analysis**

First, we investigated whether the effect of the board social capital on the cost of capital remained significant when competing with other board structure variables. In Table III, models 2 and 3, both social capital through direct ties ($\hat{\beta} = -0.121, p < 0.05$) and heterogeneous ties ($\hat{\beta} = -0.118, p < 0.1$) reduced the cost of capital when contrasted with the board size. In models 5 and 6, the reduction of cost of capital also remained significant when controlled by the number of interlocks for both direct ($\hat{\beta} = -0.141, p < 0.05$) and heterogeneous ($\hat{\beta} = -0.148, p < 0.05$) board social capital. This also occurred when we controlled by the percentage of outsider directors on the board, both for direct ($\hat{\beta} = -0.133, p < 0.05$) and heterogeneous ($\hat{\beta} = -0.142, p < 0.05$) social capital.

Second, in Table IV, we analyzed whether the effect of the social capital on the cost of capital remained significant when controlled by the voting rights concentration. Models 2 and 3 indicate that, when controlled by the concentration of the voting rights by the dominant shareholder, there is a reduction in the cost of capital by the board social capital only in direct ties ($\hat{\beta} = -0.107, p < 0.1$). When we controlled by concentrating on the five largest shareholders, the effect of social capital was also significant only for direct ties ($\hat{\beta} = -0.097, p < 0.1$, model 8). But when we controlled by the sum of the voting rights of the three largest shareholders (models 5 and 6), both social capital through direct ($\hat{\beta} = -0.111, p < 0.1$) and heterogeneous ties ($\hat{\beta} = -0.113, p < 0.1$) showed to be significant.

Third, using more robust models, in Table V, we tested whether the effect of social capital was still consistent when instrumented by the concentration of voting rights by the five largest shareholders. In models 1 and 2, Wooldridge’s endogeneity test and robust regression test point to the endogeneity of both forms of board social capital, as well as the Shea’s Partial $R^2$ shows that concentration of voting rights is significantly strong instruments to ensure there is no bias in the endogenous variable coefficients. Despite this endogeneity, the reduction of the cost of capital remained significant, both for the board social capital by direct ($\hat{\beta} = -0.070, p < 0.1$) and heterogeneous relations ($\hat{\beta} = -0.092,$
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<th>(9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social capital$^a$</td>
<td>-0.121** (0.058)</td>
<td>-0.141** (0.058)</td>
<td>-0.133** (0.056)</td>
<td></td>
<td></td>
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<tr>
<td>Scal capital hetero$^a$</td>
<td>-0.118* (0.070)</td>
<td>-0.148** (0.067)</td>
<td>-0.142** (0.066)</td>
<td></td>
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</tr>
<tr>
<td>Board size</td>
<td>-0.004** (0.002)</td>
<td>-0.003 (0.002)</td>
<td>-0.003 (0.002)</td>
<td></td>
<td></td>
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<tr>
<td>Board interlocks (degree)</td>
<td>-0.002 (0.002)</td>
<td>-0.001 (0.002)</td>
<td>-0.001 (0.002)</td>
<td></td>
<td></td>
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<tr>
<td>Outsiders percenual</td>
<td></td>
<td></td>
<td></td>
<td>-0.196** (0.081)</td>
<td>-0.176** (0.081)</td>
<td>-0.180** (0.081)</td>
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<tr>
<td>Control variables$^b$</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.154</td>
<td>0.164</td>
<td>0.160</td>
<td>0.144</td>
<td>0.158</td>
<td>0.155</td>
<td>0.155</td>
<td>0.168</td>
<td>0.166</td>
</tr>
</tbody>
</table>

**Notes:** $N = 494$, 130 companies. $^a$Amounts in billions (R$); $^b$control variables are omitted. Fixed Models. Robust SE between parentheses. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$
<table>
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<th>(7)</th>
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<th>(9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social capital</td>
<td>$-0.107^{*}$ (0.060)</td>
<td>$-0.111^{*}$ (0.060)</td>
<td>$-0.097^{*}$ (0.059)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Social capital Hetero</td>
<td>$-0.108$ (0.070)</td>
<td>$-0.113^{*}$ (0.070)</td>
<td>$-0.096$ (0.070)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Dominant shareholder</td>
<td>$0.002^{**}$ (0.001)</td>
<td>$0.001^{*}$ (0.001)</td>
<td>$0.001^{*}$ (0.001)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Sum 3 larger shareholders</td>
<td>$0.001^{*}$ (0.001)</td>
<td>$0.001$ (0.001)</td>
<td>$0.001$ (0.001)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>HHI 5 larger shareholders</td>
<td>$0.218^{***}$ (0.074)</td>
<td>$0.196^{***}$ (0.075)</td>
<td>$0.199^{***}$ (0.075)</td>
<td></td>
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<tr>
<td>Control variables</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.132</td>
<td>0.142</td>
<td>0.139</td>
<td>0.128</td>
<td>0.138</td>
<td>0.135</td>
<td>0.145</td>
<td>0.153</td>
<td>0.151</td>
</tr>
</tbody>
</table>

**Notes:** $N = 494$, 130 companies. *Amounts in billions (R$); bshareholders with voting rights; ccontrol variables are omitted. Fixed Models. Robust SE between parentheses. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$
Table V. Robustness of social capital using two-equations models by H2SLS and H3SLS estimations (private companies)

<table>
<thead>
<tr>
<th></th>
<th>H2SLS</th>
<th>H3SLS</th>
<th>H2SLS</th>
<th>H3SLS</th>
<th>H2SLS</th>
<th>H3SLS</th>
<th>H2SLS</th>
<th>H3SLS</th>
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<td>(8)</td>
</tr>
<tr>
<td>Social capital</td>
<td>-0.702* (0.386)</td>
<td>-0.918* (0.518)</td>
<td>-0.879** (0.396)</td>
<td>-1.180** (0.535)</td>
<td></td>
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<td></td>
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<tr>
<td>Social capital hetero</td>
<td></td>
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</tr>
<tr>
<td>HHI 5 larger shareholders</td>
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<tr>
<td>Instrumental exogenous variable</td>
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<tr>
<td>Control variables</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>68.540***</td>
<td>60.800***</td>
<td>71.750***</td>
<td>70.030***</td>
<td>108.310***</td>
<td>111.050***</td>
<td>97.55***</td>
<td>94.29***</td>
</tr>
<tr>
<td>Wooldridge's endogeneity test</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Robust regression test</td>
<td>3.009*</td>
<td>3.193*</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Shea's partial $R^2$</td>
<td>0.023***</td>
<td>0.018***</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.1649</td>
<td>0.1438</td>
<td>0.289</td>
<td>0.444</td>
<td>0.093</td>
<td>0.089</td>
<td>0.038</td>
<td>0.084</td>
</tr>
</tbody>
</table>

Notes: $N=504$, 130 companies. $^a$Amounts in billions (R$); $^b$shareholders with voting rights; $^c$control variables are omitted. As identification strategy in the models of instrumental variables (H2SLS), in models 1 and 2, we used the proxies of social capital as endogenous, and we included HHI larger 5 shareholders as instruments, following what was done by Dahya et al. (2008). The control variables were introduced in the two stages. In models 5 and 6, we inverted the relation, considered included HHI larger 5 shareholders as endogenous and the board social capital variables as instruments. In relation to the models of three stages (H3SLS), we considered in models 5 and 6 as exogenous variables HHI larger 5 shareholders. In the first equation, we define as endogenous variable social capital proxies, which, in turn, are also affected recursively by HHI larger 5 shareholders and control variables. In the second equation, in all models, we consider RPEG implied cost of capital as an endogenous variable. We inverted the relationship between endogenous and exogenous variables in model 7 and 8, putting HHI larger 5 shareholders as endogenous in the first equation, and board social capital and control variables as exogenous. First equations omitted. SE between parentheses. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$
In the use of robust simultaneous equations models (H3SLS), models 3 and 4, results are very similar, $\hat{\beta} = -0.088$, $p < 0.05$, for board social capital by direct ties, and $\hat{\beta} = -0.118$, $p < 0.05$ for heterogeneous ties.

Fourth, using our board social capital proxies, we also use more robust models to test Dahya’s et al. (2008) hypothesis that a strong board of directors reduces the value discount of firms with ownership concentration. In our case, we use the implied cost of capital rather than Tobin’s Q. Models 5–8 in Table V indicate that the board social capital mitigates the effect of ownership concentration discount on the cost of capital. Whether through instrumental variables (H2SLS, models 5 and 6) or through equation systems (H3SLS), the HHI 5 larger shareholders variable is no longer significant.

Fifth, we also check the robustness of our results using another proxy for the implied cost of capital: MPEG. In models 1 and 2 of Table VI, the board social capital by both direct ($\hat{\beta} = -0.178$, $p < 0.05$) and heterogeneous ties ($\hat{\beta} = -0.178$, $p < 0.05$) also reduces the cost of capital for the MPEG proxy.

Finally, we checked in models 3–8 of Table VI how the board social capital operates on the cost of capital at different levels of corporate governance quality on the Brazilian stock exchange, B3. In the listing with the highest quality requirement of corporate governance, New Market, both social capital through direct ($\hat{\beta} = -0.071$, $p < 0.1$) and heterogeneous ties ($\hat{\beta} = -0.077$, $p < 0.1$) reduce the cost of capital. At intermediate levels of quality of corporate governance, only the board social capital by direct ties reduced the cost of capital ($\hat{\beta} = -0.249$, $p < 0.1$). At the lower level of corporate governance, the effect of the board social capital was not significant.

**Discussion and conclusion**

In this article, we analyzed how the type of ownership and control moderates the effect of the board social capital on the implied cost of capital. Our results show that both the social capital of direct relations and heterogeneous relations significantly reduce the cost of capital among private companies, and not for state-owned companies. The results were still consistent when we used models to control the effect of the structural break of the coefficients due to the 2008–2009 crisis. First, these results suggest that the implied cost of capital is affected by the reliability and legitimacy of the companies, in view of the position and prestige of their board members (Rossoni et al., 2018), which increase the chances of making good decisions, precisely because they have access to differentiated relational resources present in the board network. Second, our results point out that a strong board composed of outsiders with ties to more valuable companies hypothetically has more incentives to properly monitor companies (Dahya et al., 2008). Third, this result corroborates the view that outsiders board members do not effectively exercise their role of collecting external resources in state-owned companies, either through the social isolation of other board members linked to political parties or through the ease of reallocation of financial resources by the state (Yoshikawa et al., 2014).

Additionally, only for private companies, we demonstrated that our social capital board proxies were still robust when controlled by board structure measures. Our results were consistent when contrasted with the hypothesis of board size (Fracassi and Tate, 2012), outsiders (Dahya et al., 2008; Johnson et al., 2013), and a number of interlocks (Ferris et al., 2017; Johnson et al., 2013). Our results also were robust when controlled and instrumentalized by the ownership concentration of voting rights. Dominant shareholders could try to limit the influence of more powerful directors (Dahya et al., 2008), but our data points out that this is less likely on strong boards. Boards rich in social capital – with outsider directors from higher-value companies – tend to have more incentives to adequately monitor the decision of dominant shareholders (Rossoni et al., 2018).
<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>MPEG cost of capital (private companies)</th>
<th>RPEG cost of capital</th>
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<td>(6)</td>
<td>(7)</td>
</tr>
<tr>
<td>Social capital</td>
<td>$-0.178^{**}$ ($0.010)</td>
<td>$-0.071^{*}$ ($0.039)</td>
<td>$-0.249^{*}$ ($0.135)</td>
<td>$0.098$ ($0.120)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Social capital hetero</td>
<td>$-0.023^{**}$ ($0.011)</td>
<td>$-0.077^{*}$ ($0.046)</td>
<td>$-0.210$ ($0.154)</td>
<td>$0.255$ ($0.153)</td>
<td></td>
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</tr>
<tr>
<td>Control variables</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>358</td>
<td>358</td>
<td>321</td>
<td>321</td>
<td>104</td>
<td>104</td>
<td>76</td>
</tr>
<tr>
<td>$F$</td>
<td>7.880^{***}</td>
<td>8.060^{***}</td>
<td>0.244</td>
<td>0.243</td>
<td>2.520^{**}</td>
<td>2.390^{**}</td>
<td>-</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.184</td>
<td>0.188</td>
<td>0.195</td>
<td>0.178</td>
<td>0.401</td>
<td>0.401</td>
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</tr>
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</table>

Notes: *Amounts in billions (R$); control variables are omitted. Brazilian stock exchange B3 created a premium listing, in which the highest level is New Market, where there are two others with fewer requirements, Levels 1 and 2, and the Traditional Market. New Market comprises companies that voluntarily agreed to good governance practices, such as voting rights for all shareholders, dispute resolution in an arbitration chamber, and the compulsory participation of independent board members. Levels 1 and 2 have similar rules of the new market, but do not follow the principle of one share, one vote. Companies listed in the Traditional Market follow only the Brazilian laws, which are admittedly weak for investors. Fixed models. Robust SE between parentheses. $^*p < 0.1; ^{**}p < 0.05; ^{***}p < 0.01$
We also demonstrate that the board social capital is able to mitigate the discount by ownership concentration in the implied cost of capital. As pointed out by Dahya et al. (2008), in weak legal environments, such as Brazil, strong boards tend to be an effective mechanism to repair opportunism by dominant shareholders. It should also be noted that environments with weak legal protection create intermediary protection mechanisms for investors, as premium lists. When we segment our sample according to the level of quality of corporate governance through premium lists on the Brazilian stock exchange, the effect of the board social capital was significant only in the listings with the greater contractual requirement, New Market and Levels 1 and 2. For companies which operate in the Traditional Market, which has a low guarantee for investors, the effect was not significant. As Rossoni and Mendes-da-Silva (2018) have pointed out, mechanisms such as board quality tend to be effective in the Brazilian market only in listings with higher requirements at levels of corporate governance.

Contributions
This paper evaluated how board social capital can reduce the implied cost of capital, showing that stronger and well-connected boards can facilitate firms’ access to external resources. We believe that this is the first contribution to the area of corporate finance. The second contribution involves analyzing board relational resources, as well as Rossoni et al. (2018), constituting an innovative way of evaluating the board social capital. Differently from Ferris et al. (2017), we use a board social capital proxy that weighs the presence of the outsider directors by the market value of the interconnected company. Thus, we assume that outsider directors from more valuable firms have both greater power of influence and access to more valuable information and resources (Connelly and Van Slyke, 2012). Therefore, this study differs from the majority that uses only position indicators in the network to validate board interlock hypotheses (Johnson et al., 2013). Third, using arguments of Burt (1992) and Rossoni et al. (2018), we also analyzed whether the board social capital from structural holes — heterogeneous ties — reduces the cost of capital. Directors from companies with less redundant ties tend to have more relevant and rare information and are more likely to resist pressures of controlling shareholders (Connelly and Van Slyke, 2012).

In addition, our fourth contribution refers to add important information about state-owned companies to the studies of Aharoni (1986), Dahya et al. (2008), Shleifer and Vishny (1997, 2002) and Yoshikawa et al. (2014), which evaluated specific characteristics of public management and corporate governance. As our study has shown, the social capital of the board in countries with low legal protection and management of highly politicized state-owned companies is ineffective in reducing the cost of capital. As a fifth contribution, although Caiazza and Simoni (2015), Dahya et al. (2008) and Ferris et al. (2017) emphasize that powerful boards in weak legal environments can mitigate agency problems with dominant shareholders, as in Brazil, our study points out that this tends to occur in properly monitored companies with safeguards beyond legal obligations.

Regarding the practical implications, this study provides evidence for investors, financial analysts, investment funds and society about the implication of the board social capital on the cost of capital. In this way, these actors, through what was ruled in this paper, have empirical support to better evaluate the direction of their investments, as well as the factors that influence the expected return on them.

Recommendations for future studies
The main suggestion of future studies is to test the board social capital hypothesis through the idea of relational resources in different countries with the intention of evaluating how
this governance mechanism operates in different legal and institutional contexts. Another opportunity would be to include as payment variable the payment of dividends. We can assume that when there is a dividend payment per share, which we can understand as an indicator of financial stability, i.e. dividends are paid if the debts have already been paid, the value of the company ceases to be relevant in estimating the cost of capital.

Another question that remains to be answered is: Do companies with ties to financial institutions have a lower cost of capital? Researching this question, we find that financial expertise on the board affects a variety of company issues, including debt strategies (Mizruchi and Stearns, 1994; Stearns and Mizruchi, 1993) and earnings management (An and Jin, 2004). If we assume that board members of financial institutions have access to privileged information, in addition to having specific knowledge of finance because they work directly with financial institutions, companies that have board interlocks with financial institutions may, through these relationship ties, obtain loans with differentiated costs of capital.

References


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Director interlocks and cross-cultural impact on strategies affecting shareholder–creditor conflicts

A conceptual analysis

Vinita Ramaswamy
University of St Thomas, Houston, Texas, USA

Abstract

Purpose – Director interlocks, with their extended resources and shared experiences, have the potential power to go beyond the basic role of providing advice and monitoring the activities of an organization. Interlocked directors can have a cross-cultural role in manipulating corporate choices and strategies in several areas, including capital structure, based on learned behavior in their internal company. Shareholders and creditors are the two main capital providers for a company. However, their risk return horizons are very different, and policies that benefit one group may not be optimal to the other. Interlocks can act as carriers of sub-par practices that affect the behavior of several organizations. Such transactional and relational activities may increase short-term value for equity shareholders, but increase the risk for the creditors. The purpose of this paper is to examine cross-cultural effects of interlocks on corporate strategies that affect this essential agency relationship.

Design/methodology/approach – This paper surveys the extant literature on board interlocks, board practices, equity valuation and credit risk to develop a link between such interlocks and creditor protection. Based on a brief survey of the central concepts of governance and the role of directors, this paper then provides various propositions on the role of interlocking directorships and their effect on the shareholder–creditor agency problem.

Findings – Director interlocks, through their linked common practices, have the potential to increase or worsen shareholder–creditor conflicts by magnifying strategic practices like short-termism, earnings management or through its effects on chief executive officer compensation. Such cross-cultural effects persist across ownership structures and cultural differences in governance.

Research limitations/implications – The paper is not an empirical study of the conflict. This paper uses a literature review to arrive at propositions that may impact shareholder–creditor conflicts.

Practical implications – Several studies have shown cronyism and the dense corporate network has been a large factor in the financial crisis that affected both shareholders and creditors. The influence of creditors grows with the current availability, and therefore increase in debt levels, this conflict can be magnified through homophily inherent in interlocks. For an organization to be successful in its role of protecting all stakeholders, especially the two major providers of equity capital, factors that cause conflicts must be taken into account while developing the tenets of governance policies and, on a regular basis, during the strategic planning process within the organization. Regulations affecting interlocks, including governance policies, must therefore take into account such influences.

Social implications – Board interlocks act as channels of information between companies, creating a social network where processes and policies are shared and implemented as defined by the concept of homophily. Such management actions reduce both the quality of information available to creditors and their monitoring capabilities. This juxtaposition of shareholder and creditor interest can, therefore, be worsened by director interlocks.

Originality/value – Prior literature has not specifically linked director interlocks and their mutual impact on the culture and strategy of linked corporations to the shareholder–creditor conflict.

Keywords Creditor conflict, Cross-cultural impact, Director interlocks, Director strategy, Shareholder value analysis, Short-termism

Paper type Conceptual paper

Introduction

The conceptual framework of accounting, as proposed by the IFRS and other regulatory bodies, identifies two main groups of investors as the final recipients of financial information: stockholders and creditors. The tenets of firm’s corporate governance, which
have been described as a nexus of contracts between management and various corporate stakeholders, should be optimally structured to provide a stable foundation for internal corporate decision-making, while simultaneously increasing the integrity and fairness of external reporting. And central to a good system of corporate governance is the board of directors and their role in strategic planning and decision-making.

Traditionally, the central focus of governance is to protect the interest of equity shareholders, though recent studies have indicated that a good governance system increases corporate credit rating, thus protecting the providers of credit capital as well. However, equity shareholders and creditors have differing risk metrics, returns and timelines – and strategies and actions that benefit one group may not always benefit the other. This creates a conflict between shareholders and creditors, and a company must balance the rights and returns of these two major groups of investors.

Providers of capital are particularly vulnerable as they rely on the activities of the board of directors who act as agents to maximize the firm value. The strategic planning process of management, supervised by the board, formulates activities that affect firm value, through earnings, and through risk reward compensation. Prior research has shown that board composition and the independence of the board have crucial roles to play in equity valuation, and creditor protection. When directors serve on multiple boards together (board interlocks) it affects both the principles of board composition and board independence. When the board makes decisions that favor one group over the other, it violates the governing principle of neutrality, and creates a conflict between the various stakeholders. And when these decisions are magnified by the cross-cultural shared practices of interlocked boards, the extant divergence intensifies. This paper discusses the shareholder–creditor conflict, and proposes a conceptual analysis of the cross-cultural effects of board interlocks on this conflict.

The shareholder–creditor conflict

Equity stakeholders are normally considered to be the focus of governance policies. However, Schleifer and Vishny (1997) define corporate governance as “the ways in which the suppliers of finance to corporations ensure themselves of getting a return on their investment.” According to this definition, good governance policies are set in place not just for shareholders, but also to the providers of debt.

Studies suggest that when the voting rights of the shareholders are well regulated, and extensive rights are given to creditors, the company gains in value and becomes a good investment proposition (La Porta et al., 2000). However, granting high level of rights to both groups of stakeholders can prove to be highly restrictive of management action and discretion. The unfortunate result is that one group tends to gain at the expense of the other. For example, Acharya et al. (2009) show that higher creditor rights tend to reduce risky investments by managers. But this leads to lower stock market performance, reducing the benefits to shareholders. Stronger creditor rights can also increase the likelihood of a financial crisis, as banks are willing to take higher risks (Houston et al., 2010). Another study by Klock et al. (2005) suggests that anti-takeover governance provisions, though detrimental to stockholders, can reduce the cost of debt financing. Shareholders and creditors react differently to contracts and governance provisions; the underlying reason for this conflict could arise due to the basic differences in the risk and returns to creditors and stockholders.

Figures 1 and 2 show the time horizon, the returns and risks that go to shareholders and creditors.

Given the going concern concept, equity shareholders possibly have an infinite horizon to hold their stock. After the initial purchase of stock, the shareholder’s returns come in the form of:

- Periodic dividends (both cash and stock); dividends are paid out of earnings, and companies use dividends to signal financial value and performance. Many growth
companies do not pay dividends and prefer to reinvest their earnings. Reduction of existing level of dividends is rare, and occurs only when a company is in serious financial trouble.

- Stock buybacks: when there are excess cash reserves, a company can use buybacks to reward investors. Buybacks are optional for stockholders; and higher stock returns are associated with such repurchases.
- Capital appreciation: the increase in the market price of the purchased stock provides another form of return that the stockholder could take advantage of.

However, all investments have the risk of financial loss and uncertainty. For shareholders, risk can be in the form of:

- Business risk: this is the risk of an unsuccessful business that goes bankrupt and the shares lose all market value. This could be due to poor management decisions or other uncontrollable political and economic factors or natural disasters.
- Volatility risk: stock prices can fluctuate due to bad management, faulty products or events beyond the control of management.
- Liquidity risk: an equity stakeholder may find it difficult to sell the stock if the company is performing below par, or is perceived to be performing poorly.

Creditors, on the other hand, face a very finite timeline. Once the decision to lend money is made, the returns for creditors are:

- Periodic interest: most debt comes with interest payments (though there are borrowings with zero interest rates or deep discount bonds) that are mandatory as part of the contractual agreements. These payments are fixed and cannot be changed.
- Repayment: at the end of a finite time period, companies pay back the face value of the debt. However, if there is callable debt, companies have the option of early repayment at market value.

The risk faced by creditors can respond to the same stimuli as investors but can work in opposite directions. Credit risk includes:

- Call risk: when companies decide to pay back debt early, market interest rates can be different from the stated interest rates, and creditors can receive less than the face value of the debt.
Event risk: the debt ratings of a company can be downgraded due to poor financial performance (management behavior), regulatory changes or natural disasters. Increase in debt by a company can skew the financial leverage of a company as well.

Credit spread: this is the return creditors get for bearing the risk of a corporate loan. But if interest rates decline, the spread also declines.

Default risk: this is the final risk taken by creditors – that a company cannot pay back its debt. This particularly affects unsecured creditors, especially if a company goes into bankruptcy. Debts can be restructured, but creditors usually lose value in the process.

Creditors and shareholders obviously have differing risk and return metrics. For creditors, debt agreements guarantee interest payments and debt repayment. For a shareholder, returns are not guaranteed. Companies can refuse to pay dividends or buyback stock; stock prices may not increase for them to take advantage of capital appreciation. However, actions taken by management to maximize stockholder returns can adversely affect creditors. It has been well documented that a thriving stock market can lower interest rates; higher returns to stockholders in the form of dividends or buyouts can also affect bond yields.

Recent years have focused extensively on the relationship between shareholders and managers, with the role of board of directors, in maximizing the shareholder value. Various steps have been taken to minimize the agency problem – well-designed executive compensation, rules governing board composition and role, changes in the composition of shareholders and shareholder education (Rock, 2013). While these have been fairly successful, other stakeholder needs, especially those of creditors, have been sidelined. Managers or directors, whose primary focus is the equity investor, now have the incentive to shift the risk from the shareholder to the creditor. They can do this in four ways (Rock, 2013):

1. Asset dilution: moving assets (like cash) to the shareholders anticipating an increase in market value of stock;
2. Asset substitution: acquiring risky assets to replace safer assets in an attempt to increase cash flows;
3. Debt dilution: adding debt with superior claims to existing creditors in order to invest in new projects; and
4. Underinvestment: refusing to issue new stock, even when funds are necessary for a viable project, because of the priority of the existing shareholders.

A good system of governance tries to balance the rights of creditors and shareholders. But in reality, it may not be practicable to give each group equal rights. Strong stockholder activism can force companies to pay out more dividends and repurchase more stock as a means of increasing short-term returns. Management compensation contracts can be structured to minimize the agency problem, but this leads to managerial focus on short-term results. Such short-term results can be beneficial to stockholders in the form of higher immediate returns, but they also increase the volatility and risk for creditors. Increased creditor rights can minimize short-term myopia and increase long-term value (Huang et al., 2016). Firms with strong corporate governance scores, as indicated by stockholder rights, are also linked to higher costs of debt and higher leverage (e.g. Chava et al., 2009). But stronger creditor rights can have a negative effect on shareholder value.

Figure 3 explains the inherent conflict between stockholder and creditor rights and powers. The power of creditors increase only when there is concentration of risk. Studies have shown that after a bankruptcy, creditors can force companies to make less risky, therefore lower return investment decisions and to avoid innovative new projects because of the risk involved (Acharya et al., 2009). Nini et al. (2009) show that creditors can also control capital...
expenditures and other cash payments. Such actions may lead to higher long-term growth; but in the short run, shareholders, especially those with a narrow investment horizon tend to lose value due to the absence of cash payouts and short-term capital appreciation.

Creditors, of course have legal protection; however, they do not have the means or the power to control the board or prevent opportunistic behavior. Contractual agreements and debt covenants can be used as a means of control, but it is impossible to predict, and therefore control, all future possibilities of managerial behavior. Contracts could be renegotiated, and debt covenants could be tightened, but such changes and renegotiations would be costly. Enforcement by courts who do not have all the information can also work against the creditors (Stout, 2013). As a result, even when the board works for the benefit of the shareholders, creditors may be adversely affected. Board interlocks can exacerbate this phenomenon through common shared practices. For example, Donato and Tiscini (2009) show that a higher level of bank interlocks can increase the cost of debt to non-financial firms.

**Corporate governance and the role of the board of directors**

The board is the highest policy making entity within the governance system, and has a major role to play in monitoring the decision-making activities of a corporation. These monitoring activities are intended to supervise and regulate the responsibilities of the company toward its major stakeholders. Corporate governance policies usually define the roles and responsibilities of the board in great detail. These policies are usually based on the core definition of the concept of corporate governance. But the definition of governance has developed and evolved over several disparate theories. As the foundational theories changed, the definition of the role of the director also changed:

- under agency theory, the role of directors is to be the monitoring mechanism that ensures the maximization of shareholder wealth (Malin, 2004);
- stakeholder theory suggests that the role of directors is to set up rules and procedures that safeguard all those who create value for the company (Rodriguez et al., 2002); and
- the role of the board is to mentor the managers, assist in strategy formulation and implementation and set up collaborative links with all stakeholders under the stakeholder theory (Hillman and Dalziel, 2003).

The IFRS conceptual framework also emphasizes the stewardship role of management. Finally, resource dependency theory uses corporate governance as a mechanism to link the company to all its stakeholders. The role of the board, under this theory, is to network and communicate with internal and external groups to create opportunities and facilitate inter-organizational co-ordination and exchange (Huse, 2005). A good example of this type of governance would be interlocking directorates.
At a general level, boards serve as an advisory counsel, monitor and discipline executive activities, and step in with higher authority in times of crisis (Mace, 1971). A comprehensive list of possible board responsibilities is provided by the King Report on Corporate Governance in South Africa (2009). The fundamental role of the board of directors is to set the "tone" for the company with respect to its planning and decision-making processes, ethics and compliance with legal requirements. However, in practice, boards face numerous issues and problems, especially with the need to have a diverse and independent board structure. Diversity is encouraged through the employment of women and minorities in the board, while independence is boosted by outside directors. Outside directors bring in a fresh perspective and additional knowledge to the company; however, many of the outside directors may sit on several boards, creating a network of interlocks.

**The cross-cultural impact of board networks**

Board interlocks act as channels of information between companies, creating a social network where processes and polices are shared and implemented as defined by the concept of homophily. Resource dependence theory suggests that director interlocks provide additional resources for decision-making, especially during times of demand and stress. Institutional theory explains the progression of simple rules and routines into established and authoritative guidelines through cross-cultural relationships. Three types of isomorphism (or areas of influence) explain these cross-cultural relationships:

1. Coercive isomorphism is the pressure to meet expectations. Corporations face constant pressure to meet earnings targets, and compensation contracts of managers are based on meeting targets.
2. Mimetic isomorphism is the tendency to imitate or copy practices followed by firms perceived to be successful.
3. Normative isomorphism is the development of common values and beliefs that lead to similar actions and beliefs within linked firms.

Legitimacy theory tries to understand organizational activities through social contracts. Board interlocks are social contracts between organizations, and they influence common behavior. Such social contracts can also cause accounting reports to be manipulated to change expectations of behavior. Social exchange theory also suggests the need for reciprocity, where there is an obligation to have similar responses to perceived duties. Directors on interlocked boards may feel the need to reciprocate or repeat the actions of other organizations or boards.

The effect of interlocking boards increases with several factors: the experience and knowledge of the directors; the relationship to the focal firm, membership of the interlocked director on board committees, and environmental turbulence (Shropshire, 2010). Barzuza and Curtis (2014) suggest that "interlocks contribute to outside directors' knowledge and power within the boardroom." A large body of research has shown that networks can affect sources of financing, market opportunities, acquisition decisions and other strategic issues. Simoni and Caiazza (2013) postulate that interlocks, and their qualitative and structural changes impact the competitiveness of organizations. Do such coordinated efforts improve firm performance? This relationship has been described as "tenuous" (Madhavan, 2002) with mixed results from several studies.

**The conflicting role of board networks and their cross-cultural impact**

Resource dependence theory suggests that interlocks can increase the amount of resources for the organizations involved, thus increasing the potential for better strategies, resources and, therefore, firm value. But interlocks can also encourage and support controversial practices (see Figure 4).
In their study of the learning patterns of director interlocks, Simoni and Caiazz a (2012) find that director interlocks “are a preferential channel for […] connected firms to maximize access to extant knowledge.” As a baseline, interlocking directorates can affect the capital structure of a firm, and dictate the debt/equity balance based on their prior knowledge (Gygax et al., 2016). Knowledge can refer to the sharing of resources to make strategic decisions such as capital structure, but can also be a basis for value reducing behavior. Such behavior can be found in poison pill adoptions (Davis, 1991), listing migrations (Rao et al., 2000), option backdating and expensing (Bizjak et al., 2009) and life insurance policies (Brown 2011). Interlocks can spread rapidly to susceptible firms – interlocks with firms that exhibit “bad” behavior increase the chance of such behavior by the connected firms. Institutional pressures and external uncertainties encourage firms to adopt practices that deviate from formally adopted policies; interlocking directors can encourage such practices based on experiences in their related companies (Westphal and Zajac, 2001). When interlocked directors experienced a positive response to lower disclosure in one of their companies, they were more like to spread that practice to the other firms in the network, thus lowering disclosure quality across board (Cai et al., 2013). According to Kang (2008), director interlocks instigate spillover effects between firms – financial accounting fraud from one company can have reputational effects on other connected firms.

These practices can obfuscate the clarity of financial statements; while the short-term effects may be an increase in stock value, it makes monitoring more difficult for the creditors. Interlocks are therefore closely regulated in the USA through the Clayton Act. The European Commission can prevent interlocks through direct intervention though the EU Competition Law does not directly address the practice. Australia, New Zealand and emerging economies have not directly addressed the problem of interlocks, though research has increasingly studied the problem.

Corporate governance policies are meant to regulate and oversee the composition and compensation of company executives, but interlocks can act as a means of changing governance policies themselves. For example, after the landmark case of Schoon v. Troy Corp, the boards of a large number of companies changed their governance policies. Board interlocks can have a significant influence on management action. If such actions are meant to offer short-term value to one group of investors (encouraged by compensation contracts and other agency mitigating measures of corporate governance) they can magnify the agency problem between investors. This analysis can be summarized as follows:

**P1.** Networks of director interlocks, with their tendency to spread strategic practices across firms, can increase the incidences of these practices, thus acerbating conflicts between shareholders and creditors.

Are these interactions similar across organizations and cultures? Caiazz a and Simoni (2015) suggest that the structure and power of director interlocks depends on the system of corporate governance prevalent within the organization and within the culture in which the organization operates. Firm size and ownership structure play significant roles in setting corporate governance policies. Corporate governance across countries has also developed based on their political, cultural and economic histories. Each of these situations gives rise to

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**Figure 4.** Managerial action and board interlocks
director interlocks for diverse reasons – and causes a chain reaction where interlocks spread practices that favor one stakeholder, thus widening the extant conflict.

For large corporations, especially within the USA, ownership is highly dispersed, and executive powers lie largely in the hands of management. Interlocking directors are, therefore, a conscious choice for strategic resource management. Adding class hegemony to this mix, the concept of peer cronyism ensures that each interlocked director can expect to influence the activities of others (Khatri et al., 2006). And peer cronyism has been shown reduce firm value through actions such as an artificial increase in management compensation above average levels (Hallock, 1997). In smaller organizations, where there are fewer owners, the focus tends to be on returns to the equity shareholders. Interlocking directors are chosen on the basis of their relationship to the owners, and will, therefore, act on behalf of the equity owners, and possibly against the creditors.

Analyzing this relationship across countries, the US system of corporate governance gives primacy to the equity stakeholder. There is also a very distinct separation of ownership and management, usually giving management wide, discretionary powers in controlling the activities of the corporation. As creditors and other stakeholders are sidelined, and governance policies favor the equity shareholders, interlocked directors have the means and the motive to undertake activities that maximize shareholder value, many times at the expense of the creditors.

European countries are more focused on “stakeholders” rather than “shareholders.” Boards have stakeholder representations such as employees and creditors, and they play a role in the strategic planning process. Board interlocks are fairly widespread within the EU – a study by van Veen and Kratzer (2011) found that 10 percent of directorates are interlocked. Banks and other financial institutions have an equity interest in many EU countries like Germany and Italy. This tends to increase the cost of debt (higher rate of interest to creditors) and reduce profitability (Donato and Tiscini, 2009). Such interlocks, especially horizontal interlocks, are also perceived as anti-competitive (Peterson, 2016) and there is a growing call in Europe to regulate them. Here, the conflict tends to work in the opposite direction – in favor of the creditors, rather than shareholders, but nevertheless exacerbates it.

The Asian financial crisis and the rapid growth of many Asian economies have given prominence to the organizational structure and governance policies prevalent there. In his study of director interlocks in Thailand, Peng et al. (2001) uses resource dependence theory to suggest that interlocks are densely distributed in developing economies to take advantage of the knowledge and practices of experienced directors. Mackie (2001) shows that in many Asian countries, there is a concentration of ownership in the hands of a few, and owners are more likely to be managers.

Such family-owned organizations are more likely to link to directors who are also family members (Caiazza and Simoni, 2015). These relationships, therefore, give prominence to equity owners rather than debt. Agency problems are also worsened by risky financial structures, lack of transparency, and a low level of protection to minority stakeholders (Claessens and Fan, 2002).

Based on this analysis, a second proposition regarding the cross-cultural effects of director interlocks may be summarized as:

\[ P2 \text{. Irrespective of organizational structure or governance culture, the cross-cultural effects of director interlocks have a tendency to select strategic practices that widen the shareholder–creditor conflict.} \]

A further analysis of the cross-cultural effects of interlocks on the shareholder–creditor conflict
As can be seen from Figure 4, actions that are of interest to management include influencing their compensation contracts, short-term focus on earnings, dividends and other payouts, to
mention a few. These activities tend to create short-term value to stockholders, but they increase the risk and volatility to creditors.

Short-termism and director interlocks

“Short-termism” is a common phrase used to describe managerial tendency to focus on short run returns to stockholders instead of long-term investment and growth. This practice is widespread in the USA and in Europe, where new EU legislation seeks to promote long-term shareholder involvement. Short-termism is counterproductive – a study by McKinsey (2017) finds that companies with a “long-term” culture tend to have higher revenue growth, stronger financial performance and more job creation. But Biden (2016) suggests the following reasons for such myopic behavior: institutionalized political policies such as policies that permit unlimited stock buybacks, tax policies that consider investments of more than one year as “long term, financial practices tying managerial compensation to stock performance, and shorter chief executive officer (CEO) tenure, investor activism demanding current returns rather than future growth, fear of corporate raiders and the narrow focus on quarterly earnings.

Short-termism has resulted in greater current returns to equity providers, at the expense of future growth. Total investment as a percentage of the economy has fallen from 15 to 11 percent, according to the Bureau of Economic Analysis. Interviews with the CFOs of large US companies showed that a surprising 80 percent of them would rather meet short-term earnings expectations rather than focus on long-term growth (Graham et al., 2005). A study of 1024 companies listed on the European Stock Market showed that short-term investments led to a decrease in short-term market capitalization – adding to managerial reluctance for current investments (EY Poland, 2014).

Debt management has also been affected by the short-term view – Hoogduin et al. (2010) find that short-term debt (with a focus on euros) has been increasing especially after the economic crisis. Further, after an extended period of speculative investments (because of pressure to increase short-term stockholder return), companies scramble to borrow excessive funds to cover their obligations (Dallas, 2012). Increase in debt increases refinancing risks, and instability in interest rates thus adding to the volatility of the debt market. Once again, the credit market loses as a result of focus on shareholder value. Increased creditor rights reduced the incidence of short-termism (Huang et al., 2016) but as discussed earlier, higher creditor rights can be detrimental to stockholder value.

Cross-cultural impact. Coercive isomorphism, or the pressure to meet expectations, can give power to interlock influence. For example, excessive management myopia or short-termism has been linked to the recent financial crisis. The practice spread rapidly within firms – the use of complex financial instruments, the securitization process and investor euphoria led to rapid market increase that spiraled out of control. Failures in corporate governance and a lack of board monitoring, made worse by interlocks, contributed to adverse practices by corporations (Devos et al., 2009). Interlocks, influenced by mimetic isomorphism, are a key source of information for boards, and practices adopted by a “focal” company diffuse into other related companies as well (Haunschild and Beckman, 1998). Low status directors (directors who have not reached the highest levels of their profession) who sit on interlocked boards are more likely to engage in practices such as short-termism in order to improve immediate financial performance and thus enhance their reputation (Connelly and Gangloff, 2012):

Corollary P1. Board interlocks can magnify shareholder–creditor conflict by increasing the incidence of short-termism in related companies.

As short-termism spreads and infects interlocked firms, a closely related problem is the practice of earnings management.
Earnings management and director interlocks

The level and quality of earnings reflect management stewardship and the efficacy of their resource allocation decisions. Managers and the board of directors who oversee firm strategy and plans are therefore under pressure to provide a “good” earnings number that can increase returns to investors and avoid debt covenant violations. This pressure can lead to the practice of earnings management. According to Schipper (1989), earnings management is the “intentional intervention in the external financial statement information process, with the aim or obtaining some private benefit (unlike in the neutral process of reporting financial results).” Kothari et al. (2016) adds the component of personal motivation on the part of managers – and the possibility of actions that deviate from best accounting practices in order to manipulate reported earnings.

This seemingly common practice has a negative influence on earnings quality and the transparency and integrity of a firm’s reporting. Past Chairman of the SEC, Arthur Levitt suggested that the practice of earnings management to “satisfy consensus earnings estimate and project a smooth earnings path” was detrimental to the US capital markets. Barth et al. (1999) and DeAngelo et al. (1994) report that firms with a smooth pattern of earnings report higher prices, which implies that firms have a high incentive to manage earnings. Burgstahler and Dichev (1997) find that cash flow from operations and changes in working capital are used to increase earnings when firms need to avoid decreases and losses. Real earnings management, where managers exhibit negative behavior such as reducing R&D expenditure or change the timing of long-term asset sale have a negative effect on future operating performance (Gunny, 2010). Excessive earnings management decreases investment efficiency and the allocation of resources (Julio and Yook, 2016). The complexity of the annual report also increases when there is significant opportunity for earnings management (Lo et al., 2017). Initial public offerings encourage earnings management, and firms who engaged in such activities exhibited long run underperformance (Ertimur et al., 2018). Managers also tend to actively engage in earnings management at the time of seasoned equity offering, thus leading to overvaluation of stock (Kothari et al., 2016).

Earnings management practices still continue to exist, irrespective of the regulatory environment. The process of realization (when financial statement items are recognized mostly only when the transactions are complete, and thus ignores unrealized changes in market values) and allocation (where costs are arbitrarily allocated to various time periods) encourage the practice of earnings management. Even the IFRS, which tries to address the “realization” problem by allowing market based fair values for most financial statement items, does not prevent this syndrome. Evans et al. (2015) study a sample of 616 firms from USA, Europe and Asia, and found that the type of regulation affected the style of earnings management, though in all cases such income manipulating effects continued to be pervasive.

Creditors monitor the firm with debt covenants that are measured and controlled using accounting numbers. Violating debt covenants can bring penalties ranging from waivers to renegotiation to bankruptcy. Such violations are therefore expensive for the borrower. Research has shown that firms manage their earnings upwards before a violation (e.g. Dichev and Skinner, 2002). These firms were hoping for a waiver or a renegotiation of their contracts by showing better numbers. Financially constrained firms with valuable investment opportunities have a high incentive to utilize earnings management in order to attract debt and equity investments (Linck et al., 2013). More important to creditors, earnings management is more prevalent for failing firms in danger of bankruptcy (Dutzi and Rausch, 2016). Manipulating earnings numbers reduces the ability of creditors to monitor firm performance and therefore can lead to higher default and losses.
Cross-cultural impact

Institutional theory, with the propensity to meet expectations, and to mimic “successful” organizations can contribute to the influence of interlocked boards. Legitimacy theory can also make sub-par practices more acceptable across linked firms. Earnings management is not easily visible or detected by stakeholders, and a board network can quietly and efficiently spread this practice. But, Chiu et al. (2013) show that shared directors contribute to the higher incidence of earnings management, especially if they hold an accounting relevant position. Interlocks also encourage the practice of decoupling policy from practice (Westphal and Zajac, 2001) so earnings management can occur even with good governance and control policies. Corporate disclosure policies – a way of obfuscating earnings – are also negatively affected by director interlocks (Cai et al., 2013). Finally, there are reputational penalties from director interlocks – if a director is involved with one firm with poor earnings quality, the negative effects spread to other firms they are involved with as well, thus affecting firm value (Kang, 2008):

Corollary P2. The practice of earnings management, which has detrimental effects for both shareholders and creditors, can be magnified by the presence of interlocking directors.

One of the biggest motivators of earnings management is the managerial need to meet earnings targets in order to maximize their compensation, which leads to the next conflict of interest between stakeholders.

Chief executive officer compensation, risk and director interlocks

The CEO and other top executives are considered to be the central unit responsible for planning, directing and achieving the requisite goals of the company. As a result, they are usually highly compensated for their roles in firm growth and performance. The compensation package usually consists of a combination of the following:

- base salary (short-term);
- bonus for achieving revenue, EPS and growth targets (short term);
- restricted stock grants and stock options based on target stock prices to encourage a long term focus;
- retirement benefits and “golden” parachutes in case of termination; and
- expense reimbursement and the use of corporate assets for personal use.

Managers and executives are held responsible for the growth and performance of a company. Compensation contracts are designed encourage productive behavior and to minimize and ameliorate agency problems by aligning the interests of managers and shareholders. The board of directors plays a key role in setting the compensation of the top executives in a corporation. Remuneration committees are common in the USA; however after the Cadbury Committee’s 1992 report, these have become more prevalent in the UK as well. In 2005, the European Commission also recommended that companies set up committees to deal with remuneration. In Australia, the ASX Governance Council also recommends that companies listed in the S&P ASX 300 Index establish remuneration committees with independent directors.

Studies have shown that the composition of the compensation (remuneration) committee of the board plays a significant role in setting the level and types of CEO pay (O’Reilly et al., 1988; Singh and Harianto, 1989). Daily et al. (1998) suggest that higher levels of pay were associated with committee members who were themselves involved with other companies. The implication here is that these members might share their knowledge and experience from the other organizations.
As early as 1995, Hallock found that executive compensation in highly interlocked firms was, on average, 10 percent higher, after controlling for firm and CEO characteristics. Fich and White (2003) show that mutual interlocks are closely linked with higher compensation. They interpret their results to imply that “with the aid of mutual interlocks, CEOs are able to extract significantly larger compensation packages from their firms.” And the increase (average of 13 percent increase) can be measured at the base level of salary and bonuses. Fich and White further show that director interlocks also affect the long-term compensation such as stock options and restricted stock.

Conyon and Peck (1998) show a negative relationship between remuneration committees and lower levels of CEO pay. Ezzamel and Watson (1998) observe that market pressures and social comparisons tend to increase CEO pay-related/interlocked directors exacerbate such pressures. Responding to the concerns of the impact of interlocking directorates in increasing CEO pay, the Securities and Exchange Commission now requires companies to disclose their interlocks in relation to executive compensation.

The issue of executive compensation is highly debated and contentious. Executive pay (according to the Economic Policy Institute) was 313 times that of the average worker in 2014. According to the New York Times, CEO pay increased by 21 percent in 2014 over the previous years. Long-term incentives such as stock options form a major part of such compensation contracts – nearly 80 percent of the gain in CEO compensation comes from such stock options (Elson et al., 2003).

Empirically, it has been demonstrated several times that contracts that promote shareholder/manager alignment through higher compensation packages can have a detrimental effect on other stockholders. Emphasis on stock prices in the compensation contract can lead to executive team focus only on equity shareholders to the detriment of other stakeholders. Higher CEO compensation especially stock options have been correlated with higher bond yields (Wei, 2005), and lower bond prices (Defusco et al., 1990). Research has also shown that the delta sensitivity of options (the relation between CEO wealth and stock prices) and the vega sensitivity (relation between CEO wealth and stock price volatility) were related to increased credit spreads (Daniel et al., 2004). Billett et al. (2010) find significantly negative bond returns in response to proxy statements asking for an increase in executive compensation, while garnering positive returns from stock prices.

Several studies have shown that higher levels of executive pay have led to higher risk taking activities by top management (Agrawal and Mandelker, 1987; Defusco et al., 1990). Martin et al. (2012) document that the granting of stock options incentivizes risky behavior, especially in newer managers with lower wealth. The “Compensation and Risk Research Spotlight” by the Stanford Business Corporate Governance Research Initiative also found that risk taking is negative only when it involved decision that were not beneficial to shareholders – such behavior did not take into account the effect on other stakeholders. Short-term incentives such bonuses can also encourage risky behavior – Gopalan et al. (2014) show that short-term incentives encourage managers to choose riskier projects that could lead to better short-term performance. In general terms, risky behavior by managers, encouraged by compensation contracts can lead to risk being shifted from equity shareholders to creditors.

Cross-cultural impact
Explanation for this behavior can be attributed to mimetic and normative isomorphism, where shared practices become the link between corporations. Director interlocks impact managerial activities in two ways – in setting compensation, and in monitoring their activities (the problem of moral hazard). As firms grow in size and complexity, it becomes more difficult for boards to monitor the activities of the executives. Fich and White (2003) note that increased board interlocks further weaken the monitoring capabilities of the board.
as a result of “cronyism.” And if monitoring is weak, the resultant internal controls are also weak, increasing the risky behavior of the top executives (Werner et al., 2005). The top management team is ultimately responsible for the allocation of critical resources, and is therefore the main focus of the board’s monitoring activities. If monitoring becomes weak as a result of director interlocks, and high compensation leads to incidences of higher risk activities, risk tends to shift from the shareholders, and it is the creditor who bears the brunt of the results:

Corollary P3. Board interlocks encourage higher CEO compensation, which can lead to higher incidences of risk taking to meet targets. If monitoring becomes weak as a result of director interlocks, risk tends to shift from the shareholders, and it is the creditor who bears the brunt of the results.

Stock buybacks are often linked to management compensation – the negative repercussions of buybacks can be magnified by interlocks.

Stock buybacks and director interlocks

Stock buybacks were legalized by the SEC in 1982; since then, buybacks on Wall Street have soared. During the period 2005–2014, S&P 500 firms have repurchased $3.95 trillion of their stock (Fried and Wang, 2017). The rate of buybacks has not been as high in Europe and Australia, though there seems to be an increasing trend as economies recover and grow. As cash reserves increase, and investment opportunities decrease due to low interest rates, buybacks may increase in the future as well.

Stock buybacks have been known to increase stock prices and reduce the agency costs between shareholders and managers. However, use of company resources for buybacks may come at the expense of productive investments and future growth. A Wall Street Journal chart shows that capital returns (in the form of buybacks and increases in stock prices) increased almost 20 percent between 2003 and 2013, while capital spending decreased during the same period. There is also concern that managerial incentives, especially stock options, heighten the adverse effects of stock buybacks.

Stock buybacks affect stockholders and creditors in different ways. Stockholders get immediate cash; they also benefit from the increase in stock prices. For the creditors, it represents a missed opportunity for companies to reinvest in future growth and increases the risk tolerance (and perhaps future default rates) of companies. For example, in 2015, GE announced $30bn in buybacks; stock prices surged, but Moody’s downgraded its debt. Looking at company balance sheets, this reduces equity, and as a consequence, increases the proportion of debt. This financial engineering move increases corporate risk. The cash required for stock buybacks may also come from the issue of more debt if the company does not have adequate reserves. The cash outflow is even worse when buybacks are done while stock prices are at historic highs. There is a distinct relationship between buybacks and debt. According to Thomson Reuters, a record $342bn worth of bonds were issued in the first quarter of 2014; at the same time, stock buybacks rose to $219bn. As long as the economy performs well, the risk of default is low; however economic downturns will magnify this risk as companies move toward debt, while reducing equity.

Cross-cultural impact

Legitimacy theory and homophily can make certain practices prevalent among linked companies. Companies normally have a policy regarding their buybacks – the timing, the amount, the preferred price and other details are carefully set out in the strategic policies. However, Westphal and Zajac (2001) point out that strong board control and interference can force companies to deviate from their published policies. As research constantly points out, interlocks can spread the contagion of practices between companies, and this would
affect buybacks as well. Oshikawa (2012) points out that companies with interlocked directors adopted the same buyback policies as the focal firms. Bohman (2006) argue that stock repurchases are affected not only by firm characteristics, but also by interlocked boards. As discussed earlier, board interlocks influence CEO compensation, with emphasis on stock options. And the prevalence of stock options increases the probability of buybacks, thus increasing the shareholder–creditor conflict:

*Corollary P4.* Director interlocks can increase the tendency for stock repurchases, which increases corporate risk and therefore can be detrimental to creditors.

Equity shareholders can benefit from stock buybacks; but a more common method of equity returns is through the payment of dividends. Creditors do not participate in dividends, but for creditors, it may signal an attempt to divert resources to shareholders.

**Dividend payouts and director interlocks**

Dividends are cash payments made to shareholders on a periodic basis. Several theories explain dividend payouts, but the most prevalent are the signaling theory and the agency theory frameworks. Signaling theory states that a company uses dividends to inform investors of strong prospective growth. A company’s ability to pay a steady stream of dividends or even to increase them is a signal to shareholders that the company’s fundamentals are strong. Agency theory assumes that shareholders require dividends to ensure that managers do not have excess cash on hand to invest in worthless or risky projects. According to Lazonik (2014), S&P 500 companies have spent 37 percent of their earnings on dividends and 54 percent on buybacks over the past ten years, leaving barely 10 percent of earnings for reinvestment.

Countries around the world, especially the highly developed countries currently have very high cash reserves. Market analysts say that Corporate America collectively holds about $2 trillion in cash reserves. Dividend payouts continue to grow — the payouts for the second quarter of 2017 for S&P companies was a record of $104bn. Nearly 83 percent of the S&P 500 companies pay dividends. Australia has a high rate of dividend payment as well — in 2015, nearly $78bn was paid to shareholders. Europe is in a similar situation with dividends reaching $200bn in 2014. The dividend payout ratios are fairly high as well. Australia led the payout ratios with 67 percent; UK came a close second with 60 percent. In the USA, the payout ratio was 48 percent (average over 2005–2015: Source: Bloomberg Morningstar).

Such high dividend payouts are not necessarily detrimental to companies, and therefore its stakeholders. The theoretical assumption is that if a company pays out too much in dividends, it is not retaining enough to ensure future growth. However, Zhou and Ruland (2006) showed that there was a high positive correlation between current dividend payouts and future earnings growth. Gwilym *et al.* (2006) found similar results for ten other international markets.

Shareholders in general, seem to profit from dividend payments — current cash and possible future growth. However, dividend payments aggravate the agency conflicts between shareholders and creditors (Shao *et al.*, 2013). Shareholders react positively to higher dividends while creditors view it as an attempt to shift resources from creditors to shareholders. Shao *et al.* link dividend payments to creditor rights vs shareholder rights. Brockman and Unlu (2009) studied creditor protection in 52 countries and found that poorer creditor protection leads to lower dividend payouts. Chu (2016) suggests that as shareholder/creditor conflicts increase, dividend payouts tend to be higher, shifting the risk to creditors. Through contracts and debt covenants, creditors can enforce limits on dividend payment, but this goes against the demands of the equity stakeholders.

**Cross-cultural impact**

Normative isomorphism and legitimacy theory can explain this behavior. The board establishes committees to decide on dividend payouts in many cases, and interlocking
directors are more likely to bring similar policies to the committees that they are involved with. As these interlocking directors sit on key committees such as the dividend committee, their influence tends to be higher.

Payout policies are closely linked to compensation packages paid to top executives – which in turn are influenced by interlocking directorates:

**Corollary P5.** Director interlocks, by affecting dividend policies, can increase creditor perception that corporate funds are being diverted away from alternate value investments.

**Discussion and implications: cross-cultural impact of director interlocks**

Broadly defined, agency theory and corporate governance principles address the conflicts between managers and various stakeholders. However, there can exist conflicts between the various stakeholders themselves: between shareholders and creditors, shareholders and society etc. Several researchers (Jensen and Meckling, 1976; Smith and Warner, 1979; Farre-Mensa et al., 2014) focus on the conflict of interest between creditors and equity stockholders, and posit that such conflicts increase agency costs through excessive dividend payments, asset dilution and underinvestment. Incentive compensation gives rise to a cadre of management predisposed to making decisions in favor of the target stakeholder – the equity shareholders. Creditors, when they take the role of principals, stand to lose as the agents or shareholders gain from activities of management.

Traditional corporate governance principles have given primacy to stockholders while defining and regulating the roles of directors and auditors within a corporate setting. The general viewpoint has been that creditors have legal protection through debt covenants and other regulations, while equity shareholders obtain protection from governance safeguards. But shareholders are not always the winners – as mentioned earlier in the paper, when creditors are in a position of power, then the equity shareholders tend to lose as well. When the level of debt within a corporation increases, with a corresponding increase in risk, creditors become the focus of operations, and take on the role of principals.

Current circumstances tend to signify a high stakes role for creditors within corporations. In recent years, the availability of cheap credit has increased the amount of borrowings within corporations. In the USA, the debt equity ratio is at an all-time high (Kalssar, 2016) with widening credit spreads. In Europe, the debt/EBITDA ratio has gone up from 3.3 times in 2007 to 4 times in 2017, an increase of more than 20 percent (Lightbown, 2018). In some European countries like Germany, banks and other financial institutions wield more power within corporations than their scattered shareholders. Within the Asia-Pacific, this growth in debt has given rise to an exponential growth in debt funds – funds that focus almost exclusively on debt (Wilson, 2018). Corporate bankruptcy filings in the USA (these are circumstances under which creditors gain power) increased by 25 percent in 2016, coming on top of a 46 percent increase in 2015 (Corporate Bankruptcy Recap, 2016).

At the same time, executive bonuses in the USA, Germany and Japan grew by 6–8 percent every year, while the average salary rose by only 3–4 percent during 2008–2014. This trend can be seen in other Asian countries like Japan and India (Prambock, 2016). Dividend payouts have grown to $415bn in the USA during 2015, an amount that is double the ten-year average (Downie, 2016). The average dividend payout in the USA was 37.5 percent, but in Europe, the payout was closer to 58 percent. In Australia, this ratio is even higher at 63 percent (Biden, 2016).

These factors indicate the probability of a high level of conflicts between shareholders and creditors in countries around the world. At the same time, director interlocks are becoming more prevalent across the world. Interlocks have a significant impact on the
linked organizations, and as institutional theory suggests, external pressure can act as a coercive influence to mimic the behavior of others. This commonly held behavior could help one class of stakeholder at the expense of others, with the equity stakeholder usually being the main beneficiary. While there exist some regulation against these interlocks (e.g. the Clayton Act in the USA), there is no consistent law preventing interlocks.

There are several suggestions on ways to minimize or mitigate shareholder–creditor conflicts: increased use of debt covenants that restrict dividends or risky investments, increased involvement of creditors in the strategic planning process, using conservative accounting practices to improve external reporting and increasing creditor stake in equity with the use of debt equity combinations like convertible bonds or the more recent innovation of contingent convertible bonds (or CoCo bonds). Resource dependence theory, and the coercive isomorphism, as proposed by institutional theory, would suggest that interlocked directors could wield their influence to alleviate the conflicts rather than increase them. A well-designed system of corporate governance coupled with well-defined regulation that seeks to protect all stakeholders would also increase this moderating effect.

Conclusion
The main role of the management team, monitored by the board of directors, is to allocate the firm’s scarce resources in the best interests of all the stakeholders. Equity shareholders bear the risk of investment, and, therefore, share in the total returns. Equity shareholders, in spite of their ultimate risk, are protected by corporate limited liability. The returns of credit stakeholders (and therefore their risk) are restricted to interest payments, and the payback of capital. However, the limited liability protection of shareholders does not extend to creditors – their protection is through legal contracts and legal remedies. Most creditor protection emerges mainly during bankruptcy proceedings. Nini et al. (2009) “argue that creditors maintain control rights over corporate investment policies as a second best solution to the agency costs of debt.” But information asymmetry that reduces the quality of information provided to creditors, thus lowering their monitoring capabilities, also affects the behavior of creditors (Gonec and Tinoco, 2017).

Director actions such as short-termism and earnings management provide current value, mainly to equity stakeholders, but become value at risk for the longer horizon. Board interlocks tend to act like a “contagion,” spreading sub-par practices through the corporations in the network. Such management actions reduce both the quality of information available to creditors and their monitoring capabilities. This juxtaposition of shareholder and creditor interest can therefore be worsened by director interlocks.

Future research in this area can operationalize the conceptual analysis in this paper by looking at the shareholder–creditor conflict and the cross-cultural impact of director interlocks through activities such as short-termism, earnings management and dividend payouts. Another interesting area of research would be to see how corporate governance principles and regulatory authority (as suggested by Peterson, 2016) could be modified or refined to reduce this conflict.

References


Further reading

ASX Corporate Governance council (2003), “Principles of Good Corporate Governance and Best Practice Recommendation”, p. 3.


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How nation-level background governance conditions shape the economic payoffs of corporate environmental performance

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Abstract

Purpose – Companies develop and implement environmental initiatives in particular national governance and institutional contexts. The purpose of this paper is to study how the background governance conditions of legal systems, economic policies and national culture enable or impede the relationship between corporate environmental performance (CEP) and lagged corporate financial performance (CFP).

Design/methodology/approach – This is an empirical study of 427 MNCs headquartered in 22 different countries. The authors merged data from the SiRi database (generally known as SustainAnalytics now), which contains ratings of stakeholder relations for 427 large corporations with publicly available data from Datastream.

Findings – Drawing on the new institutionalism in economics and sociology, the authors show that common-law systems and high economic freedom in a company’s home country tend to strengthen the CEP-CFP link. In addition, the home-country cultural variables of uncertainty avoidance, long-term orientation, and (to a lesser extent) masculinity may impede the deployment of CEP for maximum financial gain at the organizational level. The macro-level analysis starts to move the field toward an understanding of the particular national governance configurations that provide the most supportive conditions for any CEP-CFP links.

Originality/value – One of the central questions in the field of organizations and the natural environment is about the background conditions that may incentivize and reward firms to be more environmentally responsive. The paper addresses this issue through a nation-level investigation of the background governance conditions that may help or hinder the relationship between CEP and CFP.

Keywords Corporate environmental performance, Corporate financial performance, Governance, Institutions, Legal systems, Sustainability

Paper type Research paper

Introduction

For several decades, societal and regulatory forces have been pushing businesses to demonstrate enhanced commitment to corporate environmental performance (CEP) (Bansal and Hoffman, 2012; Hoffman, 1997, 1999; Salma, 2016). According to the Stern Review on the Economics of Climate Change (Stern, 2006) and The Economist (2008), ecological sustainability could become the central social responsibility challenge for business. In line with these predictions, a 2010 study found that 93 percent of 766 CEOs, who were surveyed worldwide, regarded sustainability as being critical to their companies’ future success (Accenture and UNGC, 2010). Similarly, according to a KPMG survey (2013), 81 percent of CEOs considered the prudent management of environmental risks a key strategic focus for their business.

Faced with these pressures, many companies – especially large and multinational corporations (MNC) – have implemented a variety of activities (including disclosures) related to environmental performance. However, some answers are still unclear in this field of inquiry. There has been an ongoing, largely inconclusive debate about the causal relationship between CEP and corporate financial performance (CFP) (see for, e.g. Belhaj and Damak-Ayadi, 2011; Busch and Hoffmann, 2011; Busch and Orlitzky, forthcoming;
Several literature reviews pointed to a small positive association between CEP and CFP, but also indicated that causality remains uncertain because of reciprocal relationships between these two variables (Orlitzky, 2008; Orlitzky et al., 2003). More recent meta-analyses have been broadly supportive of these earlier findings (Dixon-Fowler et al., 2013; Horvathova, 2012). Consistent with the cumulative evidence, CEP is now increasingly regarded as a risk management issue (Orlitzky and Benjamin, 2001; Porter and Reinhardt, 2007). Clearly, the field must go beyond the dichotomous question of whether or not CEP pays. Sometimes, higher CEP may help firms reduce their legal exposure in the future (Hoffman and Bansal, 2012). At other times, however, it may also raise social activists’ expectations of ever greater organizational commitments to environmental causes and distract executives from their fiduciary and broader economic responsibilities (Marcoux, 2003; Munk, 1999).

Many researchers now agree that the most pressing question is not whether CEP pays, but instead when/under what circumstances (see, e.g. Ambec and Lanoie, 2008; Dixon-Fowler et al., 2013; Guenther et al., in press; Orlitzky et al., 2011). In other words, how might specific moderator variables affect the financial payoffs from CEP? Dixon-Fowler et al.’s (2013) meta-analysis has started to address some of these questions. Dixon-Fowler and colleagues examined several moderators of the CEP-CFP relationship, such as types of environmental performance (reactive vs proactive environmental performance), firm characteristics (large vs small firms; public vs private firms; USA vs international firms; industry – worst offenders vs others), and methodological issues (measures of financial and environmental performance; self-report measures). In addition, nearly all types of firms appeared to benefit from CEP across different measures of CEP and CFP. Overall, they concluded that the criticism of CEP-CFP research regarding the choice and nature of variables was unfounded. Nonetheless, their meta-analysis does not shed light on possible nation-level governance variables affecting the CEP-CFP link.

Our primary objective in this paper is to examine the nation-level background governance conditions that may influence the association between CEP and CFP. To accomplish this goal, we develop new theory about several country-level variables to shed further light on the broader background governance conditions that can enable or impede the way in which CEP may pay off instrumentally and strategically for individual organizations. More specifically, company strategic decisions, typically made at company headquarters, occur in particular legal systems (civil-law systems vs common-law systems), institutions that support or restrain economic freedom, trade policies, and national cultural dimensions, which may interact with CEP to shape the instrumental-strategic payoffs of organizational commitments to environmental sustainability. Note that, with our proposition of interaction effects, we do not necessarily assume that there is a generalizable overall positive (or negative) association between CEP and CFP.

In theorizing these nation-level governance interaction effects, we focus on company headquarters and, thus, each company’s home country. The suggested important impact of company headquarters is in line with previous research, which has established that practices and policies of MNC headquarters (HQ) operations greatly influence the environmental performance of MNCs’ subsidiaries operating abroad. For example, Ruud (2002) describes the influence of MNC HQ policies on environmental policies of subsidiaries in emerging economies (where environmental standards are often lax) as creating “islands of environmental excellence in a sea of dirt” (p. 103). Similarly, Ioannou and Serafeim (2012) show the significant influence of home country institutions on corporate social performance even after controlling for the impact of host country institutions. The importance of home country institutions is partly explained by Kostova and Zaheer’s (1999) liability-of-foreignness argument, which suggests that MNC subsidiaries have to live up to higher environmental standards than domestic firms – ostensibly to match HQ standards.
Hypothesis development

Strategizing about environmental (and any other) initiatives does not occur in a vacuum. Instead, managerial decisions are developed, shaped, and changed in the context of particular institutional “background governance conditions” (Williamson, 1994, p. 79). These background nation-level governance conditions include, but are not limited to, laws, economic policies, formal regulations, property rights, and informal conventions, which not only set the “rules of the game” (North, 1990, p. 5) exogenously, but are (sometimes) also internalized by social actors. Embedded in particular governance systems (and institutional changes), actors may reframe issues, problems, and emotional and substantive meanings (Lounsbury et al., 2003; Scott, 2014). It is important to bear in mind that the law is not only a coercive force, but, according to law and society theory (Suchman and Edelman, 1997), also affects social actors’ cognitive sensemaking efforts (Weick, 1995). Culture, defined as the “collective programming of the mind that distinguishes one group […] of people from others” (Hofstede et al., 2010, p. 6), may establish norms of appropriateness (Scott, 2014). In the environmental arena, Hoffman (1997, 1999) showed how institutions could change, coevolve, and lead to various adjustments in industry norms and strategic responses. Because of the importance of strategy implementation and the interdependence between strategy formulation and execution (Mintzberg and Waters, 1985; Welch and Welch, 2005), the effectiveness of particular strategic (environmental) initiatives cannot be understood without an analysis of these rules of the game and background conditions, including national culture.

Conceptualizing the way in which this nation-level governance systems shapes strategic behavior is not always straightforward (e.g. Deephouse, 1999). Sometimes, the social milieu may act as a functional moderator that explains the effectiveness of CEP in a particular industry context, for example, high-growth environments (Russo and Fouts, 1997). Though the focal outcome variable is the same in our study as in Russo and Fouts’s study (CFP), our theorizing also substantively differs from their functional industry focus: we emphasize the importance of three higher-level governance institutions (law, economic policy, national culture) as enablers of or impediments to strategy-making that links CEP and CFP causally and instrumentally. Despite these theoretical differences, both theoretical views (CEP as particularly helpful or functional in high-growth industries vs macrolevel background enablers/impediments) result in an identical data-analytic approach: CEP interacts with the higher-level background governance condition, that is, the higher-level background condition is modeled as a (multiplicative) moderator effect.

The legal system as a background governance condition

Countries can be classified into two main legal systems – common law and civil law (Aguilera and Cuervo-Cazurra, 2004). The common law is based on the English system, whereas the civil law originates in Roman law[1]. The common law tradition, centered on judicial precedent, is the dominant legal system in Anglo-Saxon countries (Aguilera and Cuervo-Cazurra, 2004). Being based on judicial precedent, the common-law system is more flexible in its interpretation of regulations (Aguilera and Cuervo-Cazurra, 2004). In contrast, the civil-law tradition uses comprehensive statutes and codes for judicial decision-making. Countries such as Germany, France, Sweden and Denmark have civil-law systems. JuriGlobe research group’s World Legal Systems website (www.juriglobe.ca/eng/index.php) and Legal Context of Regulatory Reform website (www.ictregulationtoolkit.org/toolkit/6.3) provide detailed information about common and civil legal systems across the world.

Civil-law systems tend to pass environmental regulations only after lengthy and extensive consultations with environmentalists, unions, consumers and other stakeholders. This process often results in highly complex and formalized regulations that put considerable pressure on companies to enhance their CEP (Campbell, 2007). Thus, many
civil-law societies, known for their highly codified command-and-control regulations, may impose greater cost burdens on business than common-law systems (Newell and Stavins, 2003; Orlitzky, 2013), even after accounting for the potentially positive impact of some regulations on business innovation (Lanoie et al., 2011; Popp, 2003; Porter and van der Linde, 1995). This cost disadvantage in civil-law societies has a direct effect on profitability, compared to MNCs headquartered in common-law countries with less uniformity in environmental mandates.

At the same time, civil-law countries may also provide greater certainty around legislative interpretation and enforcement (Campbell, 2007; Porter and van der Linde 1995). This greater regulatory certainty runs counter to the idea that it is the heterogeneity of organizational practices that may enable some organizations to differentiate themselves from others (Barney, 1991; McGrath and MacMillan, 2000). If every organization in an industry must follow and implement the same regulatory baseline mandates, organizational practices are forced – by codified law – to converge over time. However, this organizational convergence undermines the strategic and profit opportunities that can only be realized in a context of diverse organizational practices (Hoopes et al., 2003; Orlitzky, 2013; Porter, 1996; Revilla and Fernández, 2013). Based on these expectations about the cost effects and diminution of differentiation opportunities from environmental initiatives under civil-law background governance conditions, we can derive the following hypothesis:

**H1.** The association between CEP and CFP is expected to be higher in common-law societies than civil-law societies.

From an empirical perspective, the legal system is a relatively weak proxy of governance conditions because its coding is binary (common law vs civil law) and thus relatively coarse-grained. So, the remaining interaction effects will rely on nation-level variables whose measurement is continuous and, thus, more fine-grained.

**Economic freedom as a background governance condition**

Free-market systems are characterized by high levels of competition, free trade and relatively low levels of government interference in the economy (Friedman, 1962; Hayek, 2011). One of the ways in which reduced government intervention may manifest is through lower levels of industry regulation (Campbell, 2007). In other words, in free markets, stakeholder involvement is not strongly institutionalized by the state, and corporations often choose to fill this institutional void by adopting CEP policies and practices voluntarily (Jackson and Apostolakou, 2010). In other words, CEP in free-market economies may become a substitute for weak formal regulatory institutions (Jackson and Apostolakou, 2010). The absence of institutionalized stakeholder involvement coupled with high competition and institutional emphasis on private property rights leads firms to be more visible and vocal regarding their CEP (Ioannou and Serafeim, 2012). Such explicit CEP (Matten and Moon, 2008) is often aimed at reputation management across multiple stakeholders (Mahon, 2002), which in turn can enhance financial performance (Fombrun and Shanley, 1990; Orlitzky, 2008; Roberts and Dowling, 2002). Thus, business executives, whose pay often tracks stock price performance, will be incentivized to choose environmental initiatives with maximum reputational and financial pay-offs (Orlitzky, 2013).

The forces of competition augment this effect of institutional embeddedness in systems of free enterprise because high levels of competition – both domestic and international – are, of course, the key characteristic of free markets. According to classical and neoclassical economics, high levels of competition will lead to higher levels of operational efficiency and higher rates of innovation (Porter and van der Linde, 1995; Schumpeter, 1934). In addition, previous research indicates that high levels of competition will result in higher levels of CEP (Flammer, 2014). Furthermore – and this point is particularly important in the context of our
hypotheses about the background governance conditions helping or hindering a CEP-CFP link – a highly competitive environment also forces business executives to ensure a strategic payoff from their particular, voluntarily chosen environmental initiatives. In economies characterized by a relatively high degree of freedom, companies that make a string of poor investments and may, therefore, ultimately fail economically cannot be expected to be bailed out by the state (which was at least true until the Global Financial Crisis of 2008). Hence, although high CEP is unlikely to be aligned with firms’ internal efficiency mandates automatically (Hart and Ahuja, 1996), high levels of competition will encourage the maintenance of those organizational practices – including CEP – that allow firms to outcompete their rivals.

At the same time, high competition, especially from low-cost international producers, may over time reduce profit margins (Ioannou and Serafeim, 2012), which again compels managers to ensure financial payoffs from any voluntarily chosen environmental initiative. This happens because firms operating in highly competitive, less munificent environments will have relatively fewer resources to allocate toward CEP – or alternative uses. In addition, under conditions of high competition, firms become concerned about preserving their reputations with their stakeholders and may respond by increasing their investments in environmental initiatives (Flammer, 2014), particularly in those areas that exhibit the most beneficial strategic payoffs for the firm (Porter and Kramer, 2006, 2011). This behavior may result from a strategic imperative; in highly competitive conditions, CEP may enable firms to differentiate themselves from their less environmentally responsible rivals (Flammer, 2014). Therefore, it seems that national environments that exhibit high levels of competition may not only enable high levels of CEP, but also force managers to scrutinize and monitor the instrumentality of their environmental initiatives more closely.

In contrast, firms headquartered in countries with strong regulatory frameworks will receive clear normative and regulatory signals about the level and related processes of CEP investments. In these systems, institutionalized stakeholder involvement is more likely (Matten and Moon, 2008). In nations with relatively high levels of government intervention in the economy, CEP often results from compliance with formal laws and regulations (Jackson and Apostolakou, 2010). Thus, CEP will be largely in the form of implicit practices – in response to institutionalized regulations (Campbell, 2007; Matten and Moon, 2008). This implies that CEP in nations with high levels of government intervention is unlikely to be aimed at earning reputational or other strategic advantages from customers and other stakeholders. In those countries, government intervention typically takes the form of command-and-control regulations, which create a legal baseline and may undermine the opportunity for the kind of stark firm differentiation that allows customers, investors, and other stakeholders to distinguish between environmentally responsible and irresponsible firms. Hence, similar to the arguments already developed for $H1$ (see above), we expect firms in countries with high levels of government intervention to exhibit weaker links between CEP and instrumental financial pay-offs from CEP:

$H2$. Higher levels of economic freedom are associated with a stronger link between corporate environmental and financial performance.

**National culture as a background condition**

Hofstede (1980) regards culture as a useful way for distinguishing the members of one human group (including at the national macro-level) from another. Country-level factor analyses allowed Hofstede (1980) to classify national culture along four distinct dimensions: uncertainty avoidance, masculinity-femininity, individualism-collectivism and power distance. A fifth dimension, long-term (pragmatism) vs short-term (normative) orientation, was added later (Hofstede et al., 2010).
Hofstede’s work has been the dominant model in cross-cultural research and has been cited over 25,000 times (Taras et al., 2009; Venaik and Brewer, 2010). In 2004, a new model, the GLOBE data, measuring cultural differences in 62 countries (House et al., 2004), was offered as an alternative to Hofstede’s cultural values framework. The GLOBE study has nine cultural dimensions, which include both practices and values. Nonetheless, Hofstede’s cultural values framework remains influential in the conceptualization of cross-cultural differences (for a meta-analytic review, see Taras et al., 2010). In fact, a detailed analysis of these two competing frameworks shows that three of the dimensions in GLOBE are very similar to Hofstede’s dimensions (Taras et al., 2010). GLOBE uses referent shift questions (i.e. those based on societal referents) compared to Hofstede’s personal reference (i.e. use of terms I and me); this referent shift can potentially reduce the reliability of GLOBE’s measures (Taras et al., 2012). In addition, Hofstede’s cultural dimensions control for national wealth. Hofstede’s matched sample of about 88,000 IBM employees across 72 countries allowed him to systematically detect differences in cultural values across countries and enabled him to isolate effects of factors such as organizational culture and demographics. GLOBE’s cultural dimensions, however, do not control for national wealth. According to Taras et al. (2012), it is inadvisable to study national cultures by comparing samples of wealthy people from one country with a sample of relatively poor people from another country, as this makes it difficult to determine whether the differences in cultural values are due to national or socio-economic differences.

Overall, what appears to tilt the balance toward continuing reliance on Hofstede’s framework is that its five dimensions capture at least three of the nine GLOBE dimensions, making it more parsimonious (Taras et al., 2010; Venaik and Brewer, 2010). Because of the continuing influence and validity of Hofstede’s framework (Taras et al., 2010; Venaik and Brewer, 2010), we will base our theoretical development of cross-cultural interaction effects on Hofstede’s dimensions.

According to Taras et al. (2009), not every study needs to examine all the cultural dimensions proposed by Hofstede; instead, depending on the research question, researchers are advised to choose only those cultural dimensions that are most relevant for their study. Previous studies that explore the relationship between cultural differences and environmental management (Vastola et al., 2017) have focused on only three of Hofstede’s dimensions (uncertainty avoidance, masculinity-femininity and long-term orientation). Vastola et al. (2017) explain that power distance (the degree to which people accept hierarchical order across society) and individualism-collectivism (the degree to which people in a country prefer to act as individuals rather than as members of group) are analogous to high masculinity scores. Therefore, the effect of these dimensions is theoretically captured through the masculinity-femininity dimension.

In addition, researchers have also identified problems with the definition and conceptualization of the individualism-collectivism dimension (Taras et al., 2010). In their meta-analytic review, spanning 30 years, Taras et al. (2010) highlight that the unreliability about individualism-collectivism can lead to lower predictive power. As a result, researchers are being cautioned about the fuzziness associated with this particular construct (Taras et al., 2010). Accordingly, in this study we chose to focus only on the three dimensions (uncertainty avoidance, masculinity-femininity and long-term orientation) that are relevant to our theorization. They are introduced in the following sections.

Uncertainty avoidance. Hofstede et al. (2010, p. 191) define uncertainty avoidance as “the extent to which the members of a culture feel threatened by ambiguous or unknown situations.” In other words, uncertainty avoidance indicates the extent to which cultures condition their members to feel comfortable in unstructured situations (Merkin et al., 2014). Unstructured situations are novel and take members outside their comfort zones. Cultures with high uncertainty avoidance try to minimize unstructured situations through strict laws
and regulations. In cultures that are accepting of uncertainty, and are low in uncertainty avoidance, individuals tend to be more comfortable with fewer rules and greater contextual ambiguity (Hofstede et al., 2010).

In sum, cultures with high uncertainty avoidance have greater formalization and higher prevalence of standardized procedures. In contrast, cultures with low uncertainty avoidance tend to have less formalization and less standardization (Venaik and Brewer, 2010). Brown and Eisenhardt (1997) found that innovations were more likely to occur under situations that are not highly formalized. More specifically, flexibility and lower levels of formalization also appear to be more conducive to environmental innovations (Hart and Dowell, 2011). In turn, more innovative CEP is likely to have a stronger relationship with CFP (Dixon-Fowler et al., 2013) because formalized rules can stifle the kind of market or process innovations required for managers to identify organizational tactics for making CEP pay off financially:

H3. Uncertainty avoidance interacts with CEP negatively, so that companies headquartered in countries with relatively low uncertainty avoidance are expected to exhibit a stronger association between CEP and CFP than companies headquartered in countries with relatively high uncertainty avoidance.

Masculinity-femininity. Another dimension applicable to our study context is masculinity-femininity (sometimes also known as competitive vs cooperative values, or achievement orientation vs consensus orientation). Masculinity is the extent to which the dominant values in society are focused on assertiveness, competitiveness, and a single-minded focus on success – values which are traditionally seen as masculine. Femininity is defined as the opposite of masculinity, that is, the dominant values are feminine-oriented values such as solidarity and caring for the weaker members of the society (Hofstede, 1994).

According to Hofstede (1994), cultures that score high on the femininity dimension emphasize relationships and prefer to resolve conflict through compromise and negotiation. A feminine culture’s emphasis on social ties and community is reminiscent of the ecologizing values proposed by Frederick (1995). The attunement of environmental and social initiatives to stakeholder and broader environmental demands requires such a cooperative value orientation (Swanson, 1995, 1999; Wicks et al., 1994). The key in optimal CEP is not to manage stakeholders, but instead to engage the community, responsively listen to the community, develop trust and create shared value (Calton and Lad, 1995; Calton and Payne, 2003; Johansen and Nielsen, 2011; Payne and Calton, 2004; Porter and Kramer, 2011). It is plausible to suggest that the less preferable technique of stakeholder management comes more naturally to those managers at home in masculine cultures, whose members may be inclined to impose their own values on others and, thus, predisposed to managing stakeholders (Merkin et al., 2014):

H4. Masculinity-femininity interacts with CEP negatively, so that companies headquartered in relatively feminine cultures are expected to exhibit a stronger association between CEP and CFP than companies headquartered in relatively masculine cultures.

Long-term orientation. This dimension, based on Confucian thinking and a later addition (Hofstede and Bond, 1988), has also been reconceptualized as the cultural dimension of pragmatism, based on research in 93 countries (Hofstede et al., 2010). Long-term orientation (high scores on this dimension) refers to a strong values orientation toward the future, including an emphasis on thrift and, more generally, societal efforts to prepare for the future (Hofstede and Bond, 1988). In contrast, short-term orientation (low scores) refers to a respect for tradition, a preference for time-honored norms (thus, these cultures are sometimes called “normative”), and a preference for the status-quo. In general, there is a lack of empirical research on this cultural dimension (Taras et al., 2010), which makes it particularly interesting in the context of this study.
For managers in short-term oriented cultures, quick instrumental payoffs are important as they make investments. Because our study focuses on relatively short one-year time windows, we expect that organizations in cultures with a greater emphasis on the short run will exhibit stronger CEP-CFP linkages. Short-term CEP efforts that do not pay off may quickly be abandoned in short-term oriented cultures. Conversely, managers that work in countries with a greater emphasis on the long run and, in Hofstede’s terminology, on “pragmatism” may work in contexts that have sufficiently institutionalized the patience to wait for the long-term payoffs of CEP (if they are considered at all). At the organizational level of analysis, this has already been shown to some extent; Flammer and Bansal’s (2014) study suggests that organizations with a long-term orientation are more likely to invest in long-term projects. Their organizational-level findings also suggest that an exogenous increase in long-term orientation leads to an increase in long-term operating performance[3]. By implication, if the social milieu does not foster a long-term orientation, managers will be relatively impatient with payoffs from all their investments, including environmental initiatives:

H5. Long-term orientation interacts with CEP negatively, so that companies headquartered in cultures that are more short-term oriented are expected to exhibit a stronger association between CEP and CFP than companies headquartered in cultures that are more long-term oriented.

Methods
Sample
We merged data from the Sustainable Investment Research International (SiRi) database (also known as SustainAnalytics now), which contains ratings of stakeholder relations for 427 large corporations for 2004 and 2005, with publicly available data from Datastream. We chose the years of 2004–2005 because, during this period, guidelines for data collection were in place to allow for standardized data and continuous improvement in data management. In addition, previous discussions of social rating agencies’ data reliability and validity suggest that these organizations follow a learning curve, and the quality of their rating process can be shown to improve over time (Chatterji et al., 2009). By focusing on data for the years 2004 to 2005, we excluded the first three years of data. Thus, we were able to benefit from the first three years of discussions between SiRi partners, trials and errors in the construction of the database, and other improvements. Also, data covering the years 2004–2005 include more companies and more countries than the previous years. It was also the most recent time period for which we had access to this proprietary database.

The companies included in our sample are headquartered in 22 countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong (China), Ireland, Italy, Japan, Korea (South), the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK and the USA. Table I provides an overview of the organization size and distribution of our sample companies in the different varieties of capitalism clusters (Amable, 2003). Comparing the smaller sample used in this study to the larger population of companies rated by SiRi, there were no significant differences in organization size (within each country). This suggests that we can consider this sample as representative of the pool of large MNCs, which are typically rated by social investment rating agencies. In other words, although our sample may not be a random sample of all organizations, the sample is appropriate because it closely tracks the population of large organizations of interest to social rating agencies and typically the target of environmental and social activists.

Dependent variables
Our outcome variables, lagged by one year and thus observed in 2005, consisted of three commonly used proxies of firm financial performance: return on assets (ROA), return on
sales (i.e. a company’s net profit margin (NPM)), and market-to-book (MTB) ratios. First, ROA is defined as operating profit/total assets; second, NPM is measured as net income/sales; and third, the MTB ratio is calculated as a company’s market value (determined in the stock market through each firm’s capitalization) divided by the firm’s accounting value (historical costs). These financial performance data were obtained for each organization, whenever available, from Thomson Datastream.

**Independent variables**

**Corporate environmental performance (CEP).** We rely on the Detailed Rating Reports of SiRi to measure CEP, observed in 2004. To our knowledge, the SiRi data set is currently the only international cross-industry data set that captures companies’ CEP with satisfactory measurement characteristics (construct validity and reliability). As described below, we performed confirmatory factor analyses and reliability analyses on the SiRi data.

The SiRi database is particularly suitable for an international comparative study such as ours for several reasons. First, the SiRi data are based upon research provided by local rating agencies present in several countries under study. Our assessment of the SiRi data.
collection and data analysis processes highlights a high degree of cross-cultural equivalence for this database (Hult et al., 2008). The database categories have been elaborated by SiRi partners in order to capture stable and meaningful aspects of stakeholder management across cultures and at a global level of analysis. Thus, this data set relies on the cross-cultural application of common, absolute standards to capture the multifaceted nature of organizational performance in an international and stakeholder context. In addition, the data collection process of SiRi has numerous features that enhance cross-cultural equivalence. To ensure consistency across countries, SiRi has developed a quality management system, which aims for continuous improvement in data gathering, knowledge management, contacts with stakeholders and corporations and incorporation of all organizational constituents’ feedback. This quality process, supported by electronic data collection procedures, ensures data comparability and standardization. Thus, the collective effort of SiRi’s rating agencies to construct a common coding process and consensus avoids, at least to some extent, the methodological limitations of other environmental ratings, such as large (or unknown or unreported) measurement error and lack of convergent validity (Chatterji and Levine, 2006; Chatterji et al., 2009; Orlitzky, 2013).

Second, our confirmatory factor analyses confirmed the validity of studying the SiRi items on the natural environment as a separate factor. SiRi’s 41 environmental items evaluate the company’s commitment toward the establishment of sound and appropriate environmental management systems, increasing efficiency in the use of resources and energy, and avoidance of harm to the environment. In assessing each company’s environmental record, consideration is given to, for example, its emissions of hazardous or toxic substances, the firm’s impact on ecosystems, waste generation, resource consumption, and so on. The reliability of the 41 items capturing these different aspects of a company’s environmental performance was very high (coefficient $\alpha$ of 0.91).

Finally, and perhaps most important, ratings of organizations’ environmental initiatives by independent observers such as SiRi (with its fiduciary responsibilities to investors) are superior to self-reported data collected via surveys. Compared to the measures used in this study, survey methods have several disadvantages, including the possibility of social desirability bias (Fernandes and Randall, 1992), unreliability of retrospective data (Golden, 1992, 1997) and common method bias (Podsakoff et al., 2003). In addition, surveys may be affected by cross-cultural equivalence biases because respondents’ understanding of questionnaire items may be influenced by cultural artifacts that are often ignored in the research design (Hult et al., 2008).

Control variables. In order to avoid model misspecification, we included several other variables in the analyses. Previous research suggests that industry membership, corporate internationalization, business risk, research and development (R&D), and organization size may be important control variables (McWilliams and Siegel, 2000; Orlitzky, 2008; Orlitzky and Benjamin, 2001). The importance of the industry sector control was highlighted by the statistically significant chi-square statistics summarizing the cross-tabulation of companies by industry and type of capitalism (not reported in this paper). The Global Industry Classification Standard was used for coding the industry sectors: energy, materials, industrials, consumer discretionary, consumer staples, healthcare, financials, information technology, telecommunication services/IT, utilities and mining. In the dummy coding for the multiple regression, mining was the omitted category.

A company’s internationalization was measured as the proportion of percentage of foreign sales – gathered from Datastream – as a share of all sales revenues (Sullivan, 1994). The ratio of total debt/total assets was used as a proxy of business risk. Estimating R&D in an international comparison can be difficult because of lack of data availability and differences in accounting rules and procedures; however, the ratio of intangibles-to-total
assets was used as a proxy of R&D, albeit an imperfect one[4]. Organization size was measured as the number of employees. To reduce the skewness of size, the natural logarithm (ln) was used.

**Background governance conditions**

For our background governance conditions (legal, economic and cultural) interaction effects (with CEP), we added variables collected from internet sources. First, the binary coding of countries’ legal systems into common law and civil law was accomplished via JuriGlobe research group’s World Legal Systems website (www.juriglobe.ca/eng/index.php) and Legal Context of Regulatory Reform website (www.ictregulationtoolkit.org/toolkit/6.3). Both these websites provide detailed information about different legal systems across the world. Common-law countries were coded as 0, civil-law countries as 1.

Second, each year the Wall Street Journal and the Heritage Foundation, one of Washington DC “s largest think tanks, rate 186 countries” levels of economic freedom. In countries that receive a high rating on this Index of Economic Freedom, individuals are free to pursue economic opportunities, work, produce, consume, and invest. In addition, in economically free countries, governments allow factors of production to move freely, and government intervention is held to a minimum necessary to protect and maintain liberty and abstain from coercion or constraint as much as possible. The four broad categories comprising the Index of Economic Freedom are: rule of law (property rights, freedom from corruption); limited government (fiscal freedom, government spending); regulatory efficiency (business freedom, labor freedom, monetary freedom); and open markets (trade freedom, investment freedom, financial freedom). Each of the ten subcategories (listed in parentheses above and equally weighted in the overall index) is evaluated on scale of 0 to 100. Further details about the meaning, construct validity, and calculation of the subcategories can be gleaned from this website: www.heritage.org/index/book/methodology. As of December 2014, the five countries ranking highest on the Heritage Index of Economic Freedom are Hong Kong, Singapore, Australia, Switzerland and New Zealand. The USA is currently ranked 12th. We used the scores of the year applicable to our study – 2004.

Finally, scores on Hofstede’s dimensions were collected from the Hofstede Centre’s website, http://geert-hofstede.com/index.php, via the Cultural Tools Country Comparison menu tab.

**Data analysis**

Three-year averages were calculated for all the proxies (covering the years 2002–2004). The CEP-CFP time lag in our ordinary least-squares regressions was one year, so covering a relatively short time horizon, in line with our earlier theorizing (e.g. H5). To examine our interaction hypotheses (H1–H5), we multiplied the value of CEP,2004 with the nation-level data that were described as background conditions above. As is typical, these interaction terms were highly correlated with its constituent variables, which may lead to the instability of regression coefficient estimates (see also Russo and Fouts, 1997). In order to minimize this multicollinearity, we standardized CEP and the interaction terms, which centers them (Aiken and West, 1991). In a way, the three different dependent variables (ROA, NPM and MTB ratio) served as robustness checks for our hypotheses.

**Results**

Table II shows the bivariate correlations r between the variables used in the hypothesis tests. Of particular note – and consistent with expectations – are the significantly positive correlation coefficients between foreign sales and organization size. Table II also shows that,
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<tbody>
<tr>
<td>1. ROA 2005</td>
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<td>2. NPM 2005</td>
<td>0.36**</td>
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<td>3. MTB 2005</td>
<td>−0.00</td>
<td>0.01</td>
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<tr>
<td>4. Foreign sales</td>
<td>0.06</td>
<td>−0.11*</td>
<td>0.02</td>
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<tr>
<td>5. Risk</td>
<td>−0.33**</td>
<td>0.01</td>
<td>−0.00</td>
<td>−0.14**</td>
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<tr>
<td>6. R&amp;D</td>
<td>0.09*</td>
<td>−0.11*</td>
<td>−0.04</td>
<td>0.21**</td>
<td>0.07</td>
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<tr>
<td>7. Org. size</td>
<td>−0.07</td>
<td>−0.22**</td>
<td>−0.04</td>
<td>0.15**</td>
<td>0.16**</td>
<td>0.09</td>
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<tr>
<td>8. CEP 2004</td>
<td>0.06</td>
<td>−0.05</td>
<td>−0.06</td>
<td>0.25**</td>
<td>0.07</td>
<td>−0.16**</td>
<td>0.30**</td>
<td>(0.91)</td>
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<tr>
<td>9. CEP × legal system</td>
<td>−0.05</td>
<td>−0.10*</td>
<td>−0.07</td>
<td>0.25**</td>
<td>0.02</td>
<td>−0.18**</td>
<td>0.10</td>
<td>0.54**</td>
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<tr>
<td>10. CEP × econ. freedom</td>
<td>0.09</td>
<td>−0.03</td>
<td>−0.03</td>
<td>0.24**</td>
<td>0.06</td>
<td>−0.15**</td>
<td>0.29**</td>
<td>0.98**</td>
<td>0.41**</td>
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<tr>
<td>11. CEP × UA</td>
<td>−0.03</td>
<td>−0.07</td>
<td>−0.10*</td>
<td>0.14***</td>
<td>0.07</td>
<td>−0.20**</td>
<td>0.28**</td>
<td>0.78**</td>
<td>0.77**</td>
<td>0.67**</td>
<td></td>
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<tr>
<td>12. CEP × masculinity</td>
<td>0.03</td>
<td>−0.04</td>
<td>−0.01</td>
<td>0.05</td>
<td>0.02</td>
<td>−0.15**</td>
<td>0.20**</td>
<td>0.75**</td>
<td>0.30**</td>
<td>0.74**</td>
<td>0.72**</td>
<td>0.73**</td>
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<tr>
<td>13. CEP × LTO</td>
<td>−0.04</td>
<td>−0.10*</td>
<td>−0.06</td>
<td>0.24**</td>
<td>0.03</td>
<td>−0.19**</td>
<td>0.18**</td>
<td>0.80**</td>
<td>0.79**</td>
<td>0.72**</td>
<td>0.85**</td>
<td>0.73**</td>
</tr>
</tbody>
</table>

Notes: 427 < n < 707. ROA, Return on assets; NPM, net profit margin (return on sales); MTB, market-to-book ratio; R&D, research and development (intangibles-to-total assets); Org. size, natural logarithm of number of employees per company; UA, uncertainty avoidance; LTO, Hofstede’s dimension of long-term orientation. *p < 0.05; **p < 0.01.
in line with corporate international diversification theory, a company’s internationalization reduces risk\cite{5}. In addition, the very high correlations between the interaction terms suggest that it is advisable to test each hypothesis in a separate regression equation in order to minimize collinearity.

The first hypothesis, which proposed a higher CEP-CPF link in common-law than civil-law systems, was supported in all three different regressions – i.e., with all three operationalizations of CFP. Table III shows that, although the hypothesis was consistently supported with the different proxies of CFP, it was supported to a different extent. Note that, because of our coding (0 = common law and 1 = civil law), negative regression coefficients are considered empirical support for $H_1$. In the equation with NPM as the outcome variable (Model 2 in Table III), the CEP-law interaction was negative and significant at a probability level $p$ of 0.01 (unstandardized regression coefficient $B$ of $-0.04$), whereas with ROA as DV (Model 1) it was significant at $p = 0.05$ ($B$ of $-0.01$). With MTB ratio as the DV (Model 3), it was significant at only $p = 0.10$ ($B$ of $-123.30$)\cite{6}. Furthermore, the $F$ value of this final model was nonsignificant, so that the results shown for Model 3 should be treated with great caution, even though the change in $F$ ($\Delta F$) was significant for the added interaction.

Figure 1(a). graphically illustrates the extent to which a common-law system may enable greater economic instrumentality of CEP in terms of NPM payoffs. As depicted in the figure, while NPM (i.e. ROS) seems to increase slightly with increasing CEP in common-law systems (top solid line in Figure 1(a)), it decreases sharply in civil-law systems (bottom dotted line in Figure 1(a)).

$H_2$ proposed that higher levels of economic freedom would be associated with a stronger relationship between CEP and CFP. As shown in Table IV, this second hypothesis was consistently supported across the three regression models – and this time with no probability levels ever rising above 0.05. In fact, the smallest $p$ was observed for the impact of the CEP-economic freedom interaction on the MTB ratio (unstandardized regression coefficient $B$ of 966.88; $p = 0.009$), with both model $F$ and $\Delta F$ statistically significant in this MTB regression model (Model 8 in Table IV). A climate of economic freedom also seems supportive of CEP being associated with ROA ($B$ of 0.05; $p = 0.018$) and to NPM ($B$ of 0.14; $p = 0.044$). Although the main direct effect of CEP$_{2004}$ was not significantly positive in any of the models, the sign of the interaction still suggests that the greater the economic freedom in which a company is headquartered, the stronger the link between CEP and CFP. Figure 1(b), with both constituent variables in the interaction dichotomized and NPM as the dependent variable, reflects this finding as well. While, at low levels of CEP, economically free and highly regulated economies seem to show very similar marginal means of NPM values, the lines diverge, in the expected direction based on the theory and the positive interaction term, at high levels of CEP.

To explore further whether it is specifically the free trade aspect of the firm’s home country’s economic freedom that matters the most, we also ran the regressions again with Heritage Foundation scores of trade liberalization for 2004 in the equation. As can be gleaned from Table IV, it does not seem to be the free trade/international competition aspect that strengthens the link between CEP and CFP because those interactions were nonsignificant in Models 3, 6, and 9 (Table IV). This suggests future research is warranted to pinpoint the specific background governance conditions within overall economic freedom that accounts for this strengthened CEP-CFP instrumentality.

$H_3$, which predicted a negative interaction term for CEP and uncertainty avoidance as a cultural background condition, was supported in terms of ROA and MTB ratios. As shown in Table V, the unstandardized $B$ was $-0.02$ for the moderator effect of uncertainty avoidance on the CEP-ROA link ($p = 0.027$), while $B$ was $-248.30$ for CEP-MTB, at $p = 0.038$. Please note that Figure 2(a) does not show the same clear interaction as Figure 1(a) and 1(b), although the slightly diverging slopes are in line with the expectation that
<table>
<thead>
<tr>
<th></th>
<th>ROA as DV</th>
<th>NPM as DV</th>
<th>MTB ratio as DV</th>
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<tr>
<td></td>
<td>Model 1 B (SE)</td>
<td>Model 2 B (SE)</td>
<td>Model 3 B (SE)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.18*** (0.04)</td>
<td>0.19*** (0.04)</td>
<td>0.51*** (0.13)</td>
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<tr>
<td>Foreign sales</td>
<td>0.00 (0.00)</td>
<td>-0.00 (0.00)</td>
<td>0.00 (0.00)</td>
</tr>
<tr>
<td>Risk</td>
<td>-0.11*** (0.02)</td>
<td>-0.11*** (0.02)</td>
<td>-0.06 (0.07)</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>0.00 (0.03)</td>
<td>-0.01 (0.03)</td>
<td>0.03 (0.11)</td>
</tr>
<tr>
<td>Org. size</td>
<td>-0.01 (0.00)</td>
<td>-0.01 (0.00)</td>
<td>-0.04*** (0.01)</td>
</tr>
<tr>
<td>Corp. env. performance (CEP 2004)</td>
<td>0.01 (0.01)</td>
<td>0.01 (0.01)</td>
<td>0.03 (0.02)</td>
</tr>
<tr>
<td>CEP&lt;sub&gt;2004&lt;/sub&gt;× legal system</td>
<td>-0.01* (0.00)</td>
<td>-0.01* (0.00)</td>
<td>-0.04*** (0.01)</td>
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\[ R^2 \]
\[ F \]
\[ ΔR^2 \]
\[ ΔF \]

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<tr>
<th></th>
<th>0.23</th>
<th>0.24</th>
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<td>4.24*</td>
<td>7.50**</td>
<td>2.83****</td>
<td>2.83****</td>
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</tr>
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</table>

**Notes:** DV, dependent variable; ROA, return on assets; NPM, net profit margin; MTB, market-to-book. Common law coded as 0, civil law coded as 1. Industry controls were included, but omitted from this table. *p < 0.05; **p < 0.01; ***p < 0.001; ****p < 0.10
company home countries with high uncertainty avoidance may impede instrumental-strategic payoffs from CEP.

According to $H_4$, we expected that companies headquartered in relatively feminine countries would exhibit a stronger association between CEP and CFP than companies headquartered in relatively masculine countries. This hypothesis was supported only with respect to ROA ($B = -0.012$) and only at $p = 0.074$ (Model 3 in Table V). When we estimated and plotted the marginal means in a general linear model that included only CEP and masculinity-femininity as fixed factors, the interaction is more discernible. As shown in Figure 2(b), ROA tends to improve more with increasing CEP in feminine cultures than masculine cultures (differences in the slopes between the two lines).

The final hypothesis predicted a negative interaction between CEP and long-term, or future, orientation in a company’s home country. This hypothesis was strongly supported with respect to ROA (unstandardized $B$ of $-0.03$; $p = 0.000$; Model 4 in Table V) and NPM ($B$ of $-0.07$; $p = 0.003$; Model 8), but not for the MTB ratio (Model 12). In addition, the two-way interaction in Figure 2(c) nicely illustrates the meaning of the predicted moderator effect: home countries that have a long-term orientation toward the future are not conducive at all to instrumental payoffs from CEP (lower, dotted line in Figure 2(c) with more negative slope than the solid line on top).

Finally, the direct main effect of $CEP_{2004}$ on CFP in 2005 warrants some attention. Across the 27 models we calculated (Tables III–V), CEP was associated with the one-year lagged CFP only seven times at $p < 0.05$; in five of these seven cases, the relationship was positive (Table III: Model 4; Table V: Models 2, 4, 6 and 8), in two others it was negative (Models 2 and 8 in Table IV). The bivariate correlation coefficients (shown in Table II) were $0.06$, $-0.06$, and $-0.06$ with ROA, NPM and the MTB ratio, respectively. So, in line with previous meta-analytic reviews, the $CEP_{t-1} CFP_t$ association (the main direct effect of CEP by itself) was negligible and not generalizable. The same conclusion can be drawn from Figures 1 and 2.

**Discussion**
In this paper, we analyzed data from 427 large corporations headquartered in 22 countries to examine the nation-level governance conditions that moderate the link between CEP and CFP. Specifically, we investigated the legal systems, economic freedom, and national
<table>
<thead>
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<th></th>
<th>ROA as DV</th>
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<td>Model 3 B (SE)</td>
<td>Model 4 B (SE)</td>
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<td>-0.01 (0.08)</td>
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<td>CEP2004 x Economic Freedom (2004)</td>
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<td>0.02 (0.07)</td>
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**Notes:** DV, Dependent variable; ROA, return on assets; NPM, net profit margin; MTB, market-to-book. Industry controls were included, but omitted from this table. *p < 0.05; **p < 0.01; ***p < 0.001.
<table>
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<th></th>
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<td>-0.03***</td>
<td>-0.03***</td>
<td>-0.03***</td>
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<td>0.24</td>
<td>0.27</td>
<td>0.10</td>
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<td>0.07</td>
<td>0.16</td>
<td>0.14</td>
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<tr>
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<td>4.42*</td>
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</table>

Notes: DV, Dependent variable; ROA, return on assets; NPM, net profit margin; MTB, market-to-book. Industry controls were included, but omitted from this table. *p < 0.05; **p < 0.01; ***p < 0.001; ****p < 0.0001.
cultural dimensions as the background conditions in companies’ home countries that shape the CEP-CFP link. Our analysis allows the field to move beyond the issue of whether it pays to be green toward establishing the background governance conditions under which it pays to be green.

Our findings, summarized in Table VI, suggest that countries with common-law legal systems (such as the UK and USA) – which are based on judicial precedent and do not have the high levels of regulatory certainty that characterize civil-law systems – enable firms to have stronger CEP-CFP associations. Interestingly, our findings run counter to some of the existing literature that suggests that higher regulatory certainty may sometimes facilitate the CEP-CFP relationship (Ambec et al., 2013; Porter and van der Linde, 1995). It may certainly be true that civil-law countries (such as Germany and France), with their highly codified environmental regulations, may push firms toward higher levels of (implicit) CEP. However, when all organizations are forced to comply with the same regulations, it undermines, to some extent, their ability to use environmental initiatives as an integral element of strategic differentiation from competitors. In general, common-law systems are more flexible in their interpretation of regulations, which are, in turn, likely to foster innovation and organizational distinctiveness (in the eyes of customers and investors, for example).
The second background condition that we investigated is the extent of economic freedom. We hypothesized that higher levels of economic freedom will lead to stronger links between CEP and CFP. This hypothesis was consistently supported across all three financial outcomes. In free-market systems, the forces of competition weed out suboptimal investments (including CEP). At the same time, low levels of government intervention push firms to make explicit CEP investments that respond to stakeholder expectations – catalyzing higher returns.

The final background conditions we investigated were three dimensions of national culture: uncertainty avoidance (H3), masculinity-femininity (H4), and long-term orientation (H5). Our findings suggest that national cultures with low uncertainty avoidance have a stronger CEP-CPF association. This is consistent with the previous theoretical logic of H1 and H2. National cultures with low uncertainty avoidance have fewer rules and are more accepting of unstructured situations – providing conditions that are more conducive for environmental innovations. In turn, more innovative CEP tends to result in higher financial payoffs (Dixon-Fowler et al., 2013). Our fourth hypothesis about masculinity-femininity (feminine cultures are an enabler of a higher CEP-CPF link) was only partially supported. There was a weak positive association when CFP was operationalized as ROA. But it was not supported for NPM or MTB. It appears that there may be other dynamics at play; in feminine countries, failure is “a relatively minor accident” (Hofstede, 1994, p. 4). Assertiveness is not encouraged, and underselling achievements is the norm (Merkin et al., 2014). Factoring in these additional dynamics, it may well be the case that, in feminine cultures, there is a lack of pressure for CEP investments to yield financial payoffs. Also, in feminine cultures – with their societal focus on nurturing values (Merkin et al., 2014) – environmental investments may be viewed as creating public goods and therefore might not be subject to rigorous return-on-investment analyses. Future research needs to investigate this further. Our final hypothesis was regarding short-term oriented cultures exhibiting a higher association between CEP and CFP. This hypothesis was strongly supported. In short-term oriented cultures, environmental (and indeed any other investments) need to demonstrate quick

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**Table VI.** Summary conclusions: support for hypotheses

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Operationalization of CFP</th>
<th>ROA</th>
<th>NPM</th>
<th>MTB ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The link between corporate environmental performance and corporate financial performance is expected to be stronger in common-law societies than civil-law societies (H1)</td>
<td>✓ │ │ (✓)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2. Higher levels of economic freedom are associated with a stronger link between corporate environmental and financial performance (H2)</td>
<td>✓ │ │ (✓)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Uncertainty avoidance interacts with CEP negatively, so that companies headquartered in countries with relatively low uncertainty avoidance are expected to exhibit a stronger association between CEP and CFP than companies headquartered in countries with relatively high uncertainty avoidance (H3)</td>
<td>(✓) │ ns │ (✓)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Masculinity-femininity interacts with CEP negatively, so that companies headquartered in relatively feminine cultures are expected to exhibit a stronger association between CEP and CFP than companies headquartered in relatively masculine cultures (H4)</td>
<td>ns │ ns │ (ns)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Long-term orientation interacts with CEP negatively, so that companies headquartered in cultures that are more short-term oriented are expected to exhibit a stronger association between CEP and CFP than companies headquartered in cultures that are more long-term oriented (H5)</td>
<td>✓ │ ns │ (ns)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** ns, Statistically non-significant (no support)
instrumental payoffs. Short-term oriented cultures thus provide background conditions that facilitate a stronger association between CEP and CFP.

Theoretical implications
One of the major issues that remains unaddressed in the literature is about the background governance conditions that enable or restrict financial payoffs from CEP. Our macrolevel analysis starts to move the field toward an understanding of the particular governance configurations that provide the most supportive conditions for any CEP-CFP link. Our findings suggest that countries with common-law systems, relatively high economic freedom, low uncertainty avoidance, and a short-term orientation are most conducive to environmental investments that have higher financial payoffs. Thus, countries such as the USA, UK and Australia – which generally have these background governance conditions – are more likely to provide a context for financial payoffs from environmental initiatives. Interestingly, femininity – the one background condition that was not strongly supported in our analysis – is also absent from these configurational effects (i.e. USA, UK and Australia have at least above-average masculine cultures). To extend our research into examining complementary typologies of background governance conditions, future research could apply other methods particularly useful to answering questions about governance complementarities, such as qualitative comparative analysis (Fiss, 2007, 2011; Rioux and Ragin, 2009).

Practical implications
It is important to stress that our research examines the nation-level background governance conditions which shape CEP-CFP associations in different countries. In this study, we did not examine the antecedents of CEP. These questions have been addressed elsewhere (see, e.g. Campbell, 2007; Ioannou and Serafeim, 2012). Accordingly, our research highlights the tension between the different goals of different societal actors (e.g. business goals vs government goals). Many firms are very concerned with the financial impact of CEP on their business, but any given governance system may not be as concerned with maximizing financial payoffs of CEP. Instead, public policy makers may be more concerned with maximizing CEP per se – and macrolevel incentives to improve CEP may require different legal structures, such as civil-law systems (see Campbell, 2007). Civil-law systems provide governance conditions that push firms to execute and be committed to CEP (Porter and van der Linde, 1995). Similarly, economic freedom and competition may have a curvilinear relationship with CEP (by itself) (Campbell, 2007); in fact, high levels of competition may lower CEP (Ioannou and Serafeim, 2012), but, as our findings suggest, strengthen financial payoffs from environmental investments. These are two very distinct questions – and voters in different nations may have different priorities. Our advice to policy makers is to acknowledge this tension; governance systems that support high levels of CEP may not necessarily be supportive of CEP-CFP payoffs, and vice versa.

Limitations
As all research, our study has a number of limitations. First, institutional theory suggests the role of macrolevel boundary conditions in shaping organizational environmental responses, but at the same time resource-based competencies and other factors can lead organizations to respond differently to the same nation-level governance institutions (Scott, 2014). Our study does not account for this heterogeneity in organization specific governance; nor does our study examine effects of inter-organizational governance (Caiazzo and Simoni, 2015; Simoni and Caiazzo, 2013). Second, although we had a sound theoretical basis for focusing on home country effects, we omitted company structure from
our analyses. It is likely that our findings are more applicable to centralized companies, which adhere more closely to HQ policies (Campbell et al., 2012). Third, though we controlled for industry main effects, industry structure (e.g. industry concentration) may in turn interact with national institutions. That is, there may be more complex, higher-order interactions (nation-level × industry-level × organization-level variable). A longitudinal panel design – capturing repeated observations for each company – would increase the number of observations and may, thus, provide more definitive conclusions for these more complex questions. Finally, the study years may be a limitation. With new environmental (pro-sustainability and pro-CSR) regulations being constantly enacted across the world (Orlitzky, 2013), we acknowledge and emphasize the temporality of our data.

Conclusion

One of the central questions in the field of Organizations and the Natural Environment is about the background conditions that may incentivize firms to be more environmentally responsive. Our paper addresses this issue through a nation-level investigation of the background conditions that may help or hinder the relationship between CEP and CFP.

Notes

1. For the purpose of this discussion, we will ignore the historical complexities that emerge from distinguishing between classical Roman Law and post-Constantine and Justinian code Roman Law, in which “the state increased the control over economic life” (Hayek, 2011, p. 246). The latter became the model for Continental Europe.

2. This dimension is not to be confused with gender-based allocation of roles. Instead, these are national dimensions. In feminine countries, both men and women exhibit values such as modesty and caring. Similarly, in masculine countries, members of both genders demonstrate assertiveness and competitiveness.

3. Of course, one needs to be careful to generalize from observations of organizational cultures to relationships that emerge from an organizations’ embeddedness in national culture. However, a meta-analytic review by Merkin et al. (2014) found that the cultural dimensions may indeed generalize across levels of analysis. Given the aforementioned lack of research on long-term vs short-term orientation at a national level, we tentatively draw on organizational level research in this area.

4. The ratio of intangibles-to-total assets is an imperfect proxy because what precisely is captured by “intangible assets” may differ from one industry to another and from one country to another.

5. We are aware that the aggregate evidence on risk and internationalization is not clear (Kwok and Reeb, 2000); what we suggest here is merely that our bivariate results point to the correctness of the original theory (internationalization reduces firm risk).

6. In the regression tables, we report unstandardized coefficients (B) and their associated standard errors, not standardized β. This explains why the magnitude of the regression coefficient is so much larger for MTB than the first two models because of differences in scaling of the DV.

References


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Corporate governance and risk in cross-listed and Canadian only companies

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Abstract

Purpose – The purpose of this paper is to investigate if there is a differential effect of corporate governance mechanisms on firm risk in Canadian companies cross-listed on US markets and Canadian companies not cross-listed (Canadian only companies).

Design/methodology/approach – Using a sample comprised of all Canadian companies included in the S&P/TSX Composite Index for the period 2009–2014, this study applies OLS and fixed effect regressions to investigate the effect of corporate governance mechanisms on firm risk. Interaction variables between governance mechanisms and the cross-listing status are used to examine if this effect is different for cross-listed firms.

Findings – Results indicate that the effect of board characteristics such as size, independence and proportion of female directors remains the same in both cross-listed and not cross-listed firms. CEO duality and insider equity ownership impact firm risk only in cross-listed companies, while institutional shareholdings, environmental, social and governance disclosure and family control affect firm risk in Canadian only firms. Overall, the empirical results indicate that some governance mechanisms impact firm risk only in firms that cross-list, while others are well-suited for Canadian only firms.

Practical implications – This study suggests that some of the differences between Canadian companies that cross-list and the Canadian companies that do not cross-list in US stock markets may change the impact of governance mechanisms on firm risk. Therefore, these findings have important implications for the design of governance mechanisms in Canadian firms. Since some of these differences are common to other economies, the conclusions can be extended to companies in other countries with similar governance structures.

Originality/value – Although previous studies have investigated the effect of governance mechanism on firm risk, this is the first paper that studies the differential effect for companies that cross-list in US markets. Specifically, differences in the ownership structure, firm control and in the regulatory and institutional environment, may explain this differential effect. Unlike most of the previous studies that focus on the effect of individual governance mechanisms, this study uses several mechanisms and their interactions at the same time.

Keywords Canada, Corporate governance, Firm risk, Cross-listing

Paper type Research paper

1. Introduction

Corporate governance mechanisms play an important role in monitoring firms and in aligning managerial and shareholder interests in developed capital markets. Although Canadian corporate governance is different in many respects and for different reasons. First, ownership structure in Canada is more concentrated than in the USA (La Porta et al., 1999; Dyck and Zingales, 2004). Second, the pyramidal ownership structures and dual classes of stock, which are more common in Canada, allow corporate insiders or families to control a firm while owning a small proportion of its equity (Ben-Amar and André, 2006; Amoako-Adu and Smith, 2001; Morck et al., 2000). Third, unlike the USA, Canada does not have a centralized regulatory authority, and securities regulation is enforced at the provincial and territorial level[1]. Fourth, the enforcement of insider trading laws is relatively weaker in
Canada than in the USA. Therefore, governance mechanisms may have a different impact on managerial incentives and firm performance in the Canadian and US contexts.

Moreover, about 30 percent of the Toronto Stock Exchange (TSX) listed companies are also listed on US stock exchanges. Cross-listing on a US exchange subjects companies to increased disclosure and a more stringent legal and regulatory environment. In addition, the bonding effect and increased scrutiny resulting from cross-listing may mitigate agency problems and reduce rent extraction from insiders in companies (Southam and Sapp, 2010). Therefore, governance mechanisms may impact managerial incentives and firm risk taking differently between cross-listed and not cross-listed Canadian companies (Canadian only companies).

This paper explores how various corporate governance mechanisms affect firm risk taking in cross-listed and Canadian only companies. Previous studies provide empirical evidence on the relation between governance quality and risk taking. More specifically, corporate governance mechanisms constraint managers’ pursuit of self-interest decision choices and mitigate agency problems. Core et al. (1999) find that firms with weaker governance structures have greater agency problems, provide greater compensation to their CEOs and exhibit worse financial performance. John et al. (2008) find that corporate risk taking is positively related to the quality of investor protection, which mitigates the existence of private benefits that lead to excessive risk avoidance. Kim and Lu (2011) argue that high levels of CEO ownership may reduce firm value by entrenching the CEO and discouraging risk taking, but this effect can be mitigated by strong external governance. In the Canadian context, Adjouad et al. (2007) find a significant relationship between governance quality and measures of performance based on market value and economic value added.

Unlike many previous studies that examine the relation between governance and firm value, this paper focuses on the relation between governance and firm risk. The agency theory postulates that the conflict of interests between managers and shareholders leads to sub-optimal risk taking. Risk averse and undiversified managers tend to take less risk than fully diversified shareholders would like them to (Amihud and Lev, 1981; Smith and Stulz, 1985; Eisenhardt, 1989; May, 1995; Holmstrom, 1999). Since risk and returns are positively related, sub-optimal risk taking results in lower shareholder wealth. Firms devise various governance mechanisms to mitigate risk-related agency problems and to motivate managers to take optimal risk. We focus on firm risk and empirically examine if and how governance mechanisms affect risk based on the cross-listing status of the firm.

The peculiar characteristics of Canadian companies provide a unique opportunity to examine how governance affects managerial risk taking. Cross-listed companies have to comply with more stringent regulations, disclosure requirements and capital market rules. The differences in the financial markets environment provide another opportunity to examine the relationship between governance mechanisms and managerial risk taking. Specifically, if cross-listing leads to more stringent legal and institutional requirements and scrutiny, and corporate governance mechanisms help in mitigating risk-related agency problems, then the same governance mechanisms should have a differential effect on firm risk in cross-listed and Canadian only companies.

A sample comprised of all Canadian companies included on the S&P/TSX index for the period 2009–2014 is used to test the hypotheses. Following previous studies, firm risk is measured by the standard deviation of daily stock returns. Unlike most previous studies that focus on the effect of individual governance mechanisms, several mechanisms are considered simultaneously, including CEO duality, board size, board composition, environmental, social and governance (ESG) disclosure scores, institutional shareholdings, insider ownership and family ownership. We also include a variable indicating the number of years the company has been cross-listed to control for the length of
the cross-listing experience. Cross-listed companies included in our sample were all cross-listed long before the start of our sample period, which helps in mitigating any concerns about the same variables affecting governance and the decision to cross-list, as cross-listing is a one-time event.

The empirical results show that there are some noticeable differences in the effect of these mechanisms on firm risk in Canadian companies that have been cross-listed and Canadian companies that are not cross-listed. Specifically, we find that CEO duality and insider ownership have a significant effect on risk taking in cross-listed companies, and no significant effect in Canadian only companies. On the other hand, institutional shareholdings, ESG disclosure scores and family ownership have a significant impact on firm risk in Canadian only companies, and no significant effect in cross-listed firms. Board characteristics like size, independence and proportion of female directors have similar and significant effects on both cross-listed and Canadian only firms. The results show that cross-listing status significantly changes the impact of some of the governance mechanisms on firm risk. Since corporate insiders have more control in Canadian firms due to more concentrated ownership and pyramidal ownership structure, CEO duality and insider ownership do not impact managerial risk taking in Canadian only companies. Conversely, family ownership is relevant only for Canadian companies, as firms that are cross-listed face different environments in the cross-listed capital markets.

This paper contributes to the literature on corporate governance and firm risk by providing empirical evidence on the differential effect of governance mechanisms on firm risk in Canadian companies. The specific characteristics of Canadian firms and capital markets are considered for explaining the impact of governance mechanisms on firm performance. It also contributes to the literature on cross-listing by showing that cross-listing status in a more developed capital market changes the impact of governance on firm risk. It provides further evidence on the effectiveness of governance mechanisms for Canadian firms that are cross-listed in the US markets.

The remainder of the study is organized as follows. Section 2 provides the motivation and outlines the hypotheses. Section 3 presents the sample and empirical methodology. Section 4 reports empirical results and Section 5 concludes the paper.

2. Hypotheses development

Corporate governance is critical for the smooth functioning of corporations in capital markets. Different mechanisms of governance have been devised by firms to mitigate agency problems that arise due to separation of ownership and control. The agency theory argues that managers take less than optimal risk for two primary reasons. First, managers are risk averse and avoid investing in risky but value increasing investments. Second, unlike shareholders who are fully diversified, managers are poorly diversified because most of their human capital and financial wealth is tied to their firms. Consequently, risk averse and undiversified managers take less risk than fully diversified shareholders would like them to (Amihud and Lev, 1981; Smith and Stulz, 1985; Eisenhardt, 1989; May, 1995; Holmstrom, 1999) and pass on positive NPV investments. The resulting sub-optimal risk taking negatively impacts shareholder wealth. To mitigate this problem, firms institute various governance mechanisms to motivate managers to take optimal levels of risk.

The effects of corporate governance on firm risk are documented in the literature. John et al. (2008), for example, find that stronger shareholder protection is associated with a higher level of firm risk and growth. Gormley and Masta (2016) show that weak corporate governance results in value destroying actions that reduce stock return volatility. Pathan (2009) finds that strong boards have a positive effect on bank risk taking. However, there is not much research on how the effect of governance changes based on the cross-listing status of the firm. Firms that cross-list in US markets are generally subjected to higher levels of
investor protection. Therefore, the same governance mechanisms may affect firm risk differently in cross-listed and not cross-listed companies.

Previous literature has extensively examined the causes and consequences of firms cross-listing. The bonding theory, for example, holds that cross-listing subjects managers to a stricter legal and regulatory environment and makes it more difficult for corporate insiders to pursue their private benefits (Coffee, 1999, 2002; Stulz, 1999). The access to external financing hypothesis posits that cross-listing helps firms to alleviate financing constraints faced in their domestic markets (Lins et al., 2005). Another theory, the managerial learning theory, argues that cross-listing allows managers to obtain more precise information about the value of future growth opportunities and, therefore, improves the informativeness of a firm’s stock price (Fernandes and Ferreira, 2008). These theories suggest that cross-listing helps in mitigating agency problems and improves corporate governance as companies from weaker governance regimes cross-list in stronger governance systems.

For Canadian firms, besides agency problems, there is the added risk of expropriation of dominant or controlling shareholders at the expense of minority shareholders (Dyck and Zingales, 2004). For widely held firms, the existence of large shareholders with greater resources and incentives to monitor managers should reduce some agency costs and have a positive effect on firm performance (Shleifer and Vishny, 1997). However, while widely held firms are prevalent in the USA and UK, in Canada, closely held firms, often family controlled, are common. These controlling shareholders are less diversified and can make sub-optimal investment decisions (Zhang, 1998). The existence of pyramid structures, that allows controlling rights with a low proportion of ownership, exacerbates this problem. Therefore, the impact of governance structures on firm value and risk taking incentives may be different in the Canadian context.

Given the above discussion, we argue that the same governance mechanism has a differential effect on firm risk in a Canadian cross-listed company compared to a not cross-listed or Canadian only company. In addition, we include all governance mechanisms in a single equation, rather than running a separate regression for each mechanism. This is important because these mechanisms could be related, as they may serve the same purpose.

2.1 Board size

Board size is an important part of internal corporate governance. Board size affects the efficiency and effectiveness of corporate boards. Small boards are considered less effective in monitoring because directors will be more susceptible to be influenced by CEOs (e.g. Jensen, 1993; Yermack, 1996; Core et al., 1999). When there are few board members CEOs can create influential relationships, but large boards are difficult to influence and manipulate. However, large boards may also lead to longer decision times due to disagreements and, in some cases, lack of consensus. Cheng (2008) points out that decisions of larger boards are less extreme because it takes more compromises to reach consensus. His empirical results show that firms with larger boards exhibit lower variability in firm performance. Wang (2012) finds that small boards give CEOs higher incentives to increase risk and are associated with higher risk taking. Nakano and Nguyen (2012) find that Japanese companies with larger boards exhibit lower performance volatility, but this effect is not as significant as in the USA. Therefore, a negative effect of board size on firm risk is expected.

However, there is also some evidence that cross-listing improves corporate governance. Changes in the ownership structure of firms that cross-list may change the effect of board size on firm risk. Furthermore, the bonding effect from cross-listing and increased scrutiny that results from listing in the US markets mitigate agency problems and may impact the monitoring role of boards on managerial action. Therefore, the intrinsic effect of board size on firm risk may change for firms that are cross-listed compared to Canadian only firms:

\[ H1. \] The effect of board size on risk taking is different in cross-listed and Canadian only firms.
2.2 Board independence

Previous studies argue that independent boards are more effective in terms of monitoring management (e.g., Crystal, 1991; Core et al., 1999). Board independence is usually measured as the proportion of independent directors on the board who have no business relationships with the corporation. It is also important to note that board independence does not take into consideration the effect of interlocking directorships (Caiazza and Simone, 2015; Simone and Caiazza, 2012) that may influence risk taking in other firms.

Previous studies present mixed evidence on how board independence affects firm risk. Pathan (2009) finds that strong boards have a positive effect on bank risk. However, Brick and Chidambaram (2008) report a negative relation between board monitoring and firm total risk. The bonding theory of cross-listing predicts that stricter legal and regulatory environments make it more difficult for corporate insiders to pursue their own interests and avoid risk taking actions. Therefore, changes in the ownership structure and level of control from insiders may change the effect of board independence in cross-listed firms. Given the conflicting findings in previous studies, and the predictions of the bonding theory, there is no a priori expectation on the effect of board independence on firm risk:

\[ H_2. \text{The effect of board independence on risk taking is different in cross-listed and Canadian only firms.} \]

2.3 Female directors on boards

Women are generally perceived as more risk averse than men. Studies on the effect of female directors on risk taking build on literature from experimental economics and psychology (Croson and Gneezy, 2009; Bertrand, 2011). This literature documents gender-related differences in risk aversion. Some studies find a positive relation between board diversity (measured by the presence of women and minorities) and firm value (e.g., Carter et al., 2003), while others find that having more women on corporate boards or top management does not generate any significant excess returns (Francoeur et al., 2008). In terms of firm risk, Sila et al. (2016) find that there is no significant effect of women directors on firm equity risk. However, Levi et al. (2014) report that firms with female directors take less risk and such firms are less likely to make acquisitions, and if they do, they pay a lower bid premium. Loukil and Yousfi (2016) find that the presence of women directors on Tunisian-listed firms’ boards is positively associated with the cash ratio, indicating risk avoidance. Rossi et al. (2017) find that the presence of women in boards in Italian firms has a negative impact on firm risk. Therefore, a negative relation between the percentage of female directors on board and firm risk can be expected. However, the effect of female directors on boards is not expected to be different in cross-listed firms:

\[ H_3. \text{The effect of female directors on risk taking is similar for cross-listed and Canadian only firms.} \]

2.4 CEO duality

The duality of the CEO (CEO/chair) is an important governance mechanism. When CEOs also serve as the chair of the board, they become more influential and powerful, and are more likely to affect investment decisions. A number of papers find that agency problems are higher when the CEO is also the chair of the board (e.g., Yermack, 1996; Core et al., 1999). In addition, previous literature shows that CEO duality may enable managers to pursue risk reduction strategies (Castañer and Kavadis, 2013; Li and Tang, 2010; Kim and Buchanan, 2011). Given the concentrated ownership structure and prevalence of dual classes of stock that allow corporate insiders or families to control firms in Canada, the negative effect of CEO duality is likely to be weaker in Canadian only firms and stronger in cross-listed firms.
Conversely, for cross-listed firms where the monitoring role of boards has a more significant impact on managerial decisions, CEO duality can have a significant impact on managerial risk taking actions:

\( H4 \). The effect of CEO/chair duality on risk taking is more pronounced in cross-listed firms than in Canadian only firms.

2.5 Institutional ownership

Large investors are important players in every corporate governance structure. They have the ability, means and the incentives to monitor firms in order to maximize their own profits (Shleifer and Vishny, 1986; Grossman and Hart, 1980; Amihud and Lev, 1981). Since institutional shareholders reduce risk-related agency problems, they are expected to increase firm risk to the optimal level. Wright et al. (1996) report a positive effect of institutional holdings on corporate risk taking. Similarly, Paligorova (2010) finds a positive relation between corporate risk taking and the equity ownership of the largest shareholder. Hutchinson et al. (2015) report a positive effect of institutional shareholdings on firm risk in a sample of Australian firms. Since cross-listing status adds another layer of monitoring and regulation, the impact of institutional ownership may be less pronounced in cross-listed firms:

\( H5 \). The effect of institutional holdings on risk taking is less pronounced in cross-listed firms than in Canadian only firms.

2.6 Insider shareholdings

Firms award equity to employees in order to align their interests with the shareholders and to reduce agency problems. Since insider equity ownership mitigates agency problems associated with risk taking, it is expected to be positively related to firm risk. However, Wright et al. (1996) mention that the impact of insider ownership heavily depends on the level of firm specific wealth of the employees and their degree of risk aversion. As a result, the impact of insider equity holdings on firm risk may become negative. Nevertheless, the impact of insider equity may be stronger in cross-listed firms, as cross-listing mitigates agency problems by exposing firms to more stringent regulations. Kim and Lu (2011) find that the risk reducing effect of CEO ownership is mitigated by strong external governance. In addition, for Canadian only firms, insider ownership may not have a significant effect on risk because of a stronger effect of concentrated ownership structures. This discussions leads to the following hypothesis:

\( H6 \). The effect of insider shareholdings on risk taking is more pronounced in cross-listed firms than in Canadian only firms.

2.7 ESG disclosure scores

The extent of disclosure of a firm’s ESG information provides investors with the tools to understand a firm’s ESG performance. Previous studies find a negative relation between social performance and firm risk (e.g. Orlitzky and Benjamin, 2001; Jo and Na, 2012; Bouslah et al., 2013; Hsu and Chen, 2015; Harjoto and Laksmana, 2018). There is also evidence that ESG disclosure is associated with lower risk. For example, Cormier et al. (2011) find that ESG disclosure reduces information asymmetry, which indirectly affects firm risk.

Since cross-listed firms are actively followed by financial analysts, investors can more easily make informed decisions about the ESG performance of these firms. The managerial learning theory of cross-listing argues that cross-listing improves the informativeness of a firm’s stock price. On the other hand, there is not as much information available for not
cross-listed firms, and these firms have lower numbers of analysts following. An increase in the disclosure of ESG information may provide investors with additional information, and, therefore, have a higher impact on firm risk. It is expected that higher disclosure scores are associated with more information asymmetry reduction in Canadian only firms than in cross-listed firms:

H7. The effect of ESG disclosure on risk taking is more pronounced in Canadian only firms than in cross-listed firms.

2.8 Family control
The presence of family members on the board and family control via concentrated ownership are distinct features in the governance of Canadian companies. Since family controlled firms have lower agency costs, the effect of risk is more pronounced in such firms. Previous studies find that family controlled firms may have less debt (McConaughy et al., 2001). Rouyer (2016) finds no significant effect of family ownership on firm performance, measured by Tobin’s Q. However, Anderson and Reeb (2003) find that firms controlled by founding families actually experience less diversification, and, therefore, are more risky. Similarly, Nguyen (2011) finds that family control and ownership concentration are positively related to idiosyncratic risk. When Canadian firms cross-list in the USA, the effect of family control weakens. Therefore, the impact of family control on firm risk may be stronger in Canadian only firms than in cross-listed firms:

H8. The effect of family ownership on risk taking is more pronounced in Canadian only firms than in cross-listed firms.

3. Data and empirical methodology
3.1 Data
The sample comprises all firms included in the S&P/TSX Composite Index of the TSX for the period 2009–2014. Since we need CEO compensation to control for CEO risk taking incentives, we use hand collected data from proxy statements. Unlike the US companies that have been required to report details of CEO compensation since 1992, Canadian listed companies were not required to report detailed information about various components of CEO compensation prior to 2008. In 2008, new accounting rules for reporting executive compensation came into effect that required companies to report detailed information on compensation. Mackenzie (2016) created a sample of hand collected data on the companies included in the S&P/TSX Index using proxy circulars for the years 2008–2014[2]. Although the data covers the period 2008–2014, data for the year of 2008 has a substantially large number of missing observations. The data for the years from 2009 to 2014 has non-missing details about executive compensation for about 98 percent of the sample. We are able to merge the compensation data with financial data on these companies from the Compustat data set. The data used to construct the governance variables comes from Bloomberg.

Cross-listed firms in US stock exchanges for each year are identified using trading data in CRSP and information available in the NYSE and the NASDAQ websites[3]. The market data used to construct firm risk comes from the Canadian Financial Markets Research Centre.

The final sample resulting from merging data from the aforementioned sources is comprised of 1,326 firm year observations for the period 2010–2014. However, the number of observations in the regressions may be lower for two reasons. First, we measure firm risk (volatility) with a one-year lag. Second, there are missing observations on some control variables for some of the firms and in certain years.
3.2 Research design

The effect of various governance mechanisms on firm risk in cross-listed and Canadian only firms is estimated using the following equations:

\[
\text{Firm risk}_{t+1} = \beta_0 + \beta_i \sum \text{Governance mechanism}_{it} + \beta_k \sum \text{Controls}_{kt} + \epsilon_t, \tag{1}
\]

\[
\text{Firm risk}_{t+1} = \beta_0 + \beta_1 \text{Cross-listed}_t + \beta_i \sum \text{Governance mechanism}_{it} \times \text{Cross-listed}_t + \beta_k \sum \text{Controls}_{kt} + \epsilon_t. \tag{2}
\]

Following previous research, we use volatility of daily stock returns to measure firm risk (e.g., Coles et al., 2006; Wright et al., 2007; Cheng, 2008; Pathan, 2009). Cross-listed is a binary variable equal to 1 if the firm is cross-listed on a US stock exchange during a specific year. Jayaraman et al. (1993) find that the listing of American Depository Receipts is associated with permanent increases in the volatility of returns of the underlying stocks. Therefore, the sign of the variable cross-listed is expected to be positive.

The governance mechanisms included in the estimation of the model are the following: board size, board independence, percentage of female directors, CEO duality, institutional holdings, insider ownership, ESG disclosure score and family ownership. Board size is measured as the total number of directors on the board. Board independence is measured as a ratio of independent directors to total directors. Institutional holdings are measured by percentage of equity held by institutions. Insider ownership is the percentage of equity held by insiders. ESG disclosure score is provided by Bloomberg and ranges between 0 and 100 [4]. Family ownership is a dummy variable equal to 1 if the firm is controlled by families and 0 otherwise. The National Bank of Canada’s list of family controlled firms is used to identify family run businesses on TSX companies [5].

Besides variables for corporate governance mechanisms, variables for CEO and firm characteristics that may affect firm risk are also included in the model. CEO characteristics that have been shown in previous literature to have significant influence on firm risk include CEO tenure and compensation (Berger et al., 1997; Guay, 1999; Coles et al., 2006). CEO tenure is the number of years the CEO has been in office. Longer tenures may indicate more agency problems as CEOs with long tenures become entrenched, have more power, and avoid risk. CEO cash compensation as a ratio to total compensation is often used as proxy for CEO risk taking (Coles et al., 2006; Cheng, 2008; Wright et al., 2007). The natural logarithm of the ratio of cash compensation to total compensation is included in all regressions.

Previous studies on risk taking find that size is an important driver of firm risk (Coles et al., 2006; John et al., 2008; Low, 2009; Boubakri et al., 2013). Size is also associated with governance quality due to investor interest and scrutiny (Chung et al., 2010). We include the logarithm of sales as a measure of firm size. We also include the market-to-book ratio in the model, which is calculated as book value of debt plus market value of equity over book value of total assets. This measure may be associated with future profitability and investment opportunities and, therefore, affects firm risk (Coles et al., 2006). Following prior studies, leverage measured by the debt-to-assets ratio is included as a control variable (Leland, 1998; Boubakri et al., 2013). Innovation is inherently associated with firm risk. R&D to assets, the proxy for innovation in the model, is calculated as the logarithm of the ratio of R&D expenditures to total assets. The model also controls for firm performance by including return-on-assets (ROA) in all regressions. Finally, year and industry controls are included in all regressions.

Table I provides descriptive statistics for the key variables used in this study. The median CEO in a cross-listed firm stays in her job for five years compared to six years in Canadian only firms, and receives 41 percent of her total compensation in cash while the...
The median CEO in a Canadian only firm receives 54 percent. Cross-listed firms are on average much larger than not cross-listed firms. The median level of sales of cross-listed firms ($2,318bn) is more than double the median level of sales of Canadian only firms ($1,040bn). Cross-listed firms have higher market-to-book ratios and lower debt ratios. However, median ROAs are not much different between the two groups. There are also some differences in the governance proxies. There are nine directors in a median board of a cross-listed firm, compared to ten directors in a Canadian only firm. The median cross-listed board is more independent than that of Canadian only firms (86 percent vs 78 percent are independent directors). However, the proportion of female directors is similar in both types of companies. Institutional ownership is much higher for cross-listed firms, with 68 percent of equity owned by institutions, vs only 38 percent of the Canadian only equity. There is not much difference in average values of insider ownership between the two types of companies (2.85 percent vs 2.35 percent).

Table II provides correlation coefficients among the independent variables. There should be no concerns about the correlation among all the explanatory variables, as the coefficients are less than 0.4, except for the correlation between sales and board size.

### Table I. Descriptive statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Full sample</th>
<th></th>
<th>Cross-listed</th>
<th></th>
<th>Canadian only</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
<td>SD</td>
<td>Median</td>
<td>SD</td>
<td>Median</td>
<td>SD</td>
</tr>
<tr>
<td>Volatility</td>
<td>27.89</td>
<td>17.55</td>
<td>31.32</td>
<td>16.97</td>
<td>25.21</td>
<td>17.78</td>
</tr>
<tr>
<td>CEO tenure</td>
<td>5.52</td>
<td>6.54</td>
<td>5.02</td>
<td>5.18</td>
<td>6.10</td>
<td>7.11</td>
</tr>
<tr>
<td>Cash compensation</td>
<td>0.48</td>
<td>0.26</td>
<td>0.43</td>
<td>0.22</td>
<td>0.55</td>
<td>0.23</td>
</tr>
<tr>
<td>Sales</td>
<td>1,354</td>
<td>8,476</td>
<td>2,265</td>
<td>9,973</td>
<td>1,032</td>
<td>7,208</td>
</tr>
<tr>
<td>Market-to-book</td>
<td>1.36</td>
<td>0.94</td>
<td>1.43</td>
<td>0.92</td>
<td>1.36</td>
<td>0.93</td>
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<tr>
<td>Debt-to-assets</td>
<td>0.22</td>
<td>0.17</td>
<td>0.18</td>
<td>0.14</td>
<td>0.25</td>
<td>0.22</td>
</tr>
<tr>
<td>ROA</td>
<td>0.10</td>
<td>0.09</td>
<td>0.11</td>
<td>0.09</td>
<td>0.11</td>
<td>0.09</td>
</tr>
<tr>
<td>R&amp;D to assets</td>
<td>0.00</td>
<td>0.02</td>
<td>0.00</td>
<td>0.02</td>
<td>0.00</td>
<td>0.02</td>
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<tr>
<td>Duality</td>
<td>0.00</td>
<td>0.33</td>
<td>0.00</td>
<td>0.28</td>
<td>0.00</td>
<td>0.38</td>
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<td>Board size</td>
<td>9.10</td>
<td>2.96</td>
<td>10.00</td>
<td>3.37</td>
<td>9.00</td>
<td>2.86</td>
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<tr>
<td>Board independence</td>
<td>80.00</td>
<td>12.81</td>
<td>85.82</td>
<td>10.68</td>
<td>77.63</td>
<td>13.04</td>
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<tr>
<td>Institutional holdings</td>
<td>46.95</td>
<td>21.88</td>
<td>68.52</td>
<td>19.45</td>
<td>39.19</td>
<td>18.38</td>
</tr>
<tr>
<td>Inside shareholdings</td>
<td>2.51</td>
<td>1.23</td>
<td>2.84</td>
<td>1.17</td>
<td>2.38</td>
<td>1.26</td>
</tr>
<tr>
<td>Female directors</td>
<td>0.00</td>
<td>0.09</td>
<td>0.08</td>
<td>0.10</td>
<td>0.00</td>
<td>0.09</td>
</tr>
<tr>
<td>ESG disclosure score</td>
<td>51.73</td>
<td>7.16</td>
<td>53.54</td>
<td>8.27</td>
<td>50.22</td>
<td>5.79</td>
</tr>
<tr>
<td>Family control</td>
<td>0.00</td>
<td>0.33</td>
<td>0.00</td>
<td>0.23</td>
<td>0.00</td>
<td>0.31</td>
</tr>
</tbody>
</table>

Notes: Volatility is the annualized standard deviation of daily stock returns. CEO tenure is the number of years the CEO has been in office. CEO cash compensation is the ratio of cash compensation to total compensation. Market-to-book is (Book value of debt + market value of equity)/(Book value of assets). Debt-to-assets is the ratio of total long-term debt to total assets. ROA is the ratio of net income to total assets. R&D is R&D expenditures/total assets. Duality equals 1 means that CEO is also the chair of the board and 0 otherwise. Board size is the total number of directors on the board. Board independence is number of independent directors/total directors on the board. Institutional holdings are the percentage of equity held by institutions. Insider shareholdings are the percentage of equity held by management and employees. Female directors are the percentage of female directors on the board. ESG disclosure score is provided by Bloomberg and ranges between 0 and 100. Family equals 1 if the company is a family owned company and 0 otherwise.

### Table II. Correlation coefficients among independent variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Full sample</th>
<th></th>
<th>Cross-listed</th>
<th></th>
<th>Canadian only</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 4. Results

#### 4.1 Corporate governance and firm risk: benchmark regressions

The first step in the analysis is the estimation of the impact of the different governance mechanisms on firm risk for the full sample, including cross-listed and not cross-listed firms. The results from the OLS and industry fixed effects regressions are presented in Table III. The coefficients on CEO tenure and cash compensation are both negative and significant in
<table>
<thead>
<tr>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>IX</th>
<th>X</th>
<th>XI</th>
<th>XII</th>
<th>XIII</th>
<th>XIV</th>
<th>XV</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO tenure</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash compensation</td>
<td>0.17*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEO duality</td>
<td>0.23*</td>
<td>0.08*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Board size</td>
<td>-0.07*</td>
<td>-0.13*</td>
<td>-0.15*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Board independence</td>
<td>0.13*</td>
<td>-0.11*</td>
<td>-0.05</td>
<td>0.09*</td>
<td>-0.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female directors</td>
<td>-0.12*</td>
<td>-0.10*</td>
<td>-0.05</td>
<td>0.14*</td>
<td>0.13*</td>
<td>0.13*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inst. holdings</td>
<td>-0.09*</td>
<td>-0.03</td>
<td>0.02</td>
<td>-0.26*</td>
<td>-0.12*</td>
<td>-0.06*</td>
<td>-0.09*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insider holdings</td>
<td>-0.16*</td>
<td>-0.11*</td>
<td>0.10*</td>
<td>0.20*</td>
<td>0.08*</td>
<td>-0.05*</td>
<td>0.31*</td>
<td>0.16*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESG disclosure</td>
<td>-0.11*</td>
<td>0.18*</td>
<td>0.22*</td>
<td>0.26*</td>
<td>0.26*</td>
<td>0.26*</td>
<td>0.20*</td>
<td>0.33*</td>
<td>0.12*</td>
<td>0.10*</td>
<td>0.09*</td>
<td>0.09*</td>
<td>0.09*</td>
<td>1.00</td>
</tr>
<tr>
<td>Family control</td>
<td>0.09*</td>
<td>0.10*</td>
<td>0.04</td>
<td>0.30*</td>
<td>-0.30*</td>
<td>-0.06*</td>
<td>-0.06*</td>
<td>-0.14*</td>
<td>-0.03</td>
<td>-0.03</td>
<td>0.14*</td>
<td>0.06*</td>
<td>0.04</td>
<td>0.09*</td>
</tr>
<tr>
<td>Sales</td>
<td>0.07*</td>
<td>-0.09*</td>
<td>-0.03</td>
<td>0.54*</td>
<td>0.07*</td>
<td>0.06*</td>
<td>0.07*</td>
<td>0.51*</td>
<td>0.28*</td>
<td>0.27*</td>
<td>0.24*</td>
<td>0.05*</td>
<td>0.05*</td>
<td>0.28*</td>
</tr>
<tr>
<td>Market-to-book</td>
<td>0.02</td>
<td>-0.05</td>
<td>0.10*</td>
<td>0.02</td>
<td>-0.02</td>
<td>0.03</td>
<td>-0.02</td>
<td>0.02</td>
<td>0.03</td>
<td>-0.03</td>
<td>0.14*</td>
<td>0.01</td>
<td>0.13*</td>
<td>0.01</td>
</tr>
<tr>
<td>Debt-to-assets</td>
<td>-0.01</td>
<td>0.11*</td>
<td>0.14*</td>
<td>0.13*</td>
<td>0.11*</td>
<td>0.12*</td>
<td>0.11*</td>
<td>0.12*</td>
<td>0.14*</td>
<td>0.11*</td>
<td>0.07*</td>
<td>0.17*</td>
<td>0.17*</td>
<td>0.17*</td>
</tr>
<tr>
<td>ROA</td>
<td>-0.14*</td>
<td>0.10*</td>
<td>-0.13*</td>
<td>0.35*</td>
<td>0.18*</td>
<td>0.35*</td>
<td>0.35*</td>
<td>0.26*</td>
<td>0.35*</td>
<td>0.35*</td>
<td>0.35*</td>
<td>0.35*</td>
<td>0.35*</td>
<td>0.35*</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>0.15*</td>
<td>-0.04</td>
<td>0.03</td>
<td>-0.05</td>
<td>-0.03</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.01</td>
</tr>
</tbody>
</table>

Note: *Significant at 5 or 1 percent

Table II. Correlation matrix of independent variables
both OLS and fixed effects regressions. CEO duality has a negative but statistically insignificant effect on firm risk in both models.

Among the board characteristics, board size and board independence are negatively related to firm risk. It seems that smaller boards are associated with more risk taking. Similarly, more independent boards are associated with lower levels of total risk. The proportion of female directors on boards is also negatively related to firm risk, indicating that the presence of women on the boards leads to lower risk. The coefficients on institutional holdings are positive and significant. It seems that institutional shareholders tend to encourage risk taking. However, the coefficients on insider ownership are all statistically insignificant. The coefficients on ESG disclosure scores and family control are both positive and significant. Greater disclosure leads to higher risk taking. Similarly, firms controlled by families seem to encourage risk taking.

4.2 Corporate governance and firm risk: effect of cross-listing status

In order to test if and how cross-listing status changes the effects of governance mechanisms on firm risk, interactions of each governance mechanism and the binary variable of cross-listed are included in the model. We include interactions of cross-listed and Canadian only sub-samples with each governance mechanism, and do not include the separate variable for each governance mechanism[6]. This simple transformation makes it easier to directly measure the effect of each mechanism on firm risk in cross-listed and Canadian only firms.
For example, the coefficient on CEO duality × cross-listed measures the effect of CEO duality on firm risk in cross-listed firms. Similarly, the coefficient on CEO duality × Canadian only measures the effect of CEO duality on firm risk in Canadian only firms.

The results are presented in Table IV. These results show that the effect of some of governance mechanisms changes when compared with the regressions for the combined sample. The coefficients on CEO duality become positive and significant for cross-listed firms. It seems that CEO duality leads to more risk taking in companies that are cross-listed and has no impact on firm risk in Canadian only firms. The effect of board characteristics, however, stays the same. Board size and board independence continue to have a negative effect on firm risk in both cross-listed and Canadian only firms. Similarly, the proportion of female directors has a negative and significant effect on firm risk in both cross-listed and Canadian only firms. These results show that the cross-listing status of a firm affects the impact of governance mechanisms on firm risk.

<table>
<thead>
<tr>
<th>Variables</th>
<th>OLS</th>
<th>Volatility, cross-listed</th>
<th>Industry fixed effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO tenure</td>
<td>-0.0014*** (0.001)</td>
<td>-0.0012*** (0.007)</td>
<td></td>
</tr>
<tr>
<td>Cash compensation</td>
<td>-0.0277*** (0.001)</td>
<td>-0.0764*** (0.000)</td>
<td></td>
</tr>
<tr>
<td>Duality × cross-listed</td>
<td>0.0336* (0.070)</td>
<td>0.0290* (0.074)</td>
<td></td>
</tr>
<tr>
<td>Duality × Canadian only</td>
<td>-0.008 (0.406)</td>
<td>-0.0092 (0.317)</td>
<td></td>
</tr>
<tr>
<td>Board size × cross-listed</td>
<td>-0.0478** (0.024)</td>
<td>-0.0437* (0.054)</td>
<td></td>
</tr>
<tr>
<td>Board size × Canadian only</td>
<td>-0.0569*** (0.000)</td>
<td>-0.0611*** (0.000)</td>
<td></td>
</tr>
<tr>
<td>Board independence × cross-listed</td>
<td>-0.1283*** (0.000)</td>
<td>-0.1372*** (0.000)</td>
<td></td>
</tr>
<tr>
<td>Board independence × Canadian only</td>
<td>-0.0268* (0.075)</td>
<td>-0.0277* (0.066)</td>
<td></td>
</tr>
<tr>
<td>Female directors × cross-listed</td>
<td>-0.1619*** (0.001)</td>
<td>-0.1682*** (0.002)</td>
<td></td>
</tr>
<tr>
<td>Female directors × Canadian only</td>
<td>-0.2848*** (0.000)</td>
<td>-0.2683*** (0.000)</td>
<td></td>
</tr>
<tr>
<td>Institutional holdings × cross-listed</td>
<td>0.0193 (0.142)</td>
<td>-0.0195 (0.131)</td>
<td></td>
</tr>
<tr>
<td>Institutional holdings × Canadian only</td>
<td>0.0188*** (0.007)</td>
<td>0.0193*** (0.003)</td>
<td></td>
</tr>
<tr>
<td>Inside ownership × cross-listed</td>
<td>0.0062* (0.081)</td>
<td>0.0058* (0.063)</td>
<td></td>
</tr>
<tr>
<td>Inside ownership × Canadian only</td>
<td>-0.0044 (0.134)</td>
<td>-0.0033 (0.215)</td>
<td></td>
</tr>
<tr>
<td>ESG disclosure score × cross-listed</td>
<td>0.0005 (0.352)</td>
<td>0.0005 (0.414)</td>
<td></td>
</tr>
<tr>
<td>ESG disclosure score × Canadian only</td>
<td>0.0023*** (0.001)</td>
<td>0.0022*** (0.000)</td>
<td></td>
</tr>
<tr>
<td>Family control × cross-listed</td>
<td>-0.0072 (0.704)</td>
<td>0.0117 (0.579)</td>
<td></td>
</tr>
<tr>
<td>Family control × Canadian only</td>
<td>0.0157* (0.057)</td>
<td>0.0201* (0.053)</td>
<td></td>
</tr>
<tr>
<td>Cross-listed</td>
<td>0.6778*** (0.000)</td>
<td>0.6966*** (0.000)</td>
<td></td>
</tr>
<tr>
<td>Year cross-listed</td>
<td>-0.0019*** (0.000)</td>
<td>-0.0018*** (0.003)</td>
<td></td>
</tr>
<tr>
<td>Log (sales)</td>
<td>-0.0205*** (0.000)</td>
<td>-0.0202*** (0.000)</td>
<td></td>
</tr>
<tr>
<td>Market-to-book</td>
<td>-0.0090*** (0.037)</td>
<td>-0.0103*** (0.008)</td>
<td></td>
</tr>
<tr>
<td>Debt-to-assets</td>
<td>-0.1579*** (0.000)</td>
<td>-0.1657*** (0.000)</td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td>-0.0362 (0.330)</td>
<td>-0.0124 (0.715)</td>
<td></td>
</tr>
<tr>
<td>R&amp;D</td>
<td>0.3473*** (0.085)</td>
<td>0.5313*** (0.005)</td>
<td></td>
</tr>
<tr>
<td>No. observations</td>
<td>1,280</td>
<td>1,280</td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.4297</td>
<td>0.417</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Coefficients are from OLS and industry fixed effects regressions of the effect of corporate governance mechanisms on firm risk. Volatility is the annualized standard deviation of daily stock returns. CEO tenure is the number of years the CEO has been in office. CEO cash compensation is the ratio of cash compensation to total compensation. Market-to-book is (Book value of debt + market value of equity)/(Book value of assets). Debt-to-assets is the ratio of total long-term debt to total assets. ROA is the ratio of net income to total assets. R&D is R&D expenditures/total assets. Duality equals 1 means that CEO is also the chair of the board and 0 otherwise. Board size is the total number of directors on the board. Board independence is number of independent directors/total directors on the board. Institutional holdings are the percentage of equity held by institutions. Insider shareholdings are the percentage of equity held by management and employees. Female directors are the percentage of female directors on the board. ESG disclosure score is provided by Bloomberg and ranges between 0 and 100. Family equals 1 if the company is a family owned company and 0 otherwise. *, **, ***Significant at the 1, 5 and 10 percent levels, respectively.

Table IV. Regressions of corporate governance mechanisms on firm risk with interactions with cross-listed and Canadian only variables.
firm does not affect the relation between board characteristics and firm risk. Overall, the results do not support \( H1 \) and \( H2 \), but provide support for \( H3 \).

The coefficients on institutional shareholdings are positive and significant in Canadian only firms. The coefficients on institutional shareholdings are negative but insignificant in cross-listed firms. It seems that institutional investors tend to encourage risk taking in cross-listed firms only. Similarly, the coefficients on ESG disclosure scores are positive and significant for Canadian only firms. In cross-listed firms, ESG disclosure scores do not seem to have a significant effect on firm risk. This result suggests that ESG disclosure reduces information asymmetry in Canadian only firms, where there is more information asymmetry. Since cross-listing itself contributes to the reduction of information asymmetry, ESG disclosure loses some of this effect. This result confirms \( H7 \). Finally, the coefficients on family control are positive and significant in Canadian only firms and not significant in cross-listed firms, supporting \( H8 \).

The coefficients on all other control variables are generally of the expected signs. Larger firms are less risky, greater R&D investment is positively associated with risk and market-to-book ratios have a negative effect on risk. However, contrary to the expectations, leverage has a negative effect on risk.

4.3 Corporate governance and firm risk: robustness test using a two-year lag
The benchmark regressions use a one-year lag between firm risk and the control variables. In order to see if the results are sensitive to a change in this lag, a two-year lag is used. The results are presented in Table V. The coefficients on all variables of interest generally stay the same. CEO duality continues to have a positive effect on cross-listed firms only. All variables for board characteristics have the same signs and significance and there is no differential effect for cross-listed firms. Institutional shareholdings, ESG disclosure scores and family control have a positive and significant effect in Canadian only firms and no significant effect on risk in cross-listed firms. These results provide robustness to the baseline regressions.

5. Conclusion and discussion
This study empirically estimates the effects of corporate governance mechanisms on firm risk in cross-listed and Canadian only firms. The results show that the effect of some of the mechanisms changes between cross-listed and Canadian only firms. CEO duality and inside stock ownership are positively related to firm risk only in cross-listed firms. It seems that cross-listing magnifies the effect of these mechanisms on firm risk and acts as a complementary mechanism. Institutional shareholdings, ESG disclosure scores and family control affect risk only for Canadian only firms, indicating that the cross-listing status substitutes and mitigates the effect of these mechanisms on firm risk. Board size, board independence and the proportion of female directors have the same effect regardless of the cross-listing status of the firm.

Overall, the results suggest that the cross-listing status changes the impact of some of the governance mechanisms but does not affect others. These changes can be attributed to the distinct characteristics of Canadian companies. Specifically, differences in the ownership structure and control, and the bonding effect and increased scrutiny for firms cross-listing in the US markets, may be the factors that result in a differential effect of the same mechanisms. Using the Canadian context also allows to test if institutional differences in capital markets and regulations impact the effect of governance on firm risk. Future research could apply this study to other countries and companies that cross-list in US markets.

Although we assume that governance mechanisms are exogenous and use a one-year lag between firm risk and governance mechanisms, there may be concerns about endogeneity. This may be a limitation of this study. However, since we are interested in the differential effect of the governance mechanisms, we do not explore the decision to cross-list. As a matter of fact, most of the firms included in our study cross-listed long before the start of our sample
period. Cross-listing is a one-time event and does not affect governance every year. There is a concern that the same variables that affect the decision to cross-list may also affect these mechanisms. To address that issue, we include market-to-book ratio, R&D expenditures and leverage as control variables. We also include a binary variable (Year cross-listed) to control for the systematic effect of cross-listing on firm risk and governance mechanisms.

Notes
1. The Canadian Securities Administrators created by ten provincial and three territories regulators in Canada is an attempt to harmonize the overall investment regulation in the country.
2. For a description of the data, see www.policyalternatives.ca/ceo2016. We thank Mr Hugh Mackenzie at Canadian Centre for Policy Alternatives for providing us the data.

4. Bloomberg researchers compile ESG data on over 11,000 companies from published reports and news items. This score measures transparency, not performance. The more information a company discloses the higher is the score.

5. The Family Advantage, October 2015.

6. Notice that Canadian only $= 1 –$ cross-listed.

References


**Further reading**


**Corresponding author**

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The impact of family vs non-family governance contingencies on CSR reporting in Bangladesh

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Department of Accountancy and Finance, University of Otago,
Dunedin, New Zealand

Abstract

Purpose – Based on the socioemotional wealth (SEW) perspective and agency theory, the purpose of this paper is to examine how the introduction of the 2006 Corporate Governance (CG) Guidelines and family governance affected the level of the corporate social responsibility (CSR) reporting of non-financial companies in Bangladesh.

Design/methodology/approach – The authors use multivariate regression to analyse 2,637 firm-level annual observations, from 1996 to 2011 annual reports of Bangladeshi publicly listed non-financial-sector companies, to investigate how firm-level CG quality affects CSR disclosure in family and non-family firms.

Findings – CG quality significantly increases the level of CSR disclosure and this relationship is stronger prior to the new CG Guidelines. Family firms’ CSR reporting levels are significantly lower than non-family firms, and this effect is stronger after the change in the CG Guidelines. CEO duality, the presence of an audit committee and profitability improve family-firm CSR reporting in Bangladesh, while non-family CSR disclosures are positively associated with board size and firm competition. Board independence is not related to CSR disclosure.

Originality/value – The authors provide evidence of the benefit of the CG Guidelines’ introduction on company CSR disclosure in an emerging economy and the importance of specific governance mechanisms that differentiate family and non-family-firm CSR disclosures in Bangladesh using a SEW framework.

Keywords Corporate governance, Bangladesh, Family firms, Corporate social responsibility, Socioemotional wealth

Paper type Research paper

1. Introduction

The Rana Plaza factory collapse and fire in 2013 in Bangladesh which killed 1,134 people serves as a strong reminder of the importance of corporate social responsibility (CSR) and the impact of companies on individuals and communities. The failure of the owners and directors to ensure the safety of their employees questions the adequacy of regulatory and CSR governance mechanisms. In particular, evidence from Italy that family firms disseminate a wider range of CSR reports but are typically less compliant with CSR standards and give different emphasis to CSR topics than non-family firms (Campopiano and De Massis, 2015) challenges the value of these firm disclosures. To what extent such findings apply to other countries with different institutional settings remains an empirical question. Therefore, to add evidence on CSR reporting in family vs non-family firms in a different research context, our first research question asks:

RQ1. Does family involvement affect CSR reporting?

Family involvement affects economic and non-economic goals, characterizing firm behaviour (Kotlar and De Massis, 2013) and preserving family socioemotional wealth (SEW) to enhance sustainability (Berrone et al., 2012[1]). Avoidable catastrophes, such as Rana Plaza, point to the urgency of understanding the association between CSR reporting and a firm’s propensity to act responsibly as a citizen in the business community. Malignment of risk and reward due to unequal voting and cash flow rights can result in decisions that benefit the family but not the business (Bendickson et al., 2016). Marques et al. (2014) argue that continuation is critical to
family owner satisfaction for companies with high family involvement. This argument moves owners from a self-interest perspective to one of long-run sustainability for all stakeholders. Using SEW analysis, they find that family participation in the firm and the importance of managing family roles in governance, management and staff are critical to CSR engagement. Building on the SEW framework, Samara and Berbegal-Mirabent (2018) report that regardless of the institutional setting, in firms with 100 per cent family ownership and first-generation leadership, environmental and social performance is catalysed by two governance configurations. One has high family presence on the board and low family involvement in management. The other finds value in outside directors offsetting the loss of social capital from high family participation in the management team as well as mitigating intra-family conflict of interest. The second type of governance configuration is generally promoted in the Anglo-Saxon countries and adopted in other countries and is based on the premise that improved corporate governance (CG) arising from such configuration raises the level of transparency, voluntary disclosure and the level of CSR reporting (Jizi et al., 2014) in both developed and emerging countries. However, there are studies that cast doubt on the efficacy of a western-styled CG model for countries with high ownership concentration and family dominance (Siddiqui, 2010; Chen et al., 2011). To examine the issue further, our second research asks:

RQ2. How do board composition and improvements in country-level CG standards affect CSR reporting?

We examine our two research questions in the context of an emerging country, Bangladesh. Similar to other emerging countries, Bangladesh faces a special set of challenges associated with CG standards and their impact on CSR reporting because it typically displays higher levels of corruption and poverty and has limited resources and legislation for prevention and remediation of both social and environmental problems (Samara and Berbegal-Mirabent, 2018; Kim et al., 2017). In addition, issues of competition and firm survival in this eighth most populous and rapidly industrialising nation plus the high incidence of family-owned and closely-held firms (Farooque et al., 2007) mean that not all Bangladeshi firms display equal interest in CSR accountability and reporting (Momim, 2013[2]. To improve the CG practices of listed companies, the Bangladesh Securities and Exchange Commission issued CG Guidelines on 20 February 2006, requiring listed companies to disclose the extent of compliance and any reasons for non-compliance. A lack of effective monitoring and enforcement of securities regulations and the dominance of family ownership render the impact of the CG requirements on firm-level CSR practices unclear.

The main premise of SEW is that family members manage the business so as to preserve and increase the social and economic benefits gained by the family from firm involvement. Central to the SEW perspective is that family firms strive to pursue non-economic family-centred goals (Gómez-Mejía et al., 2007). Cruz et al. (2014) and Kim et al. (2017) show that SEW can both benefit and disadvantage CSR initiatives. We examine the two-sided nature of SEW in terms of CG mechanisms that can foster the benefits of SEW and that can mitigate the disadvantages of SEW. First, a desire for inter-generational succession and preservation of a good family image will increase firm CSR for wholly owned family firms. However, family firms that share business ownership with outsiders may develop a more myopic orientation and a preference for more short-term profits. Controlling family ownership also gives owners the option of not responding to stakeholders’ CSR requests. Second, greater family control means that family board members have the emotional and reputational incentives and the directorial influence to oversee decisions (De Massis et al., 2014) concerning the firm’s CSR commitments (Sharma and Sharma, 2011). Conversely, non-family directors bring a more open attitude to CSR reporting. They are less concerned about the cost of meeting CSR requirements and are able to act outside the overriding
influence of family members. Therefore, larger boards with outside directors can make and implement more dynamic CSR decisions (Chakraborty, 2017). However, asymmetric family altruism (Kellermanns et al., 2012) may create intra-family conflict, reducing resources available for CSR initiatives. Third, outside board directors can monitor self-serving behaviour and identify opportunities where the firm can increase its CSR performance (Le Breton-Miller and Miller, 2016). A mix of family and outside directors is considered optimal (Samara et al., 2018). However, family influence and control over business decisions may lead to outside appointments based on family ties and personal connections compromising independence (Caiazzi and Simoni, 2015) and reducing the board’s capabilities and resources to increase CSR performance (Cuadrado-Ballesteros et al., 2015).

SEW bias means that family firms can have a positive effect on CSR linked to external stakeholders, yet have a negative impact on the internal social dimensions of the firm. Family firms can be socially responsible and irresponsible at the same time (Cruz et al., 2014). Institutional and organisational conditions can act as catalysts in the relationship between firm type and CSR. We examine how SEW affects the introduction of CG guidelines in Bangladesh and the impact of different governance contingencies on the opposing outcomes of SEW. We report that the impact of the CG Guidelines on CSR practices is significant and positive for family and non-family firms. CEO duality, audit committees and profitability enhance family-firm CSR disclosures, whereas larger boards and greater competition are related to non-family-firm CSR disclosure. Family ownership and control reduces the level of CSR disclosure in Bangladesh. In particular, environmental and employee disclosures are significantly lower following the change in mandated CG disclosures. Our findings show that while greater changes in governance improve CSR disclosure, the adoption of more independent boards by family firms is simply to comply with the new regulation. This research contributes to the SEW theory framework in the context of an emerging market introducing more stringent CG guidelines. We report that firms are not voluntarily increasing their governance metrics beyond what is required following the change in regulation. In practice, our results point to the need for regulators to adopt more stringent CSR requirements and enforcement that target family controlled firms.

2. Literature review and hypotheses development

The analysis is grounded in the theory of SEW (Gómez-Mejía et al., 2007), which is a general extension of behavioural agency theory, and states that family owners take decisions based on how they will affect their socioemotional endowment. Family-firm decisions protect SEW. This can lead to decisions that either enhance or detract from proactive stakeholder engagement (Kellermanns et al., 2012). As the global marketplace demands greater transparency concerning verifiable sustainable and ethical supply chains, firms face greater demands concerning stakeholder expectations and information needs about business practice (González-Benito et al., 2011). This is particularly challenging in an emerging economy such as Bangladesh, where business practice and accountability is difficult to monitor. Given that SEW can be associated with either a positive or negative valence (Kellermanns et al., 2012), firms can engage in harmful stakeholder behaviours while having strong SEW. We focus on CSR disclosure prior to and after a change in CG Guidelines. We consider SEW as being both beneficial and disadvantageous, depending on the combination of several governance contingencies that can improve or limit a family firm’s ability to increase its social performance. The study uses the conceptual model given in Figure 1 to explore the relation between CG and CSR disclosure.

Under SEW, absolute family ownership associates the family’s reputation with that of the firm and increases CSR reporting, preserving a good family image and protecting inter-generational succession (Campopiano and De Massis, 2015). However, family ownership can also make controlling owners less responsive to stakeholder requests, reducing CSR reporting, keeping financial resources within the firm at the expense of CSR
Based on the closed nature of family firms in Bangladesh (Farooque et al., 2007) we propose the following hypothesis:

**H1.** Family firms have lower levels of CSR reporting.

A lack of effective regulation and subsequent legitimacy in the Bangladesh market means that organisations have little motivation to act in a socially acceptable manner unless such action is directly related to organisational resources (Siddiqui, 2010). The absence of corporate social accountability has been compounded by a lack of any private CG regulatory initiatives. Weak CG has also been cited as a key reason for the lack of investor confidence in the financial statements of Bangladeshi listed companies (Asian Development Bank, 2005) and resulted in the issuance of guidelines for CG practices by listed companies in January 2006 (Bangladesh Securities and Exchange Commission, 2006)[3]. These guidelines required improvements (or an explanation of non-compliance), such as separation of the CEO and the chair, greater board independence[4], restrictions relating to board size (between 5 and 20) and the provision of audit committees.

Given Bangladesh’s political, cultural and economic forces, the market offers little protection to minority shareholders (Solaiman, 2006), challenging the efficacy of the Anglo-American-style CG Guidelines (Li and Harrison, 2008; Haxhi and van Ees, 2010). An undeveloped capital market, together with a high reliance on bank financing, limited monitoring, a poor legal framework (Siddiqui, 2010) and weak insider trading legislation and enforcement (Biswas, 2012), means that CG monitoring and enforcement mechanisms are weak, allowing many wrongdoers to go undetected (Uddin and Choudhury, 2008; World Bank, 2009). These tensions are further complicated by the prevalence of corruption in Bangladesh, which is one of the “most important determinants of social and environmental performance” in emerging markets (Claessens and Yurtoglu, 2013, p. 19)[5]. In this institutional setting, we examine the relationship between different board characteristics and CSR reporting using the SEW framework.

Under the SEW framework, CEO duality may strengthen family managers’ emotional and reputational incentives and ability (Samara and Arenas, 2017) to improve the firm’s CSR performance. Greater family control means the family has the power to influence the firm’s CSR (De Massis et al., 2014). The disadvantage of CEO duality is that family members can behave opportunistically. Conflicts of interest between family members (Le Breton-Miller and Miller, 2016) and disagreements about how resources should be invested may result in the CEO-chairman being distracted by intra-family conflict, decreasing the CSR endeavours of family firms. Based on the competing arguments, we examine the benefits and costs of CEO duality on CSR reporting using the following non-directional hypothesis:

**H2a.** There is an association between CEO duality and CSR reporting.

Independent directors bring objectivity and impartiality enabling them to monitor board decisions. Family firms may appoint outside directors to serve and advise managers, identifying opportunities for family firms to improve CSR practices. Under SEW, these benefits improve CSR decisions when they are undertaken with family board members.

![Conceptual model](image.png)
However, the effectiveness of outside directors is reduced when controlling owners make appointments based on family ties and personal connections (Cuadrado-Ballesteros et al., 2015). These limit CSR initiatives due to coercion to comply with family desires (Samara and Arenas, 2017). Given the competing arguments postulated here, we examine the impact of board independence on CSR reporting using the following hypothesis:

**H2b.** There is an association between board independence and CSR reporting.

Under SEW, small boards dominated by family members will prioritise the desire to promote inter-generational succession while preserving their family image. Consistent with this view, family controlled boards will promote CSR reporting, seeing its benefits for future generations. Conversely, these boards may choose to preserve family financial resources, allowing owners to ignore stakeholders’ CSR demands. Larger boards can monitor self-serving behaviour and direct resources to increase CSR performance (Bammens et al., 2011). They reduce family director dominance, giving institutional investors the chance to influence the short- and long-run welfare of the firm. If outside owners’ interests are focussed on short-term financial gain, CSR changes that benefit stakeholders will be limited, whereas a genuine concern for the long-term promotion of CSR benefits that improve employee welfare may improve CSR reporting. We examine the relation between board size and CSR reporting using the following hypothesis:

**H2c.** There is an association between board size and CSR reporting.

The conceptual model displayed in Figure 1 suggests that family firms, together with CG Guidelines, influence CG quality that in turn affects CSR reporting. Using the SEW framework, family ownership can enhance or compromise CSR reporting. Equally, each of the CG Guidelines can also support or hinder the family’s choice to promote or ignore CSR within the business. We examine the role of CG quality on CSR reporting using the following hypothesis:

**H3a.** There is a positive association between the change in CG quality and the change in CSR reporting with the implementation of the new CG Guidelines.

The introduction of the new CG Guidelines may strengthen CG mechanisms within the firm or not. Firms where governance is already effective may observe little change in CSR reporting, whereas firms adopting the new guidelines for the first time may change their CSR reporting practice. We examine the association between the new CG Guidelines and CSR reporting using the following hypothesis:

**H3b.** New CG Guidelines have a positive effect on CSR reporting.

Family ownership and control brings an additional dimension to the CG-CSR relationship in Bangladesh. Boards of directors in Bangladeshi firms are primarily dominated by governing or sponsor (founder) families (Farooque et al., 2007; Uddin and Choudhury, 2008). On average, the top five stockholders hold more than 50 per cent of a firm’s outstanding stock, and company boards frequently consist of executive directors, CEO and a chair from the controlling family (Siddiqui, 2010).

Because Bangladesh has such a high level of family-firm ownership and the CG Guidelines take a “comply-or-explain” approach, it is possible that family firms have followed the requirements of the CG Guidelines but not the “spirit” of the guidelines. Claessens and Yurtoglu (2013, p. 24) explain that any reforms to CG involve “changes in control and power structures, with associated losses in wealth.” Therefore, the powerful controlling families of Bangladeshi businesses may resist such change. For example, the requirement to split the position of chair and CEO may result in a husband and wife taking these positions so as to retain family control. The positions are technically split, but because Bangladesh society is “dominated by a patrilineal and patrilocal kinship system”
(Muttakin et al., 2015, p. 359), the wife may not be fully engaged and have limited power, influence or skills (Uddin and Choudhury, 2008), and so offer little to the board. Similarly, the finding of Sobhan (2016) that family controlled firms in Bangladesh tend to overstate compliance with the CG Guidelines also suggests “compliance-in-letter” by family firms, implying that governance improvement on paper for these firms may not result in improvement in CSR practices. Khan et al. (2013) and Muttakin and Khan (2014) find that higher managerial ownership or ownership by family directors has a negative influence on CSR reporting. We examine the impact of the new CG Guidelines on CG quality and CSR reporting with the following hypothesis:

\[ H4. \text{ The new CG Guidelines have a positive effect on the relationship between overall CG quality and CSR reporting for family firms.} \]

3. Data and methodology

The data consist of an unbalanced panel data set of 2,637 firm-level yearly observations from 1996 to 2011 (16 years), hand-collected from the annual reports of Bangladeshi publicly listed non-financial-sector companies. From a potential 2,805 observations, 168 were omitted due to incomplete information. The time frame of the study is long enough to measure CSR sensitivity to changes in the CG Guidelines before and after they came into effect[6]. The comprehensive sample allows examination of the evolution of and relationship between CG and CSR practices over this period and identification of any changes to CG and CSR practices before and after the introduction of the CG Guidelines requirements.

Multivariate regression is used to investigate the extent to which variability across firms in the overall CSR disclosure index \( CSRI \) is explained by firm-level overall governance quality \( \text{GovScore} \) after controlling for different firm characteristics, industry classifications and years. The study uses both individual governance elements and composite indexes, as it is unlikely that a single characteristic adequately captures governance complexity (Bauer et al., 2008). The CSR data set comprises 50 elements. The following model is estimated:

\[
CSRI_{i,t} = f(\text{Gov}_{i,t}, \text{FamFirm}_{i,t}, X_{i,t}, Z_{i,t}, e_{i,t}),
\]

where \( CSRI_{i,t} \) is the CSR disclosure index for firm \( i \) in year \( t \); \( \text{Gov}_{i,t} \) either the CG quality score for firm \( i \) in year \( t \) (\( \text{GovScore} \)), or the separate governance measures – board size \( (\ln \text{BoardSize}_{i,t}) \), CEO duality \( (\text{CEODual}_{i,t}) \) and board independence \( (\text{IndPct}_{i,t}) \) as independent factors in the model; \( \ln \text{BoardSize}_{i,t} \), the natural log of the number of directors on the board; \( \text{CEODual}_{i,t} \), a dummy variable indicating a CEO who is also chairman of the board; \( \text{IndPct}_{i,t} \), the percentage of independent directors for firm \( i \) in year \( t \); \( \text{FamFirm}_{i,t} \), a measure of family firm for firm \( i \) in year \( t \); \( X_{i,t} \), firm-level determinants of \( CSRI \) for firm \( i \) in year \( t \); \( Z_{i,t} \), control variables for firm \( i \) in year \( t \); and \( e_{i,t} \), a residual term for firm \( i \) in year \( t \).

The dependent and independent variables and their definitions and measurements are detailed in Table I.

CG is measured using a firm-level CG score \( (\text{GovScore}) \). It is an unweighted aggregate of scores (Cooke, 1989) on 65 CG elements within four categories: ownership structure and investor rights (9 elements); financial transparency and information disclosure in the annual report (15 elements); board and management structure and process (29 elements); and auditing (12 elements) (Table AI). The score ranges from 0 to 65. To test \( H2a-H2c \), we use three measures – board size, CEO duality and percentage of independent directors – to proxy for firm CG. For consistency with prior research (e.g. Anderson et al., 2004; Wintoki et al., 2012), board size is the natural log of the total number of directors serving on the board \( (\ln \text{BoardSize}_{i,t}) \), CEO duality is a dummy variable that equals one if the CEO is also the
based on previous literature (Haniffa and Cooke, 2005; Branco and Rodrigues, 2008; Khan et al., 2013), 50 items applicable to the Bangladesh environment were selected to measure CSR reporting. These were scored within five sub-indexes which cover both environmental/natural and social/fairness aspects of CSR and were amalgamated to measure the extent of CSR reporting in Bangladesh (Table AII). A CSR Index (CSRI) (ranging from 0 to 100) was calculated for each company to measure its relative level of disclosure (Cooke, 1989[7]):

\[
CSRI_{i,j} = \frac{\text{Company's Total Score}}{\text{Number of items applicable to the firm}} \times 100. \tag{2}
\]

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Label</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governance quality</td>
<td>GovScore</td>
<td>Governance quality based on 65 governance items</td>
</tr>
<tr>
<td>Board size</td>
<td>LnBoardSize</td>
<td>Natural log of number of directors on the board</td>
</tr>
<tr>
<td>CEO duality</td>
<td>CEODual</td>
<td>Dummy variable indicating a CEO who is also chairman of the board and zero otherwise</td>
</tr>
<tr>
<td>Board independence</td>
<td>IndPct</td>
<td>Number of independent directors (\div) Board size</td>
</tr>
<tr>
<td>Audit committee</td>
<td>AudCom</td>
<td>Dummy variable indicating presence of board audit committee and zero otherwise</td>
</tr>
<tr>
<td>Changes in governance quality</td>
<td>(\Delta\text{GovScore})</td>
<td>Post-CG Guidelines GovScore (-) Pre-CG Guidelines GovScore</td>
</tr>
<tr>
<td>CSR Sub-Index I</td>
<td>Community</td>
<td>(Firm score based on 7 CSR items on community involvement (\div) items applicable to a particular firm) (\times) 100</td>
</tr>
<tr>
<td>CSR Sub-Index II</td>
<td>Environment</td>
<td>(Firm score based on 8 CSR items on environmental disclosure (\div) items applicable to a particular firm) (\times) 100</td>
</tr>
<tr>
<td>CSR Sub-Index III</td>
<td>Employee information</td>
<td>(Firm score based on 19 CSR items on employee information (\div) items applicable to a particular firm) (\times) 100</td>
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<tr>
<td>CSR Sub-Index IV</td>
<td>Product and service</td>
<td>(Firm score based on 6 CSR items on product and service information (\div) items applicable to a particular firm) (\times) 100</td>
</tr>
<tr>
<td>CSR Sub-Index V</td>
<td>Other social responsibility</td>
<td>(Firm score based on 10 CSR items on other social responsibility disclosure (\div) items applicable to a particular firm) (\times) 100</td>
</tr>
<tr>
<td>Changes in CSR reporting</td>
<td>(\Delta\text{CSRI})</td>
<td>Post-CG Guidelines CSRI (-) Pre-CG Guidelines CSRI</td>
</tr>
<tr>
<td>Advertising intensity</td>
<td>AdIntens</td>
<td>Ln (advertising &amp; promotional expenditure (\div) Total assets) + 1)</td>
</tr>
<tr>
<td>Firm size</td>
<td>LnTA</td>
<td>Natural log of total assets</td>
</tr>
<tr>
<td>Profitability</td>
<td>ROA</td>
<td>Return on assets (EBITDA (\div) Total assets)</td>
</tr>
<tr>
<td>Leverage ratio</td>
<td>Leverage</td>
<td>Total liabilities (\div) Total assets</td>
</tr>
<tr>
<td>Capital expenditure ratio</td>
<td>Capexp</td>
<td>Capital expenditure (\div) Total assets</td>
</tr>
<tr>
<td>Firm risk</td>
<td>StockVol</td>
<td>Weekly stock return volatility over a 52-week period ending on the Balance Sheet date</td>
</tr>
<tr>
<td>Foreign sponsor</td>
<td>FrgnSponsor</td>
<td>Ownership by foreign sponsors in %</td>
</tr>
<tr>
<td>Outside ownership</td>
<td>OutsideOwn</td>
<td>Ownership by institutional shareholders, government, foreign investors and general public in %</td>
</tr>
<tr>
<td>Firm age</td>
<td>FirmAge</td>
<td>Natural log of number of years since listing on the stock exchange</td>
</tr>
<tr>
<td>Family presence on board</td>
<td>FamPct</td>
<td>Number of family members on board (\div) board size</td>
</tr>
<tr>
<td>Family firm</td>
<td>FamFirm</td>
<td>Dummy variable indicating family firm</td>
</tr>
<tr>
<td>Regulation change</td>
<td>REGC</td>
<td>Dummy variable indicating introduction of CG Guidelines in January 2006. REGC is coded as 1 if the financial year-end date is December 31, 2006 or later and zero otherwise</td>
</tr>
</tbody>
</table>
Family firms are identified by a dummy variable \((FamFirm)\). Non-family firms are identified when one of the following conditions is met:

1. minimum of 20 per cent ownership by either government or overseas shareholders;
2. except for public ownership, institutional ownership is the highest in the firm and institutional shareholders nominate at least two directors; and
3. no family relationship among the directors or no director, including his/her family members, has at least 20 per cent ownership in the firm.

The proportion of family members on the board is used as a second proxy for family firm. Non-family firms are coded as 0, and firms not meeting the conditions above are considered to be family firms and are coded as 1.

The overall sample period was divided into pre- and post-CG Guidelines periods. The pre-CG Guidelines period includes observations whose financial year-end date is prior to 31 December 2005. The CG Guidelines were originally issued on 9 January 2006, and most companies with a balance date of 31 December 2005 disclosed the compliance statement in their 2005 annual reports. Also a dummy variable indicating the post-CG Guidelines period is included in the model to examine the effect of the CG Guidelines.

The control variables (firm size; firm profitability; growth opportunities; advertising intensity; leverage; multinational subsidiary; firm age; and ownership by insiders, institutions, foreign shareholders and government) follow those used in prior literature (Harjoto and Jo, 2011; Muttakin and Khan, 2014; Biswas, 2015). Year and industry dummies control for year and industry fixed effects and address any possible endogeneity bias. The rationale for industry fixed effects is that firms in the same industry are likely to face similar production technologies and market conditions (Boone et al., 2007).

4. Results

4.1 Key empirical results

Descriptive statistics for the continuous and count variables for the period 1996–2011 are reported in Panels A and B of Table II. \(GovScore\) has a mean value of 25.08 and ranges from 7 to 60. \(CSRI\) has a mean value of 27.84 with a minimum of 2.08 and maximum of 80.0. The range of 77.92 for \(CSRI\) indicates a lot of variation in the overall level of the index. The individual CSR sub-indexes also have a high degree of variation. Average independent board representation is 4 per cent, and this ranges from all non-independent boards to 38 per cent of the directors being independent. Only 27 per cent of firm-year observations indicate the presence of an audit committee, but CEO duality is present in 40 per cent of cases. Mean advertising intensity, \(ROA\) and leverage are 0.28, 6.53 and 67 per cent, respectively. The sample has relatively low firm risk, with an average risk of 7 per cent per annum. Foreign and outside ownership (institutional, government, foreign investors and general public) have mean interests of 4.12 and 16.28 per cent, respectively. The mean board size is 6.4. Family representation on the board has a mean of 51 per cent. Some firms have no family board members and others have boards where all the directors are family members. About three in every four firms are family firms. Panel B of Table II reports the level of \(CSRI\) before and after the 2006 change in disclosure requirements. As expected, CSR disclosure is higher for non-family firms pre- and post-2006. For both family firms and non-family firms, the \(CSRI\) and \(GovScore\) are statistically higher after 2006. The average family-firm \(CSRI\) (\(GovScore\)) increased from 25.43 (16.51) to 28.51 (38.57), while the average non-family-firm \(CSRI\) (\(GovScore\)) rose from 28.49 (16.93) to 35.46 (39.86). The positive significant \(t\)-statistics reported in Table II show that the new CG Guidelines improved overall CG and CSR disclosures for family-and non-family-owned firms in Bangladesh, which supports H3b[8]. For the group of firms that had an audit committee, 73 per cent were non-family and
<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
<th>n</th>
<th>%</th>
<th>CSRI Before</th>
<th>CSRI After</th>
<th>t-stat</th>
<th>GovScore Before</th>
<th>GovScore After</th>
<th>t-stat</th>
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<tbody>
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<td>FamFirm</td>
<td>0</td>
<td>676</td>
<td>25.64</td>
<td>28.49</td>
<td>35.46</td>
<td>7.04***</td>
<td>16.92</td>
<td>39.86</td>
<td>−41.44***</td>
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<td></td>
<td>1</td>
<td>1,961</td>
<td>74.36</td>
<td>25.43</td>
<td>28.51</td>
<td>5.84***</td>
<td>16.51</td>
<td>38.57</td>
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<tr>
<td>CEODual</td>
<td>0</td>
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<td>59.80</td>
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<tr>
<td></td>
<td>1</td>
<td>1.060</td>
<td>40.20</td>
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</table>

Notes: Variable definitions are in Table I. ***Significant at the 1 per cent level
27 per cent were family firms. For firms where the CEO was also the chair, 60 per cent were non-family and 40 per cent were family.

Table III reports the Pearson’s product-moment correlations. CSRI is correlated with all the other continuous variables except insider ownership. The correlations are statistically significant at 5 per cent level. Most correlation coefficients are below 0.42.

Figure 2 shows the change in governance for family- and non-family-owned firms over the period of the study. It highlights the gradual increase in governance for both groups of firms leading up to and subsequent to the change in the 2006 CG requirements. Family-firm governance lagged below non-family-firm governance levels prior to 2009. However, family-firm governance improved during the last two years of the study and is surprisingly marginally higher than that of non-family firms. In contrast, overall CSR disclosure reported

<table>
<thead>
<tr>
<th>Variable</th>
<th>CSRI</th>
<th>GovScore</th>
<th>LnBoardSize</th>
<th>IndPct</th>
<th>AdvIntens</th>
<th>LnTA</th>
<th>ROA</th>
<th>Leverage</th>
<th>Capexp</th>
<th>FrgnSponsor</th>
<th>OutPct</th>
<th>FamPct</th>
<th>FirmAge</th>
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<tbody>
<tr>
<td>GovScore</td>
<td>0.44***</td>
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<td></td>
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<tr>
<td>LnBoardSize</td>
<td>0.31***</td>
<td>0.32***</td>
<td></td>
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<tr>
<td>IndPct</td>
<td>0.25***</td>
<td>0.78***</td>
<td>0.16***</td>
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**Notes:** Variable definitions are in Table I. ***Significant at 10, 5 and 1 per cent levels, respectively

**Table III.** Pearson’s rank correlation coefficients

**Figure 2.** Family- and non-family-firm governance over the sample period.
in Figure 3 shows that the non-family-firm CSR disclosure has been consistently higher than family firms’ CSR disclosure despite the change in CG requirements for both types of firms. The family CSRI was relatively unchanged for the years 2006–2008; however, the CSRI for family firms from 2008 to 2011 showed a greater rate of annual growth (25.50 per cent) compared with non-family firms (8.50 per cent) over the same period.

Table IV reports the results for the pooled ordinary least square (OLS) regressions to test the relationship between governance and CSR disclosure[9]. The models reported in columns (1), (2) and (3) include separate measures for board size (LnBoardSize), CEO duality (CEODual), percentage of independent directors (IndPct) and presence of a board audit committee (AudCom) during the post-CG Guidelines period, respectively. These measures are each used to proxy for governance[10]. The coefficient on the family-firm dummy variable in column (1) is negative and significant. This is consistent with the SEW prediction that controlling owners are less responsive to stakeholder requests, resulting in lower CSR disclosure (supports H1). The positive, significant association between CEO duality and CSR disclosure supports H2a. Consistent with SEW, greater family control has a positive influence on the firm’s CSR decisions. The coefficient on board independence is not statistically significant, implying that H2b is not supported. This is in contrast with the positive relationship, as reported in Khan et al. (2013), and suggests that the CG Guidelines requirement of at least one independent director is not sufficient to exert additional pressure on the mostly family-dominated management to improve the CSR reporting level in Bangladesh. The significant positive relationship between board size and CSR is consistent with larger boards, including more non-family directors who provide a better monitoring function. According to SEW, the board is better able to direct resources to improve CSR performance (supports H2c). Consistent with Khan et al. (2013), the presence of an audit committee (AudCom) positively affects CSR disclosure. Finally, competition, profitability, firm size and age are all associated with higher levels of CSR disclosure.

Columns (2) and (3) of Table IV report the model for CSR disclosure estimated for the sub-samples of family and non-family firms. These results identify the polarised nature of the SEW effects. Greater family-firm CSR disclosure is associated with CEO duality, the presence of an audit committee and profitability. Greater family influence over board decisions enhances the emotional and reputational incentives, increasing CSR disclosure. In contrast, non-family-firm CSR disclosure is positively associated with larger boards, suggesting the importance of outside directors and greater competition. Columns (4), (5) and (6) report the estimated models for the change in CSR disclosure as a function of the change in the governance score. For each year during the post-guidelines period, \( \Delta CSRI \) is the difference between CSRI for firm \( i \) in year \( t \) and CSRI for firm \( i \) in the most recent pre-guidelines period. The same approach is taken in calculating \( \Delta CSRI \). All three models report a positive,
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<th>Full sample</th>
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Notes: Errors are robust to heteroscedasticity and first-order autocorrelation. Standard errors are reported in parentheses below each coefficient. Variable definitions are in Table I. ***, **, * Significant at 10, 5 and 1 per cent levels, respectively.
significant association between $\Delta \text{GovScore}$ and $\Delta \text{CSRI}$, providing support to reject for $H3a$, $H3b$ and $H4$, implying that the new CG Guidelines have a positive effect on the relationship between overall CG quality and CSR reporting for both family and non-family firms. Profitability and foreign sponsor ownership also enhance CSR disclosures for family firms, while size and competition are related to CSR reporting for non-family firms.

Table V reports the results of the pooled OLS regressions for the overall CSRI and each of the CSR sub-indexes for the full data set and the sub-samples before and after the change in CG Guidelines in 2006. The results reported in columns (1), (2) and (3) for the overall CSR measure show a highly significant, positive relationship between firm governance and CSR disclosure. In addition, larger, older, better-performing non-family firms undertake more CSR disclosure. The significant negative coefficient for the family firm (FamFirm) identifier is evidence that family firms have lower overall CSR disclosure, therefore supporting $H1$. Capital expenditure and firm competition also increase CSR disclosures before and after the CG Guidelines were introduced, respectively. These results add to the prior literature and highlight the strong positive association between good governance and improved CSR disclosure. The governance coefficient reported in column (3) shows that a ten-point increase in governance quality leads to about a 5 per cent increase in overall CSR disclosure. Higher governance scores are associated with greater CSR disclosure for each of the CSR sub-indexes. However, environmental and employee information reporting is significantly lower for family firms after the introduction of the CG Guidelines. Firm size is positively associated with CSR disclosure for each of the sub-indexes and profitability is also related to disclosures regarding employees, product and service and other socially responsible reporting. Firm competition is associated with greater CSR disclosures for product and service information and other social responsibility considerations, respectively. Finally, there is no evidence of a difference in the level of CSR disclosure between family and non-family firms before and after the introduction of the guidelines for community, product and service or other socially responsible disclosures.

### 4.2 Robustness checks

The main results predicting the association between CG, family firm and CSR disclosure quality are robust to the following alternative specifications: inclusion of two additional controls (tangible assets ratio and stock volatility), exclusion of service sector firms, exclusion of observations from 2005, calculation of CSRI using total number of CSR elements (50) as the denominator and replacing the most recent CSRI (GovScore) with the average CSRI (GovScore) during the pre-guidelines period to calculate $\Delta \text{CSRI}$ ($\Delta \text{GovScore}$). As a further test of governance quality in the post-CG Guidelines period, the model in column (1) of Table V was re-estimated including a REGC dummy variable that equals 1 if the observation is from the post-CG Guidelines period and zero otherwise, interacting this dummy variable with GovScore. Results confirmed that the influence of GovScore is lower in the post-CG Guidelines period compared with the pre-CG Guidelines period. Excluding observations before 1999 so that the pre- and post-CG Guidelines periods are of similar length provides similar results.

Untabulated results of the interaction between FamFirm and GovScore in a re-estimation of Equation (1) show that there is a negative significant interaction effect ($\beta = -0.12$, p-value < 0.05). Better governance is associated with a higher CSR disclosure; however, the impact is less for family firms compared with non-family firms.

### 5. Discussion

Framed within SEW, agency and institutional perspectives of Bangladesh, this study offers three main contributions to the literature on family firms and CSR. First, using a comprehensive CG score that calibrates governance for each firm on 65 elements and a CSR data set of 50 elements, the analysis identifies a differential impact of specific governance
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<td>Yes</td>
<td>Yes</td>
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<td>0.459</td>
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**Notes:** "Before" refers to the period prior to the introduction of CG Guidelines (1996 through February 2006) and "After" refers to the period subsequent to the introduction (March 2006 through 2011). The errors are robust to heteroscedasticity and first-order autocorrelation. Standard errors are reported in parentheses below each coefficient. Variable definitions are in Table I. *, **, ***Significant at 10, 5 and 1 per cent level, respectively.
factors on CSR disclosure for family and non-family firms. Evidence that family firms have lower CSR reporting levels compared with non-family firms suggests that family owners exert absolute power to pursue their own family-centred goals at the expense of other stakeholders. Second, CEO duality and the presence of an audit committee increase CSR disclosure for family firms. Family board domination and larger, diverse non-family boards both yield greater social performance. Third, we report a strong, positive association between change in CG and change in CSR disclosure, consistent with the view that better CG guidelines enhance the level of CSR reporting. The strength of this relation decreases following the mandated CG requirements. Post-CG Guidelines, CSR disclosure for family firms is significantly lower than for non-family firms. However, post 2006, the rate of change in CSR disclosure for family firms is greater than the rate of change in CG quality. Most notably for the period 2008–2011, family-firm CSRI increased by 25.50 per cent from 26.46 to 33.21, while the family-firm GovScore grew by 16.59 per cent and non-family-firm CSRI and GovScore increased by 8.50 and 6.91 per cent, respectively.

There is a positive relationship between the presence of a board’s audit committee and the CSR reporting level, but no evidence of an association between board independence and CSR reporting level. Independent directors are less likely to exert sufficient pressure on the management to improve CSR reporting levels due to their minority position on the board. The board independence result contrasts with Khan (2010) and Khan et al. (2013), who report a positive relationship between CSR disclosure and the percentage of non-executive directors. In terms of individual CSR sub-index, family disclosure levels are lower regarding information about environment and employees. Uhlaner et al. (2004) also report evidence of an association between the physical environment and the “family” aspect of the business. There are no significant differences for the other three CSR sub-indexes following the adoption of the CG Guidelines. Similar to Campopiano and De Massis (2015), our study finds that family firms place emphasis on different CSR topics. There is no evidence of a difference in the level of reporting prior to the introduction of the CG Guidelines.

6. Concluding remarks

Increased demands by consumers for accountability and ethical practice in the workplace will bring greater scrutiny to CG and CSR disclosures. Our results show that CG quality matters, implying that the regulatory focus on improving firm-level CG is beneficial. However, the regulatory requirements of at least 10 per cent independent board members (subject to a minimum of one) are not sufficient to improve firm-level CSR practices. Our results add to findings theorised under the SEW framework, in particular those pointing to benefits from CEO duality for family firms in the Bangladeshi environment. While the results indicate that family firms tend to have lower CSR disclosure compared with non-family firms, greater family control and an effective audit committee can enhance CSR reporting. Encouraging a larger board size for non-family firms in competitive environments may also improve CSR disclosure. Given that family firms constitute about 75 per cent of the listed non-financial firms, these results imply that regulators and policy makers in Bangladesh need to find alternative ways to motivate this type of firm to engage in more in CSR-related activities. The findings point to allowing CEO duality in family firms to persist but also to mandating audit committees to oversee the firm’s operations. Board independence, while mandated, is still at a very minimal level, and this may explain why it does not improve CSR disclosures. Finally, allowing larger boards in non-family firms enables these firms to form links with the environment and society that improve CSR reporting. The more directors on the board, the higher the number of dynamic CSR decisions that can be implemented. Consideration of competitive threats and foreign ownership, together with better disclosure and accountability to improve firm reporting and resource management, is an ongoing challenge for regulators of family-owned firms in emerging markets.
Our study has some limitations. These provide opportunities for future research. First, CSR quality and GovScore are measured using the publicly available information in the annual reports and BSEC publications. Although non-disclosure does not always mean non-compliance, for non-disclosure of relevant items a firm was awarded a score of zero, lowering the firm’s calibrated CSR and GovScore for the study. Therefore, future studies might examine CSR practices within the firm that are often unreported in the annual reports, for example, fair treatment of all employees (Samara and Arenas, 2017). Second, the study period covers 1996 to 2011. Since the Bangladesh Securities and Exchange Commission issued more stringent CG Guidelines on 7 August 2012 requiring listed firms to comply (instead of “comply-or-explain”) with all the CG Guidelines’ conditions, including the requirement to increase board independence from 10 to at least 20 per cent, future studies should examine the impact of these changes on firm-level governance and CSR reporting practices. Finally, future research might examine the role of representative directors who have an expressed duty to minority shareholders (Caianza et al., 2018).

Notes

1. Socioemotional wealth is defined as “the non-financial aspects of the affective endowments of family owners” (Berrone et al., 2012, p. 2).
2. Belal and Cooper (2011, p. 654) identify the main reasons for this apparent absence of disclosure as a “lack of resources, the profit imperative, lack of legal requirements, lack of knowledge/awareness, poor performance and the fear of bad publicity”.
3. Order No. SEC/CMRRCD/2006-158/Admin/02-06, dated 9 January 2006. It was superseded by a Notification on 20 February 2006 in which the required minimum percentage of independent directors was reduced from 20 to 10 per cent.
4. At least one-tenth of the board should be independent directors (minimum of one). Independent directors must not, amongst other requirements, have any family relationship with the company’s promoters or directors.
5. See Corruption Perception Index 2015 located at www.transparency.org/cpi2015. In 2015, Bangladesh achieved a score of 25, ranking in the bottom 16 per cent (most corrupt) of the 168 countries surveyed.
6. Since the CG Guidelines came into effect on 9 January 2006, firms with a financial year-end date of 31 December 2005, disclosed the appointment of an independent director (20 firms) and the presence of an audit committee (12 firms) in their 2005 annual reports. The robustness checks in Khan et al. (2013) using the sub-sample of 2005–2006 may not necessarily capture the pre-CG Guidelines period.
7. An item is applicable if it is relevant to the firm’s nature of operation and other characteristics. For example, if the firm has foreign imports, CSR item No. 44 (value of imports: foreign currency paid) is applicable. A robustness check utilising the total number of CSR elements in calculating CSRI provided consistent results.
8. An untabulated Kruskall-Wallis H-test also shows that there is a statistically significant difference in the median GovScore ($\chi^2 = 1,536.27$ and $p$-value $< 0.001$) and the median CSRI ($\chi^2 = 73.47$ and $p$-value $< 0.001$) between the pre- and post-CG Guidelines period.
9. Multicollinearity is not a concern, as shown by the correlation matrix (Table III) and because all the variables have variance inflation factors (VIF) of less than 3.74.
10. The pre-CG Guidelines period could not be used, as no firm had an independent director before 2005 and the presence of an audit committee is found in only 15 firm-year observations (five distinct firms). Consequently, the sample size drops from 2,637 to 943.
11. With an unbalanced panel data set, companies that were listed during the post-guidelines period could not be included in column (5), resulting in a decrease in sample size from 943 to 846.
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Appendix 1

Governance element

I. Ownership structure and investor rights (Cronbach’s $\alpha = 0.75$)
1. Disclosure of ownership structure (% of equity held by sponsors, government, institutions, foreigners and general public)
2. Name-wise details of aggregate number of shares held by parent/subsidiary/associated companies and other related parties
3. Name-wise details of aggregate number of shares held by directors, CEO, Company Secretary, CFO, Head of Internal Audit and their spouses and minor children
4. Name-wise details of aggregate number of shares held by executives
5. Distribution schedule of each class of equity security for categories like less than 500 shares, 501 to 5,000 shares, …, over 1,000,000 shares
6. The number and identity of shareholders holding 10% or more are disclosed
7. AGM notice sent at least 14 days before the AGM
8. Disclosure of the company’s policy/strategy to facilitate effective communication with shareholders and other stakeholders/the company has an investors’ relations department
9. The securities regulator has not issued a warning or imposed penalty for contravention of any other securities law against any company or its directors in the current fiscal year

II. Financial transparency and information disclosure (Cronbach’s $\alpha = 0.83$)
10. Disclosure of the Board of directors’ responsibilities regarding financial communication
11. Board’s statement on fairness of financial statements
12. Board’s statement on maintenance of proper books of accounts
13. Board’s statement on consistent adaptation of appropriate accounting policies and estimates
14. Board’s statement on compliance with International Accounting Standards, as applicable in Bangladesh and disclosure of departure therefrom, if any
15. Board’s statement on risk and uncertainty for use of estimates and judgments
16. Directors’ statement on ability to continue as going concern
17. Board’s statement on significant deviation from last year operating results
18. Financial and operating results for at least last three years has been disclosed
19. Company has not received a qualified audit opinion in the current FYR
20. The auditor signs the audit report within 120 days of the FYR end date
21. The company’s AGM takes place within nine months of the FYR end date
22. Disclosure on related party transactions
23. There has been no related party transaction during the year
24. Dividend information and disclosure for non-payment

III. Board and management structure and process (Cronbach’s $\alpha = 0.92$)
25. Number of directors on the board is between 5 and 12
26. The chairperson and CEO positions held by different individuals
27. No former CEO serves on the board
28. Board includes at least one independent director
29. Qualifications and biographical information on board members
30. Role and functions of the board are disclosed
31. An audit committee has been established
32. Non-executive/Independent director(s) sit on the audit committee
33. Chairperson of the audit committee is a non-executive/Independent director
34. Chairperson of the board is not a member of the audit committee
35. CEO/Managing Director does not sit on the audit committee
36. Audit committee includes an accounting or finance expert
37. Disclosure of audit committee’s roles and responsibilities
38. Audit committee meets at least two times during the year
39. Disclosure of audit committee report/activities to the shareholders in the annual report

Table AI. Elements of governance quality score

<table>
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<th>MD</th>
<th>57.10</th>
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</thead>
</table>

(continued)
Governance element

40 A compensation committee has been established
41 Appointment of a Chief Financial Officer (CFO)
42 Appointment of the head of internal audit
43 Existence of a code of business conduct and ethics
44 The Company has a Corporate Governance Charter or Code of Best Practice
45 The details of Corporate Governance Charter or Code of Best Practice
46 During the year, the board meets at least four times
47 Average board meeting attendance is at least 75% during the year
48 Attendance of CFO and company secretary in the board meeting
49 Board members’ remuneration is disclosed
50 Managing agent/Officer’s remuneration is disclosed
51 The system of internal control is sound in design and has been effectively implemented and monitored
52 Narrative description of key features of the internal control system and the manner in which the system is monitored by the Board, Audit Committee or Senior Management
53 Risk management objective, systems, and activities in the organisation are disclosed

IV. Auditing (Cronbach’s $\alpha = 0.89$)

54 The same firm is not working as the auditor of the firm for more than three consecutive years
55 Firm has not rotated its audit firm after one year of appointment
56 Declaration that external auditor has not been engaged in appraisal or valuation services or fairness opinions
57 Declaration that external auditor has not been engaged in financial information systems design and implementation
58 Declaration that external auditor has not been engaged in bookkeeping/accounting records/financial statements
59 Declaration that external auditor has not been engaged in broker-dealer services
60 Declaration that external auditor has not been engaged in actuarial services
61 Declaration that external auditor has not been engaged in internal audit services
62 Declaration that external auditor has not been engaged in all other services as determined by the audit committee
63 Disclosure on the amount of audit fees paid to auditors
64 Disclosure that the company paid only the audit fees to the auditors
65 Amount of Audit fees is more than non-audit fees

Table AI.
Appendix 2

Disclosure item

I. Community involvement
1. Disclosure on charitable donations and subscriptions
2. Sponsoring and advertising (e.g. sponsoring sporting and recreational projects, support for the arts and culture)
3. Donations to Chief Advisor’s/PM’s Relief fund
4. Support for education (including any scholarship programme)
5. Support for public health
6. Participation in governmental social campaigns
7. Other community activity disclosure

II. Environmental disclosure
8. The firm has disclosed its environmental policies
9. Disclosure that the firm has complied with international and/or legal laws regarding environment protection
10. Disclosure that the firm has taken steps to control pollution (tannery effluent/treatment plan, dust control)
11. The firm has taken steps for prevention or repair of environmental damage (e.g. tree plantation)
12. The firm has taken steps to conserve natural resources and recycling activities (e.g. water treatment)
13. The firm has provided support for public/private action designed to protect the environment
14. The firm has been awarded for environmental protection/performance
15. Other environmental disclosure

III. Employee information
16. Number of employees or human resources or workers
17. Employee relations/Industry relations
18. The firm has incurred employee welfare related expense (e.g. canteen subsidy, medical expense, games, sports and picnic, merit scholarship, cultural and ceremonial expense, death compensation, uniform and liveries, etc.)
19. Information on the firm’s emphasis on employee education and training/HR development
20. Number of employees trained
21. Amount spent on employee training
22. Categories of employees trained
23. The company has established a recognised contributory provident fund scheme
24. In the current year, the firm provides gratuity for its permanent employees
25. The firm has a group term insurance scheme for its permanent employees
26. In the current year, the company makes allocation (5%) to WPFF and WF
27. The firm has disclosed information on managing agent/Officers’ remuneration
28. Employees/workers’ occupational health and safety
29. Company’s policy on child labour
30. The company has policies on recruitment and promotion of employees
31. The firm has disclosed the number of employees receiving salaries above Tk. 3,000/month
32. The firm has disclosed the number of employees receiving salaries below Tk. 3,000/month
33. The board has appreciated employees for their efforts
34. Other employee disclosure

IV. Product and service information
35. Nature of business and types of product produced
36. The firm has disclosed information on product development and research
37. Information on the firm’s product quality policy is disclosed
38. The firm has provided discussion on its marketing network
39. The firm has disclosed on the usage of production capacity during the year
40. Other product-related disclosure

Table AII. CSR disclosure sub-indexes (continued)
<table>
<thead>
<tr>
<th>Disclosure item</th>
<th>Impact of family vs non-family governance</th>
</tr>
</thead>
<tbody>
<tr>
<td>41 Policy/Information on fair business practices (e.g., employment and advancement of women, etc.)</td>
<td>2781</td>
</tr>
<tr>
<td>42 Expenditure on energy (fuel, electricity, etc.)</td>
<td></td>
</tr>
<tr>
<td>43 Disclosure on the total amount contributed to the national exchequer (in the forms of income tax, VAT, import duty, development surcharge and other indirect taxes and duties)</td>
<td></td>
</tr>
<tr>
<td>44 Value of imports (foreign currency paid)</td>
<td></td>
</tr>
<tr>
<td>45 Value added statement</td>
<td></td>
</tr>
<tr>
<td>46 BOD statement on commitment to establishing high level of ethics and compliance in the organisation</td>
<td></td>
</tr>
<tr>
<td>47 Existence of a code of business conduct and ethics/core values</td>
<td></td>
</tr>
<tr>
<td>48 The contents of a code of business conduct and ethics/Disclosure of statement of ethics and values, covering basic principles such as integrity, conflict of interest, etc.</td>
<td></td>
</tr>
<tr>
<td>49 Dissemination/communication of the statement of ethics and business practices to all directors and employees and their acknowledgement of the same</td>
<td></td>
</tr>
<tr>
<td>50 Management appreciation to different stakeholders (except employees)</td>
<td></td>
</tr>
</tbody>
</table>

**Table AII.**

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Director interlocks and the strategic pacing of CSR activities

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Beirut, Lebanon

Abstract
Purpose – Throughout years of corporate social responsibility (CSR) debates, most studies have focused on whether or not a firm should engage in CSR activities, while giving little attention to the firm’s engagement strategy. The purpose of this paper is to demonstrate the optimal way of engaging in CSR activities to maximize firm value while acting in a socially responsible manner.

Design/methodology/approach – The sample includes US-listed firms and was initially split into three categories (slow-paced, steady-paced and fast-paced firms) based on how fast the firm increased/decreased the pace of its CSR involvement. The sample was later split into firms that have interlocked directors and those that do not, to highlight the important role played by interlocked directors in moderating the relationship between CSR pace and firm performance.

Findings – Results suggest that firms engaging in CSR activities at a slow or steady pace experience superior financial returns than firms engaging in CSR activities at a fast pace. Further analysis indicates that rapid CSR involvement is counterproductive for firms with no interlocked directors. On the other hand, firms with interlocked directors benefit from their directors’ social network, and experience positive returns when engaging in CSR activities at a fast pace.

Practical implications – This study is of particular importance for firms establishing their CSR engagement strategies. The results highlight the optimal way a firm can engage in CSR activities while still maximizing shareholder wealth.

Originality/value – This paper is the first to study the pace determinants of a firm’s CSR engagement strategy. The absence/presence of interlocked directors is identified as a key moderating variable for the CSR–firm performance relationship. The study pinpoints the absence of interlocked directors as a constraint for firms that rapidly engage in CSR activities.

Keywords Firm performance, Resource dependence theory, CSR pace, Interlocked directors

Paper type Research paper

Introduction
The debate on corporate social responsibility (CSR) continues to grow, as firms face heightened pressure from their stakeholders to engage in socially responsible activities. While initially considered merely a fashionable idea, CSR has become a widely accepted model in the modern corporate world (Lee, 2008). Moreover, governments are enacting laws to improve firms’ social conduct (Van Beurden and Gössling, 2008). Earlier studies suggest that the main objective of organizations is to increase shareholder wealth (Friedman, 1970). However, with the increased awareness and importance of CSR involvement, firms must adjust their goals to balance increased shareholder wealth with engaging in socially responsible activities. Therefore, the questions facing modern corporations are no longer whether they should invest in CSR activities, but how they can balance those involvements with shareholder profit.

Given the expectation of CSR, globalization has pressured firms to use their resources to alleviate social problems around the world. For example, pharmaceutical companies are asked to donate vaccines and drugs to poverty-stricken patients in third-world countries (Hillman and Keim, 2001). However, even when engaging in CSR activities, a firm’s value-maximizing obligation toward its shareholders still stands. In other words, firms should invest in value-enhancing CSR activities and not use CSR as a window-dressing device to alleviate stakeholder pressure.
Tang et al. (2012) pointed out that most of the CSR literature focuses on factors that moderate the relationship between CSR and corporate financial performance (CFP), while giving little attention to a firm’s CSR engagement strategy. In other words, previous literature examines the reasons why firms should integrate CSR activities into their businesses without focusing on how to make such integration more successful. Specifically, the authors focus on the pace, path, relatedness and consistency of a firm’s engagement in CSR. Their results suggest that the CSR–CFP relationship is enhanced when firms engage in related CSR activities and do so in a consistent manner. Surprisingly, Tang et al. (2012) did not find any significant relationship between the pace of engagement in CSR activities and firm performance, and suggested that future research should examine this relationship in more detail.

Accordingly, this paper starts by investigating the efficiency of CSR activities based on the pace of a firm’s CSR engagement. Our sample is first split into three groups: slow-paced firms, steady-paced firms and fast-paced firms. Consistent with our expectations, the CSR–CFP relationship worsens as the pace of CSR engagement increases. Results indicate that CSR has a positive effect on firm performance for slow- and steady-paced firms, but this relationship becomes insignificant for fast-paced firms. These results are in line with the absorptive capacity perspective. A firm’s absorptive capacity refers to its ability to comprehend new knowledge, integrate the knowledge within the firm and use this knowledge to produce commercial output (Cohen and Levinthal, 1990). Therefore, engaging in new activities at a fast pace can be counterproductive, since firms cannot fully absorb all the benefits associated with these new activities.

Given the significant role that pace can play in the efficiency of CSR involvement, we study the determinants of the pace of CSR engagement. Specifically, we focus on director interlocks and experience, as directors play a major role in setting corporate strategies and acquiring key resources (Ruigrok et al., 2006). Director interlocks exist among firms whenever a director of a corporate board serves on the board of multiple corporations. Interlocked directors play a significant role in communicating information across firms and use their experience and social networks to impact the nature of managerial decisions (Burt, 1983). Indeed, Simoni and Caiazza (2013) suggested that interlocked directors enhance a firm’s value through their wider access to resources and by sharing the knowledge that they have acquired by serving on several boards. Our results suggest that director interlocks and director age are negatively related to the pace of CSR adoption. Interlocked and experienced directors should be more aware of their firms’ absorptive capacity and should therefore encourage a more gradual pace for CSR involvement. Engaging in CSR at a slower pace allows firms to fully absorb all of the benefits related to the CSR activity.

Finally, we test whether the presence/absence of director interlocks moderates the relationship between CSR pace and a firm’s financial performance. In other words, will the presence (absence) of experienced and interlocked directors enhance (undermine) the efficiency of fast CSR involvement? Findings indicate that engaging in CSR activities at a faster pace leads to a positive market reaction for firms with interlocked directors. Although board interlocks are negatively related to CSR pace in general, interlocked directors have the experience and knowledge to identify value-enhancing CSR opportunities that can lead to a positive effect on firm value, even if adopted at a fast pace. On the other hand, firms with no director interlocks experience a negative effect on firm value when engaging in CSR activities at a fast pace. Such firms do not have the necessary social networks to acquire the resources for value-enhancing CSR activities consistently. Therefore, engaging in CSR activities rapidly may be an act of window-dressing to ease stakeholder pressure instead of improving firm performance and increasing shareholder wealth. Our results are robust to using different measurements for the pace of CSR involvement, director interlocks and firm performance.
This study contributes to the literature in several ways. First, it answers the call by for research by Tang et al. (2012) to investigate the relationship between CSR pace and firm performance in more detail. To our knowledge, this paper is the first of its kind to address the determinants of the pace of CSR involvement. We highlight the importance of CSR pace by showing that the efficiency of CSR policies and activities varies as the pace of CSR engagement changes. This study also presents interlocked directors as a moderator for the CSR pace–firm performance relationship. The presence (absence) of interlocked directors has a positive (negative) effect on firm performance for firms rapidly engaging with CSR activities.

The rest of the paper is organized as follows. The next section surveys the literature and presents the study's hypothesis. The third section discusses the data used in this paper and the variable definitions. Then, we present our empirical findings and analysis. Finally, the study concludes by providing a summary of our findings and their implications.

**Literature review and hypothesis development**

Though the concept of firms being socially responsible toward their society and environment has been around for more than a hundred years, it was not until the end of the last century that CSR became a widespread concept and a significant determinant of a firm's success (Carroll and Shabana, 2010). CSR has been defined by different researchers using diverse contexts and models (Jamali, 2008). However, there is a general consensus that CSR encompasses a firm's voluntary engagement in environmental, social and governance activities that go beyond the firm's legal requirements (Jo and Harjoto, 2011). This approach won the support of several researchers seeking a more socially responsible environment (Laphume et al., 2008).

Although it has been subject to extensive research, empirical evidence for the relationship between CSR and CFP remains controversial (Hull and Rothenberg, 2008; Lee and Jung, 2016; Waddock and Graves, 1997). Consistent with the resource dependency theory, some researchers suggest that CSR engagement can improve a firm's efficiency and reputation among its stakeholders, leading to a positive effect on firm performance (Aguilera et al., 2006; Orlitzky et al., 2003; Waddock and Graves, 1997). Other researchers argue that CSR engagement is costly and market returns are insignificant, suggesting that CSR can negatively affect firm performance (Brammer and Millington, 2008; Friedman, 1970; Hassel et al., 2005).

**CSR involvement and firm absorptive capacity**

Though earlier studies examined the CSR–CFP relationship, few investigate the effect of the pace of adopting new CSR policies and principles. The pace of CSR engagement measures how fast a firm increases or decreases its CSR involvement as time passes (Tang et al., 2012). The significance of studying the pace of a firm's CSR engagement strategy can be explained using the absorptive capacity perspective. A firm's absorptive capacity is defined as "the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends" (Cohen and Levinthal, 1990, p. 128). In other words, in order to maximize the benefit of engaging in new activities, firms can only absorb and integrate new information at a limited pace. Rapid engagement exceeding a firm's absorptive capacity creates time compression diseconomies, resulting in a firm's inability to benefit from rapidly acquired knowledge as much as they could have if the knowledge were acquired at a more gradual pace (Dierickx and Cool, 1989). In addition to concerns about absorptive capacity, engaging in CSR activities is expensive while its returns are long term in nature (De Villiers et al., 2011; Tang et al., 2012). Therefore, engaging in several CSR activities rapidly will put a heavy financial burden on a firm and harm its short-term performance.
Therefore, we hypothesize that increasing the pace of CSR engagement will have a negative effect on firm performance:

**H1.** There is a negative relationship between the pace of CSR engagement and firm performance.

**Determinants of the pace of CSR involvement**

Agency theory proposes that one of the main functions of a board of directors is to monitor managerial behavior and ensure that managers act in the shareholders’ best interest (Linck et al., 2008). Apart from this monitoring role, directors also play a key role in setting a company’s strategic plan. Researchers have demonstrated that directors provide companies with valuable knowledge (Carpenter and Westphal, 2001), play a key role in setting corporate strategies (Ruigrok et al., 2006) and help in acquiring key resources (Hillman and Dalziel, 2003). In particular, directors’ interlocks with other companies facilitate their ability to provide resources. Director interlocks occur when a director serves on the board of more than one company at the same time (Kang, 2008). Interlocks enhance the directors’ experience and ability to acquire critical external resources through their social ties with other companies. This allows directors to play a better role in their company’s decision-making processes (Carpenter and Westphal, 2001; Ruigrok et al., 2006).

In a review article, Hillman et al. (2009) suggested that resource dependence theory has become prominent in strategic management. The authors showed that although agency theory is more commonly used in studies addressing the board of directors, empirical evidence suggests that resource dependence theory is better for investigating board behavior and decisions. Unlike agency theory which focuses more on internal dynamics, resource dependence theory views the firm as an open system that depends on interactions with its external environment (Pfeffer and Salancik, 1978). Although firms are constrained by external environmental factors, Ulrich and Barney (1984) suggested that managers try to take control of significant resources to reduce environmental uncertainty. Thus, Boyd (1990) suggested that “resource-rich” directors, i.e. directors with interlocks and access to critical resources, should be the main focus when electing directors to a company board. Empirical evidence supports this argument: firms that are able to attract powerful and interlocked directors are likewise able to acquire critical resources, and use these resources to improve their corporate social performance (Johnson and Greening, 1999; Shropshire, 2010).

Building on the absorptive capacity perspective mentioned earlier, interlocked directors are expected to be more aware of the disadvantages associated with rapid CSR involvement due to their wide experience. Accordingly, firms with interlocked directors are expected to have a slower CSR pace than firms with no interlocked directors. Hence, we hypothesize the following:

**H2.** There is a negative relationship between the presence of director interlocks and the pace of CSR engagement.

**Board interlocks as a moderator of CSR–CFP**

Given that CSR actions depend on the decisions of managers and directors, different firms are expected to apply CSR strategies in different manners (Hsu and Cheng, 2012). According to resource dependency theory, a firm’s interaction with other companies plays a crucial role in acquiring the resources necessary for its survival (Pfeffer and Salancik, 1978). These interactions enhance the possibility of engaging in CSR activities (Shropshire, 2010). Accordingly, directors’ interlocks and social ties are expected to be a significant determinant in the efficiency of a firm’s CSR activities. A director’s social capital is also expected to be a significant moderator of the CSR–CFP relationship. Director social capital encompasses the
social networks of the directors and the potential resources that they can acquire using these networks (Kim and Cannella, 2008).

Despite the large amount of research addressing director interlocks, the literature remains lacking regarding the effect of interlocks on a firm’s CSR engagement strategy. According to resource dependency theory, board interlocks can also be beneficial by reducing environmental dependence and giving directors the ability to learn new corporate practices (Davis, 1991). Consistent with the aforementioned suggestions, researchers find a positive association between director interlocks and the adoption of CSR activities (Walls and Hoffman, 2013). Berrone and Gomez-Mejia (2009) added that experienced directors who serve on several boards use their social networks to provide firms with critical connections to resources that firms might have difficulty acquiring otherwise. On the other hand, interlocked directors may lose their independence when they encounter situations with conflicts of interest among firms whose boards they serve on (Ruigrok et al., 2006). Another disadvantage of interlocked directors is the time constraints that they have compared to directors who serve on only one board (Bazerman and Schoorman, 1983).

Though director interlocks were earlier hypothesized to reduce the pace of CSR involvement due to the absorptive capacity perspective, Shropshire (2010) advocated that interlocked directors’ interactions with other firms enhance the possibility of engaging in CSR activities. It is intuitive to believe that interlocked directors will encourage CSR engagement if a good opportunity arises. In other words, interlocked directors might occasionally encourage firms to increase their CSR engagement, and thus increase the pace of CSR, only if a value-maximizing opportunity transpires. We propose that interlocked directors increase the pace of CSR engagement in an attempt to increase firm value, and not as a window-dressing device to enhance their reputation. Therefore, we hypothesize the following:

\[ H3. \] Increasing the pace of CSR engagement will have a positive (negative) effect on firm performance in the presence (absence) of director interlocks.

**Data and research methodology**

This study utilizes the Morgan Stanley Capital International (MSCI) database (formerly known as Kinder, Lydenberg and Domini (KLD)) to gather information about firms’ adoption of CSR policies. The MSCI index is the continuation of the KLD index which was developed over the past 20 years to measure a firm’s environmental and governance activities. RiskMetrics acquired KLD in 2009 and was later acquired by MSCI in June 2010. The MSCI is widely acknowledged as the most commonly used (Waldman et al., 2006), most complete (Hillman and Keim, 2001) and most widely accepted (Miras-Rodríguez et al., 2015) database for addressing firm-specific corporate social performance studies. It considers seven major dimensions when measuring a firm’s CSR engagement: environment, community, employee relationship, diversity, product, corporate governance and human rights. Consistent with previous studies, our measurement of CSR is based on these seven dimensions, in order to provide results comparable to earlier studies using the MSCI database. Tang et al. (2012) added that these seven dimensions are the most commonly examined areas of CSR in the literature, adding more credibility to using the MSCI database. Since the pace measure depends on firms having continuous observations for several years in a row, firms with missing CSR data for any given year between 2002 and 2014 were eliminated. Thus, our MSCI sample consists of 301 firms with a 13-year analysis period, and a total of 3,913 observations. In order to obtain financial data for our sample firms, we merged our data with data obtained from the Compustat database. Due to missing financial data for some firms, our final sample was reduced to 3,412 firm-year observations.
Measures

CSR
As mentioned earlier, this study uses the seven dimensions provided by the MSCI database (formerly KLD) to measure CSR scores for US firms. Consistent with previous literature (Hsu and Chen, 2015; Hull and Rothenberg, 2008; Tang et al., 2012), we first calculate the score of each dimension by subtracting the total number of concerns from the total number of strengths in each dimension. The CSR score is then formed by calculating the average of all dimensions.

Pace
The pace variable measures how fast a firm is adopting and developing CSR policies and behaviors. Following Tang et al. (2012), we calculate the pace of CSR involvement as the current CSR score minus the average CSR score for the past three years. The pace measure increases as firms adopt CSR principles more rapidly. Another measure for CSR pace is also calculated by subtracting the average CSR score for the previous two years from a firm’s current CSR score. This measure will be called pace2 and will be used for sensitivity analysis.

Director interlocks
This study utilizes the measure of director interlocks provided by the MSCI database. Director interlock is a categorical variable that increases by 1 for each of a firm’s directors that is active on four or more company boards. An alternative measure for director interlocks is used in the additional sensitivity analysis section. The alternative measure is an interlocked board indicator that takes a value of 1 if more than 50 percent of a firm’s independent directors have three or more directorships and 0 otherwise (Cashman et al., 2012; Fich and Shivdasani, 2006).

Firm performance
Consistent with earlier environmental and governance studies (Konar and Cohen, 2001; Lo and Sheu, 2007; Wang et al., 2014), this paper employs Tobin’s Q as a measure of firm performance. Chung and Pruitt (1994) developed an approximation of Lindenberg and Ross’s (1981) original Tobin’s Q using easy-to-get balance sheet information. Chung and Pruitt compared their measure of Q with that of Lindenberg and Ross and results suggest that their approximation of Q had an $R^2$ of at least 0.966 for any given year during their 10-year sample period. In other words, at least 96.6 percent of the variation in Lindenberg and Ross’s Tobin’s Q is explained by Chung and Pruitt’s approximation of Q:

\[
\text{Approximate } Q = \frac{\text{MVE} + \text{PS} + \text{Debt}}{\text{TA}}.
\]

MVE is a firm’s share price multiplied by the number of common stock outstanding. PS represents the liquidating value of a firm’s outstanding preferred stock. Debt represents the value of a firm’s short-term liabilities, net of its short-term assets in addition to the book value of the firm’s long-term debt. TA denotes the book value of a company’s total assets.

In addition to Tobin’s Q, ROA is also used as an alternative measure of firm performance in the additional sensitivity analysis section.

Control variables
In addition to the variables mentioned above, several variables are added to control for their effect on a firm’s pace of CSR engagement. Average director age is used as another measure of director experience. As mentioned earlier, experienced directors are expected to have better social ties and would therefore be more knowledgeable about a firm’s absorptive capacity. ROA is added since more profitable firms have extra resources
that can be spent on socially responsible activities. We also control for R&D expenditure, since R&D and CSR activities compete for a firm’s scarce resources (Hull and Rothenberg, 2008). Board and firm size are added to the model since larger firms with larger boards are accustomed to diversified operations, and would therefore be better equipped than their peers to handle fast engagement in CSR activities (Tang et al., 2012). We also control for CEO duality since researchers link CEO duality to better CSR involvement through improved transparency (El Ghoul et al., 2011). Finally, the percentage of women directors is added, since female board representation has been found to be positively correlated with CSR engagement (Jizi, 2017).

Descriptive statistics
Table I presents descriptive statistics for the variables used in this study. The mean CSR score is 0.03, indicating that, on average, firms in our sample have more strengths than weaknesses for the measured CSR dimensions. Pace also has a positive mean of 0.018, signifying that firms have been slightly increasing the pace of their CSR engagement during our sample period. The mean for the interlocked director variable is 0.645. This suggests that 64.5 percent of the firms in our sample have at least one interlocked director serving on their board. The variance inflation factor (VIF) is also calculated for the model to test if any multicollinearity problems exist. The VIF score for the model is 1.8, with no variable having an individual VIF score of more than 3.2. Therefore, it is safe to assume that no multicollinearity problems exist in our model.

Table II displays the change of interlocked directors over time for our sample period. During the first five years of our sample, the average interlocked directors per firm ranged between 1 and 1.5. This suggests that, on average, most firms had at least one interlocked director serving on their board during the period of 2002–2006. For the period of 2006–2014, the number of interlocked directors dropped significantly and had a range of 0.15 and 0.25 interlocked director per firm. In other words, on average, only 15–25 percent of the firms during these years had an interlocked director serving on their board. One possible explanation could be due to the financial crisis where firms wanted to appoint directors that have firm-specific information rather than directors with large social networks. In order to account for the variation in the average of interlocked directors due to year-specific events, year dummies have been added to our model (Table III).

A Hausman test is employed to identify whether a random-effect model or a fixed-effect model should be used in this study. The null hypothesis suggests that the difference between the two models (fixed-effect and random-effect) is not systematic. If the results

<table>
<thead>
<tr>
<th>Variables</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSR</td>
<td>3,412</td>
<td>0.030</td>
<td>0.483</td>
</tr>
<tr>
<td>Pace</td>
<td>3,412</td>
<td>0.018</td>
<td>0.404</td>
</tr>
<tr>
<td>Interlocked Directors</td>
<td>3,412</td>
<td>0.645</td>
<td>1.120</td>
</tr>
<tr>
<td>Avg. Dir. Age</td>
<td>3,412</td>
<td>61.923</td>
<td>3.543</td>
</tr>
<tr>
<td>ROA</td>
<td>3,412</td>
<td>5.682</td>
<td>8.301</td>
</tr>
<tr>
<td>Board Size</td>
<td>3,412</td>
<td>17.505</td>
<td>7.255</td>
</tr>
<tr>
<td>Firm Size</td>
<td>3,412</td>
<td>8.325</td>
<td>1.425</td>
</tr>
<tr>
<td>CEO Duality</td>
<td>3,412</td>
<td>0.583</td>
<td>0.493</td>
</tr>
<tr>
<td>% Female Dir.</td>
<td>3,412</td>
<td>4.205</td>
<td>7.427</td>
</tr>
<tr>
<td>R&amp;D Exp.</td>
<td>3,412</td>
<td>0.026</td>
<td>0.050</td>
</tr>
<tr>
<td>Leverage</td>
<td>3,412</td>
<td>0.176</td>
<td>0.134</td>
</tr>
<tr>
<td>Liquidity</td>
<td>3,412</td>
<td>0.139</td>
<td>0.148</td>
</tr>
<tr>
<td>Growth Potential</td>
<td>3,412</td>
<td>0.047</td>
<td>0.049</td>
</tr>
</tbody>
</table>

Table I. Summary descriptive statistics
of the Hausman test show that the null hypothesis is (not) rejected, a fixed-effect (random-effect) regression should be used (Greene, 1997). The results of the Hausman test demonstrate that the null hypothesis should be rejected (p-value<0.01), suggesting that a fixed-effect regression should be used for our model.

**Results and discussion**

We start our analysis by testing whether the pace of CSR involvement affects the CSR–CFP relationship. We split the firms in our sample into three categories: slow-paced firms (those who have a pace score within the bottom quartile), fast-paced firms (those who have a pace score within the top quartile) and steady-paced firms (those who have a pace score within the two middle quartiles). We then run regression analysis to check the effect of CSR involvement on firm performance separately for the three different firm categories. The first two columns of Table IV show that CSR engagement improves firm performance for slow-paced and steady-paced firms, respectively. On the other hand, Column 3 shows that this relationship turns into an insignificant one for fast-paced firms that rapidly engage with CSR activities. This is in line with our expectations and with the absorptive capacity theory, suggesting that rapid engagement worsens the CSR–CFP relationship.

Table V examines the determinants of the pace of CSR engagement. Specifically, we focus on director experience to test whether more experienced directors lower the pace of interlocked directors by year.

<table>
<thead>
<tr>
<th>Year</th>
<th>Interlocked directors</th>
<th>Observations</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>178</td>
<td>0.9767</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>184</td>
<td>0.9130</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>288</td>
<td>1.5403</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>290</td>
<td>1.5412</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>294</td>
<td>1.5201</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>283</td>
<td>0.2560</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>288</td>
<td>0.2058</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>289</td>
<td>0.2330</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>301</td>
<td>0.1960</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>301</td>
<td>0.1634</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>248</td>
<td>0.1508</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>236</td>
<td>0.1884</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>222</td>
<td>0.1948</td>
<td></td>
</tr>
</tbody>
</table>

**Table II.** Director interlocks by year

<table>
<thead>
<tr>
<th>Variables</th>
<th>Fixed (b)</th>
<th>Random (B)</th>
<th>Difference (b−B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSR</td>
<td>0.15673</td>
<td>0.14601</td>
<td>0.01073</td>
</tr>
<tr>
<td>Pace</td>
<td>0.05736</td>
<td>0.05583</td>
<td>0.00153</td>
</tr>
<tr>
<td>Firm Size</td>
<td>0.02973</td>
<td>0.02949</td>
<td>0.00024</td>
</tr>
<tr>
<td>Board Size</td>
<td>−0.01308</td>
<td>−0.01372</td>
<td>−0.00064</td>
</tr>
<tr>
<td>% Women Dir.</td>
<td>0.00501</td>
<td>0.00522</td>
<td>−0.00021</td>
</tr>
<tr>
<td>R &amp; D Exp.</td>
<td>2.43274</td>
<td>2.36991</td>
<td>0.06283</td>
</tr>
<tr>
<td>Leverage</td>
<td>−1.06402</td>
<td>−1.05680</td>
<td>−0.00722</td>
</tr>
<tr>
<td>Liquidity</td>
<td>1.24191</td>
<td>1.24378</td>
<td>−0.00187</td>
</tr>
<tr>
<td>Growth Potential</td>
<td>2.23133</td>
<td>2.65568</td>
<td>−0.42435</td>
</tr>
</tbody>
</table>

**Notes:** b = consistent under H0 and Ha; B = inconsistent under Ha, efficient under H0. Test – H0: difference in coefficients not systematic. \( \chi^2 = (b−B)'[(V_b−V_B)^{-1}](b−B) \). \( \chi^2 = 94.51 \). Prob. > \( \chi^2 = 0.0004 \)

**Table III.** Hausman test
engaging in CSR activities. Consistent with our hypothesis, Column 1 shows that director interlocks are negatively related to the pace of CSR engagement. This negative relationship is also observed for the average director age. This suggests that older directors and directors who serve on several boards are well aware of their firms’ absorptive capacity. Accordingly, these directors strategically decrease the pace of engaging in CSR activities.
so that their firms can fully absorb the benefits associated with such activities. Firm profitability is also shown to be positively related to pace. Firms with larger profits seem to engage more in socially responsible activities, and thus increase their CSR pace, as a way of giving back to the community. Other results indicate that larger firms and firms with larger boards increase the pace of CSR engagement. This is consistent with Tang et al. (2012), who suggested that larger firms with larger boards are accustomed to handling diversified operations and would therefore be better equipped for rapid CSR engagement than smaller firms. The second column of Table V uses the two-year pace measurement (pace2) and provides qualitatively similar results, confirming the validity of our pace measure and the results provided in Column 1.

Table VI presents descriptive statistics for the distribution of interlocked directors among firms based on the pace of the firm’s CSR engagement. Table VI shows that 39.63 percent of the fast-paced firms in our sample have at least one director serving on four or more company boards. On the other hand, 33.5 percent of the steady-paced firms and 35.2 percent of the slow-paced firms have at least one interlocked director serving on their company boards. Though the results of Table V indicate that the presence of interlocked directors is negatively related to CSR pace, Table VI shows that fast-paced firms have a higher percentage of interlocked directors than steady- and slow-paced firms. In other words, even though interlocked directors do not encourage fast engagement in CSR activities, Table VI shows that more than a third of the firms that engage rapidly with CSR activities have interlocked directors serving on their boards. To investigate this idea further, we test if there is a difference in the efficiency of CSR involvement for fast-paced firms in the presence and absence of interlocked directors.

Results from Table IV indicate that fast-paced firms experience lower returns from CSR involvement than slow- and steady-paced firms. However, do all firms experience lower returns when engaging rapidly in CSR activities? To test this research question, Table VII presents a regression analysis of our model using industry and year fixed effects. Tobin’s Q, used as a proxy for firm performance, is regressed on the aforementioned independent variables. Following Tang et al. (2012), an interaction variable between CSR and the pace of engaging in CSR is introduced, to test if the pace of adopting CSR activities moderates the CSR–CFP relationship. Though the coefficient of CSR×Pace is negative, Column 1 shows that it is insignificant, suggesting that the pace of engaging in CSR activities does not have a significant impact on the CSR–CFP relationship.

In Columns 2 and 3, the sample is divided into two parts: firms with no director interlocks (Column 2), and firms with at least one interlocked director (Column 3). For firms with no interlocks, Column 2 shows that the Pace×CSR coefficient is significantly negative. Consistent with our hypothesis, this implies that firms with no interlocks experience negative market returns when they adopt CSR activities at a fast pace. On the other hand, Column 3 shows that this relationship becomes significantly positive for firms with director interlocks. According to resource dependency theory, interlocked directors help firms

<table>
<thead>
<tr>
<th></th>
<th>Slow-paced firms</th>
<th>Steady-paced firms</th>
<th>Fast-paced firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total firms</td>
<td>853</td>
<td>1,706</td>
<td>853</td>
</tr>
<tr>
<td>Firms with 0 interlocks</td>
<td>553</td>
<td>1,136</td>
<td>515</td>
</tr>
<tr>
<td>Firms with &gt; 0 interlock</td>
<td>300</td>
<td>570</td>
<td>338</td>
</tr>
<tr>
<td>% firms 0 interlocks</td>
<td>64.8</td>
<td>66.5</td>
<td>60.37</td>
</tr>
<tr>
<td>% firms with &gt; 0 interlocks</td>
<td>35.2</td>
<td>33.5</td>
<td>39.63</td>
</tr>
</tbody>
</table>

Note: The table shows the distribution of interlocked directors among firms based on a firm’s pace of CSR engagement.

Table VI. Distribution of interlocked directors
### Table VII
The effect of director interlocks on the CSR pace-firm performance relationship

<table>
<thead>
<tr>
<th></th>
<th>With interlocks</th>
<th>All observations</th>
<th>With interlocks</th>
<th>All observations</th>
<th>With interlocks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
</tr>
<tr>
<td>CSR</td>
<td>0.1041*** (0.0406)</td>
<td>0.1565*** (0.0488)</td>
<td>0.1906*** (0.0730)</td>
<td>0.1553*** (0.0418)</td>
<td>0.1523*** (0.0510)</td>
</tr>
<tr>
<td>Pace</td>
<td>0.0464 (0.0471)</td>
<td>0.1432*** (0.0589)</td>
<td>-0.1084 (0.0841)</td>
<td>0.0627 (0.0460)</td>
<td>0.1512*** (0.0564)</td>
</tr>
<tr>
<td>CSR × Pace</td>
<td>-0.0147 (0.0288)</td>
<td>-0.0768*** (0.0386)</td>
<td>0.1172** (0.0567)</td>
<td>-0.0224 (0.0286)</td>
<td>-0.0843*** (0.0351)</td>
</tr>
<tr>
<td>Firm Size</td>
<td>-0.1046*** (0.0167)</td>
<td>-0.1227*** (0.0214)</td>
<td>-0.0767*** (0.0285)</td>
<td>-0.1040*** (0.0166)</td>
<td>-0.1259*** (0.0213)</td>
</tr>
<tr>
<td>Board Size</td>
<td>-0.0008 (0.0055)</td>
<td>-0.0118 (0.0073)</td>
<td>-0.0117 (0.0090)</td>
<td>-0.0007 (0.0055)</td>
<td>-0.0119 (0.0073)</td>
</tr>
<tr>
<td>% Female Dir.</td>
<td>0.0082*** (0.0024)</td>
<td>0.0020 (0.0044)</td>
<td>0.0101*** (0.0052)</td>
<td>0.0061*** (0.0024)</td>
<td>0.0018 (0.0044)</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>1.8670*** (0.5559)</td>
<td>1.4764*** (0.6999)</td>
<td>2.4102*** (0.9171)</td>
<td>1.8679*** (0.5559)</td>
<td>1.4758*** (0.689)</td>
</tr>
<tr>
<td>Leverage</td>
<td>-0.0347 (0.1846)</td>
<td>-0.4574*** (0.1887)</td>
<td>-0.7674*** (0.2349)</td>
<td>-0.6354*** (0.1487)</td>
<td>-0.4561** (0.1886)</td>
</tr>
<tr>
<td>Liquidity</td>
<td>1.5696*** (0.1724)</td>
<td>1.7136*** (0.2129)</td>
<td>1.2733*** (0.2883)</td>
<td>1.5698*** (0.1723)</td>
<td>1.7131*** (0.2135)</td>
</tr>
<tr>
<td>Growth Potential</td>
<td>2.8936*** (0.5713)</td>
<td>3.0462** (0.6221)</td>
<td>3.0666*** (1.0254)</td>
<td>2.886*** (0.5718)</td>
<td>1.724*** (0.2883)</td>
</tr>
<tr>
<td>Constant</td>
<td>55.0918*** (13.0814)</td>
<td>59.8558*** (17.4159)</td>
<td>82.0995*** (23.8767)</td>
<td>55.4620*** (13.0441)</td>
<td>61.3872*** (17.4094)</td>
</tr>
<tr>
<td>Industry dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Number of observations</td>
<td>3,412</td>
<td>2,246</td>
<td>1,166</td>
<td>3,412</td>
<td>2,246</td>
</tr>
<tr>
<td>Number of firms</td>
<td>301</td>
<td>301</td>
<td>301</td>
<td>301</td>
<td>301</td>
</tr>
</tbody>
</table>

**Notes:** The table presents a regression of firm performance on firm and board characteristics. The dependent variable is Tobin's Q, used as a proxy for firm performance. Pace is calculated by subtracting a firm's current CSR score from its previous three-year average CSR score (Columns 1–3) and its previous two-year average CSR score for robustness (Columns 4–6). Robust standard errors are computed following White (1980) to account for potential heteroskedasticity. ***,*** Significant at the 10, 5 and 1 levels, respectively.
acquire valuable resources through their social networks. Although results from Table V suggest that interlocked directors decrease the pace of CSR engagement, interlocked directors have the knowledge of how and when to make strategic decisions to increase the pace of CSR engagement. In other words, firms with high interlocks engage in CSR at a fast pace only when there is a value-enhancing opportunity that directors identify using their experience and social networks. On the other hand, when firms with no interlocks engage rapidly in CSR, it has a detrimental effect on firm performance. In such a case directors have limited access to outside resources, so engaging in CSR might be an attempt to appease stakeholder pressure rather than a value-enhancing activity. In Columns 4–6 the same tests are repeated using the two-year measurement of pace. The results provided by pace2 are similar to those provided by the three-year measurement, confirming the validity of our previous measure and results.

Additional sensitivity analysis

Alternative measure for director interlocks
In addition to the interlocks measure provided by the MSCI database, a new measure was developed and used in the sensitivity analysis section. The resource dependency theory suggests that independent directors play a significant role in helping firms secure vital resources that will help them achieve their goals. This is highlighted in the case of interlocked independent directors as firms appoint such directors to their board due to their large social network and wide access to resources (Lamb and Roundy, 2016). Therefore, consistent with previous literature (Cashman et al., 2012; Fich and Shivdasani, 2006), an interlocked board indicator is created where the indicator takes a value of 1 if more than 50 percent of a firm's independent directors are considered to be interlocked directors and 0 otherwise. An interlocked director is defined as a director holding three or more directorships (Ferris et al., 2003; Fich and Shivdasani, 2006). The rationale behind this measure is that firms with interlocked boards are better prepared for fast CSR involvement than firms with no board interlocks.

Table VIII displays the result of an industry fixed-effect regression of the independent variables on Tobin's Q. Table VIII provides results consistent with our hypotheses and with those displayed earlier in Table VII. Column 1 shows that the coefficient of CSR × Pace does not have a significant effect on firm performance for our overall sample. However, when the data are split into firms without interlocked boards (Column 2) and firms with interlocked boards (Column 3), the results become more interesting. Column 2 shows that the coefficient of CSR × Pace is significantly negative for firms without interlocked boards, suggesting that CSR involvement has a negative effect on firm performance as the pace of CSR engagement increases. On the other hand, for firms with interlocked boards, the coefficient of CSR × Pace is strictly positive. This suggests that the presence of a majority of interlocked independent directors has a positive effect on the relationship between the pace of CSR involvement and firm performance.

Alternative measure for firm performance
In order to improve the robustness of the results presented earlier, we re-perform the tests of Table VII using ROA as a dependent variable to proxy for a firm's accounting performance rather than financial performance. Column 1 of Table IX shows that the interaction coefficient of CSR × Pace is positive and significant. This suggests that increasing the pace of a firm's CSR involvement has a positive effect on the firm's accounting performance. In Columns 2 and 3, the data are split into firms without director interlocks (Column 2) and firms with at least one interlocked director (Column 3). The interaction coefficient of CSR × Pace is insignificant in Column 2, indicating that increasing the pace of a firm's CSR
## Table VIII. Robustness test using an alternative measure for interlocked directors

<table>
<thead>
<tr>
<th></th>
<th>All observations</th>
<th>No interlocked boards</th>
<th>Interlocked boards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>CSR</td>
<td>0.1447*** (0.0439)</td>
<td>0.1147** (0.0468)</td>
<td>0.0572 (0.1205)</td>
</tr>
<tr>
<td>Pace</td>
<td>0.0784 (0.0538)</td>
<td>0.1277*** (0.0595)</td>
<td>0.0003 (0.1492)</td>
</tr>
<tr>
<td>CSR × Pace</td>
<td>−0.0412 (0.0339)</td>
<td>−0.0570* (0.0382)</td>
<td>0.2367*** (0.1043)</td>
</tr>
<tr>
<td>Firm Size</td>
<td>0.0443*** (0.0145)</td>
<td>0.0642*** (0.0161)</td>
<td>−0.0068 (0.0355)</td>
</tr>
<tr>
<td>Board Size</td>
<td>−0.0196*** (0.0036)</td>
<td>−0.0210*** (0.0039)</td>
<td>−0.0197* (0.0102)</td>
</tr>
<tr>
<td>% Female Dir.</td>
<td>0.0089*** (0.0024)</td>
<td>0.0073*** (0.0033)</td>
<td>0.0113*** (0.0039)</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>2.8788*** (0.4140)</td>
<td>2.9686*** (0.5117)</td>
<td>2.8684*** (0.7931)</td>
</tr>
<tr>
<td>Leverage</td>
<td>−0.6105*** (0.1451)</td>
<td>−0.5368*** (0.1576)</td>
<td>−3.1239*** (0.2845)</td>
</tr>
<tr>
<td>Liquidity</td>
<td>0.5920*** (0.1296)</td>
<td>0.4930*** (0.1450)</td>
<td>0.1757 (0.3180)</td>
</tr>
<tr>
<td>Growth Potential</td>
<td>3.1574*** (0.3920)</td>
<td>3.1071*** (0.4420)</td>
<td>1.4584 (1.1319)</td>
</tr>
<tr>
<td>Constant</td>
<td>−5.3808 (18.6666)</td>
<td>2.7995 (20.9166)</td>
<td>3.7848 (46.3429)</td>
</tr>
</tbody>
</table>

Industry dummies: Yes
Year dummies: Yes
Number of observations: 3,412
Number of firms: 301
R²: 0.3012

Notes: The table presents a regression of firm performance on firm and board characteristics. The dependent variable is Tobin’s Q, used as a proxy for firm performance. Pace is calculated by subtracting a firm’s current CSR score from its previous three-year average CSR score. An interlocked board indicator where the variable takes a value of 1 if more than 50 percent of a firm’s independent directors have at least three or more directorships and 0 otherwise. Robust standard errors are computed following White (1980) to account for potential heteroskedasticity. *, **, *** Significant at the 10, 5 and 1 percent levels, respectively

## Table IX. Robustness test using an alternative measure of performance

<table>
<thead>
<tr>
<th></th>
<th>All observations</th>
<th>Without interlocks</th>
<th>With interlocks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>CSR</td>
<td>1.5782*** (0.3966)</td>
<td>2.0307*** (0.4706)</td>
<td>0.1317 (0.7500)</td>
</tr>
<tr>
<td>Pace</td>
<td>0.5200 (0.4749)</td>
<td>0.4059 (0.5931)</td>
<td>1.4684* (0.8029)</td>
</tr>
<tr>
<td>CSR × Pace</td>
<td>0.8934*** (0.3118)</td>
<td>0.5216 (0.4040)</td>
<td>1.8923*** (0.5308)</td>
</tr>
<tr>
<td>Firm Size</td>
<td>0.4527*** (0.1313)</td>
<td>0.5128*** (0.1693)</td>
<td>0.3848* (0.2220)</td>
</tr>
<tr>
<td>Board Size</td>
<td>−0.1644*** (0.0322)</td>
<td>−0.1869*** (0.0388)</td>
<td>−0.1367*** (0.0679)</td>
</tr>
<tr>
<td>% Female Dir.</td>
<td>0.0867*** (0.0224)</td>
<td>0.1267*** (0.0361)</td>
<td>0.0812*** (0.0295)</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>−5.1960*** (0.2638)</td>
<td>−54.7028*** (4.7595)</td>
<td>−47.2651*** (12.1071)</td>
</tr>
<tr>
<td>Leverage</td>
<td>−12.7406*** (1.5786)</td>
<td>−11.2280*** (2.0462)</td>
<td>−15.5880*** (2.5724)</td>
</tr>
<tr>
<td>Liquidity</td>
<td>7.2585*** (1.8607)</td>
<td>8.4663*** (2.2341)</td>
<td>6.0322* (3.4681)</td>
</tr>
<tr>
<td>Growth Potential</td>
<td>13.4679*** (3.6715)</td>
<td>12.5876*** (4.2823)</td>
<td>17.6197** (8.4439)</td>
</tr>
<tr>
<td>Constant</td>
<td>−603.9986*** (181.6349)</td>
<td>−721.2032*** (213.4229)</td>
<td>−691.0915* (365.7514)</td>
</tr>
</tbody>
</table>

Industry dummies: Yes
Year dummies: Yes
Number of observations: 3,412
Number of firms: 301
R²: 0.3012

Notes: The table presents a regression of firm performance on firm and board characteristics. The dependent variable is a firm’s Return on Assets (ROA), used as a proxy for a firm’s accounting performance. Pace is calculated by subtracting a firm’s current CSR score from its previous three-year average CSR score. An interlocked board indicator where the variable takes a value of 1 if more than 50 percent of a firm’s independent directors have at least three or more directorships and 0 otherwise. Robust standard errors are computed following White (1980) to account for potential heteroskedasticity. *, **, *** Significant at the 10, 5 and 1 percent levels, respectively
involvement does not lead to better accounting performance for firms with no interlocked directors. On the other hand, the interaction coefficient CSR × Pace is positive and significant in Column 3, designating that increasing the pace of CSR involvement can lead to better accounting performance for firms with interlocked directors.

Though earlier results from Table VII suggest that fast CSR involvement can harm a firm’s financial performance in the absence of interlocked directors, Table IX shows that this negative relationship is not realized for a firm’s accounting performance. However, the results presented in Table IX are still consistent with the fact that increasing the pace of CSR involvement leads to better returns (based on both Tobin’s Q and ROA) in the presence of interlocked directors.

Conclusion
This study proposes that director interlocks moderate the pace and efficiency of CSR activities. Preliminary findings indicate that the presence of interlocked directors enhances the possibility of engaging in CSR activities at a slow or steady pace, but not at a fast pace. However, in some cases, interlocked directors are found to be positively correlated with increasing the pace of CSR involvement. Further analysis shows that when CSR pace increases in the presence of interlocked directors, it has a positive effect on firm performance. On the other hand, pace is negatively related to firm performance for firms with no director interlocks. This suggests that firms with interlocked directors are able to identify value-enhancing CSR activities and will only increase the pace of their CSR engagement when value-enhancing opportunities are present. On the other hand, in the absence of interlocked directors, firms increase their CSR engagement as a window-dressing device to appease stakeholder pressure, resulting in a negative effect on firm performance.

These results are consistent with the notion that interlocked directors gain valuable experience from serving on several boards and show a heightened awareness when setting the strategies for CSR engagement. Given the changing regulatory environment, the influence of interlocked directors is expected to increase (Shropshire, 2010). The significance of interlocked directors arises from the fact that environmental investments are costly and their returns are uncertain. Interlocked directors provide trustworthy information regarding environmental investments, and thus decrease any possible uncertainty related to these activities. Accordingly, firms should match their board composition with their environmental needs. Overall, despite the increasing awareness of CSR, corporations still have to seek socially responsible activities that can maximize firm value to keep their shareholders content. The consequences of director interlocks on a firm’s strategic decisions are demonstrated by the directors’ heightened ability to acquire resources and find value-maximizing opportunities. In addition, interlocking companies enjoy smooth information flow and communication through their connectedness, which limits the costs of experimentation and learning (Haunschild, 1993).

The results of this paper are of particular interest to managers and policymakers. Findings suggest that interlocked directors play a significant role in moderating the relationship between CSR engagement and firm performance. Though the literature posits that CSR activities are positively related to long-term sustainability, firms should not engage in CSR activities rapidly when facing pressure from their stakeholders. Rapid CSR engagement at a pace exceeding a firm’s absorptive capacity can have a detrimental effect on firm performance, in the absence of interlocked directors. Instead, firms should appoint interlocked directors to their boards based on their specific social and environmental needs. In turn, these directors can help set the firm’s CSR engagement strategy and find value-enhancing CSR activities that would help maximize shareholder wealth.
References


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Bilal Al-Dah can be contacted at: ba62@aub.edu.lb

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The impact of interlocking directorates on innovation: the effects of business and social ties

Ana B. Hernández-Lara and Juan P. Gonzales-Bustos
Business Management, Universitat Rovira i Virgili, Reus, Spain

Abstract
Purpose – Boards of directors of large companies all over the world frequently have a certain number of shared directors, which can be motivated by social structures that foster different types of links, including investments and vertical relationships. The purpose of this paper is to identify the effects that board interlocking exerts on innovation, considering the different nature of shared directors that finally determines the type of links dominating the boards.
Design/methodology/approach – Panel regression analyses were conducted using data collected from 69 Spanish listed innovative sector companies during the period 2010–2014, which provided an unbalanced panel of 325 data observations.
Findings – The results suggested that the typology of interlocks determined their effects on innovation, which had a positive influence when independent and extra-industry directors held multiple directorships, whereas it was negative in the case of intra-industry and women interlocking directors.
Practical implications – This study provided evidence for the diverse effects of interlocking directorates and contributed to the open debate on the best board composition for improving business innovation, considering the common feature of shared directorships.
Originality/value – The value of this research was twofold. On the one hand, the study considered a wide typology of interlocking directorates, such as women, affiliated and independent directors, intra- and extra-industry directorships, as well as shared directors from the same country. On the other hand, the effects of these different interlocking directorate typologies were analysed on innovation by considering different innovation indicators.

Keywords Innovation, Corporate governance, Boards of directors, Interlocking directorates

Paper type Research paper

Introduction
Previous research has mostly been centred on analysing the effects that boards of directors have on financial performance (Dalton and Dalton, 2011) and, to a lesser extent, on firm strategies such as diversification, internationalisation and innovation (Pugliese et al., 2009).

In the specific case of innovation, existing research has widely recognised the effects of board composition (Hernández et al., 2010, 2014) by considering different features such as gender diversity (Galia and Zenou, 2012), directors’ typology (Zahra et al., 2000), board size (Zona et al., 2008), or duality (Chen and Hsu, 2009; Van Essen et al., 2012), among others. However, given that boards are social groups, the relationships and networks of the directors on the board should not be neglected, as far as they can influence their functions and decisions (Finkelstein and Mooney, 2003). Therefore, these facts support an analysis of the interlocking effect.

Interlocking directorates, or shared directors, are quite frequent because directors usually sit on multiple boards, thus building networks and links with other firms, shareholders or individuals (Barroso et al., 2016). The generalisation of this phenomenon and its potential consequences has attracted the attention of academics but there is no wide-ranging consensus on its influence.

Some arguments highlight the positive effects that can be gained by the major access that this overlap provides to directors with regard to key resources, strategic information,
learning and legitimacy (Barroso et al., 2016). On the other hand, some negative effects have also been identified caused by the small amount of time available to directors who sit on multiple boards, with subsequent negative consequences for commitment, responsibility and effectiveness in the development of their functions (Guerra and Santos, 2011).

In addition, interlocking directorates are analysed frequently as a homogeneous phenomenon, where the existence of shared directors and their number are the characteristics considered for identifying their potential impacts on performance (Barroso et al., 2016; Mazzotta et al., 2017; Tan et al., 2009) and firms’ strategies (Chen, 2014). The influences of the specific typologies of these directors who take part in different boards have also been considered, such as interlocking directors with extra- or intra-industry ties (Chen et al., 2009; McCann, 2016), interlocks linked to banks (Markarian et al., 2006), women holding multiple directorships (Gamba and Goldstein, 2009; Zenou et al., 2012), etc. However, these approaches do not take into consideration the holistic view of this phenomenon that could help to explain some of the incongruent results of previous studies, for example, using an approach that considers a more complete picture of interlocks within the boards. This picture should include frequently studied interlocking directorates, such as extra-industry ties, together with other less analysed aspects that could include the characteristics of gender, nationality or the independence of the interlocks.

Therefore, the aim of this study was to fill this gap, and respond to the following research question:

RQ1. Which is the impact that different interlocking directorates exerts on innovation?

To do so, business relationships and social structures of the interlocking effect were considered. Business relationships were analysed in terms of intra- and extra-interlocks, and social structures were contemplated in terms of gender (women interlocks), independence (affiliated and independent interlocks) and nationality (interlocks belonging to the same country). In this respect, the study expected to contribute to the examination of a broad social network of interlocks with varied effects based on the interlock type, as well as to add robustness by considering different innovation indicators.

The remainder of this study is structured as follows. The next section presents related literature and provides the hypotheses development. Afterwards, the research method is described, as well as the analyses conducted and the results. Finally, there is a section devoted to discuss the results and conclude this study.

Theoretical framework and hypotheses development

Interlocking directorates and innovation

As Mizruchi (1996, p. 271) states, “an interlocking directorate occurs when a person affiliated with one organisation sits on the board of directors of another organisation”. These interlocks provide access to crucial external information and resources (Dalziel et al., 2011), and act as an indicator for a board’s external social capital (Tian et al., 2011).

When directors sit on multiple boards, they form connections with other companies, and provide a channel to exert influences among them (Caiazza and Simoni, 2015), which can be translated into relevant benefits, although they can also provoke disadvantages. On the one hand, interlocking directorates could exert a positive impact on performance through their provision of key resources in terms of network opportunities, such as strategic information, learning and legitimacy (Barroso et al., 2016), by imitation of successful strategies (Connelly et al., 2011). On the other hand, certain costs can also be generated by the loss of director independence (Guerra and Santos, 2011), decreasing commitment and involvement with the board’s tasks (De Andrés et al., 2014), and by the limited time and attention devoted by directors to their role in this situation (Harris and Shimizu, 2004) when they frequently cannot attend all the meetings of the board or cannot prepare these meetings adequately (Finkelstein and Mooney, 2003).
With regard to innovation, although previous research is more limited, the arguments proposed are quite similar. Some academics defend a negative impact, mostly based on assumptions of the management control theory (Drago et al., 2015), which underlines the conflicts of interlocking directorates on innovation. This theory stresses the influence of managers that use interlocking directorates for enlarging their power in pursuing strategies that are not in line with shareholders’ interests, like in the case of innovation (Drago et al., 2015). Managers tend to appoint directors from other companies, who are frequently passive and conformist with the managers’ decisions, and who do not contradict those who appointed them to the board (Koenig et al., 1979). In this same line, some authors have also noted the high level of complacency and the high isolation from the external environment provoked by strong networks, which may also restrict flexibility and the responses to emerging opportunities (Dakhli and De Clercq, 2004; Florida et al., 2002). Therefore, interlocks may be a means of managerial control to serve the interests of managers, and inhibit change and innovation (Kaczmarek et al., 2014). In addition, interlocking implies devoting more time, and agenda conflicts could emerge with negative consequences for the strategic and monitoring functions of directors based on the “busyness” assumption of the agency theory (Kaczmarek et al., 2014). These dependencies and conflicts could jeopardise innovation.

However, most previous evidence points to a positive influence of interlocking directorates on innovation and, more specifically, on R&D investment, arguing that directors will imitate this investment from their interlocked firms (Han et al., 2015). According to the resource dependence theory and the social capital theory, which constitute the theoretical frameworks of the majority of the studies (Simoni and Caiazza, 2013), interlocking directorates imply adding valuable resources and social capital to the board in order to generate positive effects in terms of connectivity to other directors and executives of different companies (Chen, 2014). Director interlocking is a crucial information transmission channel, and has a direct effect on the diffusion of certain practices between organisations, reducing the uncertainty associated with their strategic initiatives, and encouraging inter-organisational mimetic processes for the most successful strategies (Connelly et al., 2011; Davis, 1996). In the specific case of innovation, given the high complexity and risk involved in this strategy, directors reduce the problem and feel more confident with this strategy when they obtain information through their external references and organisational partners. This enables them to acquire a comprehensive view of innovative alternatives and the solutions applied by these partners (Chen, 2014; Han et al., 2015). Interlocking directorates also ensure critical know-how, essential resources (including financial), complementary skills, extra legitimacy and timely information about environmental events and trends (Kor and Sundaramurthy, 2009), as well as innovation, that other companies have adopted or developed, which diminishes uncertainty in R&D activities (Chen, 2014; Wincent et al., 2010). Finally, directors highly connected to other companies have extensive experience in board decision making and normally a solid reputation that empowers them to act more independently from the firms’ management with subsequent positive effects on innovation (Mazzola et al., 2016).

In light of the more abundant empirical evidence towards a positive effect and the relevance of the arguments in favour of this relationship, the following hypothesis is formulated:

H1. There will be a positive influence of interlocking directorates on innovation.

Business relationships and innovation: intra- and extra-interlocks
One of the reasons for the lack of empirical evidence on the effects of interlocking directorates on innovation arises from the fact that this is not a homogenous phenomenon. On the contrary, different types of directors can sit on multiple boards and their typology
and nature could also explain their effects, since some board interlocks would facilitate a strategic initiative, whereas others may impede it (Connelly et al., 2011).

Previous research interested in describing the influences caused by these nuances related to the types of interlocking has focused on business interactions that involve vertical relationships (e.g., buyers-suppliers), financing relationships (e.g., with banks), and inter- or extra-industry ties. This latter distinction in interlocking directorates has especially attracted the attention of researchers studying innovation.

According to Geletkanycz and Hambrick (1997), under the logic of the resource dependence theory and the social capital theory, extra-industry ties are associated with innovation while intra-industry ties are related to behavior conforming to industry norms and to knowledge about the core industry (Simoni and Caiazza, 2013). The arguments that explain these associations are based on the location of outside contacts because when they share the same operating environment, the industry does not have access to new or different information apart from the specific knowledge of those involved (Heracleous and Murray, 2001). Also, interlocks within the same industry prefer to relate with players central to the field and avoid relationships that expose organizations to a variety of knowledge domains (Simoni and Caiazza, 2013). In this case, the directors share similar learning structures, and sitting on multiple boards deepen their understanding of strategies, best practices, policies and routinized behaviors typical to the sector (Simoni and Caiazza, 2012). On the contrary, a network where the actors belong to different operating environments and industries provides an alternative source of ideas that are beneficial for promoting changes, which include diversification and innovation (Chen et al., 2009), as well as new ways to cope with increasing levels of uncertainty and resource dependencies, which is positive for innovation (Lang and Lockhart, 1990). Hence, the following hypotheses could be formulated:

H2. There will be a negative influence of intra-industry interlocking directorates on innovation.

H3. There will be a positive influence of extra-industry interlocking directorates on innovation.

Social relationships and innovation: gender, independence and nationality
Women interlocks. The underrepresentation of women on boards has lately attracted the attention of researchers studying corporate governance (Joecks et al., 2013; Lucas et al., 2015), which coincides with a regulatory movement aimed precisely at increasing this female representation. This recent interest has led to an increase in research focused on the impact of women appointed to boards mainly on a firm’s performance (Rossi et al., 2017), but few studies have been devoted to analysing the networks of female directors (Zenou et al., 2012).

This limited research has been centered mostly on explaining the type of networks and alliances that lead to the promotion of women as directors (Zenou et al., 2012). Interlocking can trigger this promotion in a way that facilitates access to board directorships. Therefore, it could be expected that a few women would manage to have access to seats on a board and accumulate a high number of directorates (Zenou et al., 2012).

Regarding the effects that female directors exert on innovation, previous research highlights the influence of diversity and risk aversion. Women on boards help to foster a board’s diversity (Burgess and Tharenou, 2002; Midavaine et al., 2016). According to the resource dependence theory, the diversity of the board increases the information available for problem solving, improves decision making (Huse et al., 2009) and enhances the board’s ability to generate creative solutions (Kaczmarek et al., 2014) and innovation (Chen et al., 2005). Therefore, women on the board bring new perspectives, experiences,
knowledge, useful skills and other forms of leadership that positively influence R&D and innovation (Galia and Zenou, 2012; Midavaine et al., 2016; Rossi et al., 2017).

There are also negative effects for innovation strategies of appointing women to boards, and they are frequently related to the higher risk aversion and more conservative approach shown by women in decision making defended by gender differences theories (Barsky et al., 1997; Nielsen and Huse, 2010). However, in the case of female interlocking directorates, it could be expected that these negative effects would be diminished due to the empowerment of the women who sit on multiple boards and the wide experience they accumulate in different organisations. This provides them with greater knowledge concerning the most successful strategies that they can then imitate and extrapolate to the rest of the organisations where they are appointed as directors, and they do not suffer the limitations or lack of independence of other female directors who do not hold multiple directorates. Therefore, the following hypothesis could be proposed:

**H4.** There will be a positive influence of women interlocking directorates on innovation.

**Independent interlocks.** On the basis that the roles of interlocking directorates change depending on the type of director, it would be interesting to contrast the influence of inside and outside directors. This distinction resides in their different roles, with the outside directors being more oriented towards the protection of investors' interests, while inside or executive directors are more vigilant of the CEO's interests and decisions (Kang, 2008).

Inside directors are directors who currently serve as firm officers, and are in touch with routine activities, company decisions and operations (Hernández et al., 2010). On the other hand, outside directors have no professional or personal association with the company, and represent the interests of shareholders. However, outside directors do not form a homogenous group, and the level of independence is not the same for all of them, since it is possible to differentiate between affiliated directors who represent large shareholders, and independent directors selected for their professional experience and reputation.

Most of the previously published research has concentrated on the influences of non-executive directors (Pérez and Barroso, 2015) because the benefits of interlocking emerge from a rich business experience. However, the relationship between innovation and interlocking directors may change depending on their type and, more specifically, on their independence level (Han et al., 2015).

According to the agency theory, the greater the independence of directors the more vigilant they are at monitoring and supervising managerial actions, thus reducing agency conflicts (Le et al., 2006). In addition, according to the resource dependence theory, the independence of directors contributes towards enhancing the diversity of the board (Kim and Kim, 2015), providing cognitive diversity and facilitating the use of external resources that are beneficial for stimulating more innovative actions (Van Essen et al., 2012), especially those that involve exploration activities (Kim and Kim, 2015). Hence, the imitation of innovation strategies is more likely to take place when the interlocking directorates are independent directors, who are in a better position to import successful innovation strategies from the other companies where they hold a board position. In relation to the above, the following hypothesis could be proposed:

**H5.** The independence of interlocking directorates exerts a positive influence on innovation.

**International interlocks.** Finally, globalisation has positioned nationality as another relevant feature in corporate elite networks. This phenomenon has mostly been analysed in comparative longitudinal and cross-national studies that were interested in showing the rise of transnational networks on boards as a consequence of the globalisation of investments, thus increasing the diversity of the board in terms of nationality (Heemskerk, 2013).
However, in practice, this change has not emerged to any great extent (Heemskerk et al., 2016). One possible explanation for this could be related to the homophily effect, which underlines the likelihood of contacts between similar actors (Han et al., 2015), and could affect the national or transnational network orientation of the boards (Heemskerk et al., 2016).

Regarding innovation, researchers have not examined the implications of interlocks in a global context, nor have they examined the effects of international interlocks on innovation (Lamb and Roundy, 2016), but as far as international interlocks provide diversity and more independence on the board, and according to the positive influence associated to independence and diversity given by the agency and the resource dependence theory, respectively, positive effects could be expected between international interlocks and innovation. Therefore, the following hypothesis could be formulated:

\[ H6. \text{ The higher the similarity of interlocking directorates in terms of nationality the more negative the influence on innovation.} \]

Research method
Sample and data collection
The sample framework for this study consisted of Spanish companies listed on the continuous market of the Madrid Stock Exchange in the 2010 financial year, which belonged to innovative economic sectors. Innovative sectors were defined as those that accomplished at least one of the following innovation indicators (Hernández et al., 2014): the percentage of innovative firms in the sector should be higher than 30 per cent; the R&D intensity should be above 1.5 per cent; the percentage income generated by new or improved products in the sector should be above 10 per cent.

As a result, a list of 69 companies was compiled and an unbalanced panel of 325 observations was created with the data from these innovative firms for which information was available between the five consecutive years 2010–2014, both included.

Data on the structure and composition of a board were obtained from the company annual corporate governance reports listed by the Spanish National Securities Market Commission (CNMV). These reports present information on the typology and identity of the directors on each board, their leadership structure in terms of duality, their size and composition. The company annual financial reports and information on company R&D investments were gathered from the Datastream database (Thomson Reuters), which offers financial and accounting information on companies from all over the world, as well as information on board structure (Pérez-Calero et al., 2017). Finally, data related to patents were obtained from ESPACENET (European Network of Patent Databases).

Measurement of variables
Dependent variables. R&D investments and the number of patents were adopted as the main innovation indicators in this study.

R&D investments were considered in absolute and relative terms, using two different measurements. On the one hand, according to Flor and Oltra (2004), R&D expenditure (RD) was used as an input-based indicator for innovation (Hernández et al., 2010), especially for technological innovation, and as a means to identify innovating companies (Jacobsson et al., 1996; Mazzola et al., 2016). On the other hand, according to Kor (2006), R&D investments could also be measured through R&D intensity (RDint), calculated as a firm’s R&D investment divided by the number of employees (Chen, 2014), which reduces any problems related to the potential relationship of R&D with other ways of measuring firm size, such as sales or assets.

The counting of registered patents (PAT) was used as an output-based indicator for innovations, which has been frequently related to inventiveness by previously published research (Balsmeier et al., 2014).
Due to asymmetry problems in the distribution that these different innovation indicators usually exhibit, and following previously published research, these indicators were transformed by adding a very small constant (i.e. 0.001) and applying a log transformation, which reduces the skewness and maintains the regression assumptions (Chen, 2014).

**Independent variables.** This study considered independent variables as the different types of directorships that overlap when directors sit on multiple boards (Kor and Sundaramurthy, 2009).

Interlocking directorates (Interl) were calculated as the total number of board directorships that board members held in other companies divided by the board size (Barroso et al., 2016; Chen, 2014); the higher this proportion the greater the connectivity of the board with other companies.

The different types of interlocking directorates, which were considered to reflect the business and social relationships between firms, were measured as detailed below.

Business relationships were reflected through intra-industry interlocks (Intra) and extra-industry interlocks (Extra), which were measured as the proportion of interlocking directorates on the board with intra- and extra-industry ties, respectively (Chen et al., 2009).

To reflect social relationships, four types of interlocks were taken into account: women interlocks (Wom) to capture the gender dimension; affiliated interlocks (Affil) and independent interlocks (Indep) to capture the independence level dimension (outside directors were split into two types with different independence levels); and national interlocks (Nation) used to capture the transnational nature of the network. These were all calculated in a similar way, by considering the proportion of interlocking directors of each type on board (Chen et al., 2009).

**Control variables.** In accordance with previous studies of corporate governance, several control variables were included that could affect the relationships proposed between the board structure and innovation. Some of these were related to the characteristics of the companies, and others to the characteristics of their boards. Specifically, the firm-level controls proposed were: firm size, past firm performance, leverage, market value and volatility.

Firm size (Size) has been considered as a relevant control in most of the previous corporate governance studies, and was measured as the log transformation of total assets (Chen, 2014). Past firm performance was measured through the return on assets (ROA) and was included in the models as a factor with potential influence on a company’s innovation (Barroso et al., 2016; Chen and Hsu, 2009). Market value (MV) was also identified by previous research as a factor with effects on innovation (Zahra et al., 2004) and was calculated by multiplying the share price by the number of ordinary shares (Chen and Suny, 2007). Leverage (Lev), measured as total debt divided by total assets, was included because innovation requires the financial support usually provided by debt (Chen, 2014). Finally, volatility (Vol) was used as a measurement of the frequency and intensity of changes in asset price, and was included because it is a potential determinant of risk investments (Lenard et al., 2014).

Finally, the board-level controls proposed were board size and duality. Board size (Bsize) was measured as the number of directors on the board (Pérez-Calero et al., 2017), and duality (DUAL) was a dichotomous variable that had a value of 1 when the CEO was also the board chair and 0 otherwise (Chen, 2014). These two board controls were included because they have both been frequently considered as characteristics of the board structure with potential effects on innovation (Chen, 2014).

**Analyses and results**

The statistical analyses of this study were carried out by applying R version 3.4.0. (R Core Team, 2017).

Table I shows the correlation matrix and the main descriptive of the variables related to interlocking directorates, innovation and controls. The bivariate correlations between the
### Table I. Descriptive statistics and correlations

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>RDint</th>
<th>RD</th>
<th>PAT</th>
<th>Interl</th>
<th>Affil</th>
<th>Indep</th>
<th>Wom</th>
<th>Intra</th>
<th>Extra</th>
<th>Nation</th>
<th>Bsize</th>
<th>Size</th>
<th>ROA</th>
<th>MV</th>
<th>Lev</th>
<th>Vol</th>
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</thead>
<tbody>
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<td>RDint</td>
<td>-2.561</td>
<td>3.74</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>RD</td>
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<tr>
<td>PAT</td>
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<td>0.39***</td>
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<tr>
<td>Interl</td>
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<td>0.158</td>
<td>0.10****</td>
<td>0.15**</td>
<td>-0.02</td>
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<td>Affil</td>
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<td>0.416</td>
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<td>-0.02</td>
<td>-0.01</td>
<td>0.31</td>
<td>1</td>
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<tr>
<td>Indep</td>
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<td>0.19***</td>
<td>0.07</td>
<td>0.19***</td>
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<td>-0.04</td>
<td>-0.07</td>
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<td>0.10***</td>
<td>0.13***</td>
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<tr>
<td>Intra</td>
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<td>0.22***</td>
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<td>Extra</td>
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<td>0.03</td>
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<td>-0.25***</td>
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<td>-0.11****</td>
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<td>Nation</td>
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<td>0.01</td>
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<td>0.01</td>
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<td>0.18***</td>
<td>0.14*</td>
<td>0.17***</td>
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<td>0.25***</td>
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<td>0.04</td>
<td>0.06</td>
<td>0.01</td>
<td>0.02</td>
<td>0.01</td>
<td>0.25***</td>
<td>0.12*</td>
<td>0.15**</td>
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<tr>
<td>MV</td>
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<td>272</td>
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<td>0.35***</td>
<td>0.33***</td>
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<td>0.30***</td>
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<td>-0.03</td>
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<td>-0.01</td>
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<td>273</td>
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<td>0.13*</td>
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</table>

**Notes:** *p < 0.05; **p < 0.01; ***p < 0.001; ****p < 0.0001;
explanatory and control variables were below the cut-off point of 0.50 (Hair et al., 2010), suggesting that multicollinearity was not a serious problem. Nevertheless, some exceptions were observed that were above the indicated cut-off point. Therefore, additional analyses were conducted, specifically for the variance inflation factor values, and they were shown for all the models to be below the threshold of 4 (O’Brien, 2007), with the highest value being 3.05, which finally allowed any potential multicollinearity problem to be discarded.

The estimation procedure used was the random-effects estimation of panel data with robust standard errors. According to Croissant and Millo (2008), the appropriate estimation method depends on the properties of the individual component of the error that may be independent or not from the regressors. If it is correlated, the ordinary least squares estimators would be inconsistent and the best estimation procedure would be provided by the fixed-effects estimation. If the individual component of the error is not correlated with the regressors, the best procedure is the random-effects estimation. Hausman’s (1978) test detects if the individual effects are correlated with the regressors or not. If the values of the Hausman tests are not significant, the best estimation is provided by the random-effects regression model. The test results, displayed in Table II, show that the values of Hausman’s (1978) statistics are not significant for all the estimations, confirming the suitability of the random-effects regression models.

The empirical specifications proposed implied that three regressions had to be conducted, one for each innovation indicator. The specifications of the three models are indicated as follows:

\[
RD_{int,t} = \alpha_t + \beta_{11} \text{Inter}_t + \beta_{12} \text{Intra}_t + \beta_{13} \text{Extra}_t + \beta_{14} \text{Wom}_t + \beta_{15} \text{Affil}_t
\]

\[+ \beta_{16} \text{Indep}_t + \beta_{17} \text{Nation}_t + \beta_{18} \text{Size}_t + \beta_{19} \text{DUAL}_t + \beta_{20} \text{Size}_t + \beta_{111} \text{ROA}_t + \beta_{112} \text{VM}_t + \beta_{113} \text{Lev}_t + \beta_{114} \text{Vol}_t + \text{YEARdummy}_t + \mu_t + \epsilon_{it},\]

\[
RD_{it} = \alpha_t + \beta_{21} \text{Inter}_t + \beta_{22} \text{Intra}_t + \beta_{23} \text{Extra}_t + \beta_{24} \text{Wom}_t + \beta_{25} \text{Affil}_t
\]

\[+ \beta_{26} \text{Indep}_t + \beta_{27} \text{Nation}_t + \beta_{28} \text{Size}_t + \beta_{29} \text{DUAL}_t + \beta_{30} \text{Size}_t + \beta_{211} \text{ROA}_t + \beta_{212} \text{VM}_t + \beta_{213} \text{Lev}_t + \beta_{214} \text{Vol}_t + \text{YEARdummy}_t + \mu_t + \epsilon_{it};\]

\[
PAT_{it} = \alpha_t + \beta_{31} \text{Inter}_t + \beta_{32} \text{Intra}_t + \beta_{33} \text{Extra}_t + \beta_{34} \text{Wom}_t + \beta_{35} \text{Affil}_t
\]

\[+ \beta_{36} \text{Indep}_t + \beta_{37} \text{Nation}_t + \beta_{38} \text{Size}_t + \beta_{39} \text{DUAL}_t + \beta_{40} \text{Size}_t + \beta_{311} \text{ROA}_t + \beta_{312} \text{VM}_t + \beta_{313} \text{Lev}_t + \beta_{314} \text{Vol}_t + \text{YEARdummy}_t + \mu_t + \epsilon_{it};\]

The literature on corporate governance usually recognises the problem that many of the variables could be affected by endogeneity (Barroso et al., 2016), and several procedures are suggested for analysing the effect of this problem. One of these is related to the use of panel data and recommends the inclusion of time-lag effects. Therefore, this study considered a one-year interval between dependent, independent and control variables. Additionally, we included “lag effects” of the independent variables of this study as instruments (Barroso et al., 2016). These actions ensured that the direction of causality was from interlocking to innovation and not the reverse (Chen and Hsu, 2009).

The effects of interlocking on innovation were conducted in a stepwise manner and they are shown in Table II that details the three regressions, with the dependent variable being a different innovation indicator in each one. Each regression included two models, one for the control variables and a second that added the main effects of interlocking.
Table II: Random-effects panel regressions

<table>
<thead>
<tr>
<th></th>
<th>R&amp;D intensity (RDint)</th>
<th>R&amp;D expenditure (RD)</th>
<th>Patents (PAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
<td>Model 1</td>
</tr>
<tr>
<td></td>
<td>Estimate $\beta$</td>
<td>SE</td>
<td>Estimate $\beta$</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.136</td>
<td>0.191</td>
<td>-0.041</td>
</tr>
<tr>
<td>Bsize</td>
<td>0.069</td>
<td>0.163</td>
<td>0.334</td>
</tr>
<tr>
<td>Size</td>
<td>0.056</td>
<td>0.279</td>
<td>0.439</td>
</tr>
<tr>
<td>ROA</td>
<td>-0.205</td>
<td>0.074***</td>
<td>-0.124</td>
</tr>
<tr>
<td>Lev</td>
<td>-0.083</td>
<td>0.113</td>
<td>0.033</td>
</tr>
<tr>
<td>MV</td>
<td>0.277</td>
<td>0.274</td>
<td>-0.352</td>
</tr>
<tr>
<td>Vol</td>
<td>-0.286</td>
<td>0.121*</td>
<td>-0.249</td>
</tr>
<tr>
<td>DUAL</td>
<td>0.142</td>
<td>0.212</td>
<td>0.280</td>
</tr>
<tr>
<td>Step 2: main effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interl</td>
<td>0.094</td>
<td>0.091</td>
<td>0.130</td>
</tr>
<tr>
<td>Intra</td>
<td>-0.077</td>
<td>0.080</td>
<td>-0.064</td>
</tr>
<tr>
<td>Extra</td>
<td>0.137</td>
<td>0.080****</td>
<td>0.118</td>
</tr>
<tr>
<td>Affil</td>
<td>-0.043</td>
<td>0.114</td>
<td>-0.135</td>
</tr>
<tr>
<td>Indep</td>
<td>0.444</td>
<td>0.096****</td>
<td>0.455</td>
</tr>
<tr>
<td>Wom</td>
<td>-0.196</td>
<td>0.078*</td>
<td>-0.184</td>
</tr>
<tr>
<td>Nation</td>
<td>-0.056</td>
<td>0.087</td>
<td>0.044</td>
</tr>
<tr>
<td>Annual effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Instrumental variables</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Test Hausman $\chi^2$ (p-value)</td>
<td>5.1129 (0.8835)</td>
<td>12.711 (0.753)</td>
<td>4.013 (0.9106)</td>
</tr>
<tr>
<td>Adjusted $R^2$ (%)</td>
<td>8.81</td>
<td>29.8</td>
<td>19.735</td>
</tr>
<tr>
<td>$F$-statistical</td>
<td>2.463**</td>
<td>4.184****</td>
<td>3.517***</td>
</tr>
</tbody>
</table>

Notes: *p < 0.05; **p < 0.01; ***p < 0.001; ****p < 0.1
Table II shows the variables that had significant effects on any of the innovation indicators. Considering the control variables, seven controls exerted a significant effect on innovation. These included firm size, board size and duality, which maintained a positive influence on different innovation indicators; and past performance, market value, volatility and leverage which maintained a negative effect on innovation.

With regard to the main effects of interlocking and its different types, the first hypothesis argued in favour of the effects of interlocking on innovation. From the results of this study, no relationships between them could be proved, which confirmed the suitability of analysing interlocking not as a homogeneous phenomenon but instead as a heterogeneous phenomenon, where the nuances and particularities of each type of interlocking exerted different influences on innovation.

H2 and H3 proposed negative and positive effects on innovation of intra- and extra-industry interlocks, respectively. The results confirmed these two hypotheses when innovation was determined through the number of registered patents, with the effect of intra-industry interlocks being negative ($\beta = -0.196, p < 0.05$); and when innovation was determined through R&D intensity, with extra-industry interlocks being positive ($\beta = 0.137, p < 0.1$).

H4 established the positive effect of a higher proportion of women interlocks on innovation; however, contrarily to the hypothesis, the results confirm a negative relationship between these variables, when innovation was determined as R&D intensity ($\beta = -0.196, p < 0.05$) and as R&D expenditure ($\beta = -0.184, p < 0.1$).

H5 proposed that the independence of interlocking directorates exerted a positive influence on innovation. The findings confirmed that independent directors sitting on multiple boards effectively exerted a positive effect on both R&D expenditure ($\beta = 0.444, p < 0.001$). No significant effects were shown in the case of affiliated directorships. Therefore, the inclusion of two different types of outside directorates allows us to capture the independence dimension of outside directors and underline that not all of them are similar or exert the same effects on innovation. The results demonstrate the positive influence on innovation of independent interlocks, who do not have or have had in the past relationships with the company, their managers and executive directors. However, the effects of affiliated interlocks, who represent great shareholder, and whose independence could be affected by this fact, were not proved significant.

Finally, H6 proposed that higher similarity in terms of the nationality of interlocking directorates would negatively influence innovation. However, the findings did not confirm any positive or negative relationship between these variables, which meant that innovation did not seem to receive any influence of a higher transnationality in interlocking directorates.

To sum up, H2 and H3 on the negative and positive effects of intra- and extra-industry interlocks, respectively, and H5 on the positive influence of independent interlocks were supported, as far as the results confirmed these effects on at least one innovation indicator. On the contrary, H4 that established a positive link between women interlocks and innovation was rejected because the effect proved was not positive but negative instead, specifically on R&D intensity and R&D expenditure. Finally, H1 on the positive influence of interlocking and H6 on the positive effect of international interlocks on innovation were not supported or rejected with our data, due to the statistically non-significant results.

**Discussion and conclusions**

This study aimed to analyse the impact that different interlocking directorates exerted on innovation, considering business relationships and social structures. Business relationships were analysed in terms of intra- and extra-interlocks, and social structures in terms of gender, independence and nationality.
With a sample of 325 observations from Spanish listed companies that belonged to innovative sectors during the period 2010–2014, the results of the random-effects regressions confirmed that business relationships were important for determining the effects of interlocking directorates on innovation. Results of previous research were not clear on the influence of intra- and extra-industry interlocks on innovation. Our results were contrary to those provided by other researchers who have defended the importance of the similarities that companies share, as far as major similarities allow firms to enhance their trust, mutual recognition and imitation (Han et al., 2015). This means that intra-industry interlocks could be beneficial for exporting innovation strategies within the network. On the contrary, the findings of the present study were in line with the arguments of the resource dependence theory and the social capital theory that show the relevance of networking, as well as its diversity that contributes providing valuable resources, information and knowledge (Kor and Sundaramurthy, 2009). These results agreed with those of previous research based on the location of outside contacts indicating that if they share the same operating environment they lose access to new and different sources of information with subsequent negative impacts on changes and innovation (Chen et al., 2009; Heracleous and Murray, 2001; Simoni and Caiazza, 2012, 2013).

Similar results were obtained when considering the influence of affiliated and independent interlocking directorates. Previous research was not clear either on this point. The findings were opposite to those of previous research that underlined the positive influence on innovation of interlocks in touch with the day-to-day operations of a company and that know more about its operational activities in order to foster innovation, because they have essential discourse power in decision making and could probably influence R&D investment (Han et al., 2015). On the contrary, the results of this study supported the agency and resource dependence theory assumptions regarding the benefits of diversity and independence for innovation (Kim and Kim, 2015). These arguments are based on the richness of experience and external contacts of independent interlocks who could be more aware of their monitoring functions and could also provide cognitive diversity for their professional experience and links with other corporations that would be beneficial for innovation (Le et al., 2006; Van Essen et al., 2012).

Nevertheless, the results of this study did not confirm the influence of interlocking or the positive links of women and transnational interlocks on innovation. With regard to interlocking, the lack of significant results confirmed there were multiple forces that could explain the influence of interlocking, which could be one possible explanation for the lack of systematic empirical evidence shown in previous research (Chen, 2014; Chen et al., 2009). In addition, it constituted an incentive for considering the phenomenon of interlocking as a complex reality affected by the particularities of different types of networks within corporate boards.

With regard to women, there is scarce research on the effects of women interlocks on innovation, and contrarily to our hypothesis, the results confirm a negative relationship between these variables. Therefore, the results do not support that female interlocking directorates could exert an empowerment of the women who sit on multiple boards, strengthening the positive influence of their diversity, assumed by the resource dependence theory (Chen et al., 2005; Huse et al., 2009), and reducing their conservative behaviour underlined by gender differences theories (Nielsen and Huse, 2010). The data of this study confirmed that interlocking directorates in Spanish innovative companies were mostly men. Very few women hold multiple directorships (Gamba and Goldstein, 2009), and this fact could explain that until a critical mass is not accomplished, their positive influence on innovation could not be noticeable (Rossi et al., 2017). In this case, women directors could be considered simply representatives of their gender or tokens, with negative consequences on performance and innovation (Torchia et al., 2011).

Finally, the lack of empirical evidence on the influence of transnational interlocks on innovation could be explained by the scarce diversity of Spanish boards, where interlocking
directorates were mostly from the same country of the focal firm. The diversity and independence of international interlocks could not be really observed in our sample due to the scarcity of this kind of interlocking directorates, and this limitation avoids to make a contribution on this relationship, which has not been frequently addressed by previous research.

**Contributions and implications**
In conclusion, the contribution of this study to previous research was twofold. First, the study examined a broad social network of interlocks and focussed on the varied effects that different types of interlocking directorates exerted on innovation. This not only considered the most common interlocks based on business and vertical relationships but also the social structure of the ties, which included characteristics of gender, nationality and independence that all in all provided a more holistic picture of the phenomenon of interlocking directorates. Second, the study analysed the effects of interlocking directorates on innovation, whereas the published literature in this field has mainly focussed on examining how interlocking directorates affect economic and financial performance (Mazzola *et al.*, 2016). In addition, when innovation has been the firm strategy considered its measurement has frequently been limited to R&D investments (Han *et al.*, 2015). Therefore, the use of more than one innovation indicator offers a higher robustness to the results confirmed in this study.

Some theoretical and practical implications can also be derived from this research. First, at a theoretical level, the study supported the influence of networking on innovation shown by the social capital theory. On the other hand, the independence and diversity argued by the agency and resource dependence theories emerged as relevant features of interlocking for explaining its effects on innovation. The results also suggested useful clues for practitioners concerning the best interlocking directorates for improving innovation, which recommended higher proportions of independent interlocking directorates with extra-industry ties in order to improve innovation.

**Limitations**
This study had certain limitations that will provide opportunities for future research. First, with the purpose of proving a more holistic viewpoint of the interlocking phenomenon, other typologies and classifications of interlocking could be analysed by considering, for example, the levels of successfulness, centrality, plurality or activeness of the networks involved on boards. Second, there were characteristics of these networks that could also be studied for their potential influence on innovation, as would be the case for the level of interdependence, reciprocity, durability and density of the network. Finally, the inclusion of cross-national data would also offer the possibility of obtaining a clearer idea of the effects of interlocks, which were not as frequent in the case of Spanish companies, enabling, for example, further analysis of the conclusions regarding the effects of women and transnational interlocks. However, despite these limitations, this study extended the implications of the interlocking directorates’ phenomenon and the effects that business and social ties embedded on the board exerted on innovation.

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Further reading


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The role of start-up incubators
in cooperation networks
from the perspective of
resource dependence and
interlocking directorates

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Abstract

Purpose – Based on resource dependence theory and the concept of interlocking directorates, the purpose of this paper is to understand the importance of networks for start-ups and the role incubators play in these companies' networking processes.

Design/methodology/approach – The research was conducted through semi-structured interviews with the entrepreneurs responsible for three start-ups and the heads of their incubators. The interview data were subjected to content analysis using NVivo software.

Findings – The results indicate that start-ups often resort to networks to overcome their weak reputations and scarce resources. Incubators play a quite important role in this process since they promote events that encourage the creation of partnerships and networks either between start-ups within the same incubator or with external institutions. In addition, the results reveal that most cooperation networks are informal and that they fulfill needs that start-ups are not yet able to meet themselves, for example, when they compete for public tenders.

Practical implications – The present study explored this topic from two perspectives (i.e. start-ups and incubators). This approach facilitated the identification of the main features upon which start-ups depend, the entities to which these companies turn for help, the kind of communication in which they usually engage, the primary advantages of establishing cooperation networks and the main types of support given by incubators.

Originality/value – Most studies of cooperation networks are based on transaction cost economics, a resource-based perspective and/or institutional theory. In contrast, this study innovated by applying resource dependence theory and the concept of interlocking directorates, which provided an alternative explanation regarding cooperation networks’ importance to start-ups and incubators’ roles in these companies’ networking processes.

Keywords Cooperation, Network, Start-up, Resource dependence theory, Incubator, Interlocking directorates

Paper type Research paper

1. Introduction

Small enterprises play a key role in economies as they contribute to job creation, tax revenues and exports (Bollingtoft, 2012; European Commission, 2003; Storey, 1994). In addition, these firms stimulate competition, and they are a source of innovation.
However, when they are “newborn” (i.e. start-ups), they face difficulties that, in some cases, prevent them from surviving their first years (Garnsey, 1998; Hormiga et al., 2011). According to Bollingtoft (2012), one way to overcome challenges in this initial phase is to seek out the support of incubators that, by creating a business-friendly environment, compensate for some of the resource deficits that usually hamper start-ups (Lloyds and Han, 2007).

Incubators are currently defined as organisations that provide installations in which entrepreneurs can unite, interact and mobilise resources (Grimaldi and Grandi, 2005; Soetanto and Jack, 2013). Incubators are also intermediaries that help start-ups to create and develop networks with other start-ups within the same incubator or with a diverse range of stakeholders (Bergek and Norrman, 2008; Lofsten and Lindelof, 2005; Peters et al., 2004; Soetanto and Jack, 2013), as well as interlocking boards of directors (Pomba and Gutiérrez, 2011; Al-Dah, 2018; Caiazza et al., 2018). For the cited authors, institutions such as incubators have a significant impact on the practice of interlocking directorates.

Early stage entrepreneurs have ideas, knowledge and skills, but these individuals need other resources that they may not have in the first stages of the business-creation process in order to develop particular products or services (Durda and Krajcik, 2016). Thus, start-up entrepreneurs must participate in networks to acquire the information, internal resources and reputation or prominence needed to compete in global markets and develop innovative products (Conway et al., 2001; Greve and Salaff, 2003; Nijkamp, 2003). These then allow start-ups to increase their competitiveness and conquer local, national and global markets.

Various authors have argued that alliances between firms stimulate innovation, enable learning and facilitate new combinations of inter-organisational resources (Ahuja, 2000; Pittaway et al., 2004; Powell et al., 1996). However, some disagreement still exists about the results of previous studies regarding the impacts of different networks on company performance (Phelps et al., 2012; Stam et al., 2014). Bollingtoft (2012) and McAdam and McAdam (2006) reported that more research is needed on networking activities and cooperation between start-ups within the same incubator, including how entrepreneurs use networks in incubators to boost their firms’ development.

Some authors have argued that extremely little evidence has been found of incubators’ effective support of networking between start-ups (Mian, 1996; Patton et al., 2009; Soetanto and Jack, 2013). The few existing studies on this topic have only focused on one of the parties (i.e. start-ups or incubators). Collis (1991) and Priem and Butler (2001) also reported a lack of empirical research connecting resource dependence theory (Pfeffer and Salancik, 1978) and cooperation networks among start-ups since the scarce extant studies have only included multinational companies. In addition, resource dependence theory can shed light on important organisational phenomena, including decisions regarding the extent to which cooperation networks are developed (Pfeffer and Salancik, 1978) among start-ups that share an incubator.

Furthermore, interlocking directorates’ influence on cooperation networks including start-ups has been underexplored, and only a few studies have sought to develop a theoretical framework with which to investigate interlocking directorates at an organisational level. As noted by Simoni and Caiazza (2012a), interlocking network structures are understood to be a driving force promoting coopetition among firms. Since they are a part of open systems, companies (i.e. start-ups) are dependent on external resources including key customers and sources of external funding, as well as business relationships between firms. These concerns play a major role in start-ups’ decision making.

To fill these research gaps, the present study used resource dependence theory and the concept of interlocking directorates to achieve the main objective of examining networks’
importance to start-ups and incubators’ role in networking processes. To this end, the following research questions were formulated:

RQ1. How important are networks and/or cooperation to start-ups?

RQ2. What is incubators’ role in the process of network creation and/or start-up cooperation?

To answer these questions, semi-structured interviews were conducted with three entrepreneurs and/or directors who manage start-ups and the heads of incubators supporting these companies. The interview data were subjected to content analysis and data coding using NVivo software.

The remainder of this paper is organised as follows. Section 2 presents a literature review focused on the importance of networks to start-ups – with reference to resource dependence and interlocking directorates – and incubators’ roles in the development of networks. Section 3 describes the methodology used. Section 4 presents the results of the interview analysis. The final section offers the study’s conclusions, as well as its limitations and suggested future lines of research.

2. Literature review
2.1 Start-up networks based on resource dependence and interlocking directorates
In recent years, market requirements regarding quality, cost reduction and innovation have forced businesses to change their organisational behaviours, with the result that these companies increasingly need external resources (Pfeffer and Salancik, 1978; Thorne, 2009). According to Harkins and Forster-Holt (2014), this dependence on resources can explain entrepreneurial firms’ behaviours as they strive to grow and survive in increasingly competitive markets.

At an organisational level of analysis, resource dependence theory focuses on resource acquisition in organisations and ways these entities deal with resource constraints (Pfeffer and Salancik, 1978). A key assumption of this theory is that actors do not control all the important resources they need but instead rely on other actors to gain access to critical resources (Drees and Heugens, 2013; Pfeffer and Salancik, 2003). Pfeffer (1987) observed that organisations are usually connected by a network of interdependencies to other organisations and are often forced to take action to manage external interdependencies (Davis and Adam Cobb, 2010; Hillman et al., 2009).

The choice of business partners is dependent on resources’ relative position in the market, for example, whether resources are plentiful and supplies are stable. Resource dependence is not necessarily a problem, but, if resources are scarce, firms must develop strategies that reduce their dependence on resources and extend the companies’ control over their environment (Zinn et al., 1997). According to Oliver (1997) and Sachwald (1998), cooperation networks are one of the main methods used by firms to gain access to resources, reputation, skills and capabilities that are not readily available in competitive markets.

Because start-ups are “newborn” and small companies, they generally have fewer resources (Baum and Oliver, 1996; Jensen and Schott, 2015; Stinchcombe, 2000) and an inadequate reputation or legitimacy, which often prevents them from entering into certain markets (Dagnino et al., 2016; Human and Provan, 2000; Möller and Svahn, 2009). Audretsch et al. (2006) and Zeng et al. (2010) argued that, to meet these needs, start-ups depend on their capacity to develop partnerships that allow these small companies to acquire valuable resources and benefit from their partners’ reputation. Thus, networks are fundamental to start-ups’ survival and growth as these connections give young companies access to information, reputation, advice and resources otherwise rarely available (e.g. Birley, 2000; Bruderl and Preisendorfer, 1998; Hoang and Antoncic, 2003; Johannisson, 2000; Ostgaard and Birley, 1994; Simoni and Caiazzo, 2013).
At the individual firm level of analysis, studies are based on the concept of interlocking directorates (Hernández-Lara and Gonzales-Bustos, 2018; Caiazza et al., 2018; Simoni and Caiazza, 2012a, 2013). As noted by the cited authors, the practice of interlocking boards is motivated by the need to facilitate business relationships, communication, and coordination among firms. Interlocking directorates thus have the potential to increase collusion among competitors. Various studies (e.g. Gulati and Westphal, 1999) have shown that directors’ experiences in other organisations can drive strategic choices such as forming cooperation networks. These interlocking boards enhance firm performance (Pomba and Gutiérrez, 2011), and they have a positive effect on directors’ social capital (Stevenson and Radin, 2009).

According to Franco (2001), a cooperation network is a group of people or organisations directly or indirectly interconnected, and this can include different types of relationships. A strong network is one of the main factors contributing to companies’ development, with many authors arguing that networks are partially responsible for businesses’ success (e.g. Birley, 2000; Bollingtoft, 2012; Dubini and Aldrich, 1991; Freel, 2003; Hite and Hesterly, 2001; Johannisson, 1998). Networks are, therefore, one of companies’ most important assets.

Networks help start-ups to compensate for their shortcomings in terms of size, reputation and scarcity of resources, facilitating rapid growth and the conquest of international markets (Wright and Dana, 2003). Bretherton and Chaston (2005) suggested that value chains can be a great way to acquire strategic alliances that enable firms to access resources and leverage their business. Thus, start-ups – through networks – benefit from opportunities to obtain resources in less onerous ways than if these firms had to resort to the open market. In addition, resources that are usually not available in the market can be purchased within networks (Witt, 2004).

A core premise of resource dependence theory is that organisations rely on contingencies in external environments. Resource dependence emphasises the importance of organisations establishing cooperative relationships in order to gain easy access to specific scarce resources without which they could not survive (Ireland et al., 2002). Start-ups, in particular, suffer from a shortage of resources, and these firms have to create cooperation networks that enable them to overcome this limitation through the complementary resources and competitive gains these networks can offer.

Based on the interlocking directorate’s concept, Ostgaard and Birley (1994) reported that entrepreneurs’ personal networks are perceived as an extremely important resource in their companies’ early years. Various empirical studies have shown that entrepreneurs and/or directors’ personal networks more frequently include business relationships (e.g. Aldrich et al., 1989; Greve, 1995; Simoni and Caiazza, 2012a), so social and business concerns tend to intersect in entrepreneurs’ networks (Jensen and Schott, 2015). According to Caiazza et al. (2018), serving on multiple boards increases a director’s social attractiveness, network connections, reputation, social status and prestige. This means that companies in the start-up phase usually have networks that overlap with the founding entrepreneurs’ personal networks, namely, interlocking boards that create ties between firms at the level of individual directors.

The degree of rigour and official nature of the agreements and contracts formed between network partners are the main distinction made between formal or informal networks (Ibarra, 1992; Franco and Belo, 2013). Rosenfeld (1996) identified those of a more formal nature as “hard” networks, involving partnerships of production, marketing, acquisition and/or cooperation when entering into international markets. “Soft” networks are more informal ones in which start-ups come together to solve common problems, share information or acquire new skills.

Most networks created by incubator-based start-ups do not have contractual relationships, so the networks established are informal (Bollingtoft and Ulhoi, 2005; Lyons, 2000).
These networks do not allow the heads of incubators to assist companies in their organisation or management processes, but these specialists can contribute by formalising this type of networks (Birley, 2000), as well as helping in their creation and expansion and offering interactive activities (Chan and Lau, 2005). Through these activities, start-ups can help other start-ups, thereby developing more relationships and even extending these connections to include other stakeholders outside incubators (Bollingtoft and Ulhoi, 2005).

2.2 Role of incubators in network development

Business incubators play an important role in the growth of start-ups. In addition to offering shared spaces and services, incubators present opportunities to establish interlocking directorates involving incubated start-ups (Hansen et al., 2000; Lyons, 2000). Various authors have reported that start-ups headquartered in incubators have a higher survival rate than start-ups outside incubators (e.g. Colombo and Delmastro, 2002; Reitan, 1997; Sá and Lee, 2012). Typically, incubators facilitate not only the exchange of information, knowledge and resources, but also interactions, such as networking events, that give start-ups opportunities to meet entrepreneurs, investors and consultants (i.e. stakeholders). Moreover, incubators can facilitate access to researchers and research centres in partner universities (Soetanto and Jack, 2013).

According to Lyons (2000) and Totterman and Sten (2005), incubator-based start-ups gain an advantage by having access to both internal and external networks. As start-ups are physically located under the same roof, collaboration among them becomes much more likely (Lyons, 2000). McAdam and McAdam (2006) have verified that geographical proximity within incubators can influence frequency of contact, which leads to the development of social networks. Similarly, Lofsten and Lindelof (2001) found that start-ups located in university incubators are more likely to create links with the sponsoring university and to develop relationships with entities within that organisation. In addition, the physical proximity of start-up in incubators can have a beneficial effect since the environment (i.e. incubator) is conducive to cross-fertilisation of ideas and provides access to advice and networks (Bollingtoft, 2012).

However, a network-rich environment alone may not be enough to help start-ups reach their potential (Warren et al., 2009). Entrepreneurs need to recognise and respond appropriately to operational changes in their business (Vohora et al., 2004). If these individuals do not properly manage their tangible and intangible resources, entrepreneurs are unable to benefit fully from the resources provided by networks (Sá and Lee, 2012). Chan and Lau (2005) found that, in incubated start-ups, networks proved to be the least important contributing factor in the development of businesses. One reason these authors offer for this finding is that start-ups do not share the same business objectives, thus receiving few benefits from partnerships with local organisations.

According to the European Commission (2002), the development of cooperation synergies requires homogeneity among start-ups, so these companies need to be grouped by their activity sector in order to benefit from sharing their knowledge (Chan and Lau, 2005). However, Schwartzt and Hornych (2010) did not find support for this conclusion since their research failed to show that specialised incubators are more effective in developing internal networks than diversified incubators are, indicating that not all of the empirical evidence points in the same direction.

Nevertheless, researchers agree that incubators should play the role of adding value, bringing together a comprehensive set of networks with various sources of knowledge to meet the needs of incubated start-ups (Bollingtoft, 2012; Sá and Lee, 2012; Soetanto and Jack, 2013). Collaborations with universities, research centres or other institutions allow companies to benefit from knowledge and experience without the initial investment that is often required to ensure the development and growth of start-ups (Lofsten and Lindelof, 2005).
2.3 Conceptual research model

Based on the brief literature review presented in the above subsections, the conceptual research model in Figure 1 was developed, which guided the procedures followed in the current empirical research. This model focused on the importance of cooperation networks for start-ups, including the role of incubators in developing these connections. Based on the concept of interlocking directorates, this model shows that start-ups within incubator ecosystems can develop networks with other incubated start-ups (i.e. internal networks) or networks with other stakeholders that are already partners of incubators (i.e. external networks).

3. Methodology

3.1 Type of study and case selection

In order to study incubators’ role in developing cooperation networks for start-ups, a qualitative research method was chosen as the most effect approach to conducting three case studies: a university incubator, municipal incubator and technology-based incubator. Each case study focused on the relationship between a start-up and incubator in the creation of a cooperation network, thus examining both sides of this process. Yin (2014) defined a case study as a qualitative approach to research that examines a current phenomenon in its natural context, especially when the boundaries between the phenomenon and context are not clearly defined (Yin, 2014). The sample size can be small since the depth and wealth of data are key elements, and there is no need to generalise or replicate results (Altinay and Hussain, 2005).

![Figure 1. Conceptual model of research](image-url)
According to Perren and Ram (2004), qualitative methods have become more interesting to researchers who focus on entrepreneurs and small businesses because qualitative techniques facilitate the gathering of information that cannot be measured or translated into numbers (Berg, 2007). Eisenhardt (1989) and Yin (2014) argued that qualitative methods should be used when specific processes, characteristics of organisations and/or the vision or experiences of individuals need to be analysed in depth.

To address the present study’s research questions, the following criteria were used to select the cases:

1. start-ups with convenient, easily accessible information;
2. start-ups with cooperation networks;
3. start-ups headquartered in different incubators; and
4. incubators with different characteristics in order to include a municipal start-up, university start-up and technological start-up and to understand the ways that different incubators participate in network creation.

### 3.2 Collection and analysis of information

The objective of the data collection procedure was to obtain a set of information that addressed the research questions and captured the contextual complexity of the central topic (Benbasat et al., 1987; Tuli, 2011). To this end, the primary data were obtained through individual, sub-structured interviews that followed a script covering the main issues under study. The interviews included more complete, spontaneous answers resulting from interactions between interviewer and interviewee, thus avoiding problems related to a lack of clarity about how to interpret questions (Creswell, 2003). The interviews were conducted during April 2017 – for an average duration of 30 min – with the entrepreneurs responsible for the selected start-ups and the heads of the relevant incubators, which allowed a triangulation of the collected information.

All the interview data were subjected to content analysis. The systematic organisation of data sources and data coding with NVivo 11.0 software facilitated the extraction of useful, segmented information. This resulted in the creation of tree nodes, which labelled and subdivided the interviewees’ discourses. In cases in which these were widely dispersed in their content or lacked enough common elements to capture patterns due to coding difficulties, word cloud analysis was used.

### 4. Results

#### 4.1 Characterisation of interviewees and institutions

Table I features the three start-ups that participated in the study and the three incubators in which they are integrated – all located in Portugal. The first start-up is a consultancy company in forestry, headquartered in the incubator of the University of Trás-os-Montes and Alto Douro. The second case is a software development start-up based in the incubator of the municipality of Vila Real (i.e. Regia Douro Park). The third case involves a hardware development start-up that is associated with the Braga start-up incubator. The third start-up was, at the beginning, housed in the incubator’s facilities, but the facilities had to be moved to the city of Oporto. However, the start-up is still associated with its original incubator, enjoying all the advantages (i.e. virtual start-up incubation) of that relationship. The entrepreneur interviewed in Start-up 3, in addition to being a manager in this firm, is part of the directorate of another software development start-up, with which he has developed a cooperation partnership.
4.2 Analysis of results

The information obtained in the interviews was analysed using the coding system offered by Nvivo software in order to achieve the objective of coding and categorising the interview data. For the instances in which texts with similar or equivalent information appeared, the same codes were used, as shown in Figure 2.

Figure 2 shows that the role of incubators is associated with the process of start-up creation, as well as the development of networks for the start-ups under study. The interviewees recognise that the incubators, besides helping to formalise, conceptualise or validate business models, also facilitate access to resources and, in particular, help foster networking. Figure 2 also reveals that the process of creating start-ups is associated with the start-ups’ networks. The entrepreneurs recognise that, in the start-up process, they need to resort to enlisting the aid of a set of entities to overcome their companies’ lack of certain resources (i.e. installations, trademarks and patents, training programmes, financing and partnerships).

This shows that, at this stage, entrepreneurs are already interested in using partnerships to fulfil some needs. Regarding the start-ups’ networks, the entrepreneurs interviewed mentioned the types of networks and entities with whom they have relationships, as well as the communication channels that they use and the advantages that they gain from belonging to certain networks. The following subsections discuss these results further, using excerpts from the interviewees’ answers to illustrate the three main nodes in Figure 2.

4.2.1 Start-up creation process. According to various authors (e.g. Jensen and Schott, 2015; Stinchcombe, 2000; Zhang et al., 2016), entrepreneurs usually face a series of difficulties when creating their start-ups because they do not yet have the reputation and all the resources they need. The latter can include information, experience or knowledge in certain areas (e.g. tax, legal and financial issues). Thus, an important question to address is if, in the process of creating start-ups, entrepreneurs have the motivation and initiative to look for external entities that can help start-ups meet their needs.
The present study's interview results verified that entrepreneurs in the process of creating start-ups need to rely on various public or private institutions (e.g. Portugal's Agency for Competitiveness and Innovation, incubators and universities). These give the start-ups access to specific types of support (e.g. funds, training programmes, facilities, trademark or patent registration and partnership support). For example, in the case of Start-up 3, the entrepreneur said that his incubator's support was crucial in order to reach certain customers since he had not established a reputation or legitimacy in the market. This interviewee reported that:

The first institution to help was the IAPMEI, through entrepreneurship vouchers that provided us with a monthly amount to develop our business plan and product. They assigned a mentor who assisted us during the development of our business idea. […] In the start-up creation process, we also turn to the Braga start-up incubator […] because we are in the hardware business, which is very specific, and, in this area, there are no clusters in Portugal with experts in hardware. And one of the things Braga has is a very strong automotive industry. They have connections with, for example, Bosch, and we thought that […] their networking could help us to get access to hardware specialists.

Moreover, the incubator specialists agree that, currently, it is common practice to support entrepreneurs as they start their businesses, either through training and consulting or by facilitating access to a network of contacts that enables these firms to create partnerships. The head of Incubator 2 stated:

We have succeeded in guiding the company in all types of investments and even meet [with potential] investors. We help at every step in the company’s process. Our role is only to help the entrepreneur, informing him or her about the various options available.
Incubator 3’s manager reported:

In terms of incubation, the teams either physically install themselves here in the building or only associate themselves with the Braga start-up [incubator], thus gaining access to our network of partners, our network of mentors and our professional training plan.

4.2.2 Start-up cooperation networks. Regarding the importance of networks to the sustainable development of start-ups, the present study also examined the types of networks, the entities that form them, the communication channels used and the advantages that networks offer these newly-created companies.

4.2.2.1 Type of network. According to Ibarra (1992), networks can be formal or informal. The formalisation of networks usually takes place during the processes of production, marketing, acquiring assets or entering into new international markets, as formal networks require a strong commitment from stakeholders (Rosenfeld, 1996). However, informal networks are the most common since they do not require any contractual relationships and they are less bureaucratic. According to Bollingtoft and Ulhoi (2005) and Lyons (2000), most networks created by start-ups remain informal, which was confirmed by the present results obtained from the interview data. Of the three entrepreneurs under study, only the founder of Start-up 2 reported having “two or three formal relationships, with the majority being informal”.

4.2.2.2 Type of entities. Common characteristics of innovative start-ups are their volatility and flexibility since they can easily create new networks, adapt their structure to fit into networks and abandon networks if they do not produce the desired results (Durda and Krajcik, 2016). Network connections allow start-ups to create new forms of technological relationships, which allow them to identify new business opportunities and develop technological innovations (Moensted, 2010).

As can be seen from the interview excerpts below, entrepreneurs recognise that being in an incubator allows them to create partnerships with other start-ups housed in the same facilities, which often leads to interlocking directorates and partnerships between entrepreneurs. Start-up 2’s founder said:

“We also have an important partnership with a start-up within the incubator, […] which allows us to work together in our business area, if necessary. We are two companies in the same field of software development, so we have a partnership agreement in case we need to reinforce our team and the other company is freer. [In the incubator,] there can be this crossroads of interactions between professionals that reinforces the other companies’ team.

The entrepreneur behind Start-up 3 stated:

“We have another very strong partnership with another start-up that I happen to be part of as a director and that belongs to the same incubator. We were able to develop a business partnership here that is important to both parties. […] [We benefit] since we sell technology and gain knowledge in the area of algorithms, and […] [they profit] because they got a product tailor-made to meet the needs they had and much cheaper. To give you an idea, the product was so cheap it was one tenth of the market value.

In the case of Start-up 1, being housed in a university incubator allowed entrepreneurs to establish partnerships with researchers and laboratories of the same university. This corroborates Lofsten and Lindelof’s (2001) finding that start-ups located in university incubators are more likely to create links with the host university. The founder of Start-up 1 reported:

“As part of our partnership with the university, we work together with the Applied Ecology Laboratory and the Fluvial Ecology Laboratory, where they house their environmental ecology services. And we take part as complementary partners in the area of cartography and forestry, which helps them [the university staff] in some studies. For example, now […], regarding the monitoring of the Baixo Sabor [Dam], they do the studies of bats, plants, amphibians, fish and so on, and we monitor some forest plots there and […] [work on] that part of our map.
4.2.2.3 Communication channels. The communication channels between the three start-ups are chat, e-mail, Skype, telephone and, only when necessary, face-to-face meetings. This shows that new technologies and resources (i.e. internet, electricity and infrastructure) offer fast, easy ways to contact partners, which facilitates more communication and longer lasting partnerships.

In the interviews, the founder of Start-up 2 referred to the communication channels that they use in their network:

The channels used include almost all those that exist – from face-to-face meetings, e-mail, telephone, Skype and so on. They vary according to what is the most convenient at that moment. Urgent matters have to be dealt with more immediately, for example, by telephone, but less urgent matters are dealt with by e-mail, as we can wait for a response. The first meeting that happened, we made sure that it was face-to-face because I consider this to be very important since the empathy created is different. The other meetings have been by Skype, given the 300 kilometres distance. Regarding the frequency of contact, I can say that we have been in contact almost daily.

4.2.2.4 Advantages. Cooperation networks have been referred to in the literature as an important mechanism to overcome a lack of resources and reputation, which leads to various advantages for network members. From an interlocking directorates perspective, these advantages are also related to the exchange of experiences, ideas, innovations; the acquisition of new resources (Benington, 2001) and an increase in the reputation and legitimacy of governance processes (Caiazza and Simoni, 2015). In addition, cooperation networks provide access to information, funds, knowledge and skills (e.g. Klyver and Hindle, 2007; Kozubikova et al., 2015; Simoni and Caiazza, 2012b).

In the interviews, the entrepreneurs identified a number of advantages that they have gained from the networks of which they are a part. Start-up 1’s founder reported:

Usually when we get together for public acquisitions, […] we can put together a more or less robust team, with strong curricula, academic qualifications and so on. So, we do not need to hire more people, and we can lower costs and everybody wins […] We lower the costs, and we make a bigger margin of profit or gain certain services that alone we would never obtain.

The founding entrepreneur of Start-up 2 said:

We also gained an advantage at the level of knowledge because what we developed for this partner was very important in terms of the team’s growth and maturation. That is, this project allowed us to tinker with some technologies that we had never worked with. This allowed us to gain more agility and allowed us to take on more responsibilities in a platform that can serve millions of people and generate millions of euros. And therefore, there cannot be a minute that it does not work, so it requires a very high standard of work. This gave us the chance to trade ideas with companies such as Google and Visa, which we had not had before.

The Start-up 3 founder stated, “we find not only buyers for our technologies – increasing our turnover – but also get resources in areas in which we are weaker than we are in the area of software. Both parties remedy the shortcomings they have”. The main advantages thus identified by these entrepreneurs are essentially related to the exchange of experiences, potential for more sales, knowledge they can gain through partnerships, reduction of costs and failures and creation of new jobs.

4.2.3 Role of incubator. According to Hansen et al. (2000), incubators are increasingly fundamental to the process of creating and growing start-ups since these institutions offer a set of services and opportunities that entrepreneurs can rarely access without a large investment. Incubators also help start-ups build reputations and prestige and facilitate interactions and exchanges of information, resources and knowledge among entrepreneurs, allowing them to gain more experience and leverage their business (Bollingtoft, 2012; Soetanto and Jack, 2013).

The results obtained from the interviews conducted for the present study show that incubators play an important role in the lives of start-ups because these organisations facilitate
the formulation and validation of ideas and business models. Incubators also support the process of creating companies by either helping in their development or finding sources of funding. Another important point that interviewees made is that incubators also facilitate access to a variety of resources such as services (i.e. water, consultancy, internet and electricity), facilities and furniture, information dissemination events and training opportunities. These institutions further help develop networks of partnerships in which the incubator is a part. As mentioned by the head of Incubator 3:

We, as an entity, already have a large network of partners, whether they are partners who provide start-up services or potential clients for these start-ups. This network is [constantly] being developed by us as we also work to detect the needs of the companies with whom we work.

Interviewees also pointed out that incubators foster cooperation networks by drawing entrepreneurs closer together (see Figure 2 above). An example of this is when the entrepreneur behind Start-up 2 stated that:

The incubator creates a proximity with other entrepreneurs that is very important because the fact that we are in an incubator causes us to encounter start-ups similar to ours with the same needs and goals as our partners, clients or suppliers, even if it's just that we can exchange information with and help each other.

These proximity-linked relationships are important because they lead to the creation of business partnerships, risk reduction and knowledge, service and experience sharing. This was confirmed by Start-up 3’s founding entrepreneur, who said, we “have access to partners and suppliers who have already been validated by others, thereby reducing our risk”.

In addition, the interviewees verified that the incubators encourage start-ups to participate in fairs and organise mentoring programmes. These institutions also host networking events consisting of workshops, forums and presentations for start-ups, involving either external entities or other start-ups installed in the incubators. The head of Incubator 2 reported:

One of the first concerns was to have the bar and cafeteria working well because that is the ideal time for entrepreneurs to come into contact – when they have time and are carefree and relaxed and where they can easily create relationships.

Thus, in line with the existing literature, the present results support the conclusion that incubators play an important role both in the creation of cooperation networks and in the development of start-ups, based on the consensus revealed among all stakeholders.

4.3 Interviewee opinion and case comparison
According to the interview data, all participants agree that cooperation networks are important to start-ups. The interviewees believe that networks are increasingly important because they create synergies with other companies, provide access to information and services, develop partnerships with suppliers and competitors and create stronger reputations and more legitimacy. In particular, networks facilitate the sharing of resources (i.e. knowledge, contacts, funds and human resources).

The excerpts below showcase the opinions of interviewees from the start-ups and incubators under study. The founder of Start-up 1 said, “cooperation networks are always very advantageous because they create synergies between various companies, and these can complement one another”. The head of Incubator 1, in turn, stated:

This is fundamental. I really like the saying: “we go faster on our own, we go further together”. […] For those who are starting up and have no track record, they are in a sector that is often new and has many variables, so they cannot master everything. They do not have the resources to deal with everything. They can depend on a network to overcome some of the gaps. I think this is fundamental.
Start-up 3’s founder reported:

Co-operation networks are always important because a company can never be an isolated entity. It is always necessary to have partners to work with, either as suppliers or as distribution partners. Even competitors often can be part of our cooperation network.

The head of Incubator 3 observed:

Start-ups’ resources are scarce at an early stage, so networks can minimise these difficulties at an early stage or provide resources more cheaply or for free. Networks are able to provide the knowledge and help needed to avoid errors.

In order to understand the importance of networks for the three start-ups under study and the role of these incubators in the process of networking, Table II was created to compare and identify the key factors referred to in each case study.

Table II verifies the three entrepreneurs feel that the most valuable resources in the process of creating their start-ups were the chance to set up in the incubator facilities and the development of partnerships facilitated by the incubator. Start-up 3’s entrepreneur (i.e. Case 3) added that financing, trademark or patent registration and training opportunities were also highly valued resources when his company was created.

Regarding start-ups’ cooperation networks, Table II shows that the three start-ups are mostly part of informal networks and that all have cooperative relationships with other

<table>
<thead>
<tr>
<th>Theme</th>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start-up creation process</td>
<td>Installations; partnership creation</td>
<td>Installations; partnership creation</td>
<td>Finances; registration of trademarks or patents; installations; training programmes; partnership creation</td>
</tr>
<tr>
<td>Type of network</td>
<td>Informal</td>
<td>Informal and formal</td>
<td>Informal</td>
</tr>
<tr>
<td>Type of entities</td>
<td>University; company; start-ups from the same incubator</td>
<td>Company; commercial association; start-ups from the same incubator</td>
<td>Office of intellectual property support; start-ups from the same incubator</td>
</tr>
<tr>
<td>Communication channels</td>
<td>E-mail; telephone</td>
<td>Skype; face-to-face meetings; e-mail; telephone</td>
<td>Chat; face-to-face meetings; e-mail; telephone</td>
</tr>
<tr>
<td>Advantages</td>
<td>Reduced costs; boosted sales</td>
<td>Exchange of experience; generation of new knowledge; new jobs; boosted sales</td>
<td></td>
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<tr>
<td>Role of incubator</td>
<td>Formalisation of companies; formulation and validation of business models; facilitation of access to resources; promotion of networks; increase in the reputation of start-up</td>
<td>Formalisation of companies; formulation and validation of business models; facilitation of access to resources; promotion of networks; increase in the reputation of start-up</td>
<td>Formalisation of companies; formulation and validation of business models; facilitation of access to resources; promotion of networks; increase in the reputation of start-up</td>
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**Table II.** Comparison of three cases

**Source:** Authors
start-ups belonging to the same incubator. Notably, Start-up 1 maintains a relationship with the university to which its incubator belongs, as a way to build a strong enough reputation to reach other markets. Start-up 2 has a network of business associations—only formal network identified by the interviewees. With regard to Start-up 3, the incubator fostered this start-up’s cooperation with another new firm, giving rise to a complementarity of services. That is, one start-up is responsible for hardware development and the other for software development. This cooperation evolved into a network in which the two start-ups began to share the same entrepreneur and/or director, making the partnership stronger and more effective.

The channels of communication mentioned by the three entrepreneurs are telephone and e-mail, but the communication medium most used in Case 3 is chat, since the entrepreneur said that using chat allows them to add other people to conversations quickly and safely.

The greatest advantage of belonging to a network according to the three entrepreneurs is boosted sales because this is one of the most important benefits for their business. Moreover, while the entrepreneur in Case 1 focused more on cost reduction, Case 2’s founder highlighted the exchange of experiences, shared knowledge and increased number of jobs. The entrepreneur in Case 3 valued the reduction of failures and increased number of jobs.

Regarding the role of the incubators, the results shown in Table II above verify that the three incubator managers mentioned the same kinds of support provided to start-ups. These are formalising companies, formulating and validating business models, facilitating access to resources, encouraging network creation and building start-ups’ reputation.

Although some differences were found between the three cases under study, the results confirm that networks play an important role in the growth and development of start-ups. These connections help sales to increase, provide access to resources and facilitate the sharing of experiences and knowledge. In addition, incubators are a significant presence in the life of start-ups because these institutions help them gain access to certain resources, of which networks are perhaps the most important.

According to Rossi et al. (2009), the development of cooperation networks creates combinations of resources among organisations, allowing them to achieve results that would not be possible if they operated in isolation. This combination of resources is seen as a source of competitive advantages and is supported by resource dependence theory.

5. Conclusions and contributions

According to resource dependence theory, the main reason why organisations work with networks is to ensure critical resources for their survival and growth (Hillman et al., 2009; Pfeffer and Leong, 1977; Pfeffer and Salancik, 1978). In addition, an interlocking directorates perspective (Caiazzi et al., 2018) highlights the general consensus that no organisation can survive for long without networking with other institutions, which is especially true for start-ups because of their weak reputations and legitimacy and limited resources (e.g. Witt, 2004; Zhang et al., 2016). Based on these two conceptual frameworks (i.e. resource dependency and interlocking directorates), the present study sought to gain a deeper understanding of the importance of networks for start-ups and incubators’ role in promoting networks for these firms. To this end, case studies of three start-ups based in three different incubators were conducted.

An analysis of the interview data provided support for the conclusion that networks are increasingly important in the development and survival of start-ups, as entrepreneurs consider networks one of their most important assets (Bollingtoft, 2012). The creation process of the three start-ups under the study was analysed, verifying that the founding entrepreneurs have taken the initiative to find institutions that can support them in this process. The incubators, in turn, seek to encourage and pave the way for networks of contacts that allow entrepreneurs to create their own connections and find entities that can help them to operationalise their business ideas.
Regarding entrepreneurs and heads of incubators’ opinion about the importance of networks, these are seen as increasingly essential to start-ups’ success. Networks facilitate access to resources (e.g., funds, knowledge and experience), reputation or legitimacy and the cooperation of entrepreneurs and/or directors of other start-ups, which helps them to overcome specific problems or difficulties.

The start-up networks under study were found to be largely informal, and the three start-ups, in addition to having links with external entities, have at least one network including their incubator. This shows that incubators’ environments are conducive to the creation of partnerships and networks (Lyons, 2000; Totterman and Sten, 2005). The previous findings on university incubators in the literature (Lofsten and Lindelof, 2001) were also confirmed by the present results showing that the start-ups headquartered in university incubators have partnerships with researchers and laboratories of the host university.

The results further reveal that the main advantages of their networks most valued by entrepreneurs are increased sales, exchanges of experiences, new knowledge gained, reduced numbers of failures, lower costs and chances to create new opportunities for growth through partnerships. This study also confirmed that incubators play an increasingly important role in supporting start-ups, assisting in the constitution of companies and formulation of business models or providing access to critical resources (e.g., training programmes, information, infrastructure and services) and stronger reputations. Overall, the resource that appears to be most valued and that offers the best results is the networks that incubators can help to create between their own start-ups (i.e., internal networks) or with other entities (i.e., external networks). Sometimes the networks between start-ups evolve into shared directorates and/or entrepreneurs, which increases cooperation between them, as happened with Start-up 3.

According to various authors (e.g., Bollingtoft, 2012; McAdam and McAdam, 2006; Mian, 1996; Patton et al., 2009; Soetanto and Jack, 2013), more empirical studies are needed to shed light on network activities among start-ups in incubators and incubators’ support of network creation processes among start-ups. The few studies on this subject have usually focused solely on one side: either start-ups or incubators. Some authors (e.g., Collis, 1991; Priem and Butler, 2001) have further reported a lack of empirical studies relating resource dependence theory to network creation in start-ups.

In this context, this research’s findings make two significant contributions to the literature on cooperation networks. First, most studies of these networks are based on a transaction cost economics approach, resource-based perspective and/or institutional theory. In contrast, the present study used resource dependence theory, thereby providing an alternative explanation of the importance of cooperation networks for start-ups and incubators’ role in these companies’ networking processes. Second, few existing studies have considered the effects of interlocking boards on cooperation networks. The current research drew on the concept of interlocking directorates to achieve a deeper understanding of the interface between entrepreneurship and strategic management.

This study’s results also have important practical implications. Resource dependence theory emphasises external factors’ influence on organisational behaviour. Although constrained by their context, start-up managers and heads of incubators can take steps to reduce environmental uncertainty and dependence. This research’s contributions thus include providing empirical evidence that enhances the existing literature through a more accurate perception of how start-ups use networks to overcome their dependence on resources and how incubators participate in this process.

Furthermore, these results clarify more fully what start-ups’ most critical resources are, including the kinds of entities and communications they use, the important advantages they receive by establishing cooperation networks and the main types of support given by different incubators. In addition, the concept of interlocking directorates highlights that...
interlocking boards function as ties between firms and that start-up owner-managers need to view interlocking directorate formation as a strategic part of their decision process. The results offer another practical implication by confirming for incubators' entrepreneurs and managers that networks are key to overcoming resource constraints and that incubators can play a key role in fostering new partnerships and cooperation networks, which help form important liaisons.

This study was subject to some limitations that need to be taken into account both when interpreting the results and conducting further investigations. The first limitation is related to subjectivity. Even when all precautions are taken, qualitative research always involves subjectivity in the analysis of interview data, especially in the system used to codify and categorise interviews. The second limitation is the convenience sampling technique applied and the focus on only one interview per entity. The last limitation is related to how the study concentrated on the perspective of one part of the cooperation networks in question. Future research could produce interesting results by focusing on the opinions of other entities in these networks.

The limitations presented above suggest possible starting points for further studies, thus contributing to the development of the existing literature. Researchers need to extend this study to include other start-ups in different regions or countries. A comparison could be made between start-ups based on incubators and start-ups headquartered outside incubators in order to identify any differences between them in the creation of networks and incubators' contributions to this process.

References

The role of start-up incubators


Further reading

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Directorate ties: a bibliometric analysis

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Abstract

Purpose – Over the last 100 years, research on interlocking directorates has proliferated. The purpose of this paper is to realize a bibliometric analysis of articles on interlocking directorates to identify the evolutionary patterns that characterize the studies on board interlocks.

Design/methodology/approach – A bibliometric analysis of articles on interlocking directorates published since 1914 was realized to evidence how research has evolved over time. Papers were classified according to the research topic, the type of article and the use of different theories to explain board interlocks’ causes and effects.

Findings – The authors identified four different periods that characterize board interlocks studies: the emerging debate, the earliest modern era, the modern era and the post-modern era.

Originality/value – This bibliometric analysis assesses the extant literature by highlighting emerging trends and identifying several avenues for future research.

Keywords Interlocking directorates, Resource dependence, Class hegemony

Paper type Conceptual paper

Introduction

Interlocking directorates occur when a person affiliated with an organization sits on the board of directors of another organization (Caiazza et al., 2019). In this way, ties are formed that, on the one side, link together directors of different boards and, on the other side, create relationships among different organizations.

The phenomenon has been studied since 1914 from a variety of perspectives, including sociology, general management, corporate governance, social network, etc. (Useem, 1979; Pfeffer and Salancik, 1978; Rao et al., 2000; Davis, 1996). A rich literature on the topic has evidenced several theoretical and empirical explanations for their formation and evolution. Bring order to this extensive literature and identify its main research streams, it is not an easy task since the many theoretical misconceptions and empirical inconclusiveness that can be found among different authors.

Our paper classifies existing literature on board interlocks evidencing past and future trends (Caiazza et al., 2019; Glasberg and Schwartz, 1983; Caswell, 1984; Mizruchi, 1996; Davis, 1996; Chua et al., 2006; Lester and Cannella, 2006). It classifies previous studies through several criteria: type of article, main research topic and use of different theories. By considering these dimensions, the paper highlights the main patterns of past research and investigates future evolution. We, thus, identify the emerging trends in the studies on interlocking directorates and highlight future directions of research. Our findings encourage scholars to further investigate board interlocks and to expand their research agenda in order to include new topics related do their dynamics of formation and evolution.

The next section of the paper describes the research method, introduces the basics of theoretical and empirical debate on interlocking directorates, the way in which articles were selected, coded and analyzed. Based on these variables, the paper describes how studies on interlocks have evolved. It also illustrates how certain topics, theories and settings have dominated in each period. In the final part, the paper discusses the conclusions and implications for both academics and practitioners presenting a research agenda for future studies on interlocks.
Method

The debate on interlocking directorates dates as far back as the 1914. From a theoretical standpoint, the debate around interlocks has been fueled by strategic and sociological perspectives. The strategic perspective conceptualizes interlocks as ties among firms used to reduce uncertainty. The sociological perspective conceptualizes interlocks as ties among agents used to reinforce agents’ personal advantage. Aside to the theoretical debate, empirical findings provide mixed results as well. In recent decades, scholars have regularly emphasized the presence of inconclusive empirical findings on what really interlocking directorates do. For example, from a managerial perspective they are not efficient because of prevalence of managers on directors in dispersed ownership firms. Similarly, from a shareholder perspective they are totally dependent on block-holders’ decisions in concentrated ownership firms. In sum, the literature on boards interlock is characterized by theoretical pluralism and by empirical inconclusiveness, both originating from scholarly contributions and anecdotal evidence.

To systematize this evolving literature, we reviewed main studies published on academic journals in the last 100 years that directly refers to the debate on interlocks. We used the databases ABI/Inform, Business Source Premier, Ebsco-Host, JSTOR and Swetsnet to search for all publications containing simultaneously the terms interlocked board, interlocks or interlocking directorates in the title, abstract and/or keywords. This approach enabled us to identify 150 articles directly referring to the debate on boards’ interlocks that we classified according to several criteria.

In order to analyze the evolving nature of studies on boards’ interlocks, we classified the articles on the base of the research topic, the type of article and the use of different theories. Regarding papers’ research topic, we distinguished articles focused on board interlocks causes vs effects and studies focused on organizational vs individual level of analysis. Articles adopting the former perspective, consider causes and effects of board interlocks as driven by needs and benefits at an organizational level (Pfeffer and Salancik, 1978; Burt, 1983; Mintz and Schwartz, 1985). Studies adopting the latter perspective suggest causes and effects of interlocking directorates be related to needs and benefits at an individual level (Domhoff, 1967; Useem, 1984).

Regarding the type of article, we distinguished studies according to their conceptual vs empirical nature. Conceptual papers aim to advance or refine theory and are solely based on deductive reasoning without any empirical metrics. In empirical papers, instead, authors apply inductive logics, describe their methods in a separate section and argue on the strength of data obtained from qualitative research methods or quantitative methods.

Finally, to examine the theoretical development of the field, we mapped theories to which each paper explicitly refers, distinguishing between the resource dependence approach and the class hegemony approach. According to the resource dependence approach, corporations establish linkages with firms upon which they depend, because they reduce uncertainty or constraints. Conversely, studies that focus on class hegemony theory evidence that associations are the basis for a common culture, which increases directors’ capacity for coordinated economic, political and social action (Domhoff, 1967, 1970; Useem, 1979; Ratchiff, 1980; Koenig and Gogel, 1981). Although they are generally not created for this purpose, bonds between directors can sometimes facilitate linkages between the firms they command.

Mapping the evolution of interlocking directorates’ studies from time to time we systematized existing studies and identified new way for future research works. In order to describe an evolutionary pattern in board interlocks research, we identified four different periods each of them characterized by major changes in the field of study and marked by breakthrough and innovative articles in terms of theoretical approaches or methods. Our first observation window covers the period from the first publication on interlocking
directorates in 1914 (Durand, 1914; Dixon, 1914) until Koenig, Gogel and Sonquist’s literature review of 1979 that resumed the theoretical explanations of interlocks’ causes. In this period, the interest on interlocks seems to be infrequent and concentrated mainly around the 1970s. In contrast, during the 1980s the debate on interlocks was intense. New strands of research were used to investigate interlocking directorates’ causes and different theoretical perspectives were introduced and tested on American firms. Starting in the 1990 until 2009, new streams of literature started to offer different perspectives on interlocking directorates’ causes and effects in different countries. Finally, from 2010 until 2018 new emerging research trends in interlocking directorates studies can be observed.

**Empirical results**

In recent decades, scholars and practitioners have analyzed the role of boards’ interlocks from managerial and strategic perspective. Most papers have been published in managerial and sociological journal such as *Academy of Management Journal*, *Strategic Management Journal*, *Administrative Science Quarterly*, *American Journal of Sociology*, *American Sociological Review*, *Social Science Quarterly*. The historical development of the number of published articles explicitly referring to interlocks in the management literature is shown in Figure 1. As depicted, the first paper was published in 1914 and in the following decades the number of published articles steadily increased. Studies on boards and strategy were published irregularly during the early years 1914–1979. Since the 1980 the average number of articles on the topic is increased because of the growing attention of scholars in the field of strategy and governance (from 2 in the period 1971–1989 to 6 in the period 2010–2018).

**The emerging debate (1914–1970)**

The early literature explicitly referring to interlocking directorates started with the US Clayton Act of 1914. At that time, the debate was mostly driven by the practical needs that the US business community was facing and research on interlocking directorates was characterized by a discussion on the collusive nature of interlocking directorates and their legal restrictions. Main articles evidenced the legal and economic features of interlocking directorates. While Durand (1914) evidenced the collusive nature of interlocks explaining the reason of their legal restrictions, Dixon (1914) evidenced four economic causes of interlocks. According to the latter interlocking directorates arise for financial or industrial purposes, to develop business or to restrain competition (Dixon, 1914).

With few exceptions (Thomas, 1933; Warner and Unwalla, 1967; Dooley, 1969) until the 1970 interlocking directorates were perceived as being of little importance because of

![Figure 1. Historical development research on boards' interlocks](image-url)
management control theorists that advocated the central role of managers giving little relevance to directors’ role (Berle and Means, 1932; Kaysen, 1957). At that time, many of the empirical studies on interlocks were descriptive in design without any explicit theoretical propositions (Sweezy, 1953; Domhoff, 1967, 1970; Dooley, 1969). For example, congressional investigations of corporate interlocking were primarily concerned with the issue of economic concentration and with possible violations of antitrust legislation (US Congress, 1965, 1967).

In sum, key characteristics of research during this period are: conceptual nature of articles; the prevailing interest on interlocking directorates’ causes; the birth of two main theories: resource dependency and class hegemony; the separation between organizational perspective used by resource dependency theorists and individual perspective used by class hegemony theorists; and the prevalence of studies on American setting.

At the beginning of the 1970s some seminal works introduced, in the debate on board interlocks formation, two new perspectives that represent a breakpoint from the earlier legalistic and anti-collusion works. Respectively, Pfeffer and Salancik (1978) and Useem (1979) formalized the resource dependence and the class hegemony theories.

Building on previous works (Pfeffer, 1972; Allen, 1974, 1978), Pfeffer and Salancik (1978) argued that interlocking directorates are mechanisms able to reduce firms’ exposure to uncertainty ensuring the supply of resources otherwise difficult to obtain (Aldrich, 1979; Mintz and Schwartz, 1981; Schoorman et al., 1981; Bazerman and Schoorman, 1983). According to resource dependence theorists, interlocks are not collusive mechanism but coordinative, cooptative and control mechanisms (Glasberg and Schwartz, 1983; Mintz and Schwartz, 1983, 1985; Galaskiewicz et al., 1985; Zajac, 1988; Pennings, 1980; Burt, 1980, 1983; Burt et al., 1980; Mizruchi and Bunting, 1981). Considering financial relationships as a special case of resource dependence, other scholars advanced a financial control theory (also known as bank control or financial hegemony theory). According to this perspective, a firm that is heavily indebted to a bank may co-opt an officer of the bank onto its board in order to maintain a simpler access to capital and pacify the bank’s management. From the other side, the financial institutions can keep an eye on their investments (Mariolis, 1975).

Useem formalized the class hegemony theory in 1979 (Zeitlin, 1974; Soref, 1976). According to this perspective, known as upper class, class cohesion, inner circle or class-domination theory of power, board interlocks are social ties aimed at the maintenance of the power of an upper class. In that they assumed an individual perspective to explain the behavior of directors who occupy several influential positions simultaneously in order to promote their own interests in both the economic and social spheres (Koenig and Gogel, 1981; Useem, 1984; Roy and Bonacich, 1988). To support this view, scholars analyzed the reconstruction of broken ties and showed that accidentally broken ties were not typically replaced with new ties with the same firm (Palmer, 1983; Ornstein, 1980, 1982, 1984; Richardson, 1987; Palmer et al., 1986; Stearn and Mizruchi, 1986; Mizruchi and Stearns, 1988).

In the same period some studies focused on the spatial distribution of interlocks social ties (Green, 1981, 1983). Using multidimensional scaling on Canadian and American firms, Green and Semple (1981) found that interlocks were concentrated in few large cities (New York, Chicago, Toronto and Montreal) and that the density of ties among firms was inversely correlated to their distance. In that they found evidence that proximity among people of the hegemony class is relevant to create interlocking directorates.

In sum, key characteristics of research during this period are: empirical nature of articles; the deepening interest on interlocking directorates’ causes; the test of resource dependency vs class hegemony perspective; the separation between organizational perspective and individual perspective; and despite of some geographical studies the prevalent setting continue to be North America.
The modern era (1990–2009)

The beginning of the 1990s is characterized by two new tendencies in interlocks studies: the analysis of interlocking directorates consequences for both organizations and individuals and the development of studies based on geographical contexts different from North America (Kono et al., 1998; Davis and Mizruchi, 1999; Au et al., 2000; Rao et al., 2000; Beckman et al., 2004; Shaw and Alexander, 2006; Silva et al., 2006; Westphal, 2006; Crumplin, 2007; Kang and Tan, 2006; Rosenkopf and Schleicher, 2008; Khanna and Thomas, 2009; Shropshire, 2010).

Studies of this period on interlock effects argued that these ties are an effective means to spread knowledge and practices among different firms. Interlocked organizations are ties aimed to share organizational forms such as the multidivisional (Palmer et al., 1995) or specific functions (Rao and Sivakumar, 1999). Other studies showed that interlocked firms share similar strategies and behaviors (Boyd, 1990; Burris, 1991; Davis, 1991), including acquisitions (Haunschild, 1993; Haunschild and Beckman, 1998), poison pills (Davis, 1991) and golden parachutes policies (Davis and Greve, 1997), decision processes (Westphal and Zajac, 2001), market entry and expansion choices (Baum et al., 2000; Haveman, 1993).

Studying consequences of board interlocks at individual level, scholars pointed out that interlocks mainly affect directors’ careers (Pettigrew, 1992; Burris, 2005; Lester and Cannella, 2006). In particular, extending prior works, scholars argued that rewards of directors be not only the outcome of the number of boards occupied by directors but more in general the result of the social capital of board members. The amount of directors’ social capital, in turn, positively influences career advancements and compensation that derive from stock options (Hallock, 1997; Geletkanycz et al., 2001; Fitch and White, 2003, 2005; Caldarelli and Catanzaro, 2004; Chua et al., 2006; Ruigrok et al., 2006).

Moreover, in this period scholars began to analyze the phenomenon around the word (Li, 1994; Pederson and Thomsen, 1997; Fohlin, 1997, 1999; Keister, 1998; Maman, 1999). Building on sporadic prior works realized in the 1980s (Fennema and Schijf, 1985), studies of the 1990s focused mainly on Asian, European and Latin-American contexts (Peng et al., 2001; Windolf, 2002). These studies tested the theories developed for the North-American context in countries characterized by a different institutional setting. Asian-based studies examined the relation between size, financial connections, debts, corporate performances of firms and board interlocks in different countries (Lincoln and Gerlach, 2004; Heracleous and Murray, 2001) supporting bank control and resource dependency theories (Chin Huat et al., 2003; Phan et al., 2003). Peng et al. (2001) evidenced that, multinational enterprises in Thailand have very dense interlocks networks, in which ethnic Chinese directors and military directors abound and occupy the most central positions. Hamiffa and Hudaib (2006) found a significant relationship between multiple directorships and market performance of Malaysian firms.

Interlocking directorates have also received special attention in European countries (Windolf, 2002) such as Hungary (Tomka, 2001), Germany (Heinze, 2004), France (Yeo et al., 2003), Italy (Rinaldi and Vasta, 2005) and Swiss (Ruigrok et al., 2006). In particular, scholars pointed out that intra-family agency problems are the driving force behind interlocking directorates formation in these countries (Lester and Cannella, 2006; Chua et al., 2006).

In sum, key characteristics of research during this period are empirical nature of articles; the prevailing interest on interlocking directorates’ effects; the systematization of previous theories and the emerging of geographical and corporate governance issues; the net separation between organizational and individual perspectives; and the emerging debate outside North America.

The post-modern era (2010–2018)

Despite studies on board interlocks have provided an extensive and detailed view of the phenomenon they still suffer of some specific limitations (Caiazza and Simoni, 2015; Guldiken et al., 2016).
The first limitation is the lack of an explicit recognition of the institutional dimension of board interlock. Indeed, only a marginal part of literature recognizes that the process by which an interlock is formed is strongly influenced by the corporate governance system of the country in which it occurs (Gur and Greckhamer, 2017). This setting comprises several rules: the rules aimed at avoiding anticompetitive behaviors that can prohibit certain kind of board interlocks; the rules aimed at defining the firms’ corporate governance that, on the one side, set the role and power of board members; on the other side, identify the players involved and the mechanism of selection of new directors; the rules aimed at governing the relationships between financial and real economy that require to clearly separate lender and borrowers prohibiting eventually even board interlocks between banks and industrial firms (Caiazza et al., 2019; Salvaj and Couyoumdjian, 2016; Sankar et al., 2015; Withers et al., 2018; Simoni and Caiazza, 2012a, b; Cárdenas, 2015; Lamb and Roundy, 2016; Howard et al., 2017).

The second limitation of current literature is the scarce relevance given to the socio-cognitive nature of board interlock formation. Namely, board interlocks have been only seldom considered as the outcome of a decision model in which both perceptions of decision makers and social influences play a role in appointing directors who already sit on other firms’ boards. Such stance is partially related to the first point, in that, institutional settings provide the framework within which decision model arise and evolve over time (Heemskerk et al., 2016; Mazzola et al., 2016; Wincent et al., 2016; Bilgili et al., 2017; Brennecke and Rank, 2017; Braun et al., 2018; Ali, 2018). Embracing the socio-cognitive perspective opens the possibility to the recognition of board interlocks causes and effects not well captured by extant literature: political pressures, familiar and parental relationships, overlap between private and public interest, group structures, quasi markets (Shropshire, 2010; Simoni and Caiazza, 2012a, b, 2013; Martin et al., 2015; O’Hagan, 2015).

Both limitations in current studies can be overcome by considering in the future studies that board interlocks formation should be studied by taking in to account corporate governance systems and socio-cognitive models in appointing new directors. This dimension provides help in shedding light on two relevant issues of board interlocks: the decision makers whose interest the board interlock formation tends to satisfy; the key variables of the decision model that leads the formation and evolution of the board interlocks network.

Conclusion and discussion
Research on board interlocks has rapidly developed and expanded in the last four decades. Several changes have been observed across different periods in terms of questions addressed and methods applied. The growing attention can be ascribed both to new challenges companies face in multiple contexts, and to the theoretical advancements in the fields of strategic management and corporate governance. Witnessing pluralism in the literature on board interlocks in terms of both theoretical underpinnings and empirical findings, our paper contributes to the debate by providing a framework to classify the evolution of existing studies and by suggesting directions for future research.

In particular, our analysis highlights that research on interlocking directors has been developing from a descriptive analysis of interlocks firms to a critical investigation of interlocks’ main characteristics with regard to the context in which they are created. While early studies mainly discussed the causes or effects of interlocks from normative and sociological perspective more recent strand of research posits that interlocking directorates should be better contextualized to the institutional setting and socio-cognitive system of countries in which they develop. This evolution is in line with the tendency in strategic management to study the impact of the institutional context on the socio-cognitive decision models that shape organizations’ behaviors. The results of our bibliometric study are summarized in Table I.
Our study has several implications for scholars. First, it reveals the need to understand the role of corporate governance in interlocking directorates formation as most of the contemporary wisdom originates from large public companies and comparative corporate governance studies are sparse. As a result, the impact on interlocking directorates of both the national setting and of firms' characteristics is not fully understood. Multi-level approaches and international comparative corporate governance studies may contribute to the development of a better understanding of interlocking directorates.

Second, our study highlights the emerging relevance of the socio-cognitive perspective in studying the formation and the evolution of board interlocks. Indeed, scholars have recently emphasized the need to go beyond structuralism and to examine board processes, board behavior and directors' cognition. In this vein, scholars are encouraged to investigate what boards and their members actually do, think or perceive and how cognition affects interlocks. Although our literature review shows an increasing interest on these topics, the number of studies in this area is still rather limited. Given the importance of understanding politics and bargaining processes between key actors and the impact of overlapping and conflicting preferences within and between groups of actors, a considerable amount of research remains to be done in this area in order to clarify and improve our understanding of interlocking directorates. Future studies should investigate the interaction between shareholders and board members' networks and should develop more dynamic theories and research designs explicitly investigating the changing contributions of directors' ties over time. To reach this purpose, longitudinal studies based on interviews, surveys and direct observation techniques may be required in order to explore processes over an extended period of time.

Our analysis has also implications for practitioners evidencing the increasing importance of the institutional context on the socio-cognitive process that leads to selection and appointment of directors that already sit on other boards. Practitioners should be aware that most of the contemporary wisdom originates from a limited set of empirical contexts.

<table>
<thead>
<tr>
<th>Type of paper</th>
<th>Main research topic</th>
<th>Use of theories</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conceptual nature of articles, the birth of two main theories: resource dependency and class hegemony</td>
<td>The separation between organizational perspective used by resource dependency theorists and individual perspective used by class hegemony theorists</td>
<td>The prevailing interest on interlocking directorates' causes</td>
<td>The prevalence of studies on North-American setting</td>
</tr>
<tr>
<td>Empirical nature of articles, the prevailing interest on interlocking directorates' causes</td>
<td>The separation between organizational perspective and individual perspective</td>
<td>The test of resource dependency vs class hegemony perspective</td>
<td>Despite of some geographical studies the prevalent setting continues to be North America</td>
</tr>
<tr>
<td>Empirical nature of articles, the prevailing interest on interlocking directorates' effects</td>
<td>The systematization of previous theories and the emerging of geographical and corporate governance issues</td>
<td>Resource dependency becomes the most commonly used framework for exploring boards' interlock</td>
<td>The emerging debate moves outside North America</td>
</tr>
<tr>
<td>Empirical articles gain importance, some new perspectives start to emerge</td>
<td>The focus of researchers switches from boards' ties to strategic decision making in selecting directors</td>
<td>A multi-theoretical approach to the board interlocks dominates the debate</td>
<td>Empirical articles on transnational interlocks gain considerable interest in literature</td>
</tr>
</tbody>
</table>

Table I. Evolution of research on interlocking directorates
As there may be important differences across contexts in terms of role expectations, board structures and actors, practitioners should be careful in applying practices when moving from one country to another. This issue may be particularly relevant when firms expand their presence in foreign countries by creating new ventures and organizations exposed to a different socio-cognitive institutional context. The witnessed theoretical and empirical pluralism in the interlocking directorates literature is supportive in this respect.

Despite all the endeavors undertaken in the past, we highlight that the debate on interlocking directorates still provides a very promising and challenging research agenda. Management scholars are encouraged to expand their research on board interlocks by including the institutional setting in which interlocks occur and by considering the socio-cognitive processes that shape the decision to appoint a new director and in this way the formation of interlocking directorates.

References


Further reading


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