Corporate Governance

A framework for board capital

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Abstract

Purpose – *The purpose of this paper is to examine in greater depth the concept of "board capital", which the authors consider to be a bundle of three types of capital, and believe to be a clear antecedent of the board's ability to perform its roles, which have positive consequences for the firm's performance.*

Design/methodology/approach – *Through 83 firms listed on The Madrid Stock Exchange during the period 2005-2010, the authors test empirically the relationships between different dimensions of board capital and firm performance, and specially how internal social capital moderates the relationships between board human capital and external social capital with firm performance.*

Findings – *The results show that certain characteristics of human capital (average board tenure) and external social capital (directors' interlocks) are positively related to the firm performance. The empirical findings also indicate that the internal social capital, measured by board density, is positively related to the firm performance and moderates these above relationships, increasing the potential of the resources contributed by the board members and influencing to a large extent on a firm's performance.*

Practical implications – *The results of the investigation will help both executives and scholar in two ways. First, they will assist firms when they have to select board members, as they can now understand how the resources that board members bring with them can affect the firm performance. To be more effective, boards need to have members that have experience as firm's directors, external connections to other boards and many internal ties among them. Second, in this context, internal social capital is especially relevant, so the firms should look for possible ways of encouraging internal ties between directors. In this paper, the authors have opted for study the participation of directors in committees.*

Originality/value – *The authors propose that these three types of capital (human, external and internal social capital) need to be synergistically combined to create a group of directors with access to a complete set of skills, knowledge and connections, but which can still work as a compact social group when making decisions.*

Keywords *Boards of directors, Corporate governance, Boardroom dynamics*

Paper type *Research paper*

1. Introduction

The literature in the field of corporate governance describes the importance of the link between boards of directors and company results (Demb and Neubauer, 1992; Kiel and Nicholson, 2006; Sonnenfeld, 2002; Westphal and Bednar, 2005). However, despite extensive research, exactly how corporate boards influence their firms' financial performance remains a puzzle (He and Huang, 2010) or even what kinds of people make the best board members (Johnson *et al.*, 2013).

The corporate governance research agenda suggests that a firm's results depend on board effectiveness (Bird *et al.*, 2004, p. 132). Board effectiveness here is understood to be the board members' ability to perform their roles in such a way as to positively affect firm performance (Aguilera, 2005; Murphy and McIntyre, 2007). The literature has traditionally assigned three roles to the board:

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1. control or monitoring management as fiduciaries of the shareholders (Langevoort, 2001; Sundaramurthy and Lewis, 2003, Letza *et al.*, 2004);
2. service or advice to management on strategic issues (Donaldson, 1990; Donaldson and Davis, 1991, 1994; Davis *et al.*, 1997); and
3. provision of external resources that are critical for the firm's success (Hendry and Kiel, 2004; Goodstein *et al.*, 1994; Hillman *et al.*, 2000; Kakabadse *et al.*, 2001; Pearce and Zahra, 1991; Pfeffer and Salancik, 1978).

Although the board carries out several roles at once (Hillman and Dalziel, 2003; Lynall *et al.*, 2003; Macus, 2008; Roberts *et al.*, 2005), as a general rule, research has concentrated on how the board's execution of a single role affects firm performance. However, the ability of the board to fulfill these three roles will determine how effectively the board governs the firm with consequences on firm performance. Furthermore, a significant number of authors believe that these roles are intertwined, and there is no clear distinction between them (Hendry and Kiel, 2004; Hillman and Dalziel, 2003; Stiles and Taylor, 2001).

In our study, we use different aspects of board capital to describe the board's ability to have an influence on firm performance by carrying out their three roles: control, service and provision of resources. In particular, we draw upon Hillman and Dalziel (2003) and Haynes and Hillman's (2010) conceptualizations of board capital for developing a framework focusing on the human and social capital of the board. The literature on board capital identifies two key elements of the board's ability: human capital and external social capital. We reconsider this concept to include the distinction between external and internal social capital (Adler and Kwon, 2002; Kim and Cannella, 2008), and propose the interdependence of the three types of capital (human capital, external social capital and internal social capital) to understand the effectiveness of the board. Our paper makes an important contribution to the field introducing internal social capital as a necessary variable for a more complete understanding of the relationships of board human and external social capital with firm performance, arguing that these relationships cannot be interpreted accurately without considering the impact of internal social capital on them.

From our perspective, human capital, external social capital and internal social capital are all vital in developing the board's ability to perform its roles effectively, and together they form "Board Capital" (Haynes and Hillman, 2010). To be exact, the human and social external capital provide to the board a group of key resources (knowledge, experience and information about the environment of the firm) that could be used by the board in a more efficient way owing to the connection and collaboration between board members that provide the internal social capital. Internal social capital involves a bonding form of social capital that is focused on the characteristics that bring internal cohesiveness to the board and facilitates the pursuit of collective goals (Adler and Kwon, 2002). Having key resources does not guarantee their mobilization and application to the board's decision making process. It is when board members function as a cohesive group, with close ties, that they are able to exchange, combine and make use of the knowledge, experience and external resources that the board has access to through the human capital and external social capital of each of its members to a greater degree. That is why we propose a multiplicative effect of internal social capital by intensifying the positive effects of human capital and external social capital on performance. Previous studies (Hillman and Dalziel, 2003; Haynes and Hillman, 2010) have not taken into account this important distinction within the concept of board capital, either because of a lack of distinction between different types of social capital that may be present in a board (Hillman and Dalziel, 2003), or because they focus primarily on the relationship between human capital and firm performance (Nicholson and Kiel, 2004a). In our view, even if the board consists of highly qualified and experienced directors with high levels of human capital and other productive forms of external social capital, they still need the internal social capital to further drive the deployment and

mobilization of all these resources. This is the main contribution of our study which is particularly interesting in the context of board.

Internal social capital involves trust, collaboration and cohesiveness; the distinctive features of the boards mean that the advantages brought by internal social capital are particularly important for the effectiveness of this governing body. On the one hand, the complexity of the decisions taken by the board require a greater cooperation than other teams to enable a diverse set of directors to apply their various perspectives, knowledge and approaches to strategic problem solving. Directors need to communicate, assimilate cognitive frameworks and develop shared understandings. On the other hand, boards as episodic decision-making groups and being largely made up of outside directors will require a strengthening of internal ties to break down the boundaries between directors and increase the levels of trust and commitment that are required for collective actions.

In this work, we carry out a theoretical review of the board's influence on firm results. We begin with a brief analysis of the classic views and continue with an investigation of more recent works, and set out our hypotheses from the board capital perspective. Our analysis of the boards belonging to 83 firms listed on The Madrid Stock Exchange during the period 2005-2010, allows us to test empirically the relationships between different dimensions of capital board and firm performance, and in particular how internal social capital moderates the relationships of board human capital and external social capital with firm performance.

2. How does the board influence firm performance?

2.1 Formal structural attributes of boards and firm performance

A large part of the "classic" research into boards of directors has focused on a single function of the board: identifying board composition and structure as explanatory variables of firms' results (Finkelstein and Hambrick, 1990; Hambrick and Mason, 1984; Michel and Hambrick, 1992; Pfeffer, 1983; Finkelstein and Mooney, 2003; Gabrielsson and Huse, 2004). The variables that are used most often and described in the literature as *the usual suspects* have been insider/outsider ratios, board size and CEO-duality.

Decades of research have failed to reach any consensus about which aspects of the composition and structural characteristics of the board influence particular variables of firm performance, producing ambiguous and sometimes contradictory results (Daily *et al.*, 2003; Dalton *et al.*, 1998; Johnson *et al.*, 1996). Many of the publications are based on agency theory assumptions. These assumptions advocate the independent boards with a high percentage of external directors and no duality in the role of CEO and president of the board. Criticisms of this type of study soon appeared: board composition is usually considered narrowly in terms of the ratio of inside directors to outside directors, with no regard to the resources, in the form of knowledge and skills, or through their external relations, that each director brings to the board (Hillman and Dalziel, 2003; Rindova, 1999; Filatotchev, 2006; Clarysee *et al.*, 2007; McIntyre *et al.*, 2007; Minichilli and Hansen, 2007; Pugliese and Wenstøp, 2008; Kroll *et al.*, 2008; Kor and Misanyi, 2008; Sirmon *et al.*, 2008; Kim and Lin, 2010; Tian *et al.*, 2011). These works also fail to consider the links between the board members that integrate the resources they bring and their willingness to work effectively with each other. Finally, by looking at the direct relations between certain aspects of the composition and structure of the board and firm performance, these studies largely ignore the output that the board achieves by fulfilling its functions (Petrovic, 2008; Nicholson and Kiel, 2004a).

As Daily *et al.* (2003) indicate, any advance in the study of board effectiveness requires an exploration of new fields of investigation. These new fields include the analysis of the board from the human capital and social capital perspectives, adopting an integrating focus.

2.2 New trends of investigation: the board capital perspective

Board capital is intended to capture the ability of the board to provide resources to the firm (Hillman and Dalziel, 2003). This construct is coined as the composite of the human and social capital of the board of directors. The literature notes the interdependent nature of the human and external social capital (Haynes and Hillman, 2010). Considering this interdependence as well as the necessary distinction between the internal and external social capital, our paper puts forward a model, which explains in depth the mutual relationship between the three types of capital (human capital, external capital and internal capital). We now turn to discuss each of these as well as the proposal of a mutual relationship that constitutes the framework for the board capital.

2.2.1 Board human capital. Board human capital consists of a set of skills and knowledge that directors collectively bring to the board, derived from their investment in education and experience outside as well as inside of the firm (Stevenson and Randin, 2009; Minichilli and Hansen, 2007; Pugliese and Wenstøp, 2008; Nicholson and Kiel, 2004a; Wincent *et al.*, 2010; Kor and Sundaramurthy, 2009; Lester *et al.*, 2008).

Education is often seen as an attribute associated with general human capital (Brüderl *et al.*, 1992). The learning and knowledge structures generated by higher levels of formal education will be valuable for directors (Wincent *et al.*, 2010; Reeb and Zhao, 2009; Kim and Lin, 2010; Boivie and Jones, 2008). To make progress, directors are required to take in large amounts of complex information quickly. Higher levels of education will give board members a greater capacity for information processing and participation in the firm's strategies (Wiersema and Bantel, 1992). There are positive relationships between higher levels of education and a readiness to use external information, the creation of networks, receptiveness to innovation, tolerance of ambiguity and a closer monitoring of the firm's accounting systems (Crabtree and Gomolka, 1991; Wincent *et al.*, 2009; Goll *et al.*, 2007). More highly educated people are better able to find creative solutions to help the firm they represent (Wincent *et al.*, 2009). They are fundamental to the acquisition, use and understanding of knowledge, and the development of abilities that support effective decision-making. These aspects will all help the directors to fulfill the board's roles of control, service and provision of resources with positive consequences on firm results.

As well as examining the directors' levels of education, the majority of studies emphasize the more specific human capital derived from certain directors' experiences (Stevenson and Radin, 2009; Tian *et al.*, 2011; Kroll *et al.*, 2008; Haynes and Hillman, 2010; Kor and Misanyi, 2008; Sirmon *et al.*, 2008). Members of the board acquire different knowledge and skills from their current and previous professional experience, as well as their own personal experience in the company as a director. In terms of professional experience, board members with professional experience in the industry in which the firm operates will have developed some solid knowledge structures on how the industry performs and the firm's competitive environment, and they will be in a prime position from which to advise the firm's management (Castanias and Helfat, 2001; Kor and Sundaramurthy, 2009; Kim and Lin, 2010; Pugliese and Wenstøp, 2007; Westphal and Fredrickson, 2001; Kroll *et al.*, 2008). This industry-specific knowledge of the directors can help them detect emerging opportunities in the industry and evaluate managers' proposals for growth (Castanias and Helfat, 2001), therefore carrying out their role of control and service. Of equal importance, through positions in an industry, directors have developed goodwill and connections with industry players (suppliers, distributors and major customers), through which directors can help the firm acquire critical resources. Moreover, the length of the directors' tenure on the board is an important aspect for board members. During their tenure on the board, directors develop specific skills and tacit knowledge about how the board and the firm operate (Kor and Sundaramurthy, 2009; Minichilli and Hansen, 2007; Nahapiet and Ghoshal, 1998; Pugliese and Wenstøp, 2007; Zahra and Pearce, 1989). Experimental directors' knowledge of the firm can be critical for enhancing directors' ability to perform their roles on the board (Kor and Sundaramurthy, 2009; Gabrielsson and Winlund, 2000).

Directors whose tenure on a board is for a long period, build important bases of influence (Finkelstein and Hambrick, 1989; Pfeffer, 1983) which give them greater capacity to act (Kor, 2003). In addition, as companies differ in the set of resources and capabilities they have and how they manage their resources, knowledge acquired by the directors in the company through their experience on the board, become a key facilitators due to their ability to perform control service roles on the board (Kor and Sundaramurthy, 2009), therefore leading to a positive impact on company performance. Directors who have been in the business for a long time have a rich knowledge of the environment and its resources, which enables them to make the right decisions. In other words, when the experience of the directors on the board increases, its effect on a firm's performance is positive.

We therefore propose:

H1. Board human capital (general and specific) is positively associated with firm performance.

2.2.2 Board social capital. According to Nahapiet and Ghoshal (1998), social capital is "the sum of actual and potential resources embedded within, available through, and derived from, the network of relationships possessed by an individual or social unit". The origin of social capital lies in the relationships that are struck up and maintained by the players in a network and can be attributed to both individual and collective actors. As in prior works, we apply this concept to boards of directors (Hillman and Dalziel, 2003; Offstein *et al*., 2005; Lester *et al*., 2008; Kor and Sundaramurthy, 2009; Wincent *et al*., 2009; Haynes and Hillman, 2010; Tian *et al*., 2011). The definitions of board social capital vary, depending on whether the focus is on directors" relations with external agents or on ties between directors at the intraboard-level, which prompts us to make the distinction between external and internal social capital (Kim and Cannella, 2008). This distinction is necessary because each type of social capital carries different advantages for the board.

2.2.3 Board external social capital. Board external social capital can be defined as the degree to which a board has outside contacts with the environment through directors' external ties (Kim, 2005). The primary function of external social capital is that of bridging, or linking the firm to the external environment. Organizations are not closed systems, and their success depends largely on their ability to extract valuable resources from the environment, as well as their ability to respond to external contingencies (Pfeffer and Salancik, 1978; Wincent *et al*., 2009). In this sense, the board's external social capital can be a source of competitive advantage for an organization, by linking the firm to the institutional environment.

External social capital has been measured in different ways in the literature; for example, the proportion of directors on the board who:

- graduated from a prestigious school (Kim, 2005, 2007);
- who are members of external economic associations (Wu, 2008; Kim, 2005; Kim and Cannella, 2008); or
- who have worked or are currently working in government institutions (Kim, 2007; Lester *et al*., 2008; Maman, 2000; Reeb and Zhao, 2009).

These types of external ties increase the opportunities to create high-level contacts with an influential person or persons in the institutional environment, which in turn give access to valuable information, financial resources and other types of resource or influence. However, of all the external ties, the type of relation that has been studied most often, and which we refer to in this work, is the links with other firms that are made through interlocking directorates. The concept of interlocks is particularly appropriate for the study of the interorganizational networks created when a firm's board members also serve on the board of other firms (Koka and Prescott, 2002). The experience that directors acquire by serving on other boards is a valuable resource that enables them to fulfill their roles more effectively because of their ability to draw upon their external experiences (Hillman and Dalziel, 2003;

Kor and Sundaramurthy, 2009; Tian *et al.*, 2011). Boards with a high number of external connections will benefit from rapid access to a variety of key resources in the form of strategic, information, learning and legitimacy (Kor and Sundaramurthy, 2009). In this way, previous studies on interlocking directorships have shown that this type of external connection plays an important role in the dissemination of knowledge and imitation of successful strategies between firms (Burt, 1989; Shipilov *et al.*, 2010). In addition, the legitimacy of decisions taken by the firm will be improved by the presence of board members who also serve on the boards of other firms (Mizruchi, 1996; Mizruchi and Stearns, 1988, 1994; Westphal *et al.*, 2001). Legitimacy may be a prerequisite for securing resources for the firm because financial institutions or inventors may be more willing to provide funding to a firm if it believes that its directors are reputable individuals (Mizruchi, 1996).

In summary, board external social capital creates links between the organization and the external environment through which it can gain information, influence, legitimacy and other critical resources. This improves the board's ability to perform its service and resource dependence roles. We therefore propose:

H2. Board external social capital is positively associated with firm performance.

2.2.4 Board internal social capital. The starting point for our study is the concept proposed by Adler and Kwon (2002) that internal social capital consists of the links between the board directors, focusing on the internal characteristics that contribute to the cohesiveness that allows it to pursue its collective goals. We feel that this concept is the most suitable approach for an analysis of the board's ability to work as a group and to perform its roles in such a way that bring positive consequences for firm performance.

The work of Westphal (1999) was pioneering in its recognition of the importance of social ties within the board, indicating that friendship ties between the CEO and outside board members will be positively associated with their interactions regarding advice and consultation on strategic issues. The number of relationships between board members, and the strength and nature of these relationships, may affect he internal dynamics of the board, more specifically high levels of internal social capital within the board leads to improved communication and trust between its members; the sharing of experience and knowledge; familiarity with the abilities, habits and personalities of the other members and the ability to function as a team (Huse, 2007; Leblanc and Gillies, 2005).

Nahapiet and Ghoshal (1998) indicate, internal social capital creates common forms of language and metaphors, which facilitate communication between board members from different areas of business, of which the others may have little knowledge and/or experience. A primary function of internal social capital is to enhance trust between those who share it (Kim and Cannella, 2008). Trust between board members is a fundamental resource for the exchange of valuable information and for fostering teamwork within the board (Forbes and Milliken, 1999). Directors who are close to each other strengthen their ability to work together effectively. This is especially important in the case of boards of directors since, as Hambrick (1994) and Finkelstein and Mooney (2003) point out, "teamness" should not be assumed for boards because they only meet occasionally and service as a director is a part-time responsibility. Boards with high levels of internal social capital will function effectively as a group.

Research into internal social capital has relied on the use of proxies and argues that these involved in the board network gain confidence and achieve cohesion and integration, either by association with others or through the directors' social ties. With regard to the first aspect (association with others), some authors focus on the links that board members have through their social similarity, or homophily – which is defined as the degree to which pairs of individuals who interact have a similar identity or group affiliation (Kim and Cannella, 2008). Social homogeneity between individuals plays a fundamental role in developing confidence, as they create more predictable reciprocal relations (Fischer, 1982; Marsden,

1988; Kim and Cannella, 2008). Thus, for example, while some authors argue that confidence is more common between people with the same demographic background (Kim, 2005), others point to friendship (Westphal, 1999), or even to the similarity of board members' backgrounds (Westphal and Zajac, 1995). In relation to the second aspect (social ties), typical types of social ties are those that arise from family ties, close friendships, informal socializing relationships or membership of groups, and the professional ties that are created by shared experience within an organization or business community (Kim, 2005; Oh *et al.*, 2004). Other authors consider that the directors' experience of serving together on the board or by sitting on the same committee (membership of multiple board committees) gives board members the possibility of familiarizing themselves with the other members and their skills and personalities. We focus on this latter aspect (membership of same committee). This work especially focuses on the internal density of the board based on the connections or close ties created between board members that sit together not only on the board but also on the same committees (Kim, 2005; Valenti and Horner, 2010). When members of a group have a number of close ties with each other, the group is considered to be dense. Board density therefore refers to the degree of connectedness among the members of a board of directors, and this will be extremely high if all of the members have close ties with each other (Kim, 2005; Oh *et al.*, 2006).

The internal board density could positively affect the performance of the functions and business performance for three main reasons: it increases confidence, it enables the development of norms within the group and it facilitates cooperation between board members (Kim, 2005; Valenti and Horner, 2010). Primarily, a dense network brings confidence among group members. Researchers have shown that dense social groups are associated with higher levels of social solidarity (Moody and White, 2003; Kim, 2005). Second, dense networks are characterized by the existence of shared behavioral norms (Valenti and Horner, 2010; Rowley, 1997). Moreover, the existence of sanctions against any selfish behavior means these norms are kept (Coleman, 1988; Valenti and Horner, 2010; Oviatt and McDougall, 2005). Finally, another consequence of the density is greater cooperation and cohesion within the board; when board members' personal interests become dimin4ished in favor of the general consensus within the group, so agreement between the members is reached more quickly and frequently (Valenti and Horner, 2010). The existence of a high density on the board trains its members to serve and challenge management decisions that do not conform to their notions of good governance.

To summarize, the complexity and ambiguity of decision-making within boards of directors requires a diverse set of directors to cooperate with each other, to elicit maximum benefit from all of their various perspectives, information and approaches as well as requiring increasing levels of trust and commitment toward collective actions. As we have explained previously, high levels of internal social capital bring about trust, collaboration and shared objectives within the board; this improves the board's ability to perform its different roles. We therefore propose:

H3. Board internal social capital is positively associated with firm performance.

2.3 A framework for board capital

Earlier in this work, we focused on the role or contribution of human capital and social capital (both internal and external) to the board's ability to perform its roles. Each of these types of capital are vital for developing the competence that boards require, but from our perspective, it is not enough to consider and analyze them individually. We argue that the true potential of board capital lies at the intersection or bundle of these three types of capital. Our proposal, after investigating and reconsidering the concept of board capital, states that it is the interdependence of human capital and external and internal social capital that creates the board's ability to fulfill its roles. The term "Board Capital" refers to the bundle of human capital and external and internal social capital that extends beyond

merely adding them together. In this sense, internal social capital plays a fundamental role by integrating and coordinating the skills, knowledge and other resources that the board accesses through its human capital and the directors' external ties. Because of their internal social capital, the board members work effectively with each other, finding the way to contribute together to the fulfillment of the board's roles. As we mentioned in *H1*, human capital contributes to the board's ability to perform its roles. However, the use of the resources (skills and knowledge) brought by the board members through their education, experience on the board and in the industry, will depend largely on how productive their relations are within the board. Therefore, our proposal raises the idea that internal social capital influences the relationship between human capital and the board's ability to perform its roles. While human capital is necessary for the proper functioning of the board, its influence will be enhanced by opportunities brought by the internal social capital that enables it to be applied and integrated into the board's decision-making processes. This is how the links between the board members are converted into enhanced factors of the potential of the board's human capital (Macus, 2008; Nicholson and Kiel, 2004a; Barroso *et al.*, 2011). As Nicholson and Kiel (2004b, p. 450) point out, dysfunctional relationships may inhibit the flow of information to the board, which prevents its human capital from being deployed.

On the other hand, *H2* sets out the relationship between external social capital and the board's ability to perform its roles. Board external social capital, through the interlocks, creates links between the organization and the external environment through which it can gain information, influence, legitimacy and other critical resources. However, these resources will be much more valuable if they are widespread and shared within the board. Therefore, we propose that the internal social capital influences the relationship between external social capital and the board's ability to perform its roles. Internal social capital provides trust, teamwork, collaboration and cohesiveness, allowing the flow and integration of the diverse information and other resources to which the board has access, through its external directors" ties. In conclusion, we argue that a board needs decision-making ability which it gains by encouraging directors to share the resources bridged via directors' external social capital, and the extent to which they do so will depend on the internal social capital generated by its directors' internal ties.

Our proposal states that the integration of resources obtained from directors' human capital and directors' external ties, allows boards to develop new tacit knowledge that enables them to perform their roles to a greater extent. That is, over time, the collaboration among the members of the board will lead to new knowledge through mutual learning (Dyer and Singh, 1998). We believe that the internal board density improves the board's ability to assimilate and integrate the resources possessed by its members. The internal density of a board improves trust between members, which in turn reduces knowledge protection, increases the willingness to share this knowledge, encourages learning and helps create new knowledge and capabilities. On the other hand, the development of norms of reciprocity and greater commitment toward shared goals, led by dense networks, strengthen the motivation to share information and knowledge. As a result, the resources shared by board members will be richer and of a higher quality, and the effect of external capital of the board on the results of the company will be enhanced.

In view of previous paragraphs and taking into account the interdependent nature of human capital, internal social capital and external social capital, we propose that these three types of capital need to be synergistically combined to create a group of directors with access to a complete set of skills, knowledge and connections, but which can still work as a compact social group when making decisions. We therefore propose that "Board Capital" needs to be analyzed as a bundle of types of capital that captures or defines the ability of the board to perform its roles. We therefore propose that:

H4a. Board internal social capital moderates relationship between board human capital and firm performance. In such a way that when board internal social capital is

higher, the rate of improvement in the firm performance associated with the increase in human capital is more intense.

H4b. Board internal social capital moderates relationship between board external social capital and firm performance. In such a way that when board internal social capital is higher, the rate of improvement in the firm performance associated with the increase in external social capital is more intense.

2.4 Methodology

2.4.1 Sample and data collection. The sample of firms used in this study consists of the Spanish firms registered on the Madrid Stock Exchange and which were quoted on the Continuous Market during the period 2005-2010. These firms were chosen because of their requirement to publish data pertaining to their corporate governance and performance. We then eliminated:

- those firms classified as financial service companies because of the difficulty of interpreting all of the data related to this sector;
- companies that were removed from the stock market during the analysis period (we only included firms that were quoted on the stock market from 2005 to 2010 inclusive); and
- firms whose annual reports we did not have access to.

This left a group of 83 firms and 498 observations for each of the variables used in our study.

2.4.2 Dependent variable. We used return on assets (ROA) as our measurement of financial performance for each firm. We calculated the ROA (with a one-year lag, ROA + 1) as the profit derived from the company's operations divided by the firm's total assets for each year. In general, we consider that countable measures such as ROA reflect the influence of the internal management more accurately than market-based measures, which are more susceptible to the influence of exogenous economic factors (Elitzur and Yaari, 1995; He and Huang, 2010). The data on the firms' results were obtained from the DataStream database.

2.4.3 Independent and moderator variables. Information on board composition was obtained from the Comisión Nacional del Mercado de Valores (CNMV, the Spanish Stock Market Commission); from their reports, we were able to access the names of all the board members for each firm in our sample. Once we had identified the board members for each firm and year, we needed precise information about the professional background and personal data of each director. Information on board members was obtained from their companies' annual reports and websites. In some cases, it was necessary to supplement that data with information obtained from files held on the SABI and e-Informa databases (Mateos *et al.*, 2011).

On the one hand, we have the variables that define the board's human capital, such as educational level, board tenure and industry background, and, on the other hand, we have the variables that define social capital, such as the interlocks between boards (external social capital) and board density (internal social capital).

To calculate the board members' level of education, we have codified the education variable as 1 if the board member holds a master's degree and 0 if they do not (Ruigrok *et al.*, 2007; Westphal and Zajac, 1995; Wiersema and Bantel, 1992). Almost all of the board members included in our sample have a qualification in higher education (in law, economics, engineering, etc.), and a high percentage of them have also attained a master's degree. Board educational level was operationalized as the percentage of members of the board with these resources (Wincent *et al.*, 2009).

Board tenure is calculated as the average number of years that board members have served on a particular board (Golden and Zajac, 2001; Johnson *et al.*, 1993; Kaymak and Bektas, 2008; Kor and Sundaramurthy, 2009; McIntyre *et al.*, 2007).

Finally, to calculate directors' industry-specific experience, we have collected the CNAE (National Classification of Business Activities) of the firms each director has worked and currently works for (current post and a minimum of three previous posts). By analyzing this information on a joint basis, we have codified the extent of the director's experience in the industry in which the firm is placed. We consider an executive who has occupied two or more posts in the target industry to be highly experienced and one who has held one or no such posts as being poorly experienced or inexperienced. In line with previous studies (Kroll *et al.*, 2008; Tian *et al.*, 2011) board industry-specific experience was measured as the percentage of board members who are highly experienced in the same industry as the focal firm.

We define the board's external social capital through its interlocks, i.e. the links formed when one board member sits on the board of another firm. Measuring interlocks has been used previously in the literature on boards of directors (Kor and Sundaramurthy, 2009; Wincent *et al.*, 2009; Haynes and Hillman, 2010; Tian *et al.*, 2011; Filatotchev, 2006; Pombo and Gutiérrez, 2011; Ortiz *et al.*, 2012). To calculate this variable, we added the total number of links from all board members and divided it by board size – the total number of board members. The resulting measure is the average number of interlocks per board.

To obtain the information on each member's interlocks, we turned to Axesor, a consultancy specialized firm in providing information on firms and their directors, obtained from official registers. The information from Axesor, available in the Official Mercantile Registry Bulletin (BORME), provided a list of the ties that each director has with one or more boards, in both quoted and unquoted firms, for each year of the study.

To calculate a board's internal social capital, we use board density as an indicator. For this reason, we view the board as a network of individuals with social ties to each other, focusing on the connections or internal ties between directors. Board density captures the degree of intra-board connectedness by comparing the total number of existing close ties with the potential number of ties if every board member were connected to every other member. This concept of density has already been used in works investigating both top management teams (TMT) (Hayton *et al.*, 2012; Phelps and Paris, 2010; Wong and Boh, 2010) and to a lesser extent in boards of directors (Westphal and Bednar, 2005; Valenti and Horner, 2010). This study uses the ties between directors belonging to the same committee of the focal firm as the basis for measuring board density. We state that there is a close connection between two board members when they serve together on the board and are also active together on at least one of the firm's committees. Board committees are a fundamental channel through which directors interact; they are the prime movers of the board, assigning to the latter the most important, or exceptional issues. Boards meet only occasionally, so when two directors sit together on the same committee, their more frequent interaction and level of interdependence leads to closer or strengthened ties. It should be noted that the work of committees is carried out in smaller groups (four or five members on average by type of committee), which fosters a greater level of interdependence.

To calculate the internal density of the board, we needed to know the number of the committees of each firm, as well as their composition or the directors that made up each committee. This information is available from the corporate governance reports published by CNMV. The majority of firms in our sample have an executive committee, an audit committee and a nominating and compensation committee. Finally, density was calculated using UCINET6 network software.

2.4.4 Control variables. Taking the lead from other studies on corporate governance, we have included the following control variables that might affect the proposed relations: CEO/Chair duality (Ellstrand *et al.*, 2002; Holm and Schuler, 2010; Singla *et al.*, 2010),

measured as a dummy variable with the value 1 when the chief executive of a firm is also Chair of the board and 0 otherwise; board size (Kim, 2005, 2007; Kroll *et al.* 2008; Ocasio, 1994; Sanders and Carpenter, 1998; Zahra *et al.*, 2007), measured as the number of directors on the board; firm age (Barroso *et al.*, 2011; Calof, 1993; Zahra *et al.*, 2007), measured as the number of years since the firm was founded; percentage of non-executive directors (Datta *et al.*, 2009; Filatotchev *et al.*, 2001; Singla *et al.*, 2010), calculated as the sum of non-executive directors on each board divided by the total number of board members; firm size, measured by the number of employees in each firm for each year; and the firm's previous performance, measured by previous ROA (Kim, 2005; Tian *et al.*, 2011). Finally, to control for temporal and sectoral effects, we included dummy variables for each year (2005-2010) and industry, according to the stock market industry classification published by the CNMV. The information on our control variables was obtained from a number of sources, depending on whether the variable was linked to the firm or the board. At the firm level, the information on firm size and age was obtained from the Osiris database and the stock exchange sectoral classification published by CNMV. Information at board level regarding the number of directors on each board, CEO/Chair duality and the type of directors on each board was obtained from the corporate governance reports published by the CNMV.

2.4.5 Statistical estimations. To test our hypotheses, we used an estimation process that is appropriate for our theoretical arguments and robust enough to withstand the typical problems associated with panel data analysis. We therefore used the Arellano–Bond model and used the generalized methods of moments (GMM) method (Arellano and Bond, 1991; Arellano and Bover, 1995; Greene, 2003). These authors propose the use of GMM, using the lagged values of the original independent variables as instruments, thereby resolving the problem of endogeneity. Hermalin and Weisbach (2000) and Aguilera and Cuervo-Cazurra (2009) argue that endogeneity makes it hard to analyze relations between board composition and firm value, and so if this is not controlled, the results could generate errors and inconsistent estimations. In this work, potential endogeneity could be due to the problem of simultaneity or inverse causality (Hermalin and Weisbach, 2003), and therefore, in accordance with prior studies, we have included the percentage of non-executive directors within the total number of board members as sources of endogeneity (de Andrés *et al.*, 2005; Jackling and Johl, 2009; Kim, 2007; Kor and Sundaramurthy, 2009; Pombo and Gutiérrez, 2011). We used the Stata/SE software program to calculate all of our estimations.

We also considered the possible problems of heteroscedasticity and autocorrelation. To establish whether there was a problem of heteroscedasticity, we carried out a modified Wald test, which rejected the *H0* absence of heteroscedasticity, and we therefore selected the robust option in Stata for all of our models. To control for autocorrelation, we ran the Wooldridge test, using the xtserial command in Stata. The *H0* absence of correlations was rejected, and the test therefore indicated that there was a problem of autocorrelation to be corrected.

We consider our model to be "autoregressive" and have therefore included the lagged dependent variable (ROA_{t-1}) as the instrument, but the lagged dependent variable was intrinsically correlated to the non-observed effects at panel level, giving inconsistent standard estimators for the linear regression models for the random and fixed effects. This supports our use of the GMM method (Arellano and Bond, 1991; Arellano and Bover, 1995; Greene, 2003). To test the validity of the model specification when using GMM, the Hansen Statistic of overidentifying restrictions was applied to evaluate the lack of correlation between the instruments and the terminal error in all of our models. The acceptance of the *H0* Hansen statistic implies the absence of any correlation between the instruments used and the terminal error in all of our models. We also included the m_2 statistic, which enabled us to confirm the absence of any secondary-order serial correlation in the regression residuals. Further to these comparative specification tests, we included the following Wald tests in the estimations:

- first (z_1) joint significance of the reported coefficients of the explanatory variables; and
- second (z_2) joint significance of the dummy time variables.

Both were statistically significant.

Table I shows a summary of the descriptive statistics and the correlation matrix of the variables used. All of the variance inflation factors (VIFs) are substantially lower than 2, and there are therefore no problems of multicolinearity in our model. To avoid the possible problems of multicollinearity between the primary effects and interaction terms, the independent variables were centered before the interaction variables were created (Aiken and West, 1991).

3. Results

Following our GMM analysis, we propose various models, to include each of the working hypotheses. In Model 1 of Table II, we introduce the control variables, two of which are significant: firm size and board size ($p < 0.10$ and $p < 0.05$, respectively). Despite the lack of significance in the other control variables, these are, in theory, relevant and should remain in the model. All of these variables, as mentioned above, have been positively linked to the firm's performance. Models 2 to 7 are designed to test the proposed hypotheses. We have taken into account the problems of heteroscedasticity, and where this has been detected, we have estimated a robust model.

H1, *H2* and *H3* propose that both the human capital and social capital (external and internal) of the board are positively related to firm performance. According to Models 2-4, analysis confirms the *H2* and *H3* ($p < 0.01$ and $p < 0.05$, respectively) and the *H1* partially. In Model 2, the estimated coefficients of the board members' high educational attainment and industry-specific experience are not significant; however, the coefficient of the board tenure is positive and significant ($p < 0.05$). To test the interaction effects proposed in *H4a* and *H4b*, we added Models 5-7. In Model 5, the linear interaction term for tenure and board density was positive and significant ($p < 0.01$), and in Model 6, the linear interaction term for interlocks and board density was positive and significant as well ($p < 0.01$). Finally, in Model 7, the linear interaction term for tenure and board density was positive and significant ($p < 0.01$), and the linear interaction term for interlocks and board density was positive and significant ($p < 0.01$). In comparison to Models 2 and 3, Models 5-7 are fairly significant, producing an increase in the value of X^2, which suggests that board density moderates the linear effects of board tenure and interlocks on firm performance.

To facilitate interpretation of the regression coefficients, we plotted the gradients of the simple regressions of these terms (Cohen *et al.*, 2003). Figure 1 shows the relationship between board tenure and firm performance and the influence of the board density on this relationship. Figure 2 shows the relationship between interlocks and firm performance and the influence of the board density on this relationship. In both cases, the gradient is steeper when board density is greater, indicating that as board density increases, the influence of the board tenure and interlocks on the firm's results also increases.

4. Conclusions

Our work has focused on the explanation of how, through its capital, boards are able to carry out their roles, with subsequent effects on corporate performance. From our perspective, human capital, external social capital and internal social capital are all vital in developing the board's ability to perform its roles effectively and together they form "Board Capital". Unlike the traditional research focused on the control role (Agency Theory) and formal aspects of composition and structure of the board, our study is focused on how the resources provided by each of the directors (knowledge, skills and ties) and their combinations influence on firm performance (Kim and Lin, 2010; Johnson *et al.*, 2011; Shropshire, 2010; Bjornali and Gulbrandsen, 2010; Wincent *et al.*, 2009; Kim and Cannella, 2008).

Table I Correlation matrix

Variables	*Mean*	*SD*	*Minimum*	*Maximum*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
1. ROA	0.03	0.11	−0.48	0.89	1													
2. Board tenure	7.17	4.56	0	23.82	0.10**	1												
3. Board members' high educational attainment	0.45	0.2	0	1	−0.11**	0.03	1											
4. Industry-specific experience	0.59	0.22	0	1	−0.01	0.03	−0.04	1										
5. Interlocks	4.27	2.03	0.33	12.8	0.06	−0.13***	−0.02	−0.01	1									
6. Board density	0.32	0.22	0.03	0.98	0.09*	0.00	−0.09**	−0.13***	0.04	1								
7. Firm size	131,559	33,588	6	285,106	0.06	−0.25	−0.08*	0.03	0.04	0.23***	1							
8. Firm age	49.81	53.95	2	164	−0.01	0.08*	0.28***	−0.12**	−0.08*	−0.12***	−0.03	1						
9. Board size	10.94	3.55	5	21	0.06	−0.10**	−0.14***	0.11**	0.07	−0.15***	0.26***	−0.04	1					
10. % outside board member	0.81	0.12	0.33	1	0.09**	0.12***	−0.15***	−0.02	0.02	−0.04	−0.10**	0.13***	0.26***	1				
11. Industry 1					−0.09*	−0.08**	−0.22***	0.05	0.06	−0.07	−0.03	−0.12***	0.27***	0.13***	1			
12. Industry 2					0.04	−0.12***	0.12***	0.15***	0.04	−0.19***	−0.00	0.13***	0.00	0.03	−0.23***	1		
13. Industry 3					0.08*	0.18***	0.27***	−0.09**	0.02	0.01	−0.19***	0.11**	−0.23***	−0.05	−0.24***	−0.46***	1	
14. Duality					−0.08*	0.04	0.14***	0.06*	−0.01	0.11**	0.14***	−0.05	0.08	−0.21***	0.05	0.06	−0.03	1

Notes: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$; correlations above 0.12 are significant at $p < 0.01$; number of observations = 498

Table II Results of the analysis of board capital and firm performance

Variables	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*	*Model 7*
Board tenure		0.01 (0.00)**			0.01 (0.00)**		0.01 (0.00)**
Board members' high educational attainment		−0.02 (0.04)			−0.04 (0.07)		−0.05 (0.08)
Industry-specific experience		−0.04 (0.04)			−0.07 (0.06)		−0.06 (0.06)
Interlocks			0.00 (0.00)***			0.00 (0.00)***	0.00 (0.00)***
Board density				0.05 (0.03)**	0.07 (0.16)**	0.01 (0.05)**	0.06 (0.17)**
Board tenure × Board density					0.00 (0.01)***		0.00 (0.01)***
Board members' high educational attainment × Board density					0.09 (0.20)		0.09 (0.21)
Industry-specific experience × Board density					0.10 (0.13)		0.09 (0.16)
Interlocks × Board density						0.00 (0.01)***	0.00 (0.00)***
Firm size	2.24e-0.7 (2.21e-07)*	2.31e-07 (2.14e-0.17)*	2.10e-07 (2.13e-07)*	2.25e-07 (2.26e-07)*	2.10e-07 (2.08e-07)*	2.10e-07 (2.35e-07)*	1.96e-07 (2.10e-07)*
Firm age	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)
Board size	−0.01 (0.00)**	−0.01 (0.00)**	−0.01 (0.00)**	−0.01 (0.00)**	−0.01 (0.00)**	−0.01 (0.00)**	−0.01 (0.00)**
% outside board member	−0.05 (0.07)	−0.06 (0.07)	−0.06 (0.07)	−0.05 (0.07)	−0.05 (0.07)	−0.05 (0.07)	−0.05 (0.07)
Duality	0.00 (0.02)	0.01 (0.02)	0.00 (0.01)	0.00 (0.02)	0.00 (0.02)	0.00 (0.02)	0.00 (0.02)
Annual effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Z_1	16.85 **	18.85***	15.78 **	19.42***	22.48***	17.85 **	20.12***
Z_2	20.41***	19.55***	19.96***	20.27***	19.87***	18.75***	21.85***
m_2	0.34	0.38	0.33	0.35	0.51	0.33	0.50
Hansen	21.96	24.11	21.9	22.19	22.84	22.46	22.57
χ^2	41.18***	41.23***	42.48***	48.05***	54.47***	48.10***	55.95***

Notes: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$

Figure 1 Moderating effect of board density on the relationship between board tenure and firm performance

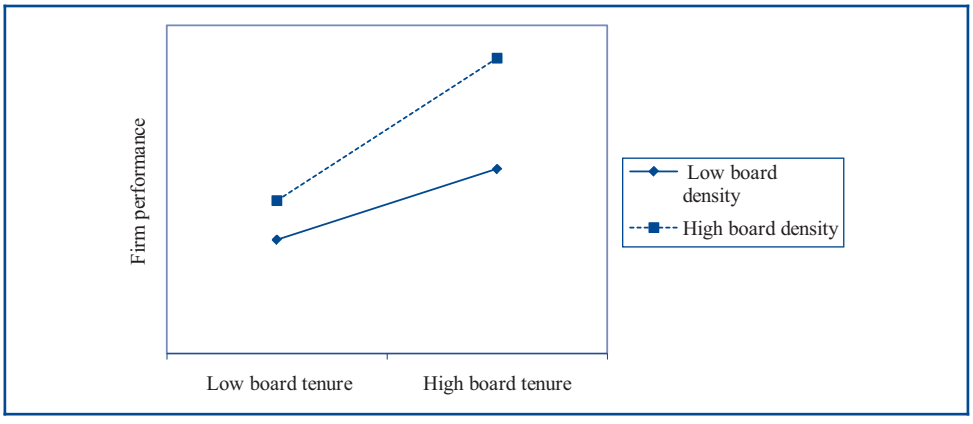
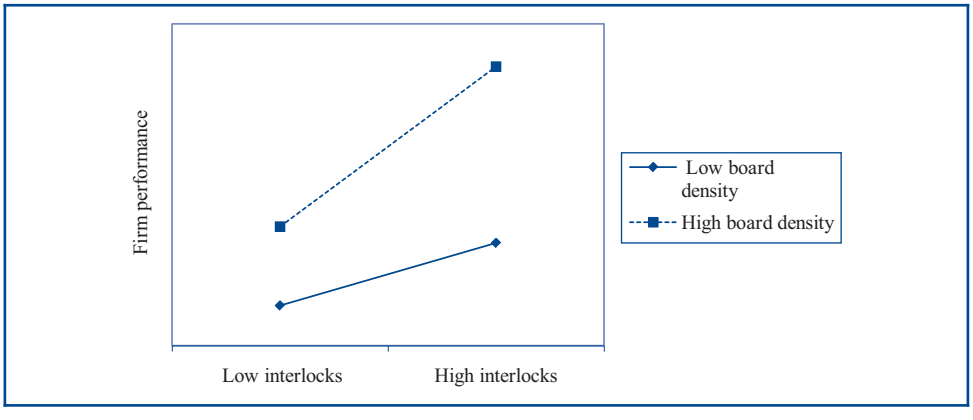


Figure 2 Moderating effect of board density on the relationship between board interlocks and firm performance



To be exact, we propose that directors bring to the board a wide range of resources from its human and external social capital which gives them the ability to perform their roles effectively, and thus they will affect positively the performance of the company. Our results show that directors with board experience based on their tenure or with extensive contacts with other boards improve business performance. Our proposal also emphasizes the role of internal social capital in the functioning of the board and its influence on firm performance, both directly and indirectly. Our results show high connectivity between the board members favor firm performance that it intensifies the positive effects of human capital and external social capital on firm performance Along with this, we interpret that a board with high density of internal ties helps that resources derived from directors' human capital and external ties are more valuable because they are shared and widespread within the board showing that an integrated set of resources is greater than the sum of each individual one. In other words, key resources bridged via directors' human capital and external social capital may have greater impact on firm performance when these resources are shared within the board, and this internal dissemination process will be more intense in board with high internal social capital.

As we mentioned in the introduction, our proposals are especially relevant for the particular context of the board directors. The boards are characterized as groups that face complex decisions for the future of the firm and episodic decision-making groups composed of a high proportion of outside directors; therefore, its effectiveness is likely to depend heavily

on its internal social capital and more specifically on the interaction between internal social capital and the others dimensions of board capital. This allows the board to function as a cohesive team deploying and mobilizing resources obtained from their board members' human capital and external social capital.

In complete agreement with previous works (Murphy and McIntyre, 2007; Murphy and McIntyre, 2007), we understand that the effectiveness of the board will depend in part on how well the board functions as a team to handle the complex tasks it faces; it is therefore necessary to consider variables that bring us to the study of the behavior of board. In this paper, we attempt to make advances by introducing internal social capital as proxy of behavioral aspects within the board such as trust, teamwork, collaboration or cohesiveness.

In future research, it would be interesting to integrate the organizational behavior literature in teams with the corporate governance literature to study more in depth the "black box" that is the inner functioning of the board and its behavior as explanatory variables of board effectiveness.

Related to the implications of this research, recent financial scandals of high-profile firms (Enron, Tyco, WorldCom, Adelphia), alongside the economic recession brought about by the crisis (Love *et al.*, 2007; Francis *et al.*, 2012) mean that every governing mechanism, not only top management, needs to be adequately qualified to be fully involved with the firm's performance. The results of our investigation will help firms in two ways: first, they will assist firms when they have to select board members, as they can now understand how the resources that board members bring with them can affect the firm performance. To be more effective, boards need to have members that have experience as firm's directors, external connections to other boards and many internal ties among them. Second, in this context, internal social capital is especially relevant so when companies consider the composition of their boards, they should not be guided only by the intent to get the maximum possible resources through the human capital of its directors or its external connections. They must also take into account the critical role internal social capital has in enhancing the positive effects of both types of capital so that its implementation is not an issue to be left to chance by the companies. The firms should look for possible ways of encouraging internal ties between directors; in this paper, we have opted for promoting the participation of directors in committees though other ways may be encouraging the frequency of meetings, board co-working experience or informal meetings outside the board.

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