



Board members' contribution to strategy: The mediating role of board internal processes[☆]



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ABSTRACT

This study aims to explore what directors do on the board, to what extent the processes occurring in the board allow the sharing and integrating of the existing knowledge, thus facilitating the board members' contributions to strategy. We adopt the view that the internal board processes increase the impact of the cognitive resources on board performance. Using survey data from 200 large Spanish companies we demonstrate that directors' level of knowledge of the firm and board job-related diversity positively influence the degree of the board's strategic involvement. Additionally, the internal processes that take place within the board – particularly *Cognitive Conflict*, the *Critical and Independent Approach* and the *Comprehensive Discussion Process* – influence the board's strategic involvement and play a partial mediating role on the aforementioned relationships. However, our results show no evidence for a positive relationship between *Board Meeting Dynamics* and the board's strategic involvement.

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1. Introduction

Boards are regarded as a valuable source of knowledge and expertise that can contribute to strategy decision-making actively initiating, implementing and evaluating strategic decisions (Johnson, Daily, & Ellstrand, 1996; Sellevoll, Huse, & Hansen, 2007). Previous studies into the antecedents of the board strategic involvement have paid attention to structural characteristics of boards, adopting an “input-output” focus. However, their results present mixed evidence. This has led many scholars to suggest other lines of research that posit boards as decision-making groups, whose internal processes should be better understood (Forbes & Milliken, 1999; Pugliese et al., 2009).

Board of directors are typically elite, large groups, with episodic functioning and part-time responsibility. The majority of board members are outside directors, whose primary affiliation is to another organization. Because of these distinctive characteristics, boards – more than other groups – face interaction difficulties and their effectiveness is likely to depend profoundly on the social and psychological processes arising from the participation, interaction and exchanges that originate from within the board (Zattoni, Gnan,

& Huse, 2015), these internal processes are critical determinants successfully fulfill its different tasks among which are boards' strategy task.

We propose that the board's degree of involvement in the firm's strategy depends on the set of knowledge and abilities of its directors (Hillman & Dalziel, 2003), and that board internal processes explain how this relation is generated (Ato & Vallejo, 2011). Clark and Maggitti (2012) conclude that the processes taking place in the top management team let effectively integrate organizational resources as knowledge and experience of the executives to formulate a well-developed strategy. Like top managers, boards face complex and non-routine problems in the fulfillment of their strategic tasks. In line with this argument, we adopt the view that the board's process mediating the relationship between resources on which the board bases its prospects of success, and board strategy involvement (Roberts, McNulty, & Stiles, 2005; McNulty, Roberts, & Stiles, 2005). Directors' knowledge and skills have been recognized as an important attribute in the board's strategic task (Minichilli & Hansen, 2007).

Although these ideas have begun to take shape in recent articles on the subject, they still need to be studied more thoroughly (Zattoni et al., 2015). Focusing on board team processes, we investigate the following question: *How do the board's internal processes affect the relation between director's knowledge and abilities and their strategic involvement?* This study aims to explore what directors do on the board, to what extent the processes occurring in the board mediate in the relationship between board job-related diversity,

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board members' in-depth knowledge of the firm and board's strategic involvement. Our main contribution lies in highlighting the importance of board processes as a means through which board members contribute to strategic decision making, helping to open the 'black box' of corporate boards (Zona & Zattoni, 2007), all of which takes into account the arguments of the Behavioral Theory of the Firm (Cyert & March, 1963) and the Team Production Theory (Blair & Stout, 2001), and studying them in a specific context, as is the Spanish case. The literature points out the importance of the board's resources in creating value in the firm (Hillman & Dalziel, 2003; Kor & Sundaramurthy, 2009), but the knowledge and experiences of the board, must be expressed in the boardroom to contribute to the decision making (Samra-Fredericks, 2000). Therefore, it is also necessary to know how the board members behave within the board – if they express different points of view (Cognitive Conflict), if they challenge the proposals from management (Critical and Independent Approach), if board meetings are dominated by certain board members (Board Meeting Dynamics) or if they spend time on productive discussions (Comprehensive Discussion Process). Our results show that the processes that take place within the board play a partial mediating role between board's resources and the board's strategic involvement. Therefore, our research makes a new contribution to this field of study by deepening in the analysis of the functioning of the board as a group of interacting individuals. Our theoretical contribution is the proposal that the board's processes are the mechanisms by which the "complementarity" of the board members should be promoted and the processes should be used to encourage the board to make use of the knowledge and capabilities of all of its members. As a result, this would reduce the problem of bounded rationality and enable the board to function effectively as a collaborative team. The article is structured as follows. First, there is a brief introduction to the literature. Then we outline our theoretical approach and derive hypotheses. After the presentation of our results, we discuss their implications for research and practice before concluding with areas for further research.

2. Theoretical background

2.1. What happens in the board?

Scholars in organization and strategy raised a number of theoretical perspectives to study the board's functioning (Huse, 2007; Hambrick, von Werder, & Zajac, 2008). In our study we suggest two important perspectives: the Behavioral Theory of the Firm (BTF) (Cyert & March, 1963) and the Team Production Theory (TPT) (Blair & Stout, 2001).

BTF helps to highlight the importance of the board's internal processes to examine more closely the interior of the boardroom and directors' behavior. From its general assumptions, our investigation focuses on bounded rationality (Greve, 2003). Exchanges between directors improves rationality in decision-making as it helps to overcome the limitation of directors' knowledge and skills (Hendry, 2005), increases the options and information sources available (Rindova, 1999) and contributes to a better understanding among all board members (McNulty et al., 2005). Internal board processes representing mechanism through which board members make decisions collectively sharing information through discussion and integration of the different points of view to reach board's strategic involvement. TPT sees the board as a collective body; the basic assumption is that through team production firms are able to achieve a level of productivity, which is higher than the sum of the individual productivities of the resources involved. In this respect, teamwork creates interpersonal ties that strengthen trust and may influence the ability to share knowledge (Nahapiet & Ghoshal, 1998). From this theoretical perspective, directors should

have the ability to share knowledge and generate new knowledge through their collaboration. As no board member is likely to possess the full complement of information and knowledge necessary to achieve the goals desired – due to his bounded rationality –, then working as a team permits greater productivity than that which can be achieved by individual efforts. Board members are expected to bring different backgrounds and perspectives into the boardroom and this will assist the strategic decision-making. However, a more diverse group of people in the boardroom is also more likely to bring different goals, values and norms (Milliken & Martins, 1996; Hambrick, Cho, & Chen, 1996). If not effectively managed this is something, which could lead to shirking and free-riding relationships among directors and reduce or completely diminish the board effectiveness. The TPT highlights the need of delve into the internal processes of the board as a variable that helps explain the degree of effectiveness in achieving the assigned roles (Gabrielsson, Huse, & Minichilli, 2007).

Both perspectives emphasize the role of knowledge for decision-making, showing that the processes taking place in the boards improve their effectiveness, they reduce the problems associated with the bounded rationality and facilitate the transmission of knowledge and the necessary cooperation for the board to function as a team. Taking into account these arguments, our model takes as a starting point the directors' knowledge of the firm and the knowledge derived from job-related diversity in the boardroom. Therefore, we argue that both theoretical perspectives support that directors' knowledge is essential in board's strategic task, and that internal processes that take place within the board mediate this relationship.

2.2. Board's strategic involvement

The literature traditionally describes two broad schools of thought regarding the board's involvement in strategy, referred to as active and passive (Castro, de la Concha, Gravel, & Perrián, 2009). The active school, in which our study is based, sees the board's directors as independent thinkers who shape their organization's strategic direction. From this perspective, strategy is the responsibility of both the TMT and the board. The board can bring differing perspectives to the planning of strategy, risk management and execution, potentially leading to better decision outcomes and improved company performance. In this context, "boards are legally responsible for the strategy and they are in an excellent position to contribute to strategy" (Pugliese et al., 2009).

2.3. Board members' in-depth knowledge of the firm as antecedent of their strategic involvement

An in-depth knowledge of the firm enhances the directors' involvement in the decisions and makes the board more active. Knowledge on the firm's industry, competitors, customers, and technology and is a sine qua non of board involvement in the strategic decision process (Hillman & Dalziel, 2003). Board members with a solid knowledge on how the industry operates and the firm's competitive environment will be in a prime position from which to advise the firm's management on strategic decisions (Kor & Sundaramurthy, 2009). Moreover, with firm-specific knowledge directors can speak a common language, enhancing strategy discussion in the board (Nahapiet & Ghoshal, 1998). TPT shows that board members must have knowledge of the firm to make decisions that create value (Kaufman & Englander, 2005); while BTF, in spite of noting that the board members' knowledge and resources are limited, recognizes their relevant role in strategic decision making (Wiseman & Gomez-Mejia, 1998). We therefore propose that:

H1. Board members' in-depth knowledge of the firm is positively related to board strategic involvement.

2.4. Board diversity

Previous research on diversity typically follows two distinctions: observable diversity and the non-observable diversity (Erhardt, Werbel, & Shrader, 2003). Within this latter group, our work focuses its attention on job-related diversity (Pelled, 1996). Job-related diversity captures the differences in knowledge bases and experiences. The magnitude of a group's total pool of task-related skills, knowledge and experience in turn represents a potential for more comprehensive decision making (Milliken & Martins, 1996). Job-related diversity is a critical determinant in generating multiple strategic alternatives, encourages the exploration of a larger number of solutions, reduces groupthink and, ultimately, leads to better decisions (Williams & O'Reilly, 1998; Tuggle, Sirmon, Reutzel, & Bierman, 2010). Board's job-related diversity can be an important attribute to the successful fulfillment of the board's strategic task (Carpenter, Geletkanyc, & Sanders, 2004; Pugliese & Wenstöp, 2007) because, from the perspective of BTF, reduces the limitations of directors' bounded rationality.

At the same time, job-related diversity may have a negative influence on boards, generating affective consequences such as decreased social identification with the group, lower satisfaction, etc. Nevertheless, such negative effects are more pronounced for gender and race diversity where social categorization usually occurs (Nielsen & Huse, 2010). On the other hand, diversity in the board members' knowledge stemming from the different tasks that they have performed does not imply that the board cannot function as a team, but rather that it must be able to integrate different points of view to make the best strategic decisions at every moment. Thus, from perspective TPT, team members complement one another rather than serve as substitutes for each other. Based on the arguments above we hypothesize that:

H2. Board job-related diversity is positively related to board strategic involvement.

2.5. The mediating role of board internal processes

Following TPT, board internal processes are essential in order to transform a collection of directors with a specific background into a team with a shared knowledge, which is collectively involved in firms' strategic decisions. TPT highlights the problems of shirking and the need to put board members' knowledge and skills to use (Kaufman & Englander, 2005; Machold, Huse, Minichilli, & Nordqvist, 2011). The complex issues that boards deal with will be better handled by combining the expertise of multiple board members, integrating the existing knowledge in the board through internal processes. From the point of view of the BTF, the board internal processes facilitate exchanges between directors improves rationality in decision-making as it helps to overcome the limitation of directors' knowledge and skills (Hendry, 2005; Rindova, 1999).

A number of empirical studies confirmed that board processes are important factors that influence board effectiveness in performing different tasks (Van Ees, van Laan, & Postma, 2008). Nielsen and Huse (2010) distinguish between two types of board processes, which have a strong influence on the exchange of information and decision-making. The first is related to the interaction between board members and affects their ability to exchange knowledge and information effectively. The second is related to the routines that facilitate this interaction. Our study focuses specifically on board interaction processes associated with the active participation of directors.

Consistent with prior studies (Roberts et al., 2005; Sellevoll et al., 2007; Zona & Zattoni, 2007), we examine four internal board processes and their mediating role in the relationship previously proposed: Cognitive Conflict (CC); Critical and Independent Approach (CIA); Board Meeting Dynamics (BMD) and Comprehensive Discussion Process (CDP). We have selected those processes because, according to our literature review, would have the greatest influence in mediating the relationship between the extent of the BMK and BD, and the BSI.

Cognitive Conflict represents a form of behavior in which board members show different views, preferences, or approaches when solving a problem or making a decision. It is necessary consider the unique information, knowledge and skills provided by each director, integrating them into the board's decision making, thus favoring their strategic involvement (Zhang, 2010; Zattoni et al., 2015). All of it helps to improve bounded rationality in board decision making by overcoming the limits in the directors' ability to process information and solve complex problems. Divergent views can inform alternative ways of competing and reduce myopic analysis (Kosnik, 1990). Therefore, CC improves decision making and is an important determinant of the integration of knowledge in the board (Forbes & Milliken, 1999) because help to synthesize multiple points of view into a decision that is often superior to any individual perspective.

Critical and Independent Approach refers to directors' behavior challenging management: expressing their opinion when they disagree with proposals from management, finding additional information to reports from management or asking them critical questions. Boards show a large variance in their willingness to challenge management. Whereas some boards tend to ratify and rubber stamp decisions taken by top management, others have been able to promote a critical and independent thinking among their directors (Huse, 2007). A CIA seldom exists in passive boards (Leblanc & Gillies, 2005) whose directors avoid disagreeing with the management. Instead, boards in which directors can freely question the proposals from management, without being perceived as trouble-makers, are active participating in strategic decision making and more receptive to unique information and knowledge that their members provide. They thereby help to create new insights by integrating the directors' own expertise in board decision-making (Simon, 1947).

Board Meeting Dynamics refers to the extent to which board meetings are dominated by certain directors exclusively, considering a negative behavior dynamic (Sellevoll et al., 2007). A key aspect, that clearly could harm the active participation of board members and their involvement in the strategy, is the centralization on decision-making or the presence of a small number of dominant directors taking over deliberations. Dominant positions not only deprive the CEO of feedback and advice from less central directors; such boards can also degenerate into fiefdoms that are unwilling to share expertise and information across boundaries.

Comprehensive Discussion Process refers to the degree of thoroughness with which decisions are tackled in the board. The proportion of time spent analyzing past decisions or predicting possible future actions will determine the degree of strategic debate and will favor, to a greater or lesser extent, the integration of alternative points of views from diverse directors. When the problems in the board meetings are usually dealt with quickly and superficially, avoiding the exchange of information or advice between directors, the board will have a limited role in a firm's strategy and board meetings are a mere formality. The board cannot be expected to participate in a firm's strategy if it is not given the opportunity to do so (Demb & Neubauer, 1992). It is also important for the debates to not become very long discussions without reaching conclusions. How comprehensive boards are when making decisions depends on numerous considerations. According to McNulty and Pettigrew

(1999), processual factors and the role of the chairman leading the board meetings facilitate or restrict the directors' involvement in strategy. It is the responsibility of the chairperson to ensure the flow of information within the board and encourage discussion to create knowledge (Huse, 2007; Zhang, 2010).

The presence and diversity of knowledge on the board is a resource that provides to the board with the capability to participate in the company's strategic decisions. However, the mere presence of this knowledge does not ensure its use (Forbes & Milliken, 1999). The board's internal processes must be constructive in order to utilize and manage the board members' capabilities. We focus on four processes: CC, CIA, BMD and CDP. The first two of these, CC and CIA, focus on the use or putting into value of the board's firm knowledge and job-related diversity. If the members of the board do not use or demonstrate their different points of view during board meetings, they cannot carry out their strategic task. The latter two processes, BMD and CDP, refer to the management of diverse opinions. In order to benefit from the firm knowledge and job-related diversity of the board, it must not be dominated by a few directors, who impose their criteria on the rest, without giving them the chance to participate. We therefore propose (see additional material, Graphic 1):

H3. Internal board processes (Cognitive Conflict, Critical and Independent Approach, Board Meeting Dynamics, Comprehensive Discussion Process) will mediate the positive relationship between the board members' in-depth knowledge of the firm and the board's strategic involvement.

H4. Internal board processes (Cognitive Conflict, Critical and Independent Approach, Board Meeting Dynamics, Comprehensive Discussion Process) will mediate the positive relationship between board job-related diversity and the board's strategic involvement.

3. Methods

3.1. Sample and data collection

The hypotheses are tested through a quantitative study based on survey data in Spain. Spanish companies follow a unitary system of corporate governance (as practised in the USA, the UK, Italy, and Portugal); they have low percentages of independent directors compared with boards in other countries; they present markedly higher proportions of reference shareholders than boards in other countries; and they have very high levels of CEO/Chair-duality. Spain, like most European countries, has a civil law system. According to the code of good governance (2015), the board will assume direct responsibility for the supervision of the management of the companies, for which it will rely on sufficient and adequate information. The selection of directors is performed by the appointments commission, made up of a majority of independent directors.

The use of survey methods is motivated by the need to avoid reliance on secondary data as proxies for internal board processes (Hambrick et al., 2008; Machold et al., 2011). With this in mind, we designed a survey instrument based on measures established in the literature (Sellevoll et al., 2007). Data were collected in 2011. The questionnaire was sent to the secretary of the board of directors of the largest 1500 Spanish companies according to sales volume (over 75 million euros). The sample was gathered from the SABI database with financial information on Spanish companies. The data used were responses from secretaries on behalf of entire boards, since governance studies incorporating primary data are usually based on a single respondent (Zhang, 2010). Furthermore, having multiple responses can increase the risk of constructing averaged measures, which would reflect divergence across reports rather than representing the constructs being investigated (Machold et al., 2011). We selected the secretaries of the board since they must be present at

all meetings, fully know the specifics of their operation and are better placed than other board members to report on these matters. He/she is a key figure in the functioning of the board because is responsible for the smooth running of board meetings. Responses were received from 200 firms. We obtained a response rate of 13% in line with previous research on board directors (Minichilli, Zattoni, Nielsen, & Huse, 2012; Van Ees et al., 2008). Archival data on non-responding firms was collected in order to check for the non-respondent bias. The Kolmogorov-Smirnov test indicates that there were no significant differences between respondent and non-respondent companies in terms of sales volume.

In order to deal with common method bias (Doty & Glick, 1998), we applied a number of procedural remedies in the instrument development and data collection phase (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). First, we protected the respondents' anonymity by assuring the confidentiality of their responses in the cover letter that accompanied the survey. Second, we invested considerable time and effort in improving the scale items and reducing item ambiguity. To enhance the construct validity of the survey measures, we conducted pre-tests (Fowler, 1993), including pilot surveys, and interviews (Carpenter & Westphal, 2001). All our questions were close-ended, but we used seven-point Likert scales to reduce possible common method bias. We also performed some of the statistical remedies for common method bias suggested by Podsakoff et al. (2003). First, we used Harman's one-factor test. The exploratory factor analysis of the items measuring all perceptual variables exhibits more than one factor with eigenvalues higher than 1.0, thus suggesting that the majority of the variance between the variables cannot be accounted for by one general factor (common method variance). Second, we used the partial correlation procedure to control for the effects of method variance (Lindell & Whitney, 2001). The results suggest that common method bias does not appear to be a problem in our data. Finally, data concerning the control variables was obtained from SABI database (see additional material, Table a).

3.2. Variables and measures

3.2.1. Dependent variable

Boards' strategic involvement was measured using five items, previously validated in other studies (Sellevoll et al., 2007; Minichilli, Zattoni, & Zona, 2009). Accordingly, we used statements about the degree to which the board: (1) often making suggestions to improve strategic decisions; (2) initiating strategy proposals; (3) making decisions on long-term strategies and main goals; (4) implementing strategy decisions; (5) controlling and evaluating strategy decisions. Following previous studies (Machold et al., 2011), it was computed as an index using the mean of these items. The Cronbach alpha for this variable is .925. The corresponding factors analyses are given in Table b (additional material).

3.2.2. Independent variables

The independent variables are BMK and BD, which were operationalized as an average of questionnaire items.

The board members' in-depth knowledge of the firm reflects the degree of the directors' understanding of firm operations. Following previous research (Sellevoll et al., 2007; Pugliese & Wenstöp, 2007), this variable measures to what point directors have extensive knowledge on aspects such as: (1) the firm's main operations; (2) the key weaknesses in the organization; (3) the firm's critical technologies and key competences; (4) the developments regarding the firm's customers, markets, products and services and (5) the threats from entrants and new products and services. The Cronbach alpha for this variable is .812. *Board job-related diversity* was measured with three items asking if directors: (1) belong to different functional areas (e.g., production, sales, marketing, finance, and

so on), (2) provide experience in different industries, and (3) have different educational backgrounds. The diversity measure was previously validated in other studies (Sellevoll et al., 2007; Pugliese & Wenstöp, 2007). The Cronbach alpha for this variable is .754 (see additional material).

3.2.3. Mediating variables

We examine four internal processes: CC, CIA, BMD and CDP. All these variables were operationalized as an average of questionnaire items. The multi-items scales used in our study had been previously validated by Sellevoll et al. (2007).

Cognitive Conflict was measured by asking if directors in the board meeting: (1) often show different views on important board issues; (2) contribute with very different perspectives on what is best for the firm; (3) think and reason in very different ways. The Cronbach alpha for this variable is .690. *Critical and Independent Approach* was measured for questioning to what extent the members of the board: (1) are very active finding additional information to reports from management; (2) express their opinion if they disagree with proposals from management; (3) ask critical questions regarding information from management. The Cronbach alpha for this variable is .757. *Board Meeting Dynamics* measures the participation in boardroom, asking if the board meetings are mainly dominated by: (1) the CEO; (2) the board chairperson; (3) certain board members; (4) all board members participate actively in board discussions (reverse item). The Cronbach alpha for this variable is .698. Finally, *Comprehensive Discussion Process* measures whether the board meetings are characterized by: (1) very thorough discussions; (2) very creative debates and discussions; (3) very fast decision-making (reverse item) and (4) very long discussions (reverse item). The Cronbach alpha for this variable is .700. The corresponding factors analyses are given as additional material.

3.2.4. Control variables

In this study, we include control variables at the industry, firm and board level. Industry characteristics potentially influence boards' strategic involvement and this may be especially evident in high-technology firms (Machold et al., 2011). Accordingly, we controlled for industry characteristics by using a dummy variable (1 = high-tech firm). At the firm level, we controlled for firm size, firm age and past firm performance. Firm size and firm age are among the standard external controls (Huse, 2000). The firm size was measured as the number of employees, and a logarithmic transformation allowed adjusting for skewness. Firm age was measured as a logarithmic transformation of the number of years the firm had existed. Past firm performance is a common predictor of future performance (Tuggle et al., 2010). Poor firm performance may lead the board to take a more active role (Stiles & Taylor, 2001). Past firm performance was measured in our model as ROA or return on assets in 2010 with a logarithmic transformation allowing an adjustment for skewness. Regarding the board, we included board size measured as the total number of board members with a logarithmic transformation allowing an adjustment for skewness.

4. Results

The variables did not correlate strongly with one another or with the control variables (see annex Table a). We conducted a VIF analysis to check multicollinearity. VIF values range from 1 to 3, thus indicating that multicollinearity is not a problem in our study. Hypotheses 1 and 2 were tested through linear regression analyses. Before running the analyses, we examined potential problems in the variables' distribution with respect to the assumptions of regression analysis. Residual analyses were conducted, but no results were found that changed the main conclusions. The linear regression analyses were conducted stepwise in order to capture

the contribution of each set of variables to the model significance. When testing the hypotheses we thus combined the interpretation of F change results in the linear regression with the beta coefficients in the models. *Hypothesis 3* was tested through PROCESS, a tool for observed variable mediation (Hayes, 2012). The goal of mediation analysis is to establish the extent to which some putative causal variable X influences some outcome Y, through one or more mediator variables. PROCESS estimates mediation models with multiple mediators operating in parallel. Although the specific indirect effects are usually of more interest than the total indirect effect in a multiple mediator model, PROCESS does provide the total indirect effect along with a bootstrap confidence interval. PROCESS has the advantage of being able to isolate the indirect effect described in *Hypotheses 3 and 4*. Furthermore, we follow a bootstrapping process, i.e., a non-parametric resampling procedure that does not impose the assumption of normality on the sampling distribution (Real, Roldan, & Leal, 2012). MacKinnon, Lockwood, & Williams (2004) show that the performance of bootstrapping is better than the traditional Sobel test (Sobel, 1982).

Model 1 is the baseline model with all control variables included. The coefficients are weak and not significant. Model 2 tests *Hypothesis 1*, which predicts a positive relationship between BMK and BSI. The estimated coefficient of BMK was statistically significant ($p < 0.00$), with a positive sign ($b = 0.384$). Including this variable improved the model fit compared to Model 1, as indicated by the significant increase in R^2 , so we find that *Hypothesis 1* was supported. *Hypothesis 2* suggests that there is a positive relationship between BD and BSI. In Model 3, the estimated coefficient of BD was statistically significant ($p < 0.00$) with a positive sign ($b = 0.285$). Including this variable also significantly improved the model fit compared to Model 1, as indicated by the significant increase in R^2 , so we find that *Hypothesis 2* was supported (Table 1).

Following Baron and Kenny (1986), a test for mediation should include three conditions. First, the mediator must be explained by the independent variable. Second, the effect of the independent variable on the dependent variable should be positive when the mediator is absent. Finally, the introduction of the mediator should be significant and, at the same time, the effect of the independent variable should either decrease in magnitude or disappear. Table 2 shows the coefficients of the direct, indirect and total effects of the model proposed. PROCESS allows us to study, in turn, the mediating role of the four processes used in this study (CC, CIA, BMD and CDP) in the relationships of BMK and BD on the BSI. Table 2 shows how the total effect of the influence of BMK on (BSI), rises to 0.72 ($p < 0.000$), when there is a consideration of the mediator role of the internal processes which allows to integrate board members' knowledge. This clearly shows the relevant influence of these processes in the BSI. Specifically, the direct effects of BMK on the four processes analyzed are positive and significant (0.41, 0.64, 0.27 and 0.36, respectively). On the other hand, we have to stress that the direct effects of these internal processes on the degree of BSI are more uneven. It can be deduced from the results obtained that the processes: CIA and CDP attain positive and significant coefficients (0.46, $p < 0.000$); while CC presents a significant but negative coefficient (-0.15 , $p < 0.01$). Finally, BMD is not significant. Regarding the indirect effects – which support *Hypothesis H3*, – it is to be highlighted that the estimated effect of CIA rises to 0.29 – which is significant, as the confidence interval calculated shows – while that CDP is 0.17, which is also significant. When an interval for a mediating effect does not contain zero, this means that the indirect effect is significantly different from zero with a 95% confidence level (Real et al., 2012). On the other hand, the indirect effect of CC is negative and significant, although it has an estimated coefficient lower than that of the other two processes (-0.06). Lastly, the estimated coefficient for BMD is not significant. Regarding the relation between BD and level of its strategic involvement, it is to be pointed

Table 1
Regression analyses.

	Model 1		Model 2		Model 3	
	Beta	S.E.	Beta	S.E.	Beta	S.E.
(Constant)	5.37**	0.757	1.138	1.023	0.609	0.989
Board size	0.316	0.245	0.167	0.229	0.091	0.220
Firm age	0.052	0.152	0.069	0.141	−0.001	0.136
Past firm performance	0.007	0.011	0.001	0.010	−0.003	0.010
Firm size	−0.078	0.088	−0.114	0.082	−0.136	0.078
High-Tech firm	−0.003	0.200	0.014	0.185	0.000	0.178
Board members' in-depth knowledge			0.384**	0.128	0.307**	0.127
Board diversity					0.285**	0.080
R	0.121		0.398		0.479	
R-squared	0.015		0.158		0.230	
F change (standard error)	0.566 (1.375)	32.373*** (1.275)	17.58*** (1.222)			

Notes: Dependent variable: Board strategy involvement.

* $p < 0.05$.** $p < 0.01$.*** $p < 0.000$.**Table 2**
Coefficients and indirect effects for mediation models (PROCESS).

	Total effect	Direct effect to					Indirect effects		
		CC	CIA	BMD	CDP	BSI	Estimate	Bootstrapping 95% confidence interval BC	
								Lower	Upper
BMK → BSI	0.72***								
BMK		0.41***	0.64**	0.27**	0.36**	0.33**			
CC						−0.15**			
CIA						0.46***			
BMD						−0.04			
CDP						0.46***			
BMK → CC → BSI							−0.06	−0.16	−0.00
BMK → CIA → BSI							0.29	0.15	0.50
BMK → BMD → BSI							−0.01	−0.08	0.01
BMK → CDP → BSI							0.17	0.06	0.35
BD → BSI	0.44***								
BD		0.29***	0.37***	0.15*	0.17*	0.24**			
CC						−0.18*			
CIA						0.45***			
BMD						−0.04			
CDP						0.49***			
BD → CC → BSI							−0.05	−0.12	−0.01
BD → CIA → BSI							0.17	0.09	0.27
BD → BMD → BSI							−0.00	−0.03	0.00
BD → CDP → BSI							0.08	0.02	0.19

Notes: BMK: Board members' in-depth knowledge; BSI: Board strategy involvement; CC: Cognitive conflict; CIA: Critical and Independent Approach; BMD: Board Meeting Dynamics; CDP: Comprehensive Discussion Process; BD: Board member Diversity.

* $p < 0.05$.** $p < 0.01$.*** $p < 0.001$.

BC: Bias corrected, 1000 bootstrap samples.

out that the total effect rises to 0.44 ($p < 0.000$) when the internal processes analyzed are considered. These results again highlight the relevant influence of these processes in the BSI. Specifically, the direct effects of BD on the four processes analyzed are positive and significant (0.29, 0.37, 0.15 and 0.17, respectively). On the other hand, we have to emphasize that the direct effects of these internal processes on the degree of BSI is more uneven. From the results obtained it is deduced that CIA and CDP attain positive and significant correlations (0.45, $p < 0.000$ and 0.49, $p < 0.000$, respectively), while CC presents a significant but negative coefficient (−0.18, $p < 0.01$). Again, BMD is not significant. Regarding the indirect effects – which support Hypothesis H4 – it is to be highlighted that the estimated effect of CIA rises to 0.17, which is significant as the confidence interval calculated shows, while that of CDP is 0.08, which is also significant. On the other hand, the

indirect effect of CC is negative and significant, although it has a somewhat more reduced estimated coefficient than those of the other two processes (−0.05). Lastly, the estimated coefficient for BMD is not significant.

5. Discussion and conclusions

Our main contribution is our proposal that the board's processes are mechanisms that should promote the “complementarity” of the board and help it to make use of the knowledge and capabilities of all of its members, thereby reducing the problems of bounded rationality and enabling the board to function as a collaborative team. The literature provides a clear consensus in judging directors' contributions to their firms as being extremely valuable. Nevertheless, few studies have gone deeply into how these resources

influence on directors' strategic involvement through the mediating role of internal processes of the board. The board will be really effective when it has access to as many resources as possible but can still work as a compact group when making decisions. From the results that are derived from our work, we can conclude that firms should orientate a great part of their effort to managing the board internal processes. Our work aimed to answer the following question: *How do the board's internal processes affect the relation between director's knowledge and abilities and their strategic involvement?* From the results of our research a set of conclusions can be drawn. Firstly, as we hypothesized, the level of knowledge of the firm by the directors and board diversity determines the degree of the board's strategic involvement. These results support that the directors' knowledge is essential for the board to develop its strategic task effectively. In this sense, the TPT notes that effective corporate boards ensure that board members have the requisite know-how to replicate and consolidate the corporation's wealth-producing team (Gabrielsson et al., 2007). Likewise, these results corroborate those other studies, which consider that composition of a board should take into account variables linked to its human capital (Haynes & Hillman, 2010; Tuggle et al., 2010). Addition, these results provide important implications for the corporate governance practices, more specifically, for the aspects related to the selection of directors. Based on the results of our research, it would be advisable to obtain a diverse board – with a wide range of skills and knowledge gained from its directors' different backgrounds – thus favoring its strategic involvement. Secondly, the internal processes that define how the board works mediate the relationship between the level and the diversity of the board's knowledge and experience and its degree of strategic involvement. These results support the TPT logic: board internal processes are essential in order to transform a collection of directors into a team with a shared knowledge.

Our results also show that the internal processes do not always generate positive effects, given the complexity of the relationships of the group components that support these processes. This opens a new line of research that further raises the interest in studying what happens inside the black box of the corporate board. As Roberts et al. (2005) argue, board structure and composition at best condition, rather than determine, board effectiveness. Instead they suggest that the behavioral dynamics of the board, coupled with the group and interpersonal relationships between “outside” directors and executive team members, have a more far-reaching impact on the board's ability to perform its tasks. Huse (2005, 2007) and Bailey and Peck (2013) address these concerns by highlighting the importance of the board's “decision-making culture”. Support for these conclusions is an important finding in our research.

Our study analyzes the measuring of the four processes identified at the same time. Nevertheless, a more thorough analysis of the role of each process in this measuring shows conclusions, which are also interesting. To begin with the first process considered, CC, mediates the relationship between BMK and BSI. However, the mediating influence of this variable is negative. This allows us to infer that when the degree of discrepancy between the directors' viewpoints relating to the topics dealt with in the board is high, strategic involvement is not facilitated. Similar results are derived when the relationship analyzed is the BD and its influence on BSI. The literature presents different visions of factors that could affect board involvement in strategy. Among them, from a cognitive point of view, board involvement in strategy is determined by dynamic interactive effects. Indeed, it is difficult to predict the determinants of this involvement (Pye & Pettigrew, 2005). Disagreement among team members concerning interpersonal incompatibility, task content, ideas or interpretations and how a task is performed and responsibilities distributed, may help explain these results (De Wit, Greer, & Jehn, 2012).

The second of the processes studied, CIA, positively and significantly mediates the two relationships proposed. These results clearly show the board's proactive role as a body of the firm's management (Castro et al., 2009) and, therefore, its involvement in the relevant decisions about its future. Those boards which are capable of thoroughly analyzing the proposals of their CEOs and TMT with a critical and proactive view are more greatly committed to the firms' strategic decisions. This is why not only it is necessary for the directors to thoroughly know their firm from different perspectives, but also, when the moment comes, they have to use this knowledge to involve themselves more proactively in their management. The third of the processes studied, BMD, basically analyzes the presence of coalitions within the board that seek to impose their final opinion on the decisions. The existence of this relevant weight both in the CEO and in those possible coalitions limits the degree of the BSI. The direct consequence of this situation is that the richness derived from the exchange of knowledge and experiences of the board members, not included in these dominant groups, is lost, which has a negative effect on the board's strategic involvement. In our investigation therefore we regard this as a “negative” behavior (Sellevoll et al., 2007). Although the results attained in our research are not significant, the negative influence of this process is deduced. The data show that the sample includes boards that are more inclined to be “less” participatory (which causes the negative value of the relationship) but, probably, with less strength than is required to demonstrate this “negative” behavior of the board. Finally, the fourth process analyzed, CDP, studies the degree of reflection and participation of the directors in the board. This facilitates the presentation of ideas as well as transferring the directors' previous experience to the situations analyzed at each moment. The existence of this process again mediates the relationships proposed. This allows us to conclude that a reflective study – not slow – of the topics to be dealt with favors the degree of board involvement in the firm's strategy.

For practitioners, our findings point to the importance of evaluating the board not only by their board members' knowledge and skills, but also by how effectively the board is operating as a team. The role of the chairperson as is central in order to turn a group of directors into an interacting and collective team. Directors' competences and knowledge need to be specially coordinated, integrated and developed in board meetings. An important feature of the chairperson is to create a climate within the board in which all board members are encouraged to contribute with their knowledge and experience (Machold et al., 2011). Furthermore, there are several practical implications that stem from the mediation of the board's internal processes in the relations analyzed. These internal processes allow the board members' knowledge to be put to use, and provides a more complete frame of reference for the selection of the best strategy for the firm.

There are limitations in our study, which can be taken into account for future research. Our study is based on 200 firms in Spain. Although the Spanish governance context has similarities to other countries, there are also notable differences. On the other hand, our sample is obtained from a selection among our country's largest firms according to their sales volume. In this respect, it must be stressed that the average size of large Spanish firms is less than other large firms in the rest of the world. There is a need for further research in different empirical settings in order to generalize the results. A potentially future line of research may be to analyze variables related to board internal social capital as moderators of the aforementioned relationship.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at [doi:10.1016/j.iedeen.2017.01.002](https://doi.org/10.1016/j.iedeen.2017.01.002).

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