Do Boards of Directors Really Matter in the Cooperation Behavior of Firms? An Exploratory Analysis in Spain

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Abstract: This paper explores the relationship between one of the major aspects of the internal mechanism of corporate governance, i.e., the board of directors, and the corporate strategy of cooperation. The study was designed to investigate whether certain board of director characteristics have an influence on the propensity to cooperate in Spanish listed non-financial firms. Our findings reveal that the propensity to cooperate in Spanish firms is driven more by a tight “management effect” whereby the highest probability of occurrence is related to firms with duality on their boards and a lower proportion of nominee directors representing controlling shareholders. This paper adds evidence to the corporate governance-corporate strategy (alliance propensity) discussion in a continental country such as Spain.

Keywords: corporate governance; alliance propensity; board of directors; duality

1. Introduction

Strategic alliances are considered voluntary agreements between parties that involve a relationship of interdependence in which they share, exchange and jointly develop resources, products and technologies for the purpose of achieving goals that they would be unable to attain on their own and which lie somewhere between the organizations’ boundaries [1]. They provide flexibility in situations in which, over time, there might well be a change in the need for resources and capabilities or in the partners’ shared targets. They are specifically preferred to other more permanent types of organizational growth because of their transitory nature or the easy return to the original situation [2]. They are vehicles to gain legitimacy which can impact deeply on their economic and competitive success [3], meaning they can also be methods to obtain firm sustainability.

Typically, partnerships have been explained by the Transaction Cost Theory (TCT), Resource Based View (RBV) or social networking approach rather than from the perspective of the involvement of the decision-making or influencing bodies. Variables such as board members’ professional background, the proportion of independent directors in a firm, the separation of the positions of CEO and chair of the board, have been used to predict the results of poison pill decisions, corporate diversification, the use of multidivisional organizational structures [4], in restructuring [5,6] and in business diversification [7–11]. However, the relationship between corporate governance and alliance business cooperation has been much scarcer. Indeed, recent research [12–14] recommends studying and further exploring the agency theory perspective, the mainstay of corporate governance doctrine, to understand behavior and strategic decisions, which include cooperation [15,16].

Moreover, the link between corporate governance and Corporate Social Responsibility (CSR) is closer nowadays. In fact, the Organization for Economic Co-operation and Development’s (OECD)
definition of corporate governance widens its meaning, reflecting this fact \cite{17} (p. 9) “Corporate governance involves a set of relationships between a company’s management, its board, its shareholders and other stakeholders.” In this sense, traditional CSR issues such as non-financial reporting practices, codes of conduct, stakeholder engagement, etc., are now being addressed by corporate governance practices \cite{18}. Furthermore, the corporate governance is assuming the principles of CSR to contribute to sustainability in the long term and pushes the management to consider them as part of the corporate strategy \cite{18}. Both CSR and corporate governance are now key pieces in determining the company’s objectives and contributing to the achievement of long-term sustainability \cite{18,19}. Corporate governance is encouraging management to incorporate CSR principles into the core of corporate strategy. However, the dynamic between governance mechanisms and CSR to align shareholder and stakeholder interests is challenging and should be studied with caution \cite{19}. Understanding the relationship between governance mechanisms and corporate strategic decisions related to CSR is therefore a relevant issue.

Thus, while the cooperative behavior of companies is not new, it has now re-emerged as a fundamental way for companies to achieve environmental, economic, and social sustainability objectives. In fact, it constitutes one of the United Nations Sustainability Development Goals (UN SDGs), specifically number 17: “Revitalize the global partnership for sustainable development”, by which more and more companies are expected to engage in sustainability-oriented alliances and partnerships with other public and private organizations. In this sense, cooperation propensity (or alliance propensity) is a more flexible option for the firms, requires less resources and could be viewed as an outcome of the network capacity of board members.

Alliances could prove a source of agency conflicts when choosing a potential alliance partner \cite{16}. Managerial and firm risk may not converge when it comes to alliance partner choice and managers who are risk-averse would prefer means of cooperation with lower career risk \cite{20}. In other cases, managers’ private profits would be relatively more modest than those they could obtain through the development of much larger investment projects such as internal growth or mergers and some acquisitions \cite{15}. On the contrary, they can be considered mechanisms that help to mitigate the agency problems arising from the free availability of cashflows, as they reduce the top manager’s room for maneuver in the allocation of resources \cite{21}. By delimiting investments and pre-committing resources, alliances reduce the tendency among top managers either to exploit more straightforward projects through which they can obtain more profitability or to squander resources by subsidizing those divisions in the firm with a below-par performance \cite{22}. This may explain why some studies have sought to empirically relate variables of ownership structure or corporate governance with business cooperation \cite{1,2,12–16}. Some researchers have reported that “good governance” measured in terms of indices (G index) drives the arrangement of value creation agreements \cite{21}; or that prior investments, sharing partners \cite{23–25}, executive directors with international experience \cite{26} or small shareholding by these executive directors \cite{15} also boost cooperation. Family ownership is associated with less propensity to cooperate \cite{27,28}. Yet, these are still heterogeneous studies with inconclusive findings that require further research.

On the other hand, alliances are associated with risks and pitfalls in which boards of directors can play a role. For example, links inside the board provide directors with information about other companies’ capabilities and activities and managers. This enables them to identify opportunities for cooperation by reducing the uncertainty arising from a lack of information about the skills, needs and behavior of potential partners \cite{29}. In fact, the board of directors has started to be given a relevant and significant role in corporate decisions such as alliances \cite{30,31}, revealing that board decisions are contingent of certain board characteristics. The involvement of the board of directors is therefore not only relevant because of its fiduciary duty in strategic decision making, but also because of the knowledge and expertise directors can provide \cite{32}.

Despite previous research, there is still ground for exploring the role that aspects such as board composition or duality between the board chair and the CEO can play in the formation of alliances. These aspects have traditionally been addressed by corporate governance from a monitoring and
control perspective in the search for greater independence as a driver of improved organization performance [33]. However, it is precisely in some studies that have tried to relate good governance to better performance through cooperation that the results are not conclusive. Consistently with this idea, we contend that in order to understand the role that boards of directors can play in the firm’s performance regarding cooperative behavior, first it is necessary to ascertain if said role is important in the alliance propensity. Thus, for example, relationships within the board can increase trust between potential partners, key for alliance formation [29] although this may mean less independence from the board or may affect the outcome of the cooperation.

Our aim is to answer the question of whether board characteristics such as board internal characteristics, board composition or duality influence firms’ decisions on cooperation. To do so, we first adopt a theoretical approach to the subject of our study, proposing some hypothesis for verification. Secondly, we conduct a quantitative study involving Spanish listed firms from 2004 to 2011. The period is long enough to cover both an expansive growth period and a contractive period in the Spanish economy, affecting alliance activity. Our results are in line with those of Post, Richman and McQuiller [31] or Yeo [34] that show the positive effect of independent directors on alliance formations and those of Bodnaruk, Massa and Simonov [21] or Ruigrok, Peck and Keller [32], concerning duality, but the sign differs. This could also be a consequence of a different institutional environment like Spain, a continental country from the corporate governance model.

This study offers three distinct contributions to the research into the relationship between board of director characteristics and alliance formation. First, we empirically explore board composition and the independence-dependence of the board chair and the CEO in decisions related to cooperation. This contributes to a better understanding of other mechanisms that may be behind the formation of alliances and that accordingly may play a role in business outcomes. Second, we analyze those effects conceptually building some alternative hypothesis to differentiate between competing theoretical perspectives and explanations [32] and responding to the need for research that provides a more holistic view of the effect of corporate governance drives on corporate strategy (alliance propensity) [33]. Third, we show evidence of the behavior of listed companies in Spain, a continental country in corporate governance characterized by greater control by concentrated shareholders and which, unlike Anglo-Saxon countries, has received less research with a board and corporate governance knowledge base [35]. The main implications of the paper are derived from the relationship shown between decision makers (board directors, chairperson, and CEO) and corporate strategy (alliances).

The paper is organized as follows. The following section presents the theoretical arguments that support the hypotheses as well as the methodology and the sample of the study. The results are displayed in Section 3, followed by a final discussion and conclusions where the research’s main contributions, limitations, and future lines of research are highlighted.

2. Materials and Methods

2.1. Theoretical Background and Hypotheses

The corporate governance literature has focused for decades on the study of the board of directors as a control mechanism of the managers in defence of the shareholders (principal-agent approach) or in protection of the different stakeholders (stakeholder theory). In this sense it has been applied to studies on strategic decisions in which agency problems, such as diversification or mergers and acquisitions, might appear [30]. The ambiguity in the findings of this stream of research, focused especially on studying the positive effects of board independence on company performance, has given way to theorizing and showing other roles of the board such as those offered by the dependence-resource approach, the contingent view or the behavioral perspective [33].

The resource dependence theory [36] attributes to the board of directors a strategic and service-oriented task, aimed at providing the resources that companies need and at amplifying the limits of the organization and the environment. It can also serve as an advisor to the CEO in this
task [37]. In short, it constitutes a critical organizational resource [33]. This idea of the board as an element at the service of the organization and shareholders’ interests is not only characteristic of this approach. Perspectives such as the Stewardship or Upper Echelons theories also advocate a service role for directors, either because the actions of executives and directors to protect and advance their careers and reputations could be aligned with those of owner’s concern [38], or because the cognitive, background or affiliation characteristics of executives, and by extension of directors, can be predictive of strategic actions [39].

On the other hand, the contingent perspective tries to explain why corporate governance is different depending on the specific organizational context [33]. The difficulty of the operations in which companies are involved, as well as the problems arising from resource acquisition, makes the design of corporate governance an important issue to consider [40]. According to this perspective, the greater the internal and environmental complexity, the greater the need for access to critical resources and therefore more professional advice (understood as larger and more independent boards) will be required. In this line of thinking, some studies show how the entrenchment behavior of CEOs is particularly prevalent in high-performing companies and how more board monitoring would be needed to prevent this [41]. This approach considers the implications that conflicts of interest and power differences between boards and CEOs generate for the company [37].

In short, the effect that the board can have on strategic decisions cannot be studied in a reductionist way. Its effect on strategic decisions and, therefore, on the company’s results must be studied from the different approaches that may be behind the dynamics of relationships that occur between its different components [42]. Thus, it becomes necessary to explore the board’s influence on strategy from the differences their components bring into the decision process: those related to power and independence, those coming from the board members’ knowledge (in terms of experience, culture, and skills) and those resulting from differences in risk perception.

2.2. Alliances and Board of Directors’ Composition

The impact of the composition of a board of directors is an issue that has been analyzed in studies related to strategy [7,43,44]. Some, such as Post, Rahman and McQuillen [31] or Yeo [34] show that the percentage of independents affects the formation of alliances. However, the results are not conclusive.

The power of directors to decide, control or influence depends not only on the amount of property rights they hold, but also on their capacity for social influence (activism) and their experience. This experience can be gained by participating in the governance structure of the company (as a board member), by observing and participating in important strategic decisions over time and by participating in the management of companies [4]. Therefore, the power to participate in strategic decisions will depend on their representation on the board of directors. In this sense, we studied the effect that the different types of directors (internal or external) may have on cooperation.

Regarding management executive directors, more executives may mean more support for board members, who in their quest for power, visibility and prestige may compromise the firm’s performance [45]. This may involve, for example, forcing the arrangement of partnership agreements regardless of the real possibilities or viability of their value creation, seeking the information these provide concerning the capability of accessing necessary resources in the future. A higher percentage of executives would give them greater freedom to decide depending on potential individual benefits in those cases in which they wished to arrange poorly defined or hastily negotiated contracts [46] which may ultimately be of little benefit to the firm as a whole and to shareholders in particular. In turn, the firm’s top managers may foster the growth of the portfolio of agreements or boost the forging of alliances in an attempt to evade competition or the need to take up defensive positions [47]. In other cases, top managers seek to show off to the market their management prowess or extend their social benefits by enlarging their network of contacts [12]. Similarly, the weakness of the management team and CEO prompts them to use cooperation as a means of continuity, prestige, and power [46], even more so if the potential partner joins the board [26].
However, executive directors are not always going to conduct themselves in an opportunistic manner (stewardship theory) [38]. Their interests may be aligned with those of shareholders in the pursuit of the best possible growth options, whereby a larger proportion of inside directors would increase the chances of entering into value-creating alliances in situations requiring resources and flexibility [48]. Furthermore, these directors may be attributed greater knowledge and information about the firm, its business, operations and prior experience, as keys for the strategic decision-making process [45]. In contrast to outside directors who have informational disadvantages about the company and decision-making [32] and who are therefore prone to financial control that encourages short-term, low-risk executive behavior [49]. Despite the different effects on value creation for the firm, executives have reasons to support the securing of agreements, even though they might be ineffective for the firm.

From an agency approach, independent directors are a good mechanism to protect shareholders’ interests [50]. In this regard, cooperation agreements can be seen as mechanisms that help to reduce the problems of agency arising from the free disposal of cash flows as they reduce the top management’s scope of action regarding the allocation of resources [21]. Partnerships, by ring-fencing investments and pre-committing resources, reduce the tendency of top management to take advantage of easier and more profitable projects or to waste resources on subsidizing bad divisions [22] of the corporation as a result of a distorted perception by management that large differences between different divisions of the company should be prevented [51]. Yet, when outside directors are managers of other potential partner companies, from the perspective of management behavior and networks, independent board control is associated with negative effects on the formation of company-company alliances by these directors [29]. This control generates distrust among executives and board members, reducing the possibilities of forming alliances, since one of the drivers of cooperation is trust [1].

Independent directors promote good decision-making rationale and could favor alliances. They will also amplify the network of potential partners, facilitating the process of forming new alliances. In addition, their characteristics related to professionalism, objectivity, and the pursuit of the best options for value creation enable them to favor those cooperation strategies that might be more advantageous and environmentally more sustainable [31]. It is precisely these types of board members that are assumed to have a more critical view of a firm’s business operations and greater freedom to defend costly and/or unpopular decisions [52]. Furthermore, they give institutional investors more confidence, especially regarding the firm’s ability to achieve better returns in international markets than if they invested in international stock exchanges [44]. Moreover, their higher relational capital may help the firm to enter into cooperation agreements that are suited to the firm’s needs.

Finally, nominee or representative board members act in a very similar way to their independent counterparts. Nevertheless, in situations of concentrated ownership or mainly family shareholders, these nominee directors tend to represent significant shareholdings, whereby executives often go hand-in-hand with them and can be assumed to be more aligned with their interests. In these cases, the actions of nominee/representative directors may be designed to influence the board toward the expropriation of minority shareholders, proceeding more as executive rather than as independent board members.

Based on this, we propose the following alternative hypotheses to explore:

**Hypothesis 1a (H1a).** A higher proportion of inside/executive and, therefore, a lower number of independent/nominee directors is positively associated to the probability to cooperate.

**Hypothesis 1b (H1b).** A higher proportion of independent/nominee directors (outsiders) and, therefore, a lower number of inside/executive directors is positively associated to the probability to cooperate.

### 2.3. Duality and Alliances

Duality occurs when the firm’s CEO also holds the position of chair of the board of directors [53]. This duality of roles, together with other variables related to the CEO’s characteristics, such as tenure...
as a board member, age, whether a founder of the firm, etc., may possibly reflect the CEO’s power and entrenchment [34,44], which might force decisions both for and against shareholders’ interests.

This variable has traditionally been considered as a sign of deviation from the principles of good corporate governance. It implies more control by the executive director as it reduces the monitoring work of the board. Meanwhile, a more independent governance structure has shown greater alignment between the interests of owners and management [54]. In addition, alliances imply a commitment of resources that limit the capacity of action of the top management [21] so they are more likely to be created in companies where the roles are separated.

As we have already discussed referring to the board’s composition, although senior executives, including the CEO, have normally been attributed a certain amount of discretion in the pursuit of power or status through the subscription or arrangement of cooperation agreements, it has also been shown that they do so to reinforce their security in the position, regardless of whether the cooperation decision is more or less aligned with shareholders’ interests. Vidal Suárez and García Canal [46] therefore contend that global alliances may reinforce the CEO’s position in three ways, irrespective of the agreement’s convenience for the firm or its shareholders: providing the CEO with visibility both inside and outside the firm, assigning them an essential role in the first stages of the agreement for giving the project continuity, and providing them with support if the partner joins the board. In this latter case, the CEO may see their position of strength reinforced on the board thanks to the inclusion of directors representing the partners involved in the agreements under way, especially in those that involve the exchange of shares.

In turn, from the stewardship theory approach, duality could be an advantage, as it ensures unity of command, with greater autonomy and response capacity, as well as more fluid communication between ownership and management [55]. The CEO would therefore back cooperation decisions that are more closely aligned to the owners’ interests than to their own. This type of supportive relationship develops trust that is particularly relevant to the formation of alliances if the external directors are representatives of potential partners [29].

Due to the fact that many of the characteristics associated with the role of the CEO can give rise to competing interpretations [56], we propose that these alternative effects are to be expected:

**Hypothesis 2a (H2a).** Duality is negatively associated to the probability to cooperate.

**Hypothesis 2b (H2b).** Duality is positively associated to the probability to cooperate.

### 2.4. Methodology

#### 2.4.1. Sample

The sample is made up of all-Spanish non-financial firms listed in Spain’s four electronic markets. It covers the following data: ownership and board structure, which were compiled mainly from the corporate governance reports issued by the firms, cooperation agreements (alliances and joint ventures) entered into by these firms, as provided by the Thomson Reuters SDC Platinum database on Mergers, Acquisitions and Alliances, and economic-accounting data taken from the Thomson One Banker and SABI databases.

Following the necessary screening process (firms without sufficient information, missing years, lags, etc.), we obtained a panel dataset of 859 cases (firm-year) with 60,130 items of data on 126 firms.

#### 2.4.2. Variables and Metrics

In keeping with other studies, the dependent variable “propensity to cooperate” is a dichotomous variable that takes the value 1 when the firm has entered into one or more agreements of any kind in the year considered.
The board’s composition involved the standard metrics used in corporate governance studies, and specifically the proportion of “executive directors”, “nominee or representative directors” and “independent directors” in the overall number of board members.

“Duality” was measured using a dummy variable which takes the value 1 if the chair of the board is the same person as the firm’s CEO, and 0 otherwise (that is non-duality) [8,43,54].

Regarding the control variables, we have chosen those most commonly used in the literature and others related to the ownership structure of firms that have recently been considered as influencers or mediating in the strategy. Before evaluate their statistical behavior in the model, the independent and control continuous variables have been processed with a one-year lag to avoid possible endogeneity problems and to incorporate the logical delay of their effect on strategic decisions.

Ownership produces effects on the strategic decisions of companies. Firm’s owners are an important and influential group for monitoring top managers’ actions [46]. There is, in fact, empirical evidence of their impact on strategy since the 80’s [15,44,57–59]. On the one hand, concentrated ownership reduces the likelihood of opportunistic behavior and actions that are particularly beneficial to management, such as decisions about faster and more rigid growth (diversification or mergers and acquisitions) [60]. In the same vein, more widely distributed ownership gives senior management greater discretion and room for maneuver in deciding their strategy [7]. On the other hand, some recent studies have focused their research on the different types of owners and their influence on corporate governance and on firm strategies [57,59,61]. Investors, far from being homogenous, constitute different categories with specific features and private goals that might have different priorities regarding corporate risk, stability, growth and performance [62,63]. Indeed, some scholars contend that it is not the concentration of ownership but instead the type of owner that influences firm behavior [4], as shareholders’ interests are not uniform, and some exercise more control in the firm, harnessing more ownership rights. The family nature of a firm, for example, has an influence that appears to be inversely related to the propensity toward cooperation [27,28]. It is true, however, that the preferences for interpersonal loyalty and long-term commitment of family shareholders favor a better climate for the management of cooperation [64]. All these reasons led us to statistically control both the concentration of shareholders, and the two most frequent types of controlling shareholders in Spain, family businesses and banks.

The concentration of ownership is the sum of the holdings of the firms’ four largest significant shareholders (more than 3%) (It has been noted that 3% is the threshold above which Spain’s CNMV currently requires the disclosure of significant shareholders. Furthermore, in the Spanish case, as in most of Europe [65], there is a high concentration of ownership, being insignificant outside the four largest shareholders.). The identification of family ownership considers first the family’s involvement solely in ownership, verifying whether the family is a blockholder in the firm [66]. This variable takes the value 1 if the main controlling shareholder is a family, and 0 otherwise. In turn, the variable used for bank or financial firm ownership takes the value 1 if the main shareholder is a bank or another kind of financial firm, and 0 otherwise [67].

In order to control the firms’ effects, the most common economic-financial parameters of the corporate governance studies have been taken into account [11,43]: size measured as “headcount” [54,58]; the performance of companies in terms of “return on assets” (ROA) and “return on equity” (ROE) [21,26,29,58] and, finally, the use of “debt level” as the ratio of debt to total liabilities [21]. Moreover, the firm’s “age” has been included, related to the firm’s ability to deploy resources to take risks, in order to achieve better relationships and more business knowledge [28]. In addition, to control the industry’s effects, both industry (SIC) and the sector’s level of regulation “sector” [8,67] have been included as dummy variables. Finally, the “year” in which the agreement has been arranged [46] and the “board size” [68] have therefore been considered as control variables.
2.4.3. Methodological Details

According to the nature of the independent, control and dependent variables, the statistical procedure used (through SPSS 21 and MATLAB R2015) to estimate a dependence model is multivariate binary logistic regression. It shows that the likelihood to cooperate (propensity to cooperate = 1) is a non-linear function of the independent and control variables and their interaction effects, where the parameters of the model were estimated using an optimization technique for maximizing verisimilitude. While our model does not study the effect of internal mechanisms on firm performance and few studies have reported on the influence of past alliances on the internal control mechanisms of companies (i.e., [69]), it might not be free from endogeneity problems. Endogeneity issues are common to corporate strategy and finance studies and can cause problems in understanding the true empirical relationships between variables [56,70]. Among the different methods (see [70] for a comprehensive analysis of the different methods for solving endogeneity in models on CEO power) to solve this problem, we opt for lagging the independent and control variables one year, as it was the most suitable criteria concerning the statistical methodology we use. In addition, a considerable number of control variables have been addressed. For these variables, multicollinearity and linear correlation have been tested to avoid the use of variables with linear effects of causality.

From a methodological point of view, the design of a statistical model that allows the validation of a theoretical model requires a very precise description of the way in which the variables intervene. When this specific detection is not possible or is not clear, and even when it is, the design that is proposed must study the relations of association between the variables, in particular, the effects of confusion and interaction [71]. Specifically, due to the exploratory nature of this study, to detect potential confusion and moderation effects, the possible interactions between continuous and categorical variables have been evaluated first. Subsequently, on the correlations calculated for the multicollinearity analysis, we checked whether they are due to confusion or moderation for their inclusion or not in the model.

The final statistical model shows the variables which, following theoretical considerations, revealed a high degree of statistical dependence and an interaction relationship relevant to the model’s validity (The proportion of the variability of “propensity to cooperate” explained by this model is between 10.1%, according to Cox and Snell’s R2, and 22.9% provided by Nagelkerke’s R2). The model general equation (or logistic function) estimated is

\[
\widetilde{\text{logit}}(p_i) = -4.197 - 1.902 \text{ (nominee directors)} + 0.578 \text{ (duality)} + 0.013 \text{ (board size)} + 0.257 \text{ (board size} \times \text{ sector)} - 0.006 \text{ (family ownership} \times \text{ age)} - 0.014 \text{ (financial firm ownership} \times \text{ Ownership concentration)} + 0.333 \text{ (headcount)} + 0.436 \text{ (ROE)} - 3.096 \text{ (sector)} - 1.881 \text{ (year = 2004)} - 1.767 \text{ (year = 2010)}
\]

(1)

The logit (pi) variable represents, on a logarithmic scale, the difference between the probabilities of belonging to one class or another, (i.e., propensity to cooperate = 1 or propensity to non-cooperate = 0), modelled as a linear function of the independent variables. Thus, from the regression coefficients obtained for the independent variables, the Odds Ratio (OR) can be directly calculated. They represent the effect that changes in the independent variables have on the likelihood of entering into agreements versus not doing so.

3. Results

A descriptive statistical analysis reveals (Table 1) that the sample contains highly concentrated firms (52.94% on average) in terms of insider ownership (24.81% on average), albeit more dispersed and with a major family presence (38.7% of observations). It also contains firms with an average of 11 board members, (fewer than the number recommended by the 2015 Good Governance Code of Spanish listed companies, which calls for 15 directors), with a higher proportion of external directors (independent and nominee/representative) than inside/executive directors, but in which almost 50% of the observations have the CEO as chair of the board of directors.
These are large firms with a higher ROA than ROE, which together with a high level of average debt (62.47%) means they have some restrictions on growth, very probably due to the recession during the years covered by the sample. The propensity behavior studied for each year showed that the average cooperation of the firms in the sample remained between 9% and 10% from 2005 to 2009, being much lower in 2004 and 2010, and recording a slight increase in 2011 (13%).

The sample also shows greater activity in the formation of alliances in the case of the transport, communications, and other utilities industry (35% of the agreements), as well as for the energy-mining sector (27%). The sectors with the least cooperation activity are services (13%) and manufacturing (10%). Also noteworthy is the absolute lack of cooperation for real estate companies, probably due to the 2008 financial crisis.

The model’s statistical estimation initially involved a study of Spearman’s correlation (Table 1) which shows that the control variables do not record overly large simple correlation coefficients for suspecting a problem of collinearity.

The multicollinearity has also been verified through two controls: the Variance Inflation Factor (VIF) and the Condition Index (CI). Only two variables have shown a slight degree of multicollinearity: the percentage of “Nominee directors” and the percentage of “Independent directors” (Although there is a certain degree of collinearity between these variables, both were included at the beginning of the statistical modeling process due to their significance in the ANOVA and in the bivariate relations).

Subsequently, to explore the discriminant capacity power of the theorized and control variables two previous analyses were conducted (Table 2): an ANOVA test and a study of the logistic bivariate relationships of each independent variable. In order to study and select the most parsimonious statistical model, the exploration of the dependencies and interactions, between the variables, started from these results.

As can be seen in Table 2, statistically speaking, the mean behavior of the percentage of nominee directors and of independent directors in addition to duality might be different for the two categories (cooperate or not) of the explained variable “propensity to cooperate”, which provides a discriminatory power of these variables in potential explanatory models of alliance formation. In contrast, the difference in the average behavior of the propensity to cooperate according to the type of majority owner or the concentration of ownership is not statistically relevant. For the rest of the control variables it is observed that only the size of the company and the debt could explain on average different behaviors between the companies that cooperate and those that do not. As Li [72] claim, different measures of size can produce biases in the models that include this variable as a fundamental characteristic of the firm. Therefore, other measures of the size of the company were considered. Data on the volume of assets and sales were gathered, also in the form of logarithms to avoid asymmetries, but they did not prove to be significant variables to distinguish the sample, so they were discarded from the analysis compared to the number of employees that does show a discriminating effect. Like Schilke and Goerzen [73], we use the number of employees as a measure of size to collect the effect that the availability of resources to face corporate strategies has on the formation of alliances.

Based on these results (Table 2) and on an untabulated analysis of variance of categorical variables on continuous variables both confusion and moderation effects were explored. The analysis was carried out by separately evaluating the variation of the OR, the p-value and the uncertainty interval for the OR (of each continuous variable with the dependent variable), when a third categorical variable was included. This analysis has been done both for each variable alone and through a multiplicative interaction in the binary logistic model. Almost in no case has a significant variation effect been found between the coefficients obtained for each variable incorporated alone and those obtained when introducing them together with a third variable. This means dismissing the existence of confusion effects between the variables in their relationship with the “propensity to cooperate” variable. The interaction effects detected improve the quality of the statistical model and are included in the final explanatory model (Table 3).
Table 1. Descriptive statistics of independent and control variables and Correlation Matrix.

|                          | Mean  | SD    | Min. | Max. | 1.   | 2.   | 3.   | 4.   | 5.   | 6.   | 7.   | 8.   | 9.   | 10.  |
|--------------------------|-------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1. Nominee directors     | 0.439 | 0.22  | 0    | 1.00 | 1    |      |      |      |      |      |      |      |      |      |
| 2. Executive directors   | 0.198 | 0.13  | 0    | 0.66 | −0.5507 | 1 |      |      |      |      |      |      |      |      |
|                          |       |       |      |      |      |      |      |      |      |      |      |      |      |      |
| 3. Independent directors | 0.322 | 0.18  | 0    | 0.88 | −0.7215 | 0.0547 | 1 |      |      |      |      |      |      |      |      |
|                          |       |       |      |      |      |      |      |      |      |      |      |      |      |      |
| 4. Board size            | 10.9  | 11.59 | 3    | 22   | 0.3299 | −0.3714 | −0.1231 | 1 |      |      |      |      |      |      |      |
| 5. Ownership concentration | 52.94 | 23.47 | 0    | 99.49 | 0.2210 | 0.0840 | −0.2858 | −0.0370 | 1 |      |      |      |      |      |      |
| 6. Return on assest (ROA)| 0.057 | 0.11  | −0.8407 | 0.8434 | −0.0038 | 0.0114 | 0.0350 | 0.1684 | 0.0178 | 1 |      |      |      |      |      |
| 7. Return on equity (ROE) | 0.050 | 0.85 | −13.942 | 3.7134 | 0.0099 | 0.0143 | 0.0075 | 0.2289 | 0.0431 | 0.6753 | 1 |      |      |      |      |
| 8. Log headcount         | 7.641 | 1.89  | 1.7918 | 12.560 | −0.0049 | −0.0432 | 0.0463 | 0.4664 | 0.0050 | 0.2256 | 0.3239 | 1 |      |      |      |
| 9. Level of debt         | 0.625 | 0.23  | 0.0479 | 2.7124 | 0.0289 | −0.0380 | −0.0463 | 0.1986 | 0.0616 | −0.1776 | 0.1126 | 0.2605 | 1 |      |      |
| 10. Age                  | 44    | 26.38 | 1    | 110  | 0.1482 | −0.1281 | −0.1674 | 0.2355 | −0.0401 | −0.0324 | 0.1077 | 0.2034 | 0.1959 | 1 |      |      |

p-Values in italics ** Significant at 95%.
Table 2. ANOVA and Bivariate Analysis of independent and control variables.

| Variable                        | p-Values | Odds Ratio (OR) = Exp (β) |
|---------------------------------|----------|---------------------------|
|                                 | ANOVA    | Logit Bivariate Model     |
| Nominee directors               | 0.0067 **| 0.304                     |
| Executive directors             | 0.4851   | 2.614                     |
| Independent directors           | 0.0211 **| 5.957                     |
| Non-duality                     | 0.0423 **| 1.784                     |
| Board size                      | 0.0007   | 1.120                     |
| Ownership concentration         | 0.2022   | 0.996                     |
| Family ownership                | 0.0842   | 1.541                     |
| Financial firm ownership        | 0.2113   | 0.608                     |
| ROA                             | 0.0751   | 7.869                     |
| ROE                             | 0.1855   | 1.635                     |
| Log headcount                   | 1.203 × 10^{-11} ** | 1.551                     |
| Level of debt                   | 0.0368 **| 2.916                     |
| Age                             | 0.416    | 1.005                     |
| Sector                          | 0.3515   | 0.775                     |
| SIC                             | 0.0017 **| 0.046–4.127               |

** Significant at 95%.

Table 3. Propensity to cooperate final statistical model.

| Variable                        | Wald     | p-Value | Odds Ratio (OR) = Exp (β) | Confidence Interval 95% to EXP(B) |
|---------------------------------|----------|---------|---------------------------|---------------------------------|
|                                 |          |         |                           | Lower    | Upper    |
| Nominee directors               | 6.825    | 0.009 **| 0.149                     | 0.036    | 0.622    |
| Duality (1)                     | 4.127    | 0.042 **| 1.783                     | 1.021    | 3.116    |
| Board size                      | 0.079    | 0.779   | 1.013                     | 0.924    | 1.111    |
| Financial firm ownership (1) × | 10.566   | 0.001 **| 1.293                     | 1.108    | 1.511    |
| ownership concentration         |          |         |                           |         |          |
| Family ownership (1) × age       | 1.316    | 0.251   | 0.986                     | 0.963    | 1.010    |
| Log Headcount                   | 15.039   | 0.000 **| 1.395                     | 1.179    | 1.651    |
| ROE                             | 1.157    | 0.282   | 1.546                     | 0.699    | 3.419    |
| Sector (1)                      | 7.840    | 0.005 **| 0.045                     | 0.005    | 0.395    |
| Year (2004)                     | 7.334    | 0.007 **| 0.152                     | 0.039    | 0.595    |
| Year (2010)                     | 6.706    | 0.010 **| 0.171                     | 0.045    | 0.651    |
| Constant                        | 25.537   | 0.000 **| 0.015                     |         |          |

** Significant p-value at 95%.

Alternative first hypotheses raised different scenarios in explaining the effect of board composition. On the one hand (H1a), it was argued that the influence of the executives (as opposed to a lesser presence of the independents) could influence the propensity to cooperate. On the other hand (H1b), that a larger presence of independents (independent and nominees) affects the greater likelihood of forming an alliance. In the light of the results, the variables of executive and independent directors have been left out of the final model. However, the percentage of nominees has remained in the model as significant and with a negative effect on the likelihood of entering an alliance (OR < 1.5; p < 0.05). It should be stressed that the percentage of independent shareholders was indeed a statistically significant variable both in the ANOVA and in the binary logistic regression analysis. In fact, the OR was above 1; in other words, if it were considered as the only variable in the statistical model, it would increase by 5.957 times the likelihood of cooperating versus not cooperating (positive effect). Nevertheless, this variable had a strong confounding effect with two variables in the statistical model, the firm size (Log headcount) and the percentage of nominees which, eventually, remained in the model by providing better validity and a more parsimonious model. These results lead us to believe that both types of directors do not act in the same way on the board of directors, at least in the framework of Spanish listed companies.

With regard to the second hypothesis, the duality (H2b) has a positive effect on the cooperation behavior of the listed Spanish listed firms. Duality (OR > 1; p < 0.05) already showed a strong
discriminatory effect variable both in the ANOVA and in the binary logistic regression previous analysis. Its place in the final model shows that this variable appears to be strong when explaining the likelihood of cooperating, which proves what is theorized in the hypothesis H2b.

Regarding the control variables, the size in number of employees and the affiliation to a regulated sector were significant. In addition, only two years had explanatory value, 2004 and 2010, the latter perhaps due to the fewer number of agreements signed. This could be explained, with a certain amount of logic, by the sample’s bias with a much higher frequency of 0 cases (no cooperation) in those years.

Finally, specific mention should be made of the interactions found in this exploratory model, one of which has proved to be statistically significant for the model. According to the values reported, when a firm belongs to a regulated industry (Sector = 1), one more director on the board (board size) would lead to a 1.293 times higher likelihood of cooperating. Two other effects have also been relevant in building the statistical model and both relate to the impact of the type of majority shareholder (family or financial institution). The appearance of these variables in interaction with others, albeit without statistical significance, improves the model’s explanatory quality. Thus, for example, the interaction between owner financial institution and concentration may reveal an effect involving a lower likelihood of cooperating in those cases in which control is concentrated in the hands of a bank [32].

In turn, the interaction between firm age and a family as the majority shareholder signals a certain negative effect of a family firm’s age as regards cooperation. These findings should, nonetheless, be taken with some degree of caution, as the statistical model is not designed to capture the whole reality and is subject to the typical biases of the complex behavior of firms.

4. Discussion

The objective of this study is to explore the relationship between internal corporate governance characteristics and cooperation strategy, providing knowledge on the stream that addresses the corporate governance’s effect on cooperation strategies in a continental market like Spain. The results show the relationship between board of director characteristics (board composition and duality) and cooperation propensity.

The first hypotheses of the study sought to explore the effect that board composition could have on the likelihood of forming alliances. The aim was to assess the prevalence of two different effects. On the one hand, whether executives in a service approach [38] or power seeking [45,46] could have a positive effect on the likelihood of an alliance, while the increased control of independent directors could negatively affect the likelihood of forming alliances [1,49]. On the other hand, whether independent directors, as a good mechanism to protect shareholders’ interests [49] and to reduce the margins for maneuver of the top management [21] and because of the capabilities and rationality they provide, could positively influence the likelihood of entering alliances [31,40].

The results for listed Spanish companies show that the proportion of executives on the board is not an important variable to explain the likelihood of cooperation. This variable did not show any discriminating power between cooperating and non-cooperating companies. This lack of significance is in line with previous results reported in [32] for which the participation of insiders in strategic decisions is not linked to the mere appointment of more insiders to the board but to other aspects of the characteristics of the board.

In the case of independent directors, there is a statistical evidence but the results do not allow to validate any of the alternative hypotheses established. In the bivariate analysis, this variable had an important discriminatory power of companies (between those which cooperate and those which do not), pointing to an effect similar to that theorized in the H1b hypothesis and in line with that reported by Post, Rahman and McQuillen [31]. However, in the final statistical model, it was excluded due to the inclusion of other variables with more explanatory power. This has been the case for the nominee director’s variable for which the statistical model provides evidence of its influence on the likelihood of forming alliances but in a negative sense.
These results have two implications. First, previous analyses (ANOVA and bivariate) already revealed a different effect for these two variables on the likelihood of cooperation. This shows the importance of studying the different board characteristics of the Spanish listed companies, as their effect is very different. First, internal corporate characteristics do affect alliance propensity. Second, as large owners tend to be those that appoint nominee directors, then we might infer that the cooperation strategy is less preferable for majority shareholders. This also shows that there might be an “expropriation” effect of the largest blocks of ownership, which are behind the nominees, on the minority shareholders, such as those reported by diversification studies. This research has shown that property directors, who accumulate a lot of risk, tend towards diversification strategies to the detriment of minority shareholders’ rights [7], and that it is particularly relevant in countries with low levels of investor protection, such as Spain. In these cases, from an agency perspective, when ownership is highly concentrated—to control the discretionary behavior of managers—the monitoring effect disappears, and the expropriation effect appears [67,74]. Hence, as the statistical model reveals, an increase in the weight of these directors has a negative effect on the formation of alliances in the cases of ownership concentration.

Regarding duality, which means, as considered in good governance codes, a lack of board independence, the model shows a positive effect on the likelihood of cooperation. The arguments behind this hypothesis support a better communication climate and support relationship with the board that favors the development of alliances [21,47]. These findings are contrary to those described by [21,32], for whom duality is a sign of poor governance and reduces the propensity to cooperate and those reported by [34], for whom the chair position of the CEO is not related to the choice of either alliance or merger and acquisition strategy. In contrast, they are consistent with the hypothesis of boards strategically involved with the company’s performance as presented by [30], who confirm a significant influence of the strategic involvement of the board to carry out an efficient management of an alliance portfolio. In their case the board’s involvement is given by the duality and size of the board. It is also possible that behind this effect lie reasons far removed from those of service and alignment. Thus, it might be endorsing the propositions whereby a CEO uses a cooperation strategy as a form of entrenchment [8,43] in pursuit of power and prestige [46] at the expense of other interests within the firm.

Concerning control variables, the model is consistent with the loading of explanatory power the literature has reported on alliances considering headcount to be a more significant variable for cooperation than other types of measures of firm size. This therefore supports the underlying notion that the bigger the size, the more resources there are available for sharing, so increases in size also increase the likelihood of cooperating over not doing so. In all probability, this variable might also be absorbing the effects derived from the firms’ capital or borrowing structure, being a variable that, in short, has no control or explanatory power over the propensity to cooperate in this model.

Despite the scant importance of the effect of the variable sector, it is statistically significant, so when a firm belongs to a regulated sector there is less likelihood of subscribing cooperation agreements. Regulated industries (electricity, energy, transport and telecommunications) tend to be more concentrated sectors that are subject to less competitive pressure and in which, for example, the returns of subsequent privatization processes have been lower than those posted by privatized firms in more competitive industries, closer to those of reference in the industry [75]. To a certain extent, the statistical model seems to support the hypothesis that the lower the competition that Spanish listed firms from regulated industries have to face, the less they need to use more flexible and less risky forms of growth. This is interesting when compared to the results of [76]. In their work these authors show how board-interlocks in regulated sectors and a greater number of former politicians have positive effects on the size of acquisitions. Meanwhile, in our research, the regulated nature of Spanish listed companies reduces the likelihood of entering alliances, which would imply that for the boards of these companies, acquisitions and alliances are alternative strategies.
Further insight comes from the interaction effect between board size and the character of a regulated sector. Although the size of the board is not a relevant variable in the model, it cannot be ignored that in the case of regulated sectors the likelihood of forming alliances is higher due to increases in the size of the board. In addition, from a resource dependency approach, larger councils improve the firm’s ability to link out and deal with uncertainty [36]. Therefore, it is possible that the lack of competition those regulated industries suffer, could be compensated by larger and probably more diverse boards, more prone to alliance formation.

5. Conclusions

From an overall perspective, the model shows that Spanish listed cooperating firms large in terms of headcount, operating in non-regulated industries, whose boards are chaired by the CEO and have fewer nominee/representative directors on their boards increase the probability of cooperation agreements. These results show not only the effect of board characteristics but the role of firms management involvement, through the duality, in the propensity to cooperate the propensity to cooperate.

This study offers various contributions. First, we contribute to the literature on alliance formation and corporate governance variables as a determinant factor. Empirically, we provide evidence of the influence of these variables on the behavior of Spanish listed companies over a long period of time, paving the way for a more in-depth analysis of the role played by boards of directors in the strategic behavior of companies. Theoretically, we contribute to the literature that studies the drivers of cooperation from other perspectives than those traditionally put forward, such as the agency theory, the resource dependence perspective or the stewardship approach. Furthermore, by focusing our work on evaluating the role of corporate governance variables in the likelihood of forming an alliance, rather than on more developed issues such as the relationship between the composition of the board and the firm’s performance, we add new evidence concerning the effect on strategy. Examining the implications for cooperation strategy that come from the nature of the decision-making bodies, we can isolate effects from which to explore other aspects that influence the outcome of these strategies, specifically alliances, on the business performance and sustainability. Although studies like [77] provide evidence of the positive effect of some internal mechanisms on sustainability performance, we believe that further research is needed on the CG-strategy decisions-performance relationship to better understand the true relationship between governance mechanisms and results. As [19] (p. 127) points out “corporate governance mechanisms, while working to benefit the shareholders, also work in favor of stakeholders”.

Second, we consider those effects conceptually building some alternative hypotheses to differentiate between competing theoretical perspectives and explanations [32], contributing to a better understanding of why different theoretical approaches can produce initially controversial results.

As does [76], we also contribute to studying the effect of corporate governance variables in a country such as Spain, whose regulatory characteristics and concentration of ownership make it different from other continental models [78], and for which research relating characteristics of boards and strategy is still very scarce and is biased by the greater number of studies concerning the Anglo-Saxon model [35].

As regards the study’s limitations, on the one hand there are those specific to the use of secondary data sources that also affect many of the studies that use them: a lack of certain values, the non-uniformity of firms or evaluation criteria, or the different units of analysis used to build the different source databases. On the other hand, and despite the efforts made to avoid the effects derived from the slight linear correlation independent and nominee directors, there is a clear need to improve the model’s quality accordingly. Moreover, by covering the years affected by the economic crisis, the sample may reflect less business activity, and therefore fewer cooperation agreements, preventing us from obtaining a more accurate model.
Nevertheless, despite the type of dependent variable used, with only two possible categories, and a sample biased by a majority of firms that do not cooperate, the statistical model used has not needed the inclusion of many variables in order to specify and discriminate the likelihood of cooperating.

Finally, we understand that the study paves the way for future developments. Some come from the assessment of results that offer research opportunities to achieve a better understanding of the factors explored. Others arise from the consideration of relevant issues to deepen this line of work, such as data, methodology or the use of other variables. With regard to the former, further research into the effect of the board composition is needed. In particular, the variables behind the distribution of power on the board. Thus, the different influence detected by the types of directors should be investigated, for example, by using other non-bounded variables or assessing the effect that ownership might have on the different behavior of these board members. In the case of duality, the inclusion of the type of agreements or other variables related to the characteristics of the CEO could help to understand its effect. Likewise, the interaction effects detected should be investigated, even though in some cases they have not been significant, due to the burden of information they contribute to the statistical model.

Regarding other avenues for research, the use of other statistical methods such as, for example, panel data, could help to better single out both the firm effect and the time effect, and the model’s replication with prior control samples could avoid selection biases. Investigating the existence, or not, of different behaviors depending on business sectors or types of cooperation would lead to valuable conclusions on the model’s general or specific nature. Attempts could also be made to consider the inclusion of more time observations and other variables, such as the direction of the development or the purpose of the cooperation, which the literature has found to be significant in the arrangement of agreements. Replicating the analysis by including a similar interval of years with a contractive and expansive period of the same sample would allow us check if the results are consistent. Other measures of the dependent variable, more closely related to the portfolio of agreements or to cooperation behavior (not just in one specific year), could inform better models that are more consistent with the reality to be studied. We likewise propose to examine the effect of the variables used on the performance of the cooperation agreements subscribed because, as prior studies have reported [79], it may be that, following their lack of generalizable conclusions, there are agency problems that lead to alliances or joint ventures that fail to create value.

Finally, some variables such as concentration of ownership were not significant in the statistical model but showed discriminant capacity when analyzed in isolation. This provides valuable information for further research into its effect, considering that this variable could influence both the propensity to cooperate and the internal mechanisms themselves.

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