“Duality CEO-Chairman and its relation with the effectiveness of the board control”

AUTHORS	Cesar Freire https://orcid.org/0000-0001-6598-7203

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Cesar Freire, Doctoral Candidate in Business Administration, CENTRUM Catolica Graduate Business School, Pontificia Universidad Catolica del Peru, Lima, Peru.

Cesar Freire (Ecuador)

DUALITY CEO-CHAIRMAN AND ITS RELATION WITH THE EFFECTIVENESS OF THE BOARD CONTROL

Abstract

The study focused on analyzing the duality CEO-Chairman and its relation on the effectiveness of the board control. A sample of 347 companies with annual sales volume greater than five million US dollars was selected; a questionnaire was provided in order to measure the effectiveness of the board control. To measure the duality CEO-Chairman secondary information was used, and verification was made about the existence of the duality. The effectiveness of the board was measured by an index obtained through the use of confirmatory factorial analysis. Statistical tests were performed, such as Student's t-test for mean difference, Chi-square to measure the dependence and regression by simultaneous equations to answer the questions. As a result, it was found out that the duality CEO-Chairman is connected in a significant way with the performance of independent directors and risk supervision of the board. The results regarding the duality relationship CEO-Chairman and performance of independent directors are shown to be inverse, while with risk supervision it becomes direct. The obtained results theoretically contribute to the knowledge regarding the practices of good corporate governance.

Keywords corporate governance, independent board, CEO's performance, board risk, board transparency

JEL Classification M14, M12, G34

INTRODUCTION

When analyzing the performance of corporate governance, specifically in those considered large corporations, a particular situation arises that deserves to be analyzed, this is when the same person performs simultaneously the functions of CEO (Chief Executive Officer) or Executive Director and Chairman (Chairman of the Board), which generates duality at the level of corporate governance (CG) (Kassim, Ishak, & Manaf, 2013). Duality therefore arises when the person who manages the organization also exercises the control over his/her own actions, thereby generating a conflict of interests and risks in the control of the company. This situation is particularly detrimental, because the shareholders seek to maximize their wealth and attribute the functions to the board to control the CEO's administration.

There are three CG entities or bodies in one organization: shareholders, directors, and CEO. When duality exists, the conflict arises in what is called agency costs, understood as conflicts of interest between shareholders and CEO, whose own objectives are not always aligned (Jensen & Meckling, 1976). Given the presence of agency costs, internal control becomes relevant, according to "this refers to the process carried out by the board of directors, management and other designated personnel to provide reasonable assurance on the achievement of

objectives regarding the effectiveness and efficiency of the firm's operations" (Committee of Sponsoring Organizations [COSO], 1992, p. 1). The role of investors is indirect, so the effectiveness of the control exercised by the board is relevant for the maximization of the wealth of the capital owners.

The effectiveness of control by the board is based on the compliance of its processes, that is, if it complies with the control activities delegated by the shareholders. According to Kassim, Ishak, and Manaf (2013), the effectiveness of the board is related to compliance with the factors concerning the performance of independent directors, risk monitoring, evaluation of CEO performance, and accessibility to information. These factors determine the effective compliance of the processes of the board, that is, the functions entrusted by the shareholders to the Chairman.

Based on agency theory, principal and agent (Chairman and CEO) pursue different objectives. While the former seeks to maximize the wealth of the shareholder, the latter aims at maximizing its income (Jensen & Meckling, 1976). Then, considering the agency problem, the shareholders' meeting forms a board to which it assigns the control functions (Tuggle, Reutzel, & Bierman, 2010). When there is duality in the functions between the CEO and the Chairman, this can generate an obvious power and significant influence on the decisions of the board, which would obscure the effectiveness of the control of the board.

In this regard, Argente (2009) held that the coexistence of the Chairman and the CEO in the entity is questioned, as it is understood that due to this situation, the board of directors would have less capacity to perform an adequate control function, adversely affecting the operations, autonomy, and professionalism of control bodies.

The problem is that the companies are increasingly implementing duality schemes and are seeking to minimize the costs by finding in duality an option that seemingly reduces significant operational costs. However, this situation could jeopardize the effectiveness of the control in the board. Therefore, the existence of duality mentioned can diminish the possibility of applying an orderly and efficient control. When the CEO and the Chairman are the same person, control is put at risk by decreasing the demands of the same person; in conclusion, compliance is affected.

This research, mostly, focuses on analyzing the characteristics of the board in financial performance, obviating a fundamental factor that is related to the efficiency of the control in the board and measured under a logic of compliance with its relevant processes (Kassim et al., 2013). Therefore, the contribution of knowledge of this research is to elucidate how the duality CEO-Chairman affects the effectiveness of the control carried out by the board, since it appears to reduce the operational costs, but could nevertheless put such control at risk.

1. LITERATURE REVIEW

1.1. Conceptual review: corporate governance

A first indication of the need for a CG scheme was the one put forward by Smith (1776) who evidenced the presence of agency conflicts in certain organizations, such that a deviation between the objectives of the shareholder and the manager could be observed. Similarly, Berle and Means (1932) reported their disagreement on the lack of control over managers within organizations. Ross (1973) explained through the agency theory the problem of principal-agent that it implies an ignorance of information that the board obtains regarding the manager.

Jensen and Meckling (1976) explained that the agency theory, which is the property-agency relationship, is a contract that commits the parties to perform a joint activity. Thus, this theory gives rise to research on CG in the economic field. According to Jensen (1993), it is in large organi-

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zations where the problem of double standards is most likely to be of major importance.

The CG for Sheifler and Vishny (1997) is how the organization ensures the return on investment. According to Apreda (2001), it is about accountability, ownership, and control. Bradley (2004) mentioned that the CG scale ranges from one to ten, rating one as very low and ten as very high.

Policies are also in place for the smooth functioning of the CG, and, according to Calder (1999), these policies are the guidelines that every organization wants to achieve. However, Kassim et al. (2013) said that performance factors are also important so that the policies of the BGC were not sufficient. For Taylor (2003), the CG is a world problem.

1.2. Conceptual review: duality CEO-Chairman

Finkelstein and D'Aveni (2003) mentioned that "The duality CEO-Chairman has opposite effects that the board must try to balance" (p. 1079). Dual positions are when the director of the board is the general manager, who is in a position to manage and at the same time supervise the direction in the future of the organization (Dorata & Petra, 2008). For Tuggle et al. (2010), duality influences the selection of board members to monitor.

Within the principal-agent theory, one of the conflicts, which is discussed in this study, is generated when the CEO and the Chairman are the same person, in which the functions of the board, in terms of control are minimized, putting the shareholder interests at risk and increasing the agency costs; therefore, the board tends to be ineffective. In this regard, Ying (1998) argued that it is assumed that the Chairman is the leader of the board, that is, prepares and develops the agendas, determines the priorities and points out the procedures to be followed; However, the role or work of the CEO is to lead the company and to make the decisions of the board of directors be fulfilled or put into practice.

The combination or duality CEO-Chairman is, by analogy, a situation similar to asking the students to grade their own homework. This dual situation could grant control of the board to the CEO and when the CEO has sufficient influence on the board's decisions, this corporate management body loses the ability and effectiveness to take appropriate control and decisions. It would, therefore, lose the power to protect itself against any misjudgments made by the CEO, and the role of protecting the interests of the shareholders. However, this is still a hypothesis that the literature has raised from different approaches and with various results (Alfraih, 2016).

1.3. Conceptual review: effectiveness of board control

Kassim et al. (2013) stated that the effectiveness of the board refers to compliance with factors concerning the performance of independent directors, risk monitoring, evaluation of the CEO performance, and accessibility of information. These factors determine the effective compliance of the processes of the board, that is, the functions that the shareholder entrusts to the Chairman.

According to Shamsher and Zulkarnain (2011), the directors must make independent decisions (that is, without any influence), thereby protecting the interests of shareholders. According to Kassim et al. (2013), "the CEO's performance evaluation referred to procedures and measures that are previously established by the board" (p. 321). According to Finkelstein and Mooney (2003), the board must have the full and timely information needed to be able to hold effective meetings and effectively feed management decisions.

1.4. Empirical review

There are several researches related to the topic of corporate governance (CG) and the performance of the board of directors, however, most of these do not relate CEO-Chairman duality to the effectiveness of control in the board. Most studies measure the CG that represents the board characteristics and financial performance. The CG may be represented by variables related to direction and control.

Uadiale (2010) exposed the impact of the management structure with the presence of duality CEO-Chairman and the ROE through an analysis

of ordinary least squares, which revealed a negative association between the ROE and the duality CEO-Chairman. On the other hand, Ujunwa (2012) measured the interference of the characteristics of the board of companies, including the CEO-Chairman duality, using a model of random effects and fixed effects of generalized least squares (GLS), which concludes that the duality CEO-Chairman is positively linked to the performance of the companies. Topal and Dogan (2014) investigated the impact of the presence of the duality CEO-Chairman and the level of performance of the company, concluding that the company does not maintain any impact on the return on assets and the return on capital; however, the characteristics such as indebtedness and the level of assets were significant to explain the financial performance in terms of return on assets, return on capital.

Wahba (2014) used the method of ordinary least squares to determine that the duality CEO-Chairman does not constantly affect the performance of companies. However, it did not analyze the incidence of duality CEO-Chairman on the control performed by the board. The research carried out by Ali and Nasir (2015) proposed to examine the role of the duality CEO-Chairman and the financial results of the company determining that the absence of duality has a significant positive impact on the firm's performance. Dunn and Sainty (2015) investigated the relationship between the qualitative measures of the board of directors and their corporate performance, resulting in the characteristics of the board of directors that are positively related to performance.

Given the research background, it can be evidenced that the effectiveness variable of control of the board has not been measured under a global perspective that incorporates the main control actions of the board (Kassim et al., 2013). Therefore, it is relevant to measure the relationship between the duality CEO-Chairman and the effectiveness of the control of the board. The following hypotheses are therefore relevant:

H1: *The duality CEO-Chairman is inversely related to the effectiveness of the control of the board.*

H1a: *The duality CEO-Chairman is inversely related to the performance factor of effectiveness of independent directors.*

H1b: *The duality CEO-Chairman is inversely related to the effectiveness of the risk monitoring factor by the board.*

H1c: *The duality CEO-Chairman is inversely related to the effectiveness of the factor of performance evaluation of the CEO.*

H1d: *The duality CEO-Chairman is inversely related to the effectiveness of the factor of accessibility to information by the directors.*

2. METHOD

The sample was drawn up based on the population size, considering a confidence level of 95%, an error margin of 0.05 and a p/q= 1, the secondary information of the 347 large companies analyzed was collected, where about 25% of companies registered the duality (SCVS, 2017). The sample size obtained was higher than that proposed by other relevant investigations (Ali & Nasir, 2015; Mars, 2010; Topal & Dogan, 2014; Ujunwa, 2012; Wahba, 2014). It was, therefore, concluded that the size of the sample was appropriate for the research carried out, which is detailed in Table 1.

Table 1. Distribution of the sample

Sectors	Without duality	With duality	Total sampling	Distribution, %
Primary	33	11	44	12.69
Secondary	64	22	86	24.71
Tertiary	162	55	217	62.60
Total	259	88	347	100.00

Note: Calculation of the stratified sample of study without and with duality CEO-Chairman.

The sample was based on the data from the latest update of the "Superintendence of Companies and Insurance" which does not include the banks. The stratification of the data was carried out through the composition of the number of large companies by each of the economic sectors. Randomness was considered at the subgroup level, that is, the total number of companies concentrated in each sector was used as a reference, and this allowed the estimation according to the proportions of the sample.

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The tool to evaluate the dependent variable related to the effectiveness of board control was a questionnaire (Kassim et al., 2013). The questionnaire was aimed at board members except the Chairman, in order to avoid bias due to duality. The application of this questionnaire was relevant, according to Rizzotti and Greco (2013), choosing the dynamic committees to represent the effectiveness when the board becomes a limitation; therefore, the application of a questionnaire that captures the effectiveness of the board is appropriate. E. Choi, W. Choi, Jang, and Park (2014) measured the effectiveness of the board through the application of a questionnaire and its effect on profits based on a questionnaire for nonprofit companies.

The survey contains a five-point Likert scale, where 1 is very disagree, 2 is disagree, 3 is neutral, 4 is agree and 5 is very agree (see Appendix A). Higher scores indicated higher council capacity in the control tasks of the board. To evaluate the reliability, the coefficients of Cronbach's alpha for the final instrument were estimated, which finally detailed 22 items.

Table 2. Cronbach's alpha coefficient per construct

Constructs	Cronbach's alpha
DDI	0.9061
ED-CEO	0.7235
SR-DIR	0.7918
AI-DIR	0.7321

Table 2 shows Cronbach's alpha. The acceptable levels for this index differ among several authors. Values between 0.70 and 0.95 are registered as acceptable by Nunnally and Bernstein (1994), Bland and Altman (1997). More conservative criteria suggest the values that range from 0.80 to 0.90 (Cortina, 1993). According to Table 2, the values that range from 0.7321 to 0.9061 are approximately acceptable and conservative for the model referring to the authors' criteria.

In order to extract the indexes representing the effectiveness of the control of the board, a confirmatory factorial analysis was used, which allowed to predict the constructs. In this regard, univariate and multivariate normality and adjustment goodness rates were measured. This process allowed measuring the dependent variable.

Three phases were considered for the analysis of the data obtained. A first analysis allowed determining the difference of mean score between the efficiency in the control of the board for companies that have duality CEO-Chairman and those that did not register this duality. At the second phase, the independence was measured through the Chi-square test with the consideration of duality CEO-Chairman. At the third phase, board effectiveness was measured in terms of the performance efficiency of independent directors, risk monitoring, performance evaluation, and accessibility of information.

Finally, an econometric model of simultaneous equations was performed to determine if the duality CEO-Chairman is related to the effectiveness of the control of the board measured in its four constructs. The data analysis was carried out through the application of simultaneous equations in order to be able to test the hypotheses raised. According to Brad, Dobre, Ciobanu, and Viorel (2015), there is the interdependence in managing the CG variables. Also, Rizzotti and Greco (2013) identified as recommended variables for the analysis those shown in Table 3.

Table 3. Description of model variables

Code	Description
ECD	Effectiveness of board control
NCE	Number of external audit committees
OB	External directors
CD	CEO duality
AD	Board activity that is described by number of board sessions
II	Institutional investors
TAMA	Asset size
TAMC	Capital size
TAMP	People size
END	Debt/assets
CREC	Increase
PERD	Loss of the company
AEG	Dummy if the company was audited by large company
ICM	Number of internal committee members
ECM	Number of external committee members
% IMCI	Percentage of independent members in committee
% EMCI	Percentage of internal committee members with experience in finance and/or accounting
% EMCE	Percentage of external committee members with experience in finance and/or accounting
FAM	Dummy 1 = family business; 0 = not family business
SP2	Dummy 1 = secondary
SP1	Dummy 1 = primary

Note: For the study, 21 variables are used, which are involved in the model proposed for the measurement of the board control efficiency.

In addition to the definitions of the main variables previously presented, the majority of variables were considered that are raised in the model of Rizzotti and Greco (2013) in which the activity of the board (AD) is described by the number of sessions in the board. According to Menon and Williams (1994) directors must remain active, even when no meetings are mentioned. So, the number of meetings is considered an approximation of their activity. Similarly, when there are no or very few meetings, effective control is unlikely.

Similarly, the institutional investors variable (II) is considered based on what Raghunandan and Rama (2007) established by the percentage of shares held by officials and directors, thus, measuring the percentage of common shares held by institutional investors unrelated to management. Following the studies of Menon and Williams (1994), a dummy variable with a value of one is used if the percentage is equal to or greater than 5% and zero otherwise. The size of the company measured based on the size of the assets is considered as influence variable, considering the value of the company's assets (TAMA), as well as based on the size of capital, considering in the same way the patrimony of the companies (TAMC), and the amount of staff (TAMP), based on several investigations (Rizzotti & Greco, 2013).

External directors OB are established as the ratio of external directors and the number of external audit committees NCE. Debt or leverage (NDE) is considered an explanatory variable, determined by the debt/asset ratio, as well as the book market value as a proxy for growth (CREC) (Rizzotti & Greco, 2013). DeFond and Jiambalvo (1991) argued that fraud and errors are more likely in low performing companies, and Klein (2002) held that shareholders of companies with past consecutive losses require less scrutiny of the financial reporting system, so it is a variable that has an effect on the control and, therefore, has been considered a dummy variable with the number one if the company had loss at the end of the year and zero otherwise. It also includes the variables number of internal committee members (ICM) and the number of external committee members (ECM) (Rizzotti & Greco, 2013).

Rizzotti and Greco (2013) explained that the companies audited by large companies have more committee activity, assuming a positive effect on the control of the company, for what is considered one if the company is audited by a large company and zero otherwise. It also includes the effect of the type of enterprise and whether or not it is familiar with dummy variables as follows: one if it is a family enterprise; zero if it is not a family enterprise and the type of enterprise, be it service, commerce, or industry. The model to be tested responds to an econometric specification of simultaneous equations, which responds to the effectiveness of the board control.

According to this, two stages are analyzed: (a) the proper application of control of the board and (b) the specification of the board activity as endogenous variable. These two stages were considered due to the endogeneity of the variables effectiveness of board control and board activity, since the model dependent variable is the efficiency of the board's internal control and one of the independent variables is the board activity, so when the organization's board activity increases, the effectiveness of the board control tends to increase. It is also necessary to consider when the effectiveness of the board control is high, this can cause less concern to increase the activity of the board measured in number of sessions, there takes place the endogeneity and, therefore, the application of simultaneous equations in two stages was considered as an alternative as follows:

$$\begin{aligned} ECD &= \beta_0 + \beta_1 \hat{AD} + \beta_2 ROA + \\ &+ \beta_3 AEG + \beta_4 \%EMCI + \\ &+ \beta_5 \%EMCE + \theta_1 TAMA + \\ &+ \theta_2 TAMC + \theta_3 TAMP + \theta_4 FAM + \\ &+ \theta_5 SP1 + \theta_6 SP2 + \delta_1 CD + u. \end{aligned} \quad (1)$$

It was established based on the two-stage model that the activity of the board plays a role of simultaneity as follows:

$$\begin{aligned} \hat{AD} &= \alpha_0 + \alpha_1 NCE + \alpha_2 OB + \\ &+ \alpha_3 TAMC + \alpha_4 END + \alpha_5 MCI + \\ &+ \alpha_6 MCE + \alpha_7 \%IMCI + \\ &+ \alpha_8 FAM + \alpha_9 SP1 + \alpha_{10} SP2 + u, \end{aligned} \quad (2)$$

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which mathematically involved the use of simultaneous equations in two stages. For Rizzotti and Greco (2013), the application of simultaneous equations to measure the effectiveness of board control is appropriate, given the presence of endogeneity. The control and theoretical variables shown in Table 4 and which were used in the study respond to the recommendations of Rizzotti and Greco (2013) in which they estimate the models of simultaneous equations. The econometric data analysis was performed in the Stata program, since it is a suitable tool for handling the simultaneous equations.

3. RESULTS

In order to verify the univariate normality, the parameters of asymmetry and kurtosis were taken into account (Hair et al., 2010). There are different authors who discuss the appropriate values of these measures to determine the presence of a severe problem with distribution. Kline (2011) argued that the absolute value in asymmetry greater than three and a value of kurtosis more than ten may indicate a problem, and values above 20 may indicate more serious problem.

Therefore, the author suggested that the absolute value in asymmetry and kurtosis should not be greater than 3 and 10, respectively. Another criterion is that proposed by West et al. (2009) which identified severe normality when presenting the values in asymmetry greater than two and kurtosis greater than seven. Table 4 shows the test of univariate normality where it is said that all the variables of the study maintained an asymmetry and kurtosis within the ranges suggested by the aforementioned authors. Therefore, a normal distribution can be assumed.

Subsequently, the multivariate normality test was performed. The results of Table 5 suggest that multivariate data constructs 1 and 3 do not approximate a normal distribution. This condition was tested by the multinormality test proposed by Mardia (1970, 1971), based on simultaneous tests for kurtosis and multivariate asymmetry (Kres, 2012). Acceptable levels in the Mardia Skewness index can acquire the values within the range from –4.9 to 49.1, between these numbers, the estimates will still remain insecure and the statistical Chi-square will not be significantly inflated (Hallow, 1985).

Table 4. Univariate normality test – asymmetry and kurtosis

Observed variables	Asymmetry	Kurtosis
DDI.11	–0.30	–1.12
DDI.12	–1.58	2.08
DDI.15	–0.35	–0.71
DDI.16	–2.02	5.45
DDI.17	–1.33	4.07
DDI.19	–1.70	5.43
DDI.110	–1.59	3.67
ED-CEO.21	–0.43	–1.12
ED-CEO.22	–0.80	–1.11
ED-CEO.23	–1.07	–0.39
ED-CEO.24	–1.12	–0.39
ED-CEO.25	–1.98	4.47
SR-DIR.31	–2.33	5.88
SR-DIR.32	–2.66	6.58
SR-DIR.33	–2.83	7.11
SR-DIR.34	–2.04	3.48
SR-DIR.35	–1.61	1.52
SR-DIR.36	–2.44	5.19
AI-DIR.41	–2.39	7.30
AI-DIR.43	–1.74	7.87
AI-DIR.44	–0.27	–0.70
AI-DIR.45	–1.96	7.43

Note: Calculation of asymmetry and kurtosis to determine the normality between the latent variables.

In this case, the values of the Mardia Skewness test for the Table 5 sample were obtained in all constructs within the ranges mentioned by the author. However, for the risk monitoring variable by the board (SR-DIR), it reached 51.09 points, having approximately 1.99 points outside the stated limits. There is also evidence that with a multivariate kurtosis of up to 63.9 in large samples, the parameters will still remain in place (Henly, 1993). However, in the results kurtosis, only constructs 2 and 4 managed to be within the parameters, with the exception of constructs 1 and 3, which have 153.25 and 122.84, respectively, well above the suggested value. Therefore, construct 2, performance evaluation of the CEO (ED-CEO), and construct 4, accessibility to board information (AI-DIR), do not have problems not normal. On the other hand, construct 1, board performance (DID), and construct 3, board risk monitoring (SR-DIR), have no normal distribution.

Table 5. Mardia multivariate normality test

Multivariate normality test	DDI	ED-CEO	SR-DIR	AI-DIR
Mardia mSkewness	36.87	9.26	51.09	10.98
Mardia mKurtosis	153.25	45.62	122.84	53.58

Note: Application of the Mardia tests to verify the normality of multivariate data.

From the application of the confirmatory factorial analysis, it was possible to estimate the predictions for each construct. The predictions of each construct served to quantify the research dependent variable. Consequently, inferential tests were carried out to determine the relationship between the duality CEO-Chairman and the effectiveness of the control of the board.

Table 6. Indexes of goodness adjustment for the models of the constructs

Index	DDI	ED-CEO	SR-DIR	AI-DIR
p > chi2	0.109	0.140	0.000	0.887
RMSEA	0.037	0.044	0.145	0.000
CFI	0.978	0.992	0.910	0.999
TLI/NNFI	0.967	0.983	0.850	0.999
SRMR	0.327	0.023	0.060	0.005
CD	0.936	0.870	0.917	0.854

Table 6 shows the adjustment measures for the maximum likelihood estimation method. In this table, most estimators are within the expected range, or very close to it. In other words, the indexes of the constructs approach the expected values with slight deviations. However, it is observed that the NNFI/TLI and CFI statistic in four constructs are higher than the expected minimum value of 0.95 (except in the case of SR-DIR), being an optimal adjustment model. In addition, the RMSEA value within the latent variables is below the maximum expected value of 0.08, with the exception of the variable SR-DIR.

SRMR ratings are higher than the expected maximum value of 0.05 in IDD and SR, while they are not for ED CEO and AI-DIR. The coefficient of determination index (CD) in the constructs is close to 0.90, which implies being close to the levels of acceptance. In this way, it is stated that the analysis of the indexes of goodness of adjustment of the model by the method of maximum likelihood is optimal for the constructs ED-CEO, SR-DIR, and AI-DIR.

Table 7. *T*-test of average contrast between the constructs and duality CEO-Chairman

Construct	T	Pr (Diff < 0)	Pr (Diff ≠ 0)	Pr (Diff > 0)
DDI	1.8611	0.9682	0.0636	0.0318
ED-CEO	0.5199	0.6983	0.6035	0.3017
SR-DIR	–3.1631	0.0008	0.0017	0.9992
AI-DIR	–0.2486	0.4019	0.8038	0.5981

Table 7 shows that *p*-values for DDI, ED-CEO, SR-DIR, and AI-DIR constructs are 0.0636, 0.6035, 0.0017, and 0.8038, respectively. Considering a level of significance of 0.05, it is assumed that there is a significant difference in the SR-DIR construct for companies with and without duality CEO-Chairman. Also, if one considers a level of significance of 0.10, it can be concluded that there is a difference in the construction DDI for companies with and without duality CEO-Chairman. In conclusion, it can be asserted that there is statistical evidence not to reject the presence of differences of levels in the variables DDI and SR-DIR for companies with and without duality CEO-Chairman duality.

Table 8. Associativity test between the study variables

Latent variables	Chi-square	Probability
Duality/performance of independent director	7.206	0.066
Duality/supervision and risk of the board	4.089	0.394
Duality/board performance evaluation	8.749	0.033
Duality/accessibility of board information	2.006	0.735

According to Table 8, it is determined by the *p*-values corresponding to the SRD and AI-DIR that there is no statistical evidence to reject the null hypothesis that indicates the independence between the duality CEO-Chairman and the abovementioned constructs. On the other hand, in the associativity test corresponding to the first construct, *p*-value of 0.066, greater than the level of significance of 0.05, is obtained, which causes the null hypothesis to be accepted and the alternative hypothesis to be rejected, which indicates that both variables are independent. In the associativity test corresponding to the third construct, a *p*-value less than 0.05 is obtained, reflecting the dependence between ED-DIR and the duality CEO-Chairman.

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The simultaneous equations to be developed are intended to observe the impact of the duality CEO-Chairman on the effectiveness of the control of the board measured by four constructs and considering other control variables that have been as specified above. The variable activity of the board is used as variable instrument for the first stage of simultaneous equations, given the problem of endogeneity presented between the variables efficiency of control of the board and board activity. Four equations have been applied on the specified constructs concerning the effectiveness of board control. The equations to be developed are simultaneous in two stages.

At the first stage, multicollinearity and robust standard errors were estimated to treat heteroscedasticity. The variance inflation factor test recorded an average value of 1.20, which is below 10, therefore, strong multicollinearity is discarded.

Table 9. Regression by simultaneous equations through MCO

Variables	DDI	ED	SR	AI
AD	0.0470[a]***	0.569	0.536	0.635
	–0.2032[b]	–0.0257	–0.0261	–0.032858
CD	0.0310**	0.434	0.0000***	0.983
	–0.1986	–0.0468	0.1459	0.0016557
TAMA	0.0500*	0.951	0.0080***	0.363
	0	0	0	6.23E–11
TAMC	0.424	0.445	0.144	0.59
	0	0	0	–1.64E–09
TAMP	0.452	0.417	0.192	0.675
	0.0001	0.0001	–0.0002	0.000103
ROA	0.0000***	0.0030***	0.0160**	0.195
	–0.0014	0.0007	0.0004	–0.000461
AEG	0.812	0.532	0.894	0.655
	–0.02	–0.0367	–0.0077	0.037007
%EMCI	0.966	0.305	0.872	0.084*
	–0.0094	0.1348	0.0212	0.2821021
%EMCE	0.0060***	0.671	0.798	0.774
	0.3097	0.0549	0.0324	0.0354104
FAM	0.698	0.495	0.181	0.841
	–0.0294	–0.036	–0.0654	0.0149667
*SP*1	0.597	0.884	0.544	0.43
	0.0497	–0.0117	0.0353	–0.095258
*SP*2	0.687	0.151	0.883	0.406
	0.035	0.0782	–0.0082	0.063061
_cons	0.0810*	0.969	0.58	0.602
	0.2872	0.0033	0.0367	–0.064411

Note: DDI = performance of independent directors, ED = CEO performance evaluation, SR = risk supervision, AI = transparency of information, [a] refers to the *p*-value and [b] is the coefficient of the variable * $p < 10\%$, ** $p < 5\%$. *** $p < 1\%$.

For robustness of the results, the Sargan and Basmann tests were estimated, which propose as a null hypothesis that the instruments are valid and the model is correctly specified. The test values were greater than 0.05, which implies not rejecting a null hypothesis.

The results in Table 9 showed that not all the variables were relevant to the DDI construct, such as *EMCI*, *FAM*, *SP*1, *SP*2, TAMCAPITAL, PERSONAL; only the variables quarterly *AD*, *ROA*, *EMCE*, and duality CEO-Chairman are included. It is verified that when there is duality, the performance of independent director's decreases, this result supports the hypothesis 1a.

For the ED variable, only the ROA variable was significant, therefore, the duality CEO-Chairman is not related to this construct. A direct relationship between the duality CEO-Chairman variable and the SR construct was evident. On the other hand, the duality CEO-Chairman variable is not related to the AI factor.

4. DISCUSSION

The objective of this research was to analyze the duality CEO-Chairman and its impact on the effectiveness of the control carried out by the board. In this regard, the effectiveness of the control of the board variable was measured based on four constructs that refer to performance of independent directors, performance evaluation of the CEO, risk monitoring and transparency of information. Therefore, this research analyzed the control activities of the board in a comprehensive way.

As a result, it was found that there is an inverse relationship between the duality CEO-Chairman and the performance of independent directors, while a positive relationship with the functions of risk supervision was evidenced. This relationship is contrary to expectations, however, it is reasonable, given that in the country where the study was carried out, periodic controls are held by public institutions and with great intensity to risk policy. Moreover, the duality CEO-Chairman has no evidenced relationship with the factors of the evaluation of the CEO performance and transparency of information.

Other research has tried to measure the relationship between the duality CEO-Chairman and the effectiveness of the control of the board, but this last tried to measure through the dynamism of committees and financial performance. In this regard, the results obtained differ. It could be evidenced that there are the investigations that report positive relations between these variables as is the case of Uadiale (2010), others show no relation as Wahba (2014), as well as other research showing an inverse relationship between these variables as Ali and Nasir (2015).

The findings of this research were based on principal-agent theory, which is the basis for establishing good corporate governance policies. Based on the above, the contribution of this research lies in the agency theory that was the beginning of corporate governance practices (Jensen & Meckling, 1976). Consequently, the contribution represents a great relevance and most of the research related to this topic has been addressed under the mentioned theoretical model.

Future research involves considering two types of sectors that are highly sensitive to analyzing the functioning of corporate governance. It is recommended to study this type of relationship in the financial sector and the nonprofit sector, and if these results are obtained, these could be contrasted under three different realities.

CONCLUSION

The study explained the relationship between the duality CEO-Chairman and the effectiveness of control of the board. In this respect the first hypotheses indicates that the duality CEO-Chairman is inversely related to the performance factor of effectiveness of independent directors, it is concluded that the duality CEO-Chairman is related to the performance of independent directors. The second hypotheses indicates that the duality CEO-Chairman is inversely related to the effectiveness of the risk monitoring factor by the board, it is concluded that the duality Ceo-Chairman is related to the effectiveness of the risk monitoring factor. The third hypotheses indicates that the duality CEO-Chairman is inversely related to the effectiveness of the factor of performance evaluation of the CEO, it is concluded that duality Ceo-Chairman is not related to the factor of performance evaluation of the CEO. The Fourth hypotheses indicates that the duality CEO-Chairman is inversely related to the effectiveness of the factor of accessibility to information by the directors, it is concluded that duality Ceo-Chairman is not related to the factor of accessibility to information by the directors.

The impact on the performance of independent directors is justified by the presence of a CEO, which in turn is Chairman, which can impose and minimize the action and the performance of independent directors. Moreover, the direct relationship with the supervision of risk is justified by the presence of public institutions that increases requirements of control regarding risk.

Therefore, while it has not been possible to demonstrate in all cases that the duality CEO-Chairman has an effect on the control of the board, it has been demonstrated with sufficient evidence that in the case of risk control and the performance of independent directors, duality does have an effect, and this may be helpful to come up with a model to explain the control of the board based on the duality CEO-Chairman.

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APPENDIX A

Table A1. Variables names

Codification	Variables' names
DDI	Performance of independent directors
DDI.11	Skills to provide strategic visions
DDI.12	Effectiveness of representing the interests of its shareholders
DDI.15	Compression on the nature of the business / company
DDI.16	Contributions in meetings with the committee
DDI.17	Meetings of the register of assertive and constructive contributions
DDI.19	Relations between general managers
DDI.110	Communicate interactively with other board members
ED-CEO	CEO's performance evaluation
ED-CEO.21	Board of directors informs the director/manager about the performance obtained based on the evaluation results
ED-CEO.22	Board evaluates the director/manager using KPI (performance indicators/meters)
ED-CEO.23	Board establishes an exit mechanism linked to the performance of the director/manager
ED-CEO.24	Board establishes a reward system (incentive) based on long-term performance
ED.CEO.25	Board informs the director/manager about the failures detected based on the evaluation of the results
SR-DIR	Risk supervision by the board
SR-DIR.31	Board request to the general administration to consider emerging risks that could be faced
SR-DIR.32	Board receives updates from the general administration on risk management issues
SR-DIR.33	Board creates awareness regarding risk management
SR-DIR.34	Board reports on the importance of good risk management to the general administration
SR-DIR.35	Board attends planned trainings on risk management
SR-DIR.36	Board reviews strategies before the crisis
AI-DIR	Transparency of information for directors
AI-DIR.41	Managers talk in depth about company affairs
AI-DIR.42	Managers have access to information when requested from management
AI-DIR.43	Deny access to managers when they need to go to the company's accounting records and books
AI-DIR.44	External professional assistance requirement expenses are paid by the company