

AN EXPLORATION OF BOARDS OF DIRECTORS' QUALITY: THE DEVELOPMENT OF AN INDEX FOR DIRECTORS ATTRIBUTES AND THE RELATION WITH FIRM VALUE AND PERFORMANCE

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Abstract

In an environment with poor quality of Corporate Governance Mechanisms, the quality of directors' attributes might exert an important role to improve firm's value and performance. I developed an index to explore the quality of Board of Directors based on Brazilian and international corporate governance codes to measure directors qualitative attributes. The sample consist in 24 Brazilian firms that traded at NYSE in the period over 1999-2006. The results show us that board of directors with high types of attributes can improve value measured individually and by the quality index. The main results indicate that firm value improved with high types of professionals, accountants seated in boards, directors with high level of education and that participated in executive training.

Keywords: Board of Directors' Quality, Corporate Governance, Firm Value, Directors Qualitative Attributes

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1 Introduction and Theoretical Motivations

Boards of directors (hereafter, BOD) are one part of internal mechanisms of corporate governance that is responsible to plan firms long-term strategies to reduce possibilities to the firms takes wrong ways in the long horizon and to avoid shareholder expropriation by executives. Considering the conventional view of agency problems BOD as well as auditors are intermediaries to avoid shareholder expropriation by managers or to act in their interests (BECHT; BOLTON; RÖELL, 2002).

The optimal performance of firms to improve value depends on the capacity of the BOD to align interests among minorities and majorities shareholders and monitoring executives' decisions (JENSEN; MECKLING, 1976). Complementarily, the performance of BOD is affected by a composition of mixed low or high attributes of each director.

This paper seeks on a different way from other traditional studies that commonly test corporate governance mechanisms one by one and after aggregate all mechanisms in an index of corporate governance quality that limit their explanation creating a "missing link" among firm value and performance (BHAGAT; BOLTON; ROMANO, 2007). The focus is mainly on qualitative characteristics of BOD and directors attributes⁸ composition such as age, recommended size of BOD, education degrees, post-graduations, directors' actualization (participation in executive programs), to attempt to develop an index of board of director's quality.

⁸ Sometimes I use BOD characteristics involving directors' attributes to avoid repetition of terms. However, characteristics of BOD are internal mechanisms of corporate governance and attributes of directors are qualitative features of each director, both suggested by international codes of corporate governance.

The attributes of each director build the human capital of boards in firms. A combination of high types of directors can improve their quality in monitoring and planning as suggested by Zajac and Westphal (1996, p. 508) “directors seek to develop and maintain a favorable reputation as active representatives of shareholder welfare, thus enhancing their human capital on the boards on which they sit and increasing their attractiveness as candidates for board appointments at other firms”. Thus, the high attributes of directors can contribute to firm in the product market competition and for the person in the job market competition. Furthermore, the optimal arrangement of these characteristics can improve firm value and performance.

Leblanc (2003) argues that it is difficult to learn about personal attributes, notwithstanding, “behavioral characteristics of individual directors are crucial, if not determinant, of overall board effectiveness” (LEBLANC, 2003, p. 205). As a result, it was considered that quality of BOD measured by the sum of some characteristics recommended by corporate governance codes and directors’ attributes will allow us to develop an index that can contribute to maximize returns to shareholders and consequently the firms’ values.

An index could support many researchers and economic agents to evaluate the quality of board of directors despite their subjectivity feature. This research use few characteristics tested in many studies and other suggested by us based on different corporate governance codes. The results for each characteristic will be presented, and all attributes together in a unique index as well. This index will be tested with firms’ value and performance.

There are no empirical evidences⁹ in the literature about indices that tries to measure quality of BOD estimated by directors attributes developed using as guide different countries codes of corporate governance. In this sense, a comparison among principal codes was done and organized by Gregory (2000) and I selected some characteristics of BOD and attributes of director suggested in most part of the time in codes such as experience, skills, capacity to understand financial statements, age, diversification of formation (different bachelor degrees), participation in executive education programs, post-graduations, and so on.

Feltovich, Harbaugh and To (2002) and Spencer (2002) show that in signaling models despite of costs of education, it increase ability with unobserved attribute that contributes positively to productivity suggesting that continuous education and training in the level of human capital can contribute to high performances of directors reducing adverse selection of directors to sit in BODs. Then, high quality of BOD can be related to less adverse selection and less consequences to investors and shareholders reducing agency costs.

In this way, directors have incentives to develop a reputation to be recognized by the market and job competition market, and reputation is a construct of the expertise developed on his/her professional trajectory signaling to the market that they are experts in reduce conflicts, monitoring firms planning and executives activities. Thus, the quality of the directors attributes and their expertise signaling to the market their capacity to work as expected to protect shareholders interests considering reputation as a dynamic concept that overrides the past seats of the directors or his posture in the market if he (her) never was seated in a BOD (SHAPIRO, 1983; FAMA; JENSEN, 1983; CARCELO et al, 2002).

As a result, there are two objectives as follow: 1) to verify whether directors’ attributes recommended by Brazilian corporate governance code and other codes contribute to improve firms value and performance and; 2) to develop an index of quality of board of directors and analyze its relation with firm value and performance. Four measures of value was used to capture the impact of high types of directors to firm value, such as, value as firm market value, two different estimations of Tobin’s Q and market-to-book and for performance return on equity (ROE).

In this research, were analyzed in 24 Brazilian boards of directors 1.108 seats of firms with American Depositary Receipts (ADR) traded at New York Stock Exchange (NYSE) over 1999-2006 period totalizing 119 observations. The participation in two institutional environments with different legal systems intuitively requires a more qualified BOD, motivating this research to study Brazilian firms.

⁹ To my knowledge, with similar attributes, until 2008.

Brazil is considered an environment with weak enforcement and poor institutions of governance, on the other hand, when these firms goes to NYSE its necessary many adjustment among corporate governance structure (internal and external), production, good teams of executive officers, employees and directors to perform based on shareholder interests. Consequently, the political costs of these firms growth together with the reputation since these firms are monitored by more specialized agents of the market forcing them to improve their corporate governance mechanisms (WATTS; ZIMMERMAN, 1990).

Different econometric procedures were applied: estimators with panel data with fixed effects, random effects and ordinary least squares (OLS robust standard errors) regressions, although, the Breusch-Pagan and Hausman test indicates that the best estimator is OLS. In general, the main results are: i) The model that tests separated Directors' attributes individually shows that directors with high attributes as higher education degrees, types of expertise and BOD that follows recommendations from corporate governance codes improve value in almost of all measures of value, and for performance only the attribute of directors with master and doctor degrees; ii) The second model that verifies the Board of Directors Quality Index (BODQI) show that the combination of high types of directors seated in BODs have positive and statistical relation with all measures of value used, but no statistically significant relation with performance.

This research has five sections. Section 2 presents related research and the development of hypotheses. Section 3 discusses about corporate governance indices developed around the world. Section 4 shows the development of Board of Directors Quality Index (BODQI). Section 5 shows the methodology, sample construction and the analyses of regressions results. Finally, section 6 concludes.

2 Related Researches and Hypotheses Development

Many questions have been inquired about corporate governance mechanisms and board of directors, and their relations and their impact on firm's value and performance, but there is still a long way for new evidences in empirical researches. Murphy and McIntyre (2007) asked "What characteristics make some boards more effective than other boards, and what is an appropriate measure of board effectiveness?" Complementarily, Hermalin and Weisbach (2003) asked "how do board characteristics affect the observable actions of the board?" The answers for these questions can contribute to the literature, regulators and firms to do a better arrangement in their boards.

These characteristics are unobservable attributes that each director developed throughout his/her career building their human capital because high types of qualified director can do enhanced BOD function as decision control (FAMA; JENSEN, 1983; SPENCE, 2002; McINTYRE; MURPHY; MITCHELL, 2007).

In the literature there is a gap that tries to link group characteristics into organizational outcomes, and many times it is simply assumed (YERMACK, 1996). Therefore, I use some recommendation of Brazilian Corporate Governance Code and others (GREGORY, 2000) and link with signaling and agency theories, because some characteristics developed with high quality generate reputation in the market providing us theoretical foundations to create the proxies in this study.

Looking for Brazilian BODs they are characterized by Silveira (2004) as follow: 1) is unclear the division between directors and executive officers principally in familiar firms; 2) Informal structures with absent of committees; 3) Most of directors are outsiders but not independents; 4) scarcity of qualified directors; and 5) compensation is considered an irrelevant factor. In this sense, using firms listed in two different institutional environments the expectation is that high types of directors (combinations of qualifications) can appear in the sample.

The sample consists of Brazilian firms with ADR traded on NYSE which is considered the most developed capital market in the world. These firms have a higher political cost to continue creating value and increase performance considering the monitoring from internals and externals (WATTS; ZIMMERMAN, 1990), these costs extend to the board reputation (ZAJAC; WESTPHAL, 1996). Thus, the first hypothesis is:

H1: Firms with board composition formed by high types of directors' attributes affect value and performance positively.

The attributes explanation will be discussed in section 4, but was mentioned earlier the characteristics that will be observed. This hypothesis (H1) will allow us to validate the characteristics individually to develop the board of director's quality index. Thus, the functions for firm value and performance is:

Firm value f (Directors Characteristics individually, internal mechanisms, control variables)

Firm Performance f (Directors Characteristics individually, internal mechanisms, control variables)

To observe the boards and its effectiveness is necessary to join theories to link their skills to the firm's outcomes. Because of this gap among theory and variables, results of many researches can be unclear. In fact many other indices have the same problem considering many mechanisms of corporate governance together (BHAGAT; BOLTON; ROMANO, 2007). The expectation in this index focuses only in one mechanism of corporate governance and considers only some characteristics and directors attributes, in this sense, results are less affected by this gap. As a result, the second hypothesis and functions are:

H2: Board of Director Quality Index is positively related to Firms value and performance positively.

Firm value f (BOD Characteristics, internal mechanisms, control variables)

Firm Performance f (BOD Characteristics, internal mechanisms, control variables)

Empirical evidences testing recommendations from corporate governance codes are in a way with positive research methodology (in accounting literature see Watts and Zimmerman, 1990). If the propositions emanated by regulators or institutions in codes are not convergent with reality (empirical results) the proxies and index will be unsuccessful to explain the relation among BOD characteristics and firm value and performance.

3 Corporate Governance Indices

Many indices that measure corporate governance quality have been developed and have statistical relation to firms' performance and value. But some results are controversial because the lack of theoretical link with indices interpretation and, as well as, their modest explanatory power. This section reviews some studies that developed indices of corporate governance because Hagan, Bolton and Romano (2007)¹⁰ revisited almost all studies with indices developed in corporate governance literature.

Black (2001) developed an index that when firm have higher score as well weak corporate governance structure affect negatively the log of firm value. He used a small sample with the 21 greater Russian firms, because him consider the fragile institutions and enforcement, private benefits and insider information giving the most weight to disclosure and transparency. In this study is highlighted that firm with higher quality of corporate governance structure have ADR traded on the NYSE and increases value too. Klapper and Love (2002) use a ranking developed by Credit Lyonnais Securities Asia (CLSA) that cover seven broad categories: management discipline, transparency, independence, accountability, responsibility, fairness, and social awareness. But, they use the sum of first six categories and control by firm-level governance, other firm-level characteristics and country-level with legal environment. They conclude that in environment with ineffective laws and enforcement firms establish good corporate governance and provide further investor protection.

Many researchers applied their studies in most developed capital markets (United States and United Kingdom) in these markets the role of corporate governance is for complementation, on the other hand, in countries defined as emerging markets corporate governance have an important role with substitution effects.

Beiner et al (2004) use the agency framework to test in Swiss firms a broad corporate governance index with control variables. They found positive relationship between corporate governance and Tobin's Q covering in its index 38 different governance attributes that are not legally required until the research period. The points observed were corporate governance commitment, shareholders' rights, transparency,

¹⁰ I suggest reading the Bhagat, Bolton and Romano (2007) paper for further information and for a complete survey about indices.

management and supervisory board matters, and auditing. In this same direction using a sample of Korean firms Black, Jang and Kim (2006) found positive relation among the Korean Corporate Governance Index (KCGI) and market value of firms.

In Brazil and Chile, Leal and Carvalhal-da-Silva (2005) elaborated a corporate governance index (CGI) with 24 questions concerning four dimensions: disclosure, board composition and functioning, Ethics and Conflicts of Interest and Shareholder rights. The CGI is positive related with corporate value.

Board of directors are integrated in many indices of corporate governance as an internal mechanism that impact value positively when there is quality in governance (BEINER et al, 2004; BLACK; JANG; KIM, 2006) or impact value negatively when the scores are composed by the sum of fragile mechanisms (BLACK, 2001), but the scores of the BOD rarely are tested separated and are the focus in these studies.

Bhagat, Bolton and Romano (2007) review many studies that developed corporate governance indices and concluded that there is no consistent relation between governance indices and measures of corporate performance. Additionally, infer that governance indices are highly imperfect instruments because it captures different dimensions of corporate governance and become complicated to separate the impact of each element added inside the index and corporate value.

As discussed above the most of characteristics of the BOD normally analyzed are internal mechanisms of corporate governance as independence (composition inside versus outsiders), chief executive officer is the chairman of the BOD, meeting frequency and interlocking, on the other hand, tenure on the team, age and size are qualitative characteristic, but results in many studies are controversial because BOD affect performance/value and performance/value affects BOD composition (HERMANLIN; WEISBACK, 2003; MURPHY; McINTYRE, 2007).

Considering all empirical evidences about the impact of corporate governance indices around the world in firms' value and performance, and despite the possible gap of theoretical foundations, these indices can be seen as signaling of high types of corporate governance quality or low types of quality supporting different dimensions governance structure (SPENCE, 2002; ZAJAC; WESTPHAL, 1996).

4 Development of Board of Directors Quality Index (BODQI)

The Board of Directors Quality Index (BODQI) was elaborated based on recommendations of many codes of corporate governance around the world, mainly in Brazil as described in Gregory (2000) that systematized by topics each mechanism of corporate governance considered in codes. The main intention is to focus only in Board of Directors recommendations about mechanisms, skills, expertise, knowledge's and so on.

The quality of board of directors is complex to state clearly their effects on firm value and performance. In many studies of corporate governance quality indicates that firm with good internal or external (or both dimensions) mechanisms have higher value in the market (SHLEIFER; VISHNY, 1997; FAMA; JENSEN, 1983). In this sense, the role of the quality of BOD can reduce the possibility of expropriation by executive officers or mitigate earnings management practices when the BOD are formed by outsiders and have independence (PEASNELL; POPE; YOUNG, 2000; HERMALIN; WEISBACH, 2003; KLEIN, 2006).

Directors are decision makers (LEBLANC, 2003) and the best decision can improve firm value measured in the stock's prices and performance measured by accounting ratios (JENSEN; MECKLING, 1979; FAMA; JENSEN, 1983).

In the corporate governance literature many variables uses diversity (proportion ratios, as an example, outsider directors divided by board size) in BOD characteristics. In this study, the diversity (percentage in variables, as will be explained) to categorize parameters to use binary variables (dummy) to control similar characteristics of firms was used, to finally obtain score from firms. But, first all categorized attributes will be tested separately.

To develop an index of BOD quality was considered two dimensions together, some internal mechanisms and the quality of directors attributes to identify high types of directors. The expected signals of slopes coefficients will be described in tables.

Spencer (2002) and Feltovich, Harbaugh and To (2002) presented signaling models of individuals with high types of education that contributes to companies growth and to improve performance, but in some cases these high types do not signaling to the market their reputation, doing *countersignaling* phenomena and sometimes the medium types have signaling more to the market because they need to show their quality or characteristics odd from others. Because of these models, the intuition is that directors that have higher education, skills and knowledge can contribute more to firms' growth opportunities, performance and value (dependent variables) that will be explained after directors attributes and control variables.

Table 1. Variables Definitions: Education Attributes in the Board of Directors Quality Index

<i>iMBA</i>	Consider 1 if firms have directors with post-graduations in any quantity and hope that will have positive slope coefficient in regression. MBAs courses can bring to directors modern management tools, techniques or practical cases to implement their knowledge in firms.
<i>iMD/PhD</i>	Through the same intuition in MBA variable, the idea to use and control for directors that hold Master or Doctor degrees is that they improve their qualifications and expertise. There is no information of how many directors have these courses in any area and to be conservative considering one point with firms that have at least one director with any post-degree seated in the BOD. There is no expectation to beta signal.
<i>iBusinDeg</i>	Undergraduates' in business areas in almost all codes are preventive to the characteristics that lead to business experience and recommend to directors have knowledge in finance, accounting, economics and management (GREGORY, 2000), in Brazilian code recommendation is that at least three directors needs to have basic knowledge of finance and accounting, again, to be more conservatively was considered at least 50% of board, 1 point to firms with directors bachelors in accounting, business administration and economics and expect to have positive slope coefficient.
<i>iOtherDeg</i>	Other degrees capture the diversity of different undergraduates such as law, engineering, geology and others courses that can contribute to discuss ideas and others point of view or specific to the firm business strategy. The suggestion is at least 30% of directors' bachelors in others courses and expects to be positive relation to firm value and performance.
<i>iAccount</i>	Accountant seated in BOD is a proxy for higher knowledge in accounting, auditing and financial management areas as recommended by IBGC Code (2003, p. 22) and other codes (GREGORY, 2000) for at least one of the three directors with basic knowledge in finance and accounting. Even others directors have high knowledge in accounting and finance, the expectation is that accountants are instructed to improve monitoring to avoid earnings management or fraud practices and work as an advisor in BOD. Thus, consider 1 point to the index if firm have an accountant seated in the BOD. This point we construct to differentiate firm characteristics, because firms win point in <i>iBusinDeg</i> and one more in this variable. There is no expectation for the signal of this variable.

The variables presented above suggest that high types of individuals inside the BOD can contribute better to performance than low types. However, these attributes of directors need to be aligned with firm corporate governance structure as will show in table 2. Table 4 will present control variables of the models to moderate slope coefficients effects and table 5 contain the explanation of five dependent variables used in this research. Tables will be present in sequence to preserve tables and number of pages. All tables discussed above will be present as follow:

Table 2. Variables Definition: Other Characteristics and Board of Directors Quality Index

<i>iSize</i>	Board size – there is no conclusive answer in the literature for an adequate board size. Each firm needs to have sufficient directors to do a better control of executive officers. The Brazilian Institute of Corporate Governance (IBGC) recommends BOD size between 5 and 9 directors. The expectation is positive slope coefficient for firms that follow this recommendation. Finally, BOD size can contribute to improve their performance and monitoring (JENSEN, 1993).
<i>iAge</i>	Age as suggested in the literature an adequate amplitude can contributes to directors renew ideas and discuss planning between young and old directors. There is no expectation to the signal of this slope coefficient. Many codes consider age as a relative weight to firm performance. A mean age between 30 and 60 years is a reasonable standard deviation to work together young and old directors.
<i>iCeoCourse</i>	Executive/Management Programs is considered a additional contribution in BODs. Education or actualization (participation in these programs) increases BOD quality. Thus, we accept the advice from IBGC that directors must continue improving their performance to act with long-term focus that it is essential submit themselves to training programs for continuing to upgrade and recycling knowledge's (IBGC, 2003,

	p. 32).
<i>iBusy</i>	Busy Directors/Others activities of directors since they do not assume more than 3 responsibilities beyond the actual board such as another board seats, office functions, work in other firms and so on. This feature agrees with board size, because great BOD can emerge free-rider problem or out of attention with firm long-term planning (JENSEN; MECKLING, 1976). Thus, consider one point for firms with no more than 30% of directors in this condition and zero otherwise. There is no expectation for the signal.
<i>iMax20%</i>	No more than 20% of executive officers or internals in the BOD. How there is few studies of BOD characteristics in Brazil, assume that more than 20% (what is a high amount) of executives or employees because IBGC recommend to BOD have more independents directors than internal directors in the same direction of international codes (GREGORY, 2000). If firms have this parameter wins one point or zero otherwise to the score. The signal expectation is that firms that attend this proposition have positive slope coefficient.
BODQI	The Board of Directors Quality Index is the sum of points obtained variables discussed above divided by 10. The assumption is that the aggregate composition of attributes can affect positively value and performance and to reduce bias control variables was applied together.

Table 3. Variables Definition: Control Variables

<i>Indep</i>	The independence level of the BOD. An internal mechanism of corporate governance measured by outsiders' directors divided by total size.
<i>Ceopresi</i>	Almost all codes recommend that there are different persons seated on officer and BOD. If CEO is different person from the chairman of the BOD obtain 1 and 0 otherwise.
<i>Lntime</i>	Time in years that firms have ADRs listed in NYSE (log of years) can show a learning curve to improve corporate governance mechanisms.
<i>ADR3</i>	Higher ADR Level is used only for firms in the third level because the sample consists mainly in firms with ADR level 2 and ADR level 3.
<i>Lnassets</i>	Firm Size (log of assets) is a specific characteristic and size can affect governance structure in two points: agency costs and firms' financing structure.
<i>Capintens</i>	Capital Intensity or Tangibility is a proxy for firm's effectiveness and we suppose to be related to Tobin's measures and performance.
<i>Govern</i>	State-Owned Management firms assuming 1 whether state-owned control or 0 otherwise. Firms managed by government can have weak governance structure and affect value negatively.

Table 4. Variables Definition: Dependent Variables

<i>Firmvl</i>	Firm Value is measured by total value of the firm shares divided by total assets.
<i>Tobin1</i>	Tobin's Q 1 is $[(\text{book value of assets} - \text{book value of equity} + \text{firm value of the equity}) / \text{book value of assets}]$. The expectation is that this formula capture other relations that the traditional measure.
<i>Tobin2</i>	Tobin's Q 2 is $(\text{market value of equity} + \text{book value of debts defined as the sum of current debt, long-term debt and inventories less current assets}) / \text{book value of assets}$.
<i>Mtb</i>	Market-to-book indicates growth opportunities and expectation of the market. We measure by market value of the equity divided by book value of the equity.
<i>OpRoe</i>	To measure performance return on equity is the ratio of net operating income divided by book value of the equity.

In this research were applied panel data regressions with fixed effects, random effects and ordinary least squares estimators for each dependent variable: four measures of value (*firmvl*, *tobin1*, *tobin2*, *market to book*) and one of firm performance (*OpRoe*) to verify the relation of each variable and after the second regression with BODQI with control variables.

5 Methodology, Sample and Results

Initially, the data contained in 20-f report obtained from NYSE non-US listed companies it was used, but the lack of some qualitative and standardized data of director's curriculums, force us to use together the data provided from Brazilian Securities Exchange Commission (CVM) to complement or confirm some information as education degrees, ages or directors occupations. Additionally, some information was taken from Economática's database to estimate dependent and control variables.

We analyze in these reports 1.108 short directors' curriculums to organize the BODQI as the sum of ten qualitative categories divided by ten. This score change by year, however with a little variation by firm and year. This sample does not follow the most of assumptions in social sciences such as random and great number of observations by year; it can affect the regressions results.

As a result, the sample consist in 24 Brazilian firms with ADR listed at NYSE in the over period 1999-2006 totalizing 119 observations. The descriptive statistics is presented in table 5:

Table 5. Descriptive statistics of Independents (I) and Dependents (D) variables

Variable	Obs	Mean	Std. Dev.	Min	Max	Total (sum)
Size (I)	119	9.310	2.88	3	16	1108
Age (I)	107	54.395	5.20	44.73	65.33	
MBA (I)	119	2.378	1.75	0	8	283
Md (I)	119	1.781	1.46	0	6	212
Doc (I)	119	0.949	1.03	0	4	113
%business (I)	119	0.463	0.20	0	0.857	524
%otherprof (I)	119	0.443	0.19	0.111	1	487
Account (I)	119	0.184	0.38	0	1	25
%busy (I)	119	0.456	0.23	0	1	505
%max20 (I)	119	0.072	0.12	0	.5	66
Cursoexec (I)	119	0.630	0.80	0	3	75
Indceo (I)	118	0.830	0.37	0	1	98
%indep (I)	119	0.907	0.14	0.118	1	101
ADRtime (I)	119	4.873	2.63	0.6	14	
Capintens	116	10.700	45.79	0.188	315.503	
Lnassets	119	15.929	1.27	12.491	19.165	
ADR3 (I)	119	0.394	0.49	0	1	
Govern (I)	119	0.201	0.40	0	1	
iMBA (I)	119	0.823	0.38	0	1	98
iAccount(I)	119	0.184	0.39	0	1	22
iMD/PhD (I)	119	0.882	0.32	0	1	105
iBusy (I)	119	0.310	0.46	0	1	37
iCeocourse (I)	119	0.445	0.49	0	1	53
iSize (I)	119	0.537	0.50	0	1	64
iAge (I)	119	0.722	0.45	0	1	86
iBusinDeg (I)	119	0.478	0.50	0	1	57
iMax20% (I)	119	0.857	0.35	0	1	102
iotherDeg (I)	119	0.621	0.48	0	1	74
Firmvl (D)	119	0.847	0.76	0.052	5.770	
Tobin1 (D)	119	1.435	0.71	0.692	6.072	
tobin2 (D)	119	1.103	0.67	0.085	5.405	
Mtb (D)	119	1.993	1.31	0.213	8.2756	
OpRoc (D)	119	0.307	0.17	-0.236	0.787	
BODQI (I)	119	0.586	0.14	0.3	1	69.8

There is difference about directors skills across firms when look to the academic degrees, experience and age. The descriptive statistics show us that a small proportion of all directors participated in programs of post-graduations such as MBA, Master or Doctor Degrees and, still less management courses for director's actualization with new management techniques, taking into account this sample.

Unintentionally underestimate other professions it's rare to find accountants inside the board considering the strong recommendations of almost all corporate governance codes that need professionals to be stay up-to-date and to have deep understanding of financial statements. In this sample are closer to 2.5% the percentage of accountants seated in these boards.

The number of directors' bachelor in business areas and other degrees do not close exactly for two reasons. First, the report does not disclose information of all directors and, second, because in some cases directors are too old and/or do not have a bachelor degree. The BOD need to be diversified to exchange ideas and different points of view, but needs to consist of professionals with high preparation and background to develop core competencies and avoid frauds or take decisions in their interests.

Considering the 1.108 seats and the maximum score of 119 points for all firms, and all qualitative characteristics observed its little to this sample achieving 69.8 points, slightly surpassed the half score.

The table of correlation matrix was suppressed for the first regression with each variable of the index because exceed the number of pages and page limit. However, I draw attention to some points as the correlation 51.45% among *iMBA* and *iMd/PhD*. The same situation occurs with *iBusiDeg* and *iOtherDeg* achieving 74.62% of correlation. Other high correlation is *Ceopresi* used as control variable with *imax20%* achieving 52.22%. To reduce the possibility of regression problems the variance inflation factor (VIF) observes potential problems of multicollinearity that will be present in regression results.

The final sample totalizes 119 observations from 1999 to 2006. The panel data regression with fixed effects, random effects and ordinary least squares (OLS robust standard errors) was applied. The Breusch-Pagan and Hausman statistics shows that random effects are better specified than fixed effects but OLS are better specified than random effects and the results will be presented only for OLS robust regression. The correlation matrix only for the second regression is:

Table 6. Correlation of Dependents variables, Index and Control Variables

	BODQI	Indep	Ceopresi	Lnat	Lntime	capinst	govern	AD3
BODQI	1.0000							
Indep	0.1021	1.0000						
Ceopresi	0.0992	0.3394	1.0000					
Lnassets	0.1305	0.1363	-0.0131	1.0000				
Lntime	0.0811	-0.0256	-0.1310	0.1696	1.0000			
Capint	-0.0201	0.1185	0.1017	-0.0771	-0.1265	1.0000		
Govern	0.1941	-0.0245	0.2169	0.4285	-0.3058	-0.0949	1.0000	
ADR3	-0.2738	-0.0071	0.1015	0.1336	-0.3634	-0.1684	0.3854	1.0000
Vlrfirm	0.0963	-0.0958	0.0042	-0.2271	-0.0689	-0.0717	-0.1862	0.0237
Mtb	0.1246	0.0137	0.0441	-0.1433	0.0350	-0.0379	-0.2329	-0.0284
Tobin1	0.0924	-0.0576	0.0278	-0.2054	-0.0732	-0.0467	-0.2111	0.0320
Tobin2	0.1165	-0.0402	0.0495	-0.1272	-0.0759	-0.1022	-0.1455	0.0541
OpRoe	0.0173	0.0728	-0.1789	0.3190	0.0875	-0.0649	0.0114	0.1282

The correlation matrix shows us that there is small correlation among variables, no one above 50%, principally with BODQI and dependents and others independents as control variables. Other interesting point is the negative correlation (-0.2738) between BODQI and ADR, suggesting that firms in strong governance environments decrease the quality of BODQI.

In the first regression that test separately all variables considered to construct the index of board of directors' quality (categorized by dummy variables) and control variables such as internal mechanisms of corporate governance, firm specific, ADR level and state-owned control (*govern*). The first regression uses only these control variables because there are many independents variables as follow in table 7.

This approach aims to verify the importance of skills of the BOD and how they can affect value and performance of firms and to validate statistically each characteristic. Thus, the evidences indicates that all training and higher degrees of education can contribute to improve value and/or performance, but first to improve directors' performance that contributes to firms strategies in accordance to arguments of Feltovich, Harbaugh and To (2002) and Spence (2002). Nonetheless, *iMBA* is negative related with performance (*OpRoe*).

Table 7. Results of the Five Regressions With Individual Characteristics

$$\text{Dependent (1-5)} = \beta_0 + \beta_1 iMBA_{i,t} + \beta_2 iAccount_{i,t} + \beta_3 iMD/PhD_{i,t} + \beta_4 iBusy_{i,t} + \beta_5 iCeocourse_{i,t} + \beta_6 iSize_{i,t} + \beta_7 iAge_{i,t} + \beta_8 iBusinDeg_{i,t} + \beta_9 iMax20\%_{i,t} + \beta_{10} iOtherDeg_{i,t} + \beta_{11} Indep_{i,t} + \beta_{12} Ceopresi_{i,t} + \beta_{13} Lnat_{i,t} + \beta_{14} Goven_{i,t} + \beta_{15} ADR3_{i,t} + \varepsilon_{i,t}$$

Independent variable	Models with Dependent Variables					VIF
	firmvl (1)	tobin1 (2)	tobin2 (3)	mtb (4)	OpRoe (5)	
<i>iMBA</i>	0.115 (0.453)	0.126 (0.366)	0.040 (0.774)	0.250 (0.367)	-0.102 (0.011)**	1.90
<i>iAccount</i>	0.441 (0.006)***	0.385 (0.009)***	0.401 (0.005)***	0.832 (0.013)**	-0.015 (0.687)	1.36
<i>iMD/PhD</i>	0.718 (0.023)**	0.675 (0.017)**	0.685 (0.013)**	1.274 (0.006)***	0.166 (0.005)***	2.64
<i>iBusy</i>	0.253 (0.122)	0.247 (0.096)*	0.250 (0.083)*	0.304 (0.221)	0.037 (0.329)	1.45
<i>iCeocourse</i>	0.354 (0.004)***	0.331 (0.004)***	0.342 (0.002)	0.697 (0.004)***	-0.002 (0.965)	1.70
<i>iSize</i>	0.453 (0.005)***	0.377 (0.012)**	0.373 (0.009)***	0.778 (0.017)**	-0.012 (0.777)	1.90
<i>iAge</i>	-0.091 (0.523)	-0.137 (0.304)	-0.167 (0.212)	-0.521 (0.074)*	-0.014 (0.742)	1.92
<i>iBusinDeg</i>	-0.601 (0.030)**	-0.571 (0.023)	-0.496 (0.043)**	-0.752 (0.052)*	-0.004 (0.937)	3.14
<i>iMax20%</i>	-0.781 (0.107)	-0.798 (0.068)*	-0.569 (0.182)	-1.141 0.084	-0.018 (0.774)	3.37
<i>iOtherDeg</i>	0.363 (0.095)*	0.359 (0.064)*	0.309 (0.102)	0.451 (0.173)	0.029 (0.575)	3.04
<i>Indep</i>	0.350 (0.013)**	0.303 (0.018)	0.313 (0.009)***	0.600 (0.029)**	0.040 (0.267)	1.50
<i>Ceopresi</i>	0.391 (0.172)	0.473 (0.071)*	0.392 (0.131)	0.959 (0.025)**	-0.025 (0.610)	2.24
<i>Lnassets</i>	-0.092 (0.178)	-0.059 (0.366)	-0.018 (0.753)	-0.054 (0.630)	0.066 (0.002)***	3.31
<i>Govern</i>	-0.654 (0.001)***	-0.687 (0.000)***	-0.613 (0.753)	-1.474 (0.000)***	-0.105 (0.017)**	1.57
<i>ADR3</i>	0.268 (0.088)*	0.282 (0.046)**	0.348 (0.015)**	0.567 (0.028)**	0.091 (0.015)**	1.82
Intercept	0.958 (0.259)	1.077 (0.167)	0.177 (0.811)	0.074 (0.963)	-0.902 (0.002)***	
R²	45.67%	48.14%	42.77%	46.96%	46.38%	

Obs.: All variables that start with “i” are binary (1 or 0) according to the BODQI. Dependents variables: firmvl, tobin1, tobin2, mtb and roe; Independent variables and control variables was presented in tables 1, 2 and 3, respectively.

As expected master and doctor degrees (*iMD/PhD*) and executive/management (*iCeocourse*) courses can contribute to improve value and performance in accordance with Spence (2002) and Feltovich, Harbaugh and To (2002) that high types of education signaling high-quality of directors to the market and increase the reputation of the firm in this context. Complementarily, it is possible that Brazilian and North American investors consign confidence in high types of BODs.

A board with few busy directors (*ibusy*) are positive related to Tobin’s Q (models 2 and 3). In this sense, they have more time to plan firms’ strategies contributing to maximize shareholder value. The proxy to have at least one expert in accounting (*iaccount*) in BODs contributes to improve value, but there is no statistical relation with performance. Possible the market realize this as a potential mechanism to mitigate fraud or earnings management.

Another questionable recommendation by codes is the size of BOD, the evidence in this paper shows that one BOD that follows the advisor suggestion to have between five to nine seats have positive relation with value. This is consistent with the idea that when there are fewer people to plan, monitoring executive officers and take decisions, tends to be more efficient and faster than large BOD avoiding free-rider problem (BECHT; BOLTON; RÖELL, 2002).

The *iAge* have negative slope coefficient with all dependent variables but statistically significant only with market to book suggesting that too much old directors do not contribute to seize growth opportunities. The characteristic *iOtherDeg* contributes to increase value but with small slope coefficient according to the idea that different undergraduates in the BOD exchange more expertise in specific points.

After evaluated the effect and relation (by regressions above) of each characteristics parameterized by binary variables, the results of the second regression using the index of board of directors quality will be present as follow:

Table 08. Results of the Five Regressions

$$\text{Dependent (1-5)} = \beta_0 + \beta_1 \text{BODQI}_{i,t} + \beta_2 \text{Indep}_{i,t} + \beta_3 \text{ceopresi}_{i,t} + \beta_4 \text{lnat}_{i,t} + \beta_5 \text{Intime}_{i,t} + \beta_6 \text{capintens}_{i,t} + \beta_7 \text{govern}_{i,t} + \beta_8 \text{ADR3}_{i,t} + \varepsilon_{i,t}$$

Independent variables	Models with Dependent variables					VIF
	firmvl (1)	tobin1 (2)	tobin2 (3)	mtb (4)	OpRoe (5)	
<i>Bodqi</i>	1.051 (0.022) [2.33]	1.026 (0.016) [2.45]	0.989 (0.016) [2.45]	2.045 (0.015) [2.47]	0.079 (0.401) [0.84]	1.28
<i>Indep</i>	-0.022 (0.912) [-0.11]	-0.022 (0.907) [-0.12]	0.032 (0.856) [0.18]	0.042 (0.902) [0.12]	0.037 (0.299) [1.04]	1.29
<i>Ceopresi</i>	0.063 (0.634) [0.48]	0.124 (0.287) [1.07]	0.142 (0.245) [1.17]	0.329 (0.121) [1.56]	-0.065 (0.092) [-1.70]	1.24
<i>Lnassets</i>	-0.139 (0.030) [-2.20]	-0.093 (0.111) [-1.61]	-0.037 (0.498) [-0.68]	-0.065 (0.536) [-0.62]	0.055 (0.002) [3.25]	1.64
<i>Intime</i>	-0.574 (0.091) [-1.71]	-0.541 (0.092) [-1.70]	-0.479 (0.110) [-1.61]	-0.606 (0.224) [-1.22]	0.018 (0.505) [0.67]	2.36
<i>Capintens</i>	-0.004 (0.017) [-2.43]	-0.003 (0.034) [-2.15]	-0.003 (0.016) [-2.44]	-0.004 (0.091) [-1.71]	-0.0001 (0.552) [0.64]	1.23
<i>Govern</i>	-0.653 (0.030) [-2.20]	-0.741 (0.009) [-2.65]	-0.636 (0.018) [-2.41]	-1.372 (0.005) [-2.89]	-0.084 (0.110) [-1.61]	1.87
<i>ADR3</i>	-0.066 (0.637) [-0.47]	-0.014 (0.912) [-0.11]	0.007 (0.953) [1.41]	-0.996 (0.064) [1.87]	0.077 (0.057) [1.92]	1.86
Intercept	3.578 (0.006) [2.80]	1.970 (0.020) [2.37]	0.937 (0.242) [1.18]	1.178 (0.471) [0.72]	-0.620 (0.015) [-2.48]	
R²	32.98%	32.52%	28.20%	22.57%	23.93%	

Obs.: Dependents variables: firmvl, tobin1, tobin2, mtb and roe; **Bodqi** is the board of directors quality index; the others are control variables was explained in table 3. Coefficients are shown in first line, [p-value] appears in second line and (t-statistics) in third line.

The results show positive and strong slope coefficients¹¹ 1.051, 1.026, 0.989, 2.045, for firm value, tobin1, tobin2 and market-to-book with BODQI, respectively. But the BODQI is not statistically significant with performance measured by *OpRoe*.

This result is interesting because in all tests the slope coefficient is higher than other studies that used indices. In this case, this research focuses only in BOD quality as mechanism of corporate governance not mixed with others dimensions of governance, avoiding problems with theoretical and outcomes of statistical regressions link. The results suggest that the market recognize these high types of BODs when look for value variables.

¹¹ The slope coefficients changes in very small percentage when use different or insert new control variables. For BODQI the lower coefficient obtained in tests was 0.84.

In both regressions the dummy variable *govern* for firms state-owned have negative relation to value and performance suggesting that these firms can be target of potential political conflict of interests or a lack of professional management. This result suggests that possibly there are more agency problems in these companies.

ADR3 is only significant but negative related to *mtb* (-0.996), however, slight positive relation with *OpRoe* which may suggests that market realize the high costs to trade ADRs at US Capital Market to arrange firm internally.

6 Conclusion and Implications for Future Research

This paper developed a new index that measure the quality of Board of Directors contributing to the literature about internal corporate governance mechanisms using diversity on directors' attributes to categorize the points to the BODQI. The focus in one feature of corporate governance can improve analysis and the empirical relations among variables, while in the literature there are many indices linking internal and external mechanisms and put all together making it difficult to analyze results providing unclear links among indices and firm value and performance (BHAGAT; BOLTON; ROMANO, 2007).

The results firstly show the relation of each characteristics and their relation with different measures of value and performance. The main evidences that impact value positively are: i) directors with higher education degrees; ii) accountants seated in the boards; iii) directors that participated in management/executive programs (courses) and; iv) the BODQI impact firm value positively greater than variables separated.

These results show that market recognize growth opportunities of firms (looking to the market-to-book) and the signaling of higher education degrees and other characteristics sounds good to the reputation of these directors in the market. Meanwhile, these results lead us to inconclusive considerations about arrangement of different bachelor's degrees of the directors.

The expectation is that the index developed in this study can contributes to the literature, investors, practitioners and regulators since the BODQI is related with all dependents variables of value and focus only in qualitative characteristics and attributes that signaling quality and reputation from board of directors to the market.

As many studies with specific samples using large firms as Carcello et al (2002), this research have the same limitations such as to use large public firms and a small number of observations, because of these boundaries this study should be regarded as an exploratory investigation.

For future research I suggest to use a large sample of firms sorted randomly and an international comparison of the index to validate their consistency or put new variables (characteristics) in the context. Another concern is whether board of director's characteristics affects firm value or the environment needs boards of directors with high types of professionals.

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