DIFFERENT LEVELS OF CORPORATE GOVERNANCE AND THE OHLSON VALUATION FRAMEWORK: THE CASE OF BRAZIL

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Abstract

We examine whether Brazilian companies with enhanced corporate governance levels have higher market values according to the model of Ohlson (1995), modified to include variables such as governance level, type of control and shareholding structure. This study produces empirical results based on information taken from the Economática® and Brazilian Securities Commission (CVM) databases, in the period from 2004 to 2010. Multiple linear regression on panel data is used to analyze a sample of 90 firms through 630 observations. The findings indicate that the addition of governance measures to the model increased its explanatory power, suggesting that nonfinancial information about governance practices and ownership structure also can explain the market value of stocks. The results also indicate that firms with shares traded on the Level 2 and New Market trading segments of the BM&FBovespa, which require enhanced governance practices, are important signals of good governance and consequently increase firms' market value. The type of control was also positively related to the market value, suggesting that firms under family control and government control are more valuable than companies without concentrated control.

Keywords: Corporate Governance, Value, Ohlson, Family Control

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1. Introduction

The world in recent years has been passing through various cultural, social, economic and political transformations. Accounting, along with other sciences, has been facing pressures to adjust to the new perspectives and new demands from society, such as changes in the ways to compensate stockholders and executives and the emergence of more complex organizational models, in an economy increasingly based on information (Hopwood, 2007:1369). Just at Ball and Brown (1968) pioneered understanding the behavior of earnings in the capital market, the importance of corporate governance to firm value has been documented since the seminal work of Jensen and Meckling (1976), considered a watershed in research on corporate governance, which has prompted many other empirical studies and theoretical models (Saito and Silveira, 2008:79).

As in the majority of works on corporate governance, there is a need to mention the seminal work of Berle and Means (1932), who through statements like "...there are no dominant owners, and control is maintained in large measure apart from ownership" (Berle and Means, 1932:110) started the discussions about the separation of ownership and control in large companies in the United States and contributed to the future development of research on corporate governance.

There are many interesting points that can be discussed regarding corporate governance as an instrument to reduce agency conflicts and increase information transparency. The management of conflicts and reduction of information asymmetry can – or at least should – help increase a firm's efficiency and also its market value (Lee, Lin and Chang, 2011:420, Sampaio, Lima and De Paula, 2011:2). However, there have been few studies of these issues in the Brazilian market.

During the past decade Brazil has undergone many transformations, resulting in a more liquid capital market, greater transparency and better corporate governance. An example of this is the creation by the BM&FBovespa[1] of special trading segments requiring higher levels of corporate governance, called Level 1, Level 2 and New Market (detailed in Section 2), which in theory can increase the market value of the firms listed in these segments.

[1] The BM&FBovespa was created in 2008 through the merger of the BM&F (Mercantile and Futures Exchange) and Bovespa (São Paulo Stock Exchange).

Various studies have examined the relationship between corporate governance and the value of firms. These studies have often presented diverging results regarding the characteristics for identifying the outcome of these practices in the Brazilian capital market. Neves and Lemes (2009) studied the effect on stock price and liquidity of Brazilian firms with ADRs traded on the New York Stock Exchange (subject to the Sarbanes-Oxley Act among other rules) in comparison with those adhering to the New Market. The authors did not identify any significant differences between the average stock prices of the 10 firms listed in the New Market and the 24 with ADRs traded in the American market.

In a more recent study, Sampaio, Lima and De Paula (2011), through difference of means tests and correlation studies, did not find significant differences for the stock returns of firms under family control and those not under family control, and also did not find any differences in the returns of family firms with and without family members holding senior management positions.

According to Terra and Lima (2006:35) "...investors react differently to some signals of good corporate governance practices," such as to firms that are faster versus slower in disclosing their financial statements and privately owned versus government-controlled firms. However, these authors did not find a statistically significant difference in the returns for companies listed on the BM&FBovespa with different governance levels (Terra and Lima, 2006:44).

In contrast, according to Dalmácio et al. (2005:14), "corporate governance characteristics can significantly affect the valuation models, mainly in countries with different characteristics than those found in the more developed countries." Two features of the Brazilian market that differ from those of more developed countries are that credit is mainly obtained through banks rather than the bond market and shareholding is highly concentrated (Lopes, 2002:77). Based on the statement of Hopwood (2007:1370-71) that accounting "...can be and indeed should be constantly examined, re-examined, interrogated, and criticized within the world of knowledge", this paper examines the following research question: **From the perspective of the Ohlson valuation model, does enhanced corporate governance increase the value of firms in the Brazilian capital market?**

To respond to this question, we made some adjustments to the model as originally proposed by Ohlson (1995) to capture the influences of differentiated corporate governance on the market value of Brazilian firms, through the addition of governance proxies in the model.

The model of Ohlson (1995) is a "...model of a firm's market value as it relates to contemporaneous and future earnings, book values, and dividends" (Ohlson, 1995:661). Based on the dividend discount model, he constructed a model that reflects a firm's market value in terms of its book value, abnormal earnings (residual income) and other information (Ohlson, 1995, pp. 665-672; 679). The adaptation of this model in the present study consists of including characteristics of corporate governance within the scope of this "other information", which can increase the explanatory value of the model in the sense of evidencing the importance the market gives to the corporate governance characteristics captured by the proxies employed in this work.

The paper is organized into five sections including this introduction. The next section reviews the concepts and characteristics of corporate governance and the model of Ohlson (1995), as well as their importance to accounting research, to serve as a foundation for the model. The third section explains the methodological procedures and econometric considerations, while the fourth presents and discusses the results and the fifth section contains the conclusions and suggestions for future research.

2. Theoretical Framework

2.1. The Residual Income Valuation of Ohlson (1995) and Corporate Governance

Ohlson's valuation model is very popular in the accounting literature (Kothari, 2001:76). Indeed, it has "...become the basis for empirical work in financial accounting" (Lopes, 2001:49). Its importance to the academic community is unquestionable (Lopes, 2001:49-51), and although many articles have applied the model in a wide range of settings and for varied purposes, the article of Ohlson (1995) contains all the structure to serve as a theoretical foundation for statistical modeling of firm value.

Based on the dividend discount model (Ohlson, 1995:666), in which firm value is explained by the present value of future dividend flow, Ohlson (1995) presented in his seminal work "Earnings, book values, and dividends in equity valuation" a model in which the value can be explained only by accounting variables[2], according to the equation below:

[2] Ohlson (1995) presents in his model a to value firms by their book value and future residual income adjusted by the risk-free rate of return.

$$P_{it} = BV_{it} + \sum_{t=1}^{\infty} R^{-t} E_t(RI_{it+\tau}) \quad (1)$$

Where: P_t is the stock price of firm i at time t, BV is the book value of firm i at time t, R is the risk-free rate of return plus one, and $E_t(RI_{t+\tau})$ is the expected residual income of firm i in period $t+\tau$, where τ = 1, 2, 3... This model is also known as the residual income valuation (RIV) model.

By this approach, the firm is valued by its book value and residual income, in contrast to the attention paid to dividends in other valuation models. Ohlson's (1995) model also assumes that the information dynamics makes the connection between current and future information from abnormal earnings in an autoregressive process according to equations (2) and (3).

$$RI_{it+1} = \omega RI_{it} + v_{it} + \varepsilon_{1t+1} \quad (2)$$

$$v_{it+1} = \gamma v_{it} + \varepsilon_{2t+1} \quad (3)$$

Where: v_{it} is other information besides residual income, ε_{1t+1} and ε_{2t+1} are error terms, and ω and γ are the angular coefficients between the explanatory and dependent variables (non-negative coefficients less than 1).

Based on the assumption that abnormal earnings tend to zero and do not last for long periods of time and that a four-year period for predicting abnormal earnings is sufficient to increase the model's explanatory power, Bernard (1995) argued that this model forecasts and explains stock prices better than models based on short-term dividend predictions and discounted cash flow. Starting from this context, the model here is based on Dechow, Hutton and Sloan (1999) and Hand and Landsman (2005), modifying the model so that the "other information", represented by v_{it} in equation (2), contains corporate governance characteristics, which in turn can increase the model's explanatory power in the sense of explaining firms' stock prices. Equation (1), when combined with equations (2) and (3), produces the following equation:

$$P_{it} = BV_{it} + \alpha_1 RI_{it} + \beta_1 CG_{it} \quad (4)$$

Where: CG represents the corporate governance of firm i in period t, measured by the proxies presented in section 3.3.2, Table 1.

In this sense, equation (4) assumes that the market value of the stock (P_{it}) depends on the book value (BV_{it}) adjusted by current residual income (RI_{it}) and corporate governance (GC_{it}), allowing response to the research question because the variable (GC_{it}) captures part of the "other information" originating from "non-accounting" variables (Ohlson, 1995:668) reflecting corporate governance.

It should be pointed out that my aim here is not to evaluate the quality of Ohlson's model to value companies. My objective is to apply the model as a tool to estimate to what extent the value of firms is connected to corporate governance mechanisms, within the approach of Ohlson's model.

2.2. Corporate governance and differentiated levels in Brazil

The concept of corporate governance started to be coined in the 1930s. With the seminal work of Berle and Means (1932), *The Modern Corporation ad Private Property*, a perspective was introduced regarding the ownership structure of firms. This served as the basis for many other studies over the ensuing decades (with the emergence of the concept of "company government" by Jensen and Meckling (1976)) that contributed to what is today known as corporate governance.

Corporate governance within the accounting approach can be understood as a set of practices that seek to mitigate the costs related to agency problems. For Lopes (2008:171), "... corporate governance mechanisms arise as instruments to correct the flaws in markets." These flaws involve agency conflicts and the related problem of asymmetric information. Agency conflicts generate information asymmetry, which at high levels can erode investor confidence in a given situation. In this respect, Shleifer and Vishny (1997:737) argue for a broad definition of corporate governance: "Corporate governance deals with the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment."

To encourage higher levels of corporate governance in Brazil, the BM&FBovespa created three special trading segments requiring rising levels of governance: Level 1, Level 2 and the New Market (*Novo Mercado*), with the idea of giving greater visibility to firms that achieve determined governance standards and thus make them more attractive to investors because of the greater security in terms of information, and in theory, lower agency costs. In the New Market segment, the firms may not make

distinctions over rights (voting rights and preferential call on cash flows) and can only issue common voting shares. Besides this characteristic of the ownership structure, others can also be highlighted for their importance in enhancing transparency and governance, according to the New Market Listing Rules issued by the BM&FBovespa, in force since May 2011:

- 100% tag-along right, meaning that in case of sale of control, the minority shareholders have the right to sell all their shares for the same price negotiated with the controlling shareholder or group;
- If a decision is reached to delist a company, it must make a public offer to repurchase all the shares for at least the economic value;
- The board of directors must have at least five members, of whom at least 20% must be independent directors (this is only a recommendation in the other segments);
- Minimum free float[3] of 25%;
- Mandatory arbitration of corporate disputes;
- Detailed monthly disclosure of the securities trading of the directors, officers and controlling shareholder.

The other two special listing segments, Level 1 and Level 2, are intermediate between the traditional trading venue and the New Market. Basically, Level 1 requires a minimum free float of 25% and disclosure of additional information than that required by legislation, such as more complete accounting reports and disclosure of securities traded by directors, officers and controlling shareholders. Level 2, in turn, demands the characteristics of Level 1 plus others, such as use of a committee to resolve conflicts of interest rather than the judiciary. In fact, most of the features of Level 2 are the same as those of the New Market, except that companies in this segment can issue preferred shares[4] and the tag-along right is only 80% rather than 100% of the price paid to the controlling shareholder in case of sale of control.

The legal environment also affects corporate governance characteristics. According to Watson (1974), the laws of countries are not written from scratch, but rather are transplanted from a few legal traditions. In this context, two blocks of countries stand out, those following the common law tradition and those in the civil law (or code law) tradition. La Porta et al. (1998:1116) state that countries that follow the common law tradition tend to offer greater protection to creditors and shareholders than those that follow the civil law tradition, irrespective of the country's per capita income.

Brazil, although it is not predominantly market oriented and follows the code law tradition, also has adopted many legal features of the Anglo-Saxon common law model and the Nippo-German model, and its corporate rules can be considered more flexible than those found in Germany, for example (Lopes, 2009:192).

3. Methodology

This article has a positive characteristic because it tries to explain phenomena based on their relations, and also has "... its roots in empiricism..." (Martins and Theóphilo, 2007:41). In this sense, the methodology is empirical-analytic, normal in studies in the positive tradition, since it seeks to explain the relationship between proxies for corporate governance and the value of companies in the Brazilian capital market. Studies with this approach use techniques of data collection, treatment and analysis that are generally quantitative, besides tending to address practical issues with concern for causal relations between variables (Martins, 2002:34).

This study is explanatory because the purpose is to deepen knowledge and explain aspects. For Gil, (2009:42), this type of research "... has the main concern of identifying the factors that determine or contribute to the occurrence of a phenomenon."

In terms of the technical procedures utilized, this study can be classified as bibliographical because it relies on concepts developed by other authors in academic books and articles, and is also ex-post-facto, which according to Gil (2010:54) is characterized by "...systematic and empirical investigation in which the investigator does not have direct control over the independent variables...".

3.1. Some econometric considerations

The data are treated in two dimensions: temporal and spatial. In this context, we employ regression[5] with panel data to consider the effects of unobservable variables in cross-section data[6], such as changes in accounting policies or economic perspectives from one year to the next, reducing the possible collinearity of the variables (the reason autocorrelation tests are not necessary) in function of the larger number of observations studied, producing more informative and efficient data. The use of panel data involves a combination of cross-section and time-series techniques, allowing more than one type of company

[3] The free float is the portion of shares available in the market (not in the hands of the controllers or held in treasury by the company).

[4] Besides preference in receiving dividends, the preferred shares issued by firms listed in the Level 2 segment confer voting rights in certain situations such as mergers and acquisitions.

[5] All the regressions were carried out with White's correction for problems of heteroskedasticity, as covered in section 4.

[6] Cross-section data consider a set of observations (such as firms or groups of firms) during a period of time, such as a quarter or year).

to be analyzed over a time period (Brugni et al., 2011:11).

According to Gujarati (2006:514), the repeated study of a sample of firms over a time series is more suitable when applied under the technique of estimating panel data because it explicitly takes into consideration specific individual variables, making it more "suitable to the study of the dynamics of change." The panel here is balanced because the number of observations is the same in each unit of time.

The three most common approaches to analyze panel data are pooled ordinary least squares (POLS), which is the most conventional form of data analysis, fixed effects and random effects (Fávero et al., 2009:382). To define which of these three approaches to use in this article, we applied two tests: the Hausman test, to define the best model between fixed effects and random effects; and the Breusch-Pagan test, to define the best approach between POLS and random effects. The results are reported in the fourth section.

3.2. Sample selection and data treatment

The sample is drawn from the information on listed Brazilian firms in two databases: that of Economática and that maintained by the Brazilian Securities Commission (CVM), as well as the information released to investors by the companies studied.

Of the total of 791 securities listed in the Economática database and traded up to the date of this writing, we only considered shares issued by companies, thus disregarding other types, such as ADRs and investment fund shares. The sample covered the most liquid common and preferred shares of each firm in each year, to eliminate repeated observations. Of the 670 stocks, we removed those of firms with negative equity, since positive abnormal earnings based on negative equity values do not have an obvious economic interpretation (Frankel and Lee; 1988:29; Gregory et al., 2005:503). We also excluded financial institutions and insurance companies from the sample, due to various factors, such as the difficulty of estimating the cash flow from financial services and the differentiated regulatory rules applicable to banks and insurers as opposed to other listed companies. We then removed firms with zero stock exchange presence[7] in any year of the study (2004 to 2010), as well as firms without any information on the main shareholder in all the years, to eliminate part of the estimation and sample selection problems that can occur from having an unbalanced panel (Wooldridge, 2001:250). After applying these selection criteria, the final sample was composed of 90 firms over a time period of seven years, for a total of 630 observations in a balanced panel.

3.3. Definition of the variables

The model used here is the RIV model of Ohlson (1995). This choice is justified because of the important role that net equity (book value) plays in valuation of companies in Brazil (Dalmácio et al., 2005:14) and its possibility of being modified to capture the effects of other variables to explain the market value (Dalmácio et al., 2005:10). To capture the influences of the corporate governance proxies on the firms' valuation, we modified the residual income model of Ohlson (1995) to include as "other information" the measures of governance and their relations with the stock prices. The resulting empirical model can be represented by the following equation:

$$P_{it} = \alpha_0 + \beta_1 BV_{it} + \beta_2 RI_{it} + \gamma_1 CG_{it} + e_{it} \quad (5)$$

Where: P_{it} is the stock price of firm i in year t; BV_{it} is the book value of firm i in year t; RI_{it} is the residual income (abnormal earnings) of firm i in year t; and CG represents the corporate governance proxies of firm i in year t, with all the variables except governance scaled as price per share[8].

3.3.1. Dependent variable

As mentioned, the aim of this article is to identify the relationship between adhesion to enhanced corporate governance standards and other governance proxies with firms' stock prices. In this context, we did not change the dependent variable of the original model (P_{it}), with this value being the stock price on the last trading day of each year.

3.3.2. Explanatory variables

The original model seeks to explain the stock price by two variables: book value and residual income. Besides these two measures, we added three governance proxies and their interactions with book value, as described in Table 1, to identify not only the relations between governance and value, but also the interactions between the characteristics of corporate governance and book value.

[7] Stock exchange presence here is the ratio of the number of days the stock of firm i in year t was traded and the total number of trading days in that year.

[8] Both types of measurement – general and per share – have limitations, which in turn caused research limitations here. Other potential limitations of this study are the fact we assumed Brazilian GAAP satisfy the clean surplus premises, which may not be the case, and also the assumption of no stock splits in the study period. For more details, see Ohlson (2000).

Table 1. Variables included in the model

ariables	Description
	Price per share
V	Book value, or stockholders' equity
I	Residual income, or abnormal earnings
1	Dummy for companies with shares listed for trading in the Level 1 segment of the BM&FBovespa. Assumes a value of 1 if the firm is listed in this segment and 0 otherwise.
2	Dummy for companies with shares listed for trading in the Level 2 segment of the BM&FBovespa. Assumes a value of 1 if the firm is listed in this segment and 0 otherwise.
M	Dummy for companies with shares listed for trading in the New Market segment of the BM&FBovespa. Assumes a value of 1 if the firm is listed in this segment and 0 otherwise.
FAM	Dummy for companies under family control (value of 1, 0 otherwise).
GOV	Dummy for companies under government control (value of 1, 0 otherwise).
VC	% holding of the largest holder of common (voting) shares with voting rights.
NVC	% holding of the largest holder of preferred (non-voting) shares with voting rights
FAM*BV	Interaction variable between the ownership structure characteristics (family control) and the book value
GOV*BV	Interaction variable between the ownership structure characteristics (government control) and book value
VC*BV	Interaction variable between the percentage holding of the largest holder of voting capital and book value
NVC*BV	Interaction variable between the percentage holding of the largest holder of non-voting capital and book value

Source: Authors.

- **Market value per share (P)**: Represented by the closing stock price on the last trading day of year t.
- **Book value (BV)**: Represented by the book value per share of firm in year t.
- **Residual income (RI)**: **The residual income was obtained as follows**:

$$RI_{it} = EPS_{it} - (E)EPS_{it} \qquad (6)$$

Where: RI_{it} is the residual income of firm i in year t; EPS_{it} is the earnings per share of firm i in year t; and $(E)EPS_{it}$ is the expected earnings per share of firm i in year t.

The expected earnings per share ($(E)EPS_{it}$) was obtained by the following equation:

$$(E)EPS_{it} = BV_{it-1} * (1 + r_t) \qquad (7)$$

Where: BV_{it-1} is the book value per share of firm i in year t-1; and r_t is the risk-free rate of return in year t. The risk-free rate of return in this work is the interest rate paid on passbook savings accounts in year t, as set by the Central Bank of Brazil.

- **Enhanced corporate governance levels (L1, L2 and NM):** This variable was determined by observing the information disclosed by the firms to investors during the study period, supported by consulting the investor relations pages of the firms' websites to identify possible migration between governance levels.
- **Family control (cfam)**: The criteria for classifying firms as family controlled were based on those of La Porta et al. (1999) with some modifications: to be considered a family firm, the level of concentration of common shares held by the main shareholder was changed from 10% to 35% of the shares with voting rights, since the characteristics of the firms studied by those authors do not apply to Brazil in the same way. We also observed up to four levels of equity participation with pyramidal structure, and classified as family firms those controlled by a single shareholder, the same as done by La Porta et al. (1999:481).
- **Percent holding of the largest holder of voting capital (pvc):** Represented by the ratio between the total common shares held by the main shareholder and the total common shares of firm i in year t.
- **Percent holding of the largest holder of non-voting capital (pnvc):** Represented by the ratio between the total preferred shares held by the

main shareholder and the total preferred shares of firm i in year t.

- **Government control (cgov)**: Companies were considered to be government controlled when the majority of the voting shares are held either by the federal or a state government, or subsidiaries thereof.
- Two control variables were added to the model: one for size, since this can have a direct influence on the variables of interest, and one for level of indebtedness, because debt as well as size can influence the flow of resources to the firm and its profit and return.
- **Size (size)**: The proxy for size was the natural logarithm of total assets, as reflected in the equation below:

$$SIZE_{it} = \ln(TA_{it})$$

- **Indebtedness (ind)**: The proxy for indebtedness also took into consideration the operational liabilities of the firms, which in Brazil have relative expression within total liabilities. The debt level was given by the ratio of debt capital over total liabilities:

$$IND_{it} = \frac{DC_{it}}{TL_{it}}$$

Where: IND_{it} = indebtedness of firm i in year t; DC_{it} = debt capital (current + long-term liabilities) of firm i in year t; and TL_{it} = total liabilities (current + long-term liabilities plus stockholders' equity) of firm i in year t.

Additionally, we analyzed the corporate governance measures through their interactions with book value to observe if there were any relations between them.

3.4. Metric Utilized

The modification of the Ohlson (1995) model resulted in the following empirical multiple linear regression model:

$$\begin{aligned} P_{it} = {} & \alpha_0 + \beta_1 BV_{it} + \beta_2 RI_{it} + \phi_1 L1_{it} + \phi_2 L2_{it} + \phi_3 NM_{it} + \gamma_1 CFAM_{it} + \gamma_2 CGOV_{it} + \gamma_3 PVC_{it} + \\ & \gamma_4 PNVC_{it} + \omega_1 CFAM_{it} * BV_{it} + \omega_2 CGOV_{it} * BV_{it} + \omega_3 PVC_{it} * BV_{it} + \\ & \omega_4 PNVC_{it} * BV_{it} + \lambda_1 SIZE_{it} + \lambda_2 IND_{it} + e_{it} \end{aligned} \quad (8)$$

Where: α_0 = intercept; β_1 and β_2 = angular coefficients between the original variables of the Ohlson model and the stock price; ϕ_1, ϕ_2 and ϕ_3 = angular coefficients between the variables representing adherence to enhanced corporate governance levels and the stock price; γ_1, γ_2, γ_3 and γ_4 = angular coefficients of the corporate governance variables and the stock price; ω_1, ω_2, ω_3 and ω_4 = angular coefficients between the interaction variables and the stock price; λ_1 and λ_2 = angular coefficients between the control variables $SIZE_{it}$ and IND_{it}, respectively, and the stock price.

4. Results and Discussions

Before formulating the model described in item 3.4, we performed econometric tests with various variables to identify potential problems that could result in inconsistencies of parameters and biased estimates.

The aim of these tests was to detect possible problems of multicollinearity and heteroscedasticity as well as to define the pest approach among regression with pooled ordinary least squares (POLS), fixed effects or random effects. To detect multicollinearity, we used the variance inflation factor (VIF), which measures how much the variance of a coefficient is inflated by its collinearity. The VIF values were less than 5, suggesting no evidence of multicollinearity.

To identify heteroscedasticity, we used the Breusch-Pagan / Cook-Weisberg test, which indicated problems of heteroscedasticity due to rejection of the null hypothesis that the error terms are homoscedastic. It was thus necessary to use robust Huber-White estimators, which according to Baum (2006:136) are useful in cases where the null hypothesis of homoscedasticity is rejected.

After conducting the tests for multicollinearity, heteroscedasticity and variance of the residuals, we obtained the variables and the model described in item 3.4. Table 2 presents the descriptive statistics of the variables utilized.

Table 2. Descriptive statistics of the modified Ohlson model

Variable	Obs	Mean	Std. Dev.	Q1	Median	Q3
p	630	15.78133	26.79377	2.70010	8.79399	21.20194
bv	630	21.88477	56.69977	1.06771	7.86255	20.25762
ri	630	2.12129	17.57050	0.00809	0.63105	2.72783
l1	630	0.16984	0.37591	0.00000	0.00000	0.00000
l2	630	0.06190	0.24117	0.00000	0.00000	0.00000
nm	630	0.06667	0.24964	0.00000	0.00000	0.00000
cfam	630	0.61111	0.48789	0.00000	1.00000	1.00000
cgov	630	0.14603	0.35342	0.00000	0.00000	0.00000
pvc	630	0.62872	0.25705	0.46890	0.60910	0.88170
pnvc	630	0.04035	0.14354	0.00000	0.00000	0.00000

Source: Authors.

Nearly 40% of the firms in the sample are listed in one of the three special trading segments, with 17% in the Level 1 segment, 6% in Level 2 and 7% in the New Market.

The mean value per share of R$ 21.88 indicated by the model was higher than the average of market value of R$ 15.78. The difference in volatility between the book value and market value of the stocks (represented by the difference between the standard deviations) also was much greater than the difference between the average market value and book value of the stocks.

The average residual income was about 10% of the average book value of the shares. Its standard deviation of 17.57 suggests that the variation in stock prices does not accompany the variation in earnings with the same magnitude, a possibility that requires confirmation by other techniques and evaluation of other variables as well as their explanatory relations with the market value of the shares.

The ownership structure characteristics were measured by the holding of the main shareholder, based on La Porta et al. (1999). The 62.87% average holding of the main shareholder in the voting capital (common shares) versus the 4.03% participation in the non-voting capital (preferred shares) suggests there is considerable dispersion of the non-voting capital and a large portion of the capital is required to establish control.

Another characteristic of the ownership structure is that the concentration remains high in Brazil in comparison with countries like the United States, where ownership of firms is typically dispersed, but is relatively normal in comparison with the great majority of countries. This is in line with the idea of La Porta et al. (1999:474) that the great majority of firms to not fit the description of Berle and Means (1932). Of the 630 observations in the sample, 69.84% were firms where the principal shareholder owns more than 50% of the voting shares, while 38.89% of the observations consisted of firms where the main shareholder owns more than half the total capital. The average of the total shares (common and preferred) held by the main shareholder was 45.03% and the total of common shares held by the main shareholder was 62.87%. During the period studied, there were no substantial changes in the ownership structure of the firms in the sample, as shown in Table 3.

Table 3. Description of the ownership structure of the firms in the sample

Year	Obs	Total shares held by the main shareholder	Standard deviation	Q1	Median	Q3
2010	90	45.75%	23.88	29.18	42.50	59.28
2009	90	46.18%	23.96	28.98	42.73	63.52
2008	90	46.41%	23.86	28.82	43.75	63.52
2007	90	45.13%	23.15	28.73	42.97	58.44
2006	90	43.81%	22.99	27.98	41.85	58.35
2005	90	44.00%	23.17	26.95	40.15	57.77
2004	90	43.96%	23.42	27.17	39.61	58.44
TOTAL	630			28.48	41.24	58.44
MEAN		45.03%				

Ano	Obs	Total of common shares held by the main shareholder	Standard deviation	Q1	Median	Q3
2010	90	61.36%	26.33	43.53	58.32	87.76
2009	90	62.66%	25.91	46.2	60.14	88.17
2008	90	63.79%	25.91	46.98	62.91	88.72
2007	90	63.05%	25.31	46.01	62.17	87.54
2006	90	62.80%	25.72	46.89	59.87	88.14
2005	90	63.33%	25.74	46.98	60.66	88.95
2004	90	63.11%	25.78	46.48	60.67	88.45
TOTAL	630			46.89	60.91	88.17
MEAN		62.87%				

Source: Authors.

The Pearson correlation coefficients indicate a weak correlation between the book value and the corporate governance variables as well as between the abnormal earnings and the governance variables. In this sense, if the governance proxies capture the price variations of the shares, P_{it}, they tend to explain the part of the market value that is not reflected in the performance indicators (BV and RI).

Table 4. Pearson correlations for the modified Ohlson model

Pearson Correlations							
	p	bv	ri	cfam	cgov	pvc	pnvc
p	1.0000						
bv	0.5867	1.0000					
ri	0.5315	0.5138	1.0000				
cfam	0.0432	0.1440	0.0041	1.0000			
cgov	0.0468	-0.0313	0.0107	-0.5184	1.0000		
pvc	0.0036	0.0066	0.0107	0.1576	-0.0970	1.0000	
pnvc	0.0184	0.0442	0.0196	0.028	-0.0461	0.0755	1.0000

Source: Authors.

The correlations of 58.67% and 53.15% between the stock price on the one hand and book value and residual income, respectively, on the other indicate the possibility of high explanatory power of accounting variables for the market value of the shares. The pairwise correlations of the governance variables are weak. Only the correlation between family control and government control is strongly negative, as expected. These weak pairwise correlations indicate that the proxies utilized capture different information about corporate governance practices.

We analyzed the model of equation (8) and the regressions modeled only with the proxies for family control, government control and participations of the main shareholder in the voting and non-voting capital, and also the original Ohlson model. The results are reported in columns 1 to 6 of Table 5.

To define the approach of the regressions with panel data utilized in this article, we applied two tests: the Hausman test and the Breusch-Pagan test. The results of the Hausman test showed that the random-effects approach is more appropriate than the fixed-effects one for the model, since the null hypothesis that the error correction model is adequate was not rejected. The multiplier test for random effects of Breusch and Pagan rejected the null hypothesis that the variance of the residuals, which reflect individual differences, is equal to zero, confirming that the best approach for the model was random effects. Therefore, all the evidence and results of the regressions are presented under the perspective of the random-effects approach.

The R^2 of the original model of Ohlson (1995) (column 6) was 0.42, which can be considered good explanatory power for the market price of the shares. The addition of the governance measures to the model increased the explanatory power, suggesting that non-financial information regarding governance practices can help explain the market value.

Column 1 of Table 5 shows that book value and abnormal earnings are not the only important variables to explain the market value of firms; adhesion to enhanced governance levels, type of control and level of holding of the main shareholder in the capital are also important in this respect, since these variables are all positively related to the market value. The governance measures are statistically significant at 5% (family control and government control are significant at 1%) and are positively related to the dependent variable (with the exception of Level 1 listing, which is not statistically significant).

For the sample analyzed, the results suggest that adhesion to Level 2 or the New Market trading segments sends important signals of good governance and thus increases firms' market value.

The type of control – government or family – also had a positive influence on market value. Unlike in countries with dispersed ownership characteristics, in Brazil firms controlled by families or the state are on average more valuable than those with diffuse control. The figures in column 2 corroborate this, indicating a slightly stronger influence of family control than government control over the dependent variable, both at 1% significance.

Columns 3, 4 and 5 report the effects as measured by the Ohlson model including the percentage holding of the main shareholder in the voting capital (pvc), the original model including the percentage held in the non-voting capital (pnvc), and the original mode with both these variables included and the non-voting capital, respectively. In all cases the results demonstrate that both variables are positively related to the stock price, indicating that firms controlled by a single shareholder (state or individual) or by a family are more valuable than firms with dispersed capital.

Table 5. Regression analysis of Ohlson and corporate governance factors

Exp. Var.	1	2	3	4	5	6
intercept	-42.7469***	-35.0776***	-40.7302***	-28.3233***	-39.0738***	10.2120***
	(11.2311)	12.5971	(9.8686)	(10.1423)	(9.8862)	(1.2097)
bv	0.83831***	0.6119***	0.5556***	0.2286**	0.5132***	0.2042**
	(0.2298)	(0.2042)	(0.2001)	(0.1031)	(0.1814)	(0.0992)
ri	0.4948***	0.5022***	0.4941***	0.4975***	0.4948***	0.5102***
	(0.1626)	(0.1791)	(0.1613)	(0.1642)	(0.1590)	(0.1730)
l1	-1.3750					
	(2.0469)					
l2	11.3860***					
	(3.3952)					
nm	6.2920**					
	(2.7079)					
cfam	4.9892***	7.0743***				
	(2.2995)	(2.0612)				
cgov	5.4648***	6.4602***				
	(2.0987)	(2.0734)				
pvc	10.0925***		9.2980**		7.9362**	
	(3.7609)		(3.8549)		(3.5159)	
pnvc	8.0762**			9.1841***	7.8913**	
	(3.3684)			(3.6121)	(3.4395)	
cfam*bv	-0.3326	-0.4107*				
	(0.2246)	(0.2147)				
cgov*bv	-0.3901	-0.3997*				
	(0.2098)	(0.2093)				
pvc*bv	-0.4170**		-0.5011***		-0.4248***	
	(0.1833)		('0.1962)		(0.1717)	
pnvc*bv	-11.8312			-20.6433**	-11.6965	
	(8.4998)			(10.56579)	(8.3631)	
size	1.9046***	1.8502***	2.0905***	1.7865***	2.0391***	
	(0.5286)	(0.5813)	(0.4528)	(0.4837)	(0.4535)	
ind	-0.0043*	-0.0038*	-0.0037*	-0.0039*	-0.0035*	
	(0.0081)	(0.0084)	(0.0086)	(0.0084)	(0.0086)	
Adjusted R^2	0.4855	0.4393	0.463	0.4391	0.4641	0.4159
N	630	630	630	630	630	630

Notes: This table presents the results of the regression for stock price on book value, residual income and corporate governance factors. The standard errors are reported in parentheses and the asterisks (*, ** and ***) represent significance levels of 10%, 5% and 1%, respectively.

Source: Authors.

Additionally, the findings show that book value, although having an important role in the valuation of companies in Brazil, is not very informative when interacted with the corporate governance measures, indicating that governance practices can influence the stock price without altering the book value, helping to explain the part of the price that is not related to financial variables. Moreover, just a few characteristics of good governance manage to explain a good portion of the market value of firms, suggesting that the type of control and participation of the main shareholders appear to be adequate to capture part of the remaining variations in stock price.

5. Final Considerations

In this work we sought to examine the role of corporate governance and to estimate its contribution to the value of Brazilian companies from the perspective of the model developed by Ohlson (1995). In considering that the book value and market value tended to be different in the period studied – in function of questions such as market inefficiency, for example – we tried to find a realistic approach that took into consideration a time horizon of seven years. The results of the descriptive statistics corroborate this affirmation, since they demonstrate that on average the book value per share is higher than the market value per share in Brazil.

The findings indicate that the R^2 value of the Ohlson model increases when it is modified to capture corporate governance characteristics. This means that book value and abnormal earnings are not the only important variables for firm valuation.

The empirical results suggest that corporate governance is also important to determine firms' market value. A possible mechanism behind this result is that investors tend to place more trust in firms with enhanced governance levels than in firms without any special governance features. Adhesion to the Level 2 and New Market trading segments, for the sample analyzed, are important signals of good governance and consequently increase the market value of those firms. The results also provide evidence that the ownership structure plays a large role in stock values in Brazil. In this respect, firms under family control and government control tend to be more valuable than those without concentrated control, suggesting that the proxies for type of control are adequate to measure governance characteristics.

Book value, although recognized as important for valuation in Brazil, is not very informative when interacted with corporate governance measures. These results signal that governance practices can influence the stock price without altering the book value of companies, helping to explain the portion of the stock price not related to financial variables.

Although the results point to the importance of corporate governance measures, the Ohlson model was able to explain a large portion of the stock price, demonstrating the relevance of book value and residual income in the valuation of firms in Brazil.

Given that firm size can influence the corporate governance model (Alves and Barbot, 2007:119-120), future studies could incorporate new measures of characteristics of boards of directors, such as composition and size, to try to identify if those characteristics have any upward or downward influence on the valuation of firms in Brazil.

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