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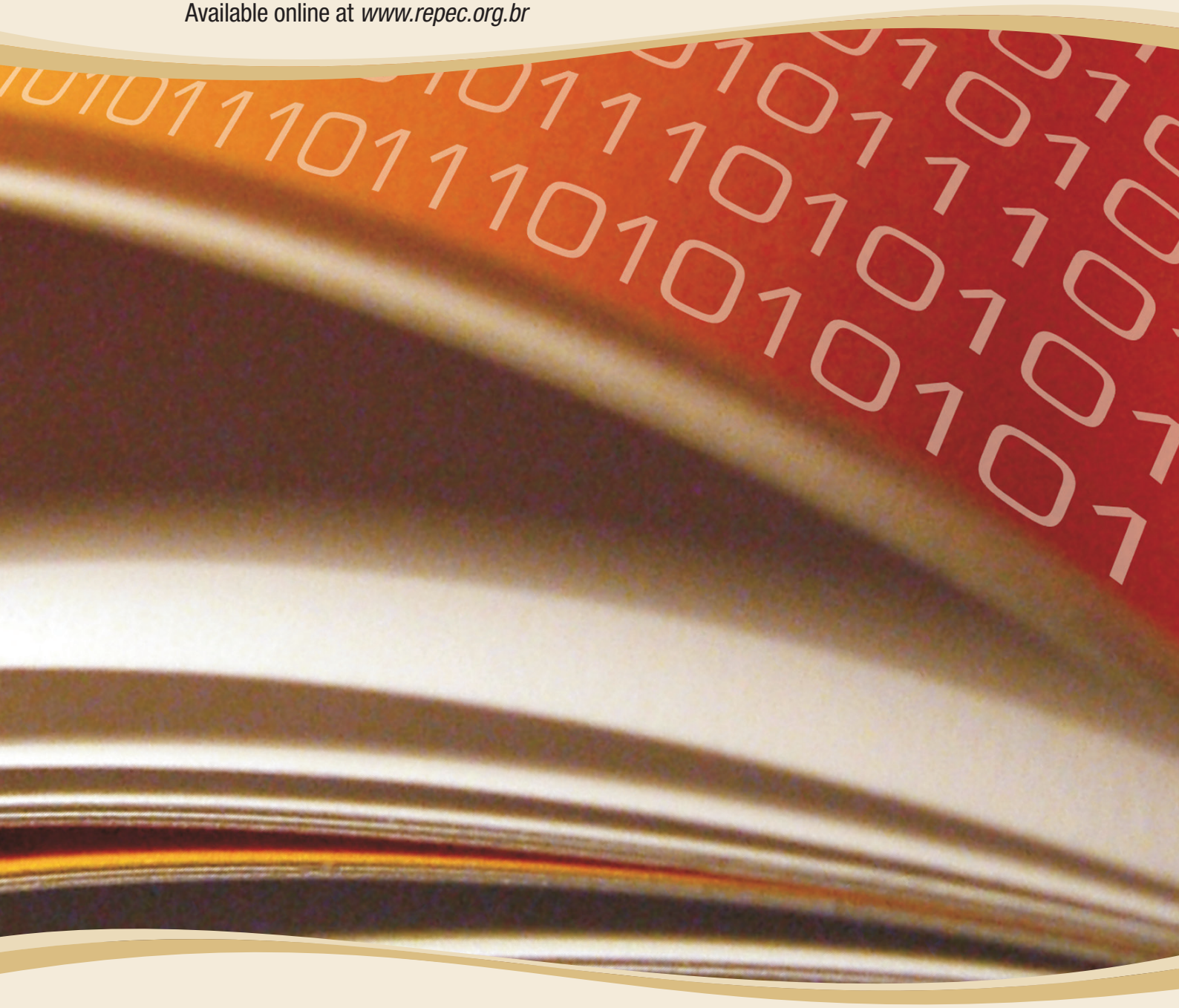

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Editorial

Dear Readers,

The Journal of Education and Research in Accounting (REPeC) is a quarterly electronic journal, published in Portuguese, English and Spanish, and is organized by the Federal Accounting Council (CFC), Brazilian Accounting Foundation (BCF) and the Brazilian Academy of Accounting Sciences (ABRACICON).

It was with great pride that we received the news last July that Journal of Education and Research in Accounting (REPeC) was evaluated by Qualis CAPES and reached the **concept B2**. This is another great achievement for the journal, which has been trying to evolve in terms of quality of the published scientific production. We will continue working on the project, now with a priority focus on increasing the number of indexers.

In this Volume no. 7, Issues no. 3, of July to September of 2013, we have articles that involve different areas of Accounting, as seen as follows.

The first article in this issue, entitled "**Impact of Convergence to International Accounting Standards in Brazil on The Informational Content of Accounting**", written by *Marcelo Alvaro da Silva Macedo, Márcia Reis Machado, Márcio André Veras Machado and Pedro Henrique Cardoso Mendonça,* aimed at article investigates the impact of the process of convergence to international accounting standards in Brazil on the informational content of accounting, focused on the changes in the main accounting and financial ratios and on the relevance of accounting information.

The next work, of the authors *Andréia Carpes Dani, Franciele Beck, Paulo Sérgio Almeida-Santos and Carlos Eduardo Facin Lavarda,* entitled "**Analysis of The Property Structure of Companies Listed on The Corporate Sustainability Index Through the Application of Social Networks**" aimed to verifying the configuration of the property structure and relationship network of shareholders in Brazilian companies listed on the BM&FBovespa Corporate Sustainability Index (CSI).

The third article, entitled "**Executive Remuneration and Financial Performance: a Study of Brazilian Companies**", written by *Elizabeth Krauter,* aimed to investigate the relation between executive remuneration and financial performance in Brazilian companies. The results indicated a significant relation between financial remuneration and financial performance.

Under the title "**A Study on the Accounting Factors Influencing the FIRJAN Municipal Development Index (IFDM) in Brazilian Capitals**", the fourth article published, authored by *Bruna Camargos Avelino, Valéria Gama Fully Bressan and Jacqueline Veneroso Alves da Cunha.* The study showed a statistically significant association between the variables Interest and Debt Charges, Capital Expense, Investments, spending on Culture and Social Assistance and Current Transfers on the one hand and the total IFDM of the selected public entities on the other, showing that accounting information is relevant to determine the IFDM of the capitals analyzed.

The penultimate article in this issue titled "**The Role of The Board of Directors in Hiring the Audit Firm: Empirical Evidence from Brazil**", written by *Kadija Celante Pizetta and Fábio Moraes da Costa*, aimed to investigate if there is a relationship between the characteristics of the board of directors and the type of independent audit firm engaged by companies listed on the São Paulo Stock Exchange (BM&FBovespa).

The last article has the topic "**The Relationship Between Auditing Quality and Accounting Conservatism in Brazilian Companies**" written by *Iana Izadora Souza Lapa de Melo Paulo, Paulo Roberto Nóbrega Cavalcante and Edilson Paulo*. The article shows that the conservatism of accounting information is positively affected by the size of the audit firm and negatively affected by the time of engagement of the auditors, the distance between the date of the opinion and publication date of the financial statements.

A good reading to all!

Prof. Dr. Valcemiro Nossa
General Editor

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Impact Of Convergence To International Accounting Standards In Brazil On The Informational Content Of Accounting

Abstract

This article investigates the impact of the process of convergence to international accounting standards in Brazil on the informational content of accounting, focused on the changes in the main accounting and financial ratios and on the relevance of accounting information. For this purpose, we analyzed publicly traded nonfinancial companies, considering information for 2009, disclosed at the start of 2010 (BRGAAP – partial IFRS) and for the same year, disclosed at the start of 2011 (full IFRS). The purpose of analyzing the data for 2009 was to isolate any other influence found in the accounting statements that did not come from the alteration in accounting standards. The results indicate that the indicators Indebtedness (DEBT), Asset Turnover (AT), Gross Margin (GM), Operating Cash Flow over Total Assets (OPCFA) and Operating Cash Flow over Stockholders' Equity (OPCFE) are lower in the financial statements prepared according to full IFRS. Analysis of the informational capacity of Net Income by means of regression allowed detecting that Net Income has higher explanatory power of the behavior of stock prices under full IFRS. With respect to the informational content of Stockholders' Equity, the results indicate no significant change in explanatory power on the behavior of stock prices.

Keywords: IFRS, informational content of accounting, convergence to international accounting standards, accounting ratios.

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1. Introduction

The emergence and development of multinational companies, the growth of the international financial market and the changing behavior of investors, among other factors, have led to internationalization of economic activity, causing a need for uniform financial statements across borders. However, the interpretation and understanding of accounting information at the international level are hampered by multiple factors, including the diversity of accounting principles and rules on the preparation of financial statements in each country (Callao, Jarne & Laínez, 2007).

> As other players have been appearing, as a consequence of the evolution of business and organizations, accounting has been undergoing gradual transformation, from an ingenious system of bookkeeping and simplified financial statements to a complex system of information and evaluation, with relevant scientific, institutional and social characteristics, having the central aim of satisfying the need for information of the internal and external users with respect to the entity under analysis (Iudícibus, Martins & Carvalho, 2005, p. 11).

The conceptual structure for preparation and disclosure of accounting reports, previously called the basic conceptual structure of accounting, no longer involves just the objectives of accounting, but rather takes in the objectives of accounting reports. This change can be credited to the evolution of the economy, and the consequent expansion of the tasks performed by accounting.

According to Brazil's Accounting Pronouncements Committee (*Comitê de Pronunciamentos Contábeis* – CPC, 2011), the objective of accounting reports is to provide accounting information that is useful to actual and potential investors as well as creditors. It further stresses that accounting reports may not satisfy all the information needs of users (investors and creditors), so they need to pay heed to other information, such as on economic conditions, the political situation and the perspectives and panorama of the company and its economic sector.

Brazil's capital market has experienced strong growth over the past decade, even in moments when the American and European economies were in crisis. Although still incipient in relation to developed markets like the American, the trading volume and number of investors in Brazil has been growing rapidly. According to statistics available at the site of the BM&FBovespa (the Mercantile and Futures Exchange/ São Paulo Stock Exchange), in 2002 there were 85,249 individual (natural person) investors, while in February 2012 this number had grown to 569,826.

In this context, there is a need for accounting in a universal language, to stay abreast of the information needs of investors and creditors in an increasingly complex market without frontiers. As put by Carvalho, Lemes & Costa (2008, p. 14), "strong capital markets cannot exist without transparency and disclosure, and the mechanism par excellence of transparency and disclosure in these markets is the set of financial or accounting demonstrations." Corroborating this idea, the CPC stresses the need to use information beyond that presented in financial statements.

To overcome the accounting language barrier, more than 100 countries are engaged in the challenge or following a common standard for accounting practices. For this purpose, they are adopting the international standards issued by the International Accounting Standards Board (IASB). In Brazil, this process of convergence to international accounting standards started with the enactment of Law 11,638 in December 2007, which took effect in January 2008, requiring a gradual shift to international standards. During this process, there were conceptual modifications, changes in accounting criteria, changes in classification of transactions and inclusion of transactions previously presented off the balance sheet. The objective of the internationalization process of accounting envisioned by lawmakers, according to Lantoo & Sahlström (2009), was to improve the transparency and comparability of accounting statements.

Considering these changes, in this article we address the following research question: What impact has the convergence to international accounting standards in Brazil had on the informational content of accounting?

To answer this question, we analyze the impact of this convergence process in Brazil on the information content of accounting, based on two perspectives: the changes caused in the main accounting and financial ratios and the alterations in the explanatory power of the accounting categories Net Income (NI) and Stockholders' Equity (SE) on stock prices in the Brazilian capital market.

To attain this overall goal, it was necessary to divide the study into two specific objectives: (i) to investigate indications of significant differences between the ratios calculated for the accounting data for 2009 (published in 2010) and for those referring to that same year (republished in 2011); and (ii) to investigate indications of a change in the explanatory power of stock prices in the Brazilian market based on the accounting information for 2009 and 2010.

2. Review of the Literature

2.1 The Internationalization Process of Accounting

The process for internationalization of accounting is the process by which counties, working together, make changes in their accounting systems to reduce divergences between them so as to make their rules compatible (Weffort, 2005). This process cannot be considered a standardization of accounting rules, but rather a harmonization. According to Niyama (2006), standardization is a process of establishing uniform criteria, without flexibility, while harmonization preserves each country's inherent particularities.

According to Santos & Calixto (2010), the adoption of International Financial Reporting Standards (IFRS) in Brazil, as in other countries, will bring benefits to firms such as greater liquidity, lower cost of capital and greater valorization and attractiveness in the market. For multinational companies, harmonization reduces the costs of maintaining different accounting systems (according to each country) and also facilitates the task of preparing consolidated financial statements, besides reducing the loss of information in the conversion of accounting standards.

On the other hand, accounting standards based more strongly on judgments can contribute to a more propitious environment for earnings management, with examples of the potential instruments for this type of manipulation being the discount rates used to bring appraisal of investments to present value and the depreciation rates based on useful lifetime of assets. However, it must be stressed that the use of judgment in accounting practice does not necessarily mean it will be abused to massage earnings (Baptista, 2009).

In Brazil, due to its code law heritage, the laws determine the accounting standards per se and governmental agencies have the power to interpret and elaborate on the basic legal framework. Therefore, the basic accounting rules come from the law and are refined and interpreted by decrees, resolutions, normative instructions, pronouncements and other regulations. In this context, the establishment of accounting rules and standards has traditionally been carried out almost entirely by the federal government, resulting in a strong connection between accounting and tax aspects (Iudícibus, 2010).

Besides the influence of the Brazilian legal system on accounting practices, the fact that the Brazilian capital market is less developed compared to many other countries also has a strong impact on the quality and relevance of the accounting information disclosed.

> In companies with few shareholders (in the Brazilian case, where in many firms the control is in the hands of a single shareholder), accounting loses its role of reducing the information asymmetry between shareholders and managers. In these firms, the majority shareholder has privileged access to the firm's management information and does not need accounting reports to orient investment decisions. (Lopes, 2002, p.77).

Lantoo & Sahlström (2009) point out that previous studies have shown that the adoption of IFRS improves the transparency and comparability of the financial statements between companies. In general, the adoption of IFRS benefits investors especially in countries where actual and potential investors have not

been the priority of the supervisory entity, such as in Brazil and several European countries. This change in priority can be seen in Brazil with the Basic Conceptual Pronouncement (R1) issued by the CPC, correlated with the Blue Book 2011 from the International Accounting Standards Board (IASB), which establishes that the objective of accounting reports is to provide information that is useful for all decisions related to the supply of funding to the firm, considering the primary users to be existing and potential investors, lenders and other creditors.

2.2 The Convergence Process in Brazil

The convergence process in Brazil was marked by two occurrences. The first was the creation of the Accounting Pronouncements Committee (CPC), by Resolution 1,055 from the Federal Accounting Board in 2005 and the enactment of Law 11,638 in 2007. However, it is necessary to mention some antecedents, such as Communication 14,259/2006 from the Brazilian Central Bank, Instruction 457/2007 from the Brazilian Securities Commission (CVM) and Circular 357/2007 from the Superintendency of Private Insurance (SUSEP). In all these cases, specific aspects were covered regarding disclosure of information in line with IFRS.

Similar to the IASB, the CPC is formed by accountants, academics and representatives of companies and financial institutions, with people drawn from the following bodies: Federal Accounting Board (CFC), Brazilian Association of Publicly Traded Companies (ABRASCA), Independent Auditors Institute of Brazil (IBRACON), Association of Capital Market Investment Analysts and Professionals (APIMEC), BM&FBovespa and the Institute for Accounting, Actuarial and Financial Research (FIPECAFI).

The second occurrence, the watershed in this convergence process, was the enactment of Law 11,638/2007, which created a series of changes in accounting practices and determined, in its Art. 177, § 5, that the rules issued by the Brazilian Securities Commission (CVM) shall be formulated in harmony with international accounting standards. That law was the result of Bill 3,741, introduced in the Chamber of Deputies (the lower house of Congress) in 2000, proposing modification of the chapter of the Law of Corporations (Law 6,404/1976) that covers accounting matters, to eliminate regulatory barriers and to align Brazilian accounting rules with international ones.

The CPC was created for the purpose of studying, preparing and issuing Technical Pronouncements on accounting procedures and information disclosure, in function of the needs for international convergence of accounting standards, centralized issuance of rules in Brazil and democratic formulation of these rules. However, that body does not have legal powers to issue accounting rules, because the Brazilian Constitution prevents governmental entities from delegating functions to private entities (Iudícibus, Martins, Gelbcke & Santos, 2010). Because of this constraint, it was agreed that the CPC would first issue the Technical Pronouncements and then the various governmental entities with authority over certain sectors or types of companies (CFC, CVM, Central Bank, regulatory agencies) would issue their own resolutions to apply the CFC's recommendations. Up to March 2012, the CPC had issued 39 Technical Pronouncements. Of these, the CVM and CFC have approved all of them, while the National Health Agency has approved 38, SUSEP 36, the National Electric Energy Agency (ANEEL) 19 and the National Land Transport Agency (ANTT) has approved 4. All of these entities have also approved the Basic Conceptual Pronouncement and the Pronouncement for Small and Medium Businesses.

The CPC has a dual mission regarding convergence:

> On one side is the universal need to integrate accounting rules to international standards; on the other is the need to allow participation in the internal debate by representatives of all actors in the Brazilian market – government, private initiative and academic institutions – through free and democratic dialog in the CPC. (Plöger, 2005).

To complement the changes in accounting practices initiated by Law 11,638/2007, Law 11,941/2009 established further changes to the Law of Corporations (Law 6,404/1976), among them that the commercial accounting and the financial statements regulated by that law cannot be modified in function of tax law or other specific legislation.

During the process of convergence, with the amendment of the Law of Corporations and the issuance of the Technical Pronouncements by the CPC, various changes were established in accounting practices, which can be classified as: (i) changes in accounting criteria; (ii) changes in classification; and (iii) inclusion of accounting for transactions presented off the balance sheet. The Appendix summarizes the main changes, especially those that have caused significant effects on the financial statements.

2.3 Empirical Evidence

With the advance of the process of convergence to international standards, various studies have been performed, particularly for the purpose of investigating the influence of the adoption of IFRS on the quality of accounting information. Below we briefly summarize some of these studies.

Bartov, Goldberg & Kim (2005), utilizing data on 417 German firms, observed greater relevance of accounting information presented according to Generally Accepted Accounting Principles in the United States (US-GAAP) and IFRS than their German counterparts. Barth, Landsman & Lang (2008), through a study of 21 countries, also observed greater relevance of accounting information prepared according to the international standards than local ones. Corroborating this finding, Morais & Curto (2009) showed that in European countries, information according to IFRS is more relevant than that in local GAAPs.

The study by Perramon & Amat (2006) indicated that the adoption of international accounting standards can influence the result of Spanish companies with different sizes and profitability levels. In turn, Hung & Subramanyam (2007) concluded that the total assets and net equity, as well as variations in equity, are more relevant according international standards that German ones. In this same line, Chalmers, Clinch & Godfrey (2009) indicated that the earnings of Australian firms became more relevant with the adoption of IFRS, but the equity value did not significantly change. On the other hand, Haller, Ernstberger & Froschhammer (2009) analyzed 103 German companies and found an increase in stockholders' equity and net income after the adoption of IFRS in 2005.

Chalmers, Clinch & Godfrey (2008) concluded that the accuracy of financial analysts' forecasts increased after the implementation of international accounting standards, indicating the improved quality of the information available to analysts. Investigating financial ratios, Miranda (2008) concluded that the adoption of IFRS can cause significant changes in the financial indicators of banks in some European countries. Lantto & Sahlström (2009), in a survey of Finnish companies, found evidence of a positive change in the main financial ratios after adoption of IFRS. In turn, Silva, Couto & Cordeiro (2009) indicated there was a significant and generally positive impact on the quality of the information in the financial reports of listed Portuguese firms after the adoption of IFRS.

Ding, Hope, Jeanjean, & Stolowy (2007) demonstrated, from studying data from 2001 on firms on 30 countries, that the absence index (the extent to which the rules on determined accounting issues present in international standards are lacking in national ones) is determined by, among other elements, the importance of the stock market and the concentration of ownership. In contrast, the divergence indicator (extent to which the rules regarding the same accounting issue differ between national and international standards) is positively associated with the level of economic development and the importance given to the accounting profession, but is limited by the importance of the stock market. They further found that a higher level of absence implies more opportunities for earnings management and reduction of the disclosure of specific information to investors, while greater divergence from international accounting standards is associated with richer information in the capital markets.

In the Brazilian context, Santos & Calixto (2010) studied the effects of the first phase of the transition to IFRS in companies listed on the BM&FBovespa, starting in 2008, and found higher profits with IFRS than with the previous rules, which might have been explained by the reduction of Brazilian accounting conservatism. Lima (2010) found that adjustments for reconciliation of net income and stockholders' equity in the transition period to IFRS were relevant for the Brazilian capital market.

Macedo, Machado & Machado (2011) observed differences in the relevance of accounting information regarding EPS (earnings per share) and BVPS (book value of equity per share) in the periods before and after the first phase of the convergence to international accounting standards in Brazil, with EPS presenting a gain and BVPS a loss in informational content. The study by Braga, Araujo, Macedo & Corrar (2011) showed there was a significant change (increase) only in the indebtedness index with the republication of the accounting statements for 2007 according to the new accounting practices adopted in Brazil.

In general, the studies that have been published so far show positive impacts of adopting IFRS. However, the findings of some studies do not corroborate these results. The work of Niskaen, Kinnunen & Kasanen (2000), examining Finnish firms, showed that the change in earnings from the local standards to IFRS did not bring a significant increase in the relevance of this accounting information. In this same line, Van der Meulen, Gaeremynck & Willekens (2007) did not find a significant difference in relevance between profits presented according to US-GAAP and IFRS for German New Market firms. In turn, the study by Vishnani & Shah (2008) showed that the new information brought by the cash flow statement due to the process of convergence to international standards in India was not relevant.

In Brazil, Grecco, Geron & Formigoni (2009) showed that the adoption of new accounting practices in 2008 brought greater conservatism to the financial statements of listed companies. Finally, Klann & Beuren (2011) concluded that although better quality was expected with the adoption of the rules from the IASB, the application of IFRS in some countries has not corresponded to this expectation, by not presenting significant differences in relation to the local standards with respect to earnings management.

To contribute to the above findings, our aim here is to analyze the impact of the adoption of IFRS no Brazil, from two perspectives: of changes in accounting information, through analysis of financial ratios calculated with information from financial statements prepared according to BRGAAP and IFRS; and the relevance of accounting information, by analyzing which set of accounting information is able to best explain stock prices – that according to BRGAAP or IFRS.

In this line, we can mention the studies of Perramon & Amat (2006), Silva, Couto & Cordeiro (2009), Haller, Ernstberger & Froschhammer (2009), Lantto & Sahlström (2009), Santos & Calixto (2010) and Braga et al. (2011), all of whom studied the impact of the adoption of IFRS by analyzing the changes in accounting information. In turn, the articles by Niskaen, Kinnunen & Kasanen (2000), Bartov, Goldberg & Kim (2005), Van der Meulen, Gaeremynck & Willekens (2007), Hung & Subramanyam (2007), Morais & Curto (2008), Barth, Landsman & Lang (2008), Morais & Curto (2009), Chalmers, Clinch & Godfrey (2009) and Macedo, Machado & Machado (2011) all analyzed the question from the standpoint of the relevance of accounting information for the capital market.

3. Methodology

This study can be characterized, according to Vergara (2010), as a descriptive and explanatory exercise, because we aim to shed light on the impact of IFRS adoption on the informational content of accounting reports by analyzing the differences in financial ratios and the relationship between this information and stock prices. Regarding the approach used, it can be classified as empirical-positivist according to the framework proposed by Martins & Theóphilo (2009), because it presents techniques for collection, treatment and analysis of quantitative data, where the scientific validation is sought by instrumental tests, levels of significance and systematization of operational definitions.

The sampling process is non-probabilistic, because we obtained our sample from a naturally restricted universe, composed of listed nonfinancial companies contained in the Economática database. The companies included in the study were those with the necessary information in each year of analysis. Because part of the analysis depended on the ratio between stock prices and the accounting information, we used a cutoff criterion according to the liquidity of the shares, considering a value of 0.01 as the minimum for inclusion of the firms in the analysis. This criterion is important in studies of this nature, in which it is considered that companies' stock prices can reflect the relevant information available in the market (hypothesis of semi-strong market efficiency). With this, the final sample was composed of 148 firms.

We collected from Economática data on earnings (net income) per share (EPS), stockholders' equity per share (BVPS), net income (NI), stockholders' equity (SE), total assets (TA), current assets (CA), long-term assets (LTA), current liabilities (CL), long-term liabilities (LTL), net revenue (NR), gross profit (GP) and operating cash flow (OCF).

Based in these data, it was possible to calculate the ratios used in the analysis. The choice of these indicators was discretionary, in light of those used in other works, such as Assaf Neto (2006), Braga (2003), Iudícibus (2008), Marques, Carneiro Junior & Kühl (2008), Matarazzo (2003), Pereira da Silva (2008) and Perez Jr. & Begalli (2002). These ratios are summarized in Figure 1.

We tried to consider financial indicators from various perspectives. Because of this, there are two indicators of capital structure, two of liquidity, one of turnover, two of margin, two of profitability and two related to cash flow.

Denomination	Acronym	Formula
Participation of Debt Capital	PCT	(PC+ELP)/AT
Indebtedness	END	(PC+ELP)/PL
General Liquidity	LG	(AC+RLP)/(PC+ELP)
Current Liquidity	LC	AC/PC
Asset Turnover	GA	RL/AT
Gross Margin	MB	LB/RL
Net Margin	ML	LL/RL
Return on Assets	RSA	LL/AT
Return on Equity	RSPL	LL/PL
Operating Cash Flow over Total Assets	FSA	FCO/AT
Operating Cash Flow over Stockholders' Equity	FSPL	FCO/PL

Figure 1. Financial Ratios Analyzed

Source: Research Data.

Besides this, to analyze the relevance of the accounting information to the capital market, we collected the price of the stock with greatest liquidity of each firm, considering the liquidity index provided by Economática. The prices were the closing quotations for April 30, 2010. We chose the last day for disclosure of the annual financial statements in Brazil based on the assumption of a semi-efficient market, whereby the impact of the accounting figures should already be incorporated into the stock prices.

This choice to consider a single date for the stock prices rather than the date each company published its financial statements is in line with orientations of other authors, who have used this same simplification, such as Lang, Raedy & Yetman (2003), Costa & Lopes (2007) and Morais & Curto (2008).

The choice of the 2009 fiscal year for analysis is justified by the fact that accounting information for this year was available both according to Brazilian GAAP (BRGAAP) and IFRS. The reason is that the obligation to apply full IFRS only applied to the 2010 fiscal year, and firms, to make the information for 2009 comparable with that for 2010 were obliged to republish the figures for 2009 in 2011 along with the financials for 2010.

The logic of the first part of the analysis was to analyze the differences between the ratios calculated from the 2009 data published in 2010 and those disclosed again in 2011. For this purpose, we tested whether the information for each ratio came from the same population. If this was confirmed by a test of equality of the means, it would indicate a statistically significant difference between the values of each ratio under each of the accounting standards considered. Operationally, we tested whether the mean of each ratio calculated with the 2009 data published in 2010 (BRGAAP) was equal to the ratio calculated with the data from 2009 as republished in 2011, or formally, H_0: *indicator(2009-2010) – indicator(2009-2011)* = 0. Hence, H_1: *indicator(2009-2010) – indicator(2009-2011)* ≠ 0.

Since the information being analyzed was from the same set of companies in two different situations, i.e., presented according to two different GAAPs, the application of difference of means tests for matched samples was indicated. According to Siegel & Castellan Jr. (2006), tests for matched samples are applied when the researcher wants to establish whether two treatments are different. In the case of the financial statements for 2009, we wanted to test whether the treatment given to the accounting information under the local standard (BRGAAP) was different from that given by the international one (IFRS), that is, if the adoption of IFRS generated a significant impact on the informational content of accounting in the specific case of the ratios under analysis.

The choice of the test for matched samples depends on the evaluation of the basis assumption that the variables (ratios) are normally distributed. To test this assumption, we used the Komolgorov-Smirnov test, at 5% significance. As shown in the analysis of the data, the financial ratios were not normally distributed. Therefore, we used the two leading nonparametric tests for the case of matched samples: the sign test and the Wilcoxon test.

For our purposes, for the sign and Wilcoxon tests, the acceptance of the H_0 would indicate that the ratios based on the accounting information for 2009 published in 2010 or republished in 2011 are equal. In turn, the rejection of H_0 would indicate there are significant differences between the ratios calculated based on the two accounting reporting standards.

In the second part of the analysis, we sought to analyze the effect of the adoption of IFRS on the informational content of the firms' financial statements. Therefore, the focus of the analysis was substantially different from the previous one. In this case our focus was to analyze if the full IFRS adoption altered the capacity of financial information (specifically EPS and BVPS) to explain stock prices in the Brazilian market, by means of regression analysis.

The analysis below is therefore divided into two parts. In the first we use only earnings (net income) per share (EPS) and in the second only book value per share (BVPS). For all the analyses we used simple linear regressions in cross-section, always with the stock price as the dependent variable and the accounting ratios, individually, as the independent (explanatory) variables. We reiterate that our focus is on whether the accounting information from 2009 published in 2010 is able to more accurately explain the behavior of the stock prices of firms in the Brazilian market than the information for that same year as republished in 2011.

Therefore, to verify individually the explanatory capacity of EPS and BVPS on the one hand and stock prices on the other, we used the following equations, based on the studies of Collins, Maydew & Weiss (1997) and Macedo, Machado, Murcia & Machado (2011):

$$p_{i,t} = \alpha_0 + \alpha_1 LLPA_{i,t} + \varepsilon_i \quad (1)$$

$$p_{i,t} = \alpha_0 + \alpha_1 PLPA_{i,t} + \varepsilon_i \quad (2)$$

Where:

- $p_{i,t}$ = Dependent variable, representing the stock price of firm *i* at time *t*;
- α_0 = Intercept;
- α_1 = Coefficient of slope for *EPS* or *BVPS*;
- *EPS* = Independent variable, obtained by dividing the net earnings shown in the income statement by the number of shares of firm *i* at time *t*;
- *BVPS* = Independent variable, obtained by dividing the stockholders' equity shown in the balance sheet by the number of shares of firm *i* at time *t*;
- ε = Random error (white noise), with normal distribution, mean zero and constant variance.

For the regression analysis, we basically considered the values of R^2, the Akaike and Schwarz information criteria and the p-values of the *F*-test (significance of R^2) and the *t*-test (significance of the angular coefficient of the independent variable).

According to Gujarati (2006), Corrar, Paulo & Dias Filho (2007) and Fávero, Belfiore, Silva & Chan (2009), analysis of R^2 reveals the explanatory power of the independent variables on the dependent variable. In turn, the Akaike and Schwarz information criteria show the goodness of fit of the model (both criteria are the lower the better type). Finally, the p-values of the *F*- and *t*-tests show if the independent variables together and individually, respectively, are statistically able to explain the behavior of the dependent variable.

For the case of the assumptions of simple regression, as indicated by Gujarati (2006), Corrar, Paulo & Dias Filho (2007) and Fávero et al. (2009), to test the normality of the residuals we used the Jarque-Bera (JB) test and to test the homoscedasticity of the residuals we used the Breusch-Pagan-Godfrey (BPG) test. According to Fávero et al. (2009), in general it is not necessary to test for autocorrelation of the residuals when working with cross-section data, as in the present study.

For the cases where we found a problem of heteroscedasticity of the residuals, we used the White test, which according to Gujarati (2006) corrects the standard errors of the coefficients, making them consistent for heteroscedasticity. To analyze the differences in the ratios, we used the SPSS 17.0 software, while to analyze the relevance of the accounting information, we used Eviews 6.0.

4. Analysis of the Results

As stated before, the analysis was carried out in two phases: (i) investigation of whether there were statistically significant differences between the ratios calculated with the 2009 information according to BRGAAP (published in 2010) and those computed with the information under full IFRS (republished in 2011); and (ii) analysis of the impact of IFRS on the information content of accounting, by examining the capacity of EPS and BVPS to explain the behavior of the stock prices.

In the former case, the first step was to calculate the mean values of each financial ratio, and in a preliminary analysis, to observe the behavior of the ratios with the information based on the two GAAPs. From the results in Tables 1 and 2, it can be seen that only Participation of Debt Capital (PDC) has a distribution tending to normal. In turn, according to the results of the nonparametric tests of the difference of means, in both cases the differences are only significant at 5% for the indicators Indebtedness, Asset Turnover, Gross Margin, Operating Cash Flow over Total Assets and Operating Cash Flow over Stockholders' Equity.

In relation to the ratios that showed a significant change due to adoption of IFRS, it can be seen that in all cases both the mean and median are lower than those obtained with data published under full IFRS, a contrary result to that found by Braga et al. (2011), who observed an increase in the debt ratio. However, the findings here are coherent with those of Haller, Ernstberger & Froschhammer (2009).

Table 1
Means and Medians of the Ratios

Ratio	Means		Medians	
	Data 09 - 10	Data 09 - 11	Data 09 - 10	Data 09 - 11
PCT	0.6043	0.5920	0.5528	0.5482
END	1.8218	1.5007	1.1760	1.1525
LG	1.2276	1.3031	0.9628	0.9772
LC	2.0201	2.0380	1.7583	1.6977
GA	0.7296	0.6827	0.5794	0.5335
MB	0.3568	0.3547	0.3256	0.3247
ML	0.0236	0.0422	0.0836	0.0949
RSA	0.0413	0.0482	0.0517	0.0531
RSPL	0.1587	0.1415	0.1392	0.1330
FSA	0.0707	0.0580	0.0835	0.0679
FSPL	0.2572	0.2095	0.1804	0.1487

Source: Research Data.

Table 2
Results of the Tests of Difference of Means of the Ratios

Indicador	p-valor		p-valor	
	Test K-S 09-10	Test K-S 09-11	Wilcoxon Test	Sign Test
PCT	0.2000	0.2000	0.1660	0.8600
END	0.0000	0.0000	0.0050	0.0430
LG	0.0000	0.0000	0.9450	0.7290
LC	0.0000	0.0000	0.0970	0.1160
GA	0.0000	0.0000	0.0000	0.0000
MB	0.0000	0.0000	0.0120	0.0150
ML	0.0000	0.0000	0.2250	0.1710
RSA	0.0000	0.0000	0.4230	0.7310
RSPL	0.0000	0.0000	0.2380	0.2250
FSA	0.0010	0.0000	0.0000	0.0000
FSPL	0.0000	0.0000	0.0000	0.0000

Source: Research Data.

Continuing, we applied regression analysis to the EPS and BVPS and the stock prices. Preliminarily, with respect to the assumptions of the regression, in all cases there was a problem of normality of the residuals, according to the results of the Jarque-Bera (JB) test, as shown in Tables 3 and 4. However, according to the central limit theorem and considering we used 148 observations, this assumption can be relaxed (Brooks, 2002). In turn, with respect to heteroscedasticity, according to the results of the Breusch-Pagan-Godfrey (BPG) test, it can be perceived that in the regressions with data from 2009 as presented in 2010, the residuals are homoscedastic. For these cases, the results are presented considering the correction of White for heteroscedasticity. In turn, in the regression with the BVPS for 2009 published in 2011, despite having a p-value for the BPG test higher than the 5% significance level, which would lead to rejection of the hypothesis of homoscedasticity of the residuals, we decided, by precaution, to present the results with application of the White correction.

Table 3
Data for EPS

Explanatory or Independent Variable	Coefficient	Standard Error*	t*	*p-value**
LLPA 09-10	1.9064	0.9274	2.0557	0.0416
C	15.1591	1.4261	10.6295	0.0000
Additional Information	**Values**	**Additional Information**		**Values**
R^2	0.1366	Akaike Information Criterion		7.6763
F (*p-value*)	0.0000	Schwartz Information Criterion		7.7168
Jarque-Bera (*p-value*)	0.0000	Breusch-Pagan-Godfrey (*p-value*)		0.0021

Explanatory or Independent Variable	Coefficient	Standard Error	t	*p-value*
LLPA 09-11	1.7886	0.2902	6.1629	0.0000
C	14.7092	0.9587	15.3437	0.0000
Additional Information	**Values**	**Additional Information**		**Values**
R^2	0.2064	Akaike Information Criterion		7.5919
F (*p-value*)	0.0000	Schwartz Information Criterion		7.6324
Jarque-Bera (*p-value*)	0.0000	Breusch-Pagan-Godfrey (*p-value*)		0.1531

* Estimated with White's correction for heteroscedasticity

Source: Research Data.

From the results shown in Table 3, it can be seen that both the EPS for 2009 presented in 2010 and that presented in 2011 are statistically significant in explaining the behavior of the share prices, since the p-value for the *F*- and *t*-tests are lower than 5%. Therefore, the null hypotheses that R^2 is different from zero and that the angular coefficient of the independent variable EPS is different from zero cannot be rejected. In other words, the profit, whether determined based on Full IFRS or not, is a good measure to explain the behavior of the stock prices of the companies in the sample.

However, a comparison of the power of EPS to explain the stock prices shows that both the value of R^2 and the values of the Akaike and Schwarz information criteria are higher than for the data presented in 2011. The reason is that the EPS data published in 2010 are able to explain 13.66% of the variation in the stock prices, while the data presented in 2011 explain 20.64% of the variation in this dependent variable. In other words, there was a significant change in the ability of profits to explain the prices of the firms' shares.

This finding is corroborated by analysis of the information criteria, because in both cases (Akaike and Schwarz) there is a reduction of the values from 2010 to 2011, which shows the greater informational capacity of EPS to explain the stock prices.

In summary, this shows that with the adoption of IFRS in Brazil, EPS gained strength in explaining the behavior of stock prices.

In turn, in relation to BVPS, the results presented in Table 4 also show that both the data published in 2010 and in 2011 are significant in explaining the behavior of the companies' stock prices. This can be observed by the p-values of the *F*- and *t*-tests, which are lower than the 5% significance level, so that the regression as a whole is significant, as well as the angular coefficient of BVPS.

Table 4
Data for BVPS

Explanatory or Independent Variable	Coefficient	Standard Error*	t*	*p-value**
PLPA 09-10	0.6569	0.1459	4.5039	0.0000
C	11.2268	1.2994	8.6768	0.0000
Additional Information	**Values**	**Additional Information**		**Values**
R^2	0.3152	Akaike Information Criterion		7.4445
F (*p-value*)	0.0000	Schwarz Information Criterion		7.4850
Jarque-Bera (*p-value*)	0.0000	Breusch-Pagan-Godfrey (*p-value*)		0.0001

Explanatory or Independent Variable	Coefficient	Standard Error*	t*	*p-value**
PLPA 09-11	0.5259	0.0779	6.7538	0.0000
C	11.5848	1.0100	11.4706	0.0000
Additional Information	**Values**	**Additional Information**		**Values**
R^2	0.3083	Akaike Information Criterion		7.4546
F (*p-value*)	0.0000	Schwarz Information Criterion		7.4951
Jarque-Bera (*p-value*)	0.0000	Breusch-Pagan-Godfrey (*p-value*)		0.0556

* Estimated with White's correction for heteroscedasticity

Source: Research Data.

However, an important difference in relation to the EPS data is that in the case of BVPS, the values of R^2 and the Akaike and Schwarz criteria are not different. With respect to the explanatory power on the behavior of stock prices of BVPS, for both the data published in 2010 and those republished in 2011, slightly over 30% of the variation of the stock prices can be explained by the variation of BVPS. In other words, despite the reduction of the explanatory power and the informational content of the data published in 2010 in comparison with that republished in 2011, this reduction does not support the affirmation of a change in the informational content of the BVPS ratio.

5. Conclusions

The aim of this study was to analyze the impact of the process of convergence to international accounting standards in Brazil on the informational content of accounting, based on two perspectives: the changes caused in the main financial ratios and the alterations in the explanatory power of accounting information, namely net income and stockholders' equity (EPS and BVPS, respectively), on share prices in the Brazilian capital market.

To achieve this objective, it was necessary to separate the analysis into two aspects: (i) verification of whether there are indications of a difference between the ratios calculated with the information for 2009 published in 2010 and that for the same year republished in 2011; (ii) verification of whether there are indications of a change in the power of EPS and BVPS to explain stock prices in the Brazilian capital market between the ratios based on the data published in 2010 and those republished in 2011.

The results indicate that the ratios Indebtedness (DEBT), Asset Turnover (AT), Gross Margin (GM), Operating Cash Flow over Total Assets (OPCFA) and Operating Cash Flow over Stockholders' Equity (OPCFE) are lower when using the data from the full IFRS financial statements. These results corroborate the findings of Santos & Calixto (2010), who detected higher profits with the adoption of IFRS, explained by the reduction of accounting conservatism. On the other hand, the results run counter to those found by Braga et al. (2011), who observed a significant increase in the debt ratio. In any event, the results are coherent with those of previous studies (Silva, Couto & Cordeiro 2009; Haller, Ernstberg & Froschhammer, 2009).

Analysis of the informational capacity of EPS by regression indicated that by applying full IFRS, this ratio's explanatory power increased. A possible explanation is that profit according to IFRS more adequately represents the economic reality of firms, so that migration to full IFRS brought alterations in the information content of profit in the sense of incorporating information already considered by investors in the formation of stock prices. These findings corroborate those of Barth, Landsman & Lang (2008), Morais & Curto (2009), Chalmers, Clinch & Godfrey (2009) and Macedo, Machado & Machado (2011).

With respect to the informational content of BVPS, the results indicate there was no significant change in its explanatory power. Hence the set of changes in the formation of shareholders' equity brought by adoption of full IFRS seems not to have been relevant in the Brazilian capital market.

A relevant limitation of this study is the fact that some of the firms already could have presented their information for 2009 according to full IFRS since the publication in 2010. Therefore, for these companies there was no difference in the financial statements published in the two years. Additionally, it was not part of the scope of this study of whether there was any alteration in the underlying numbers for 2009 published in 2011 with in comparison with those republished in 2011. We assumed that there was no significant early adhesion to full IFRS and that in general the only changes in the information republished in 2011 were due to the shift in accounting standards.

We suggest that future studies analyze the determinants of positive or negative variations in some financial ratios of each firm, to better understand the impact of the adoption of IFRS in Brazil.

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Appendix. Main Changes in Accounting Practices

Subject	Before Convergence Process	After Convergence Process	Components of the Financial Statements Potentially Affected by the Changes / Potential Effect
Conceptual structure for preparation and disclosure of financial statements	Fundamental accounting principles: entity; continuity; opportunity; recording at original value; inflation adjustment; accrual; and prudence. Attributes of accounting information: reliability, timeliness, clarity; and comparability.	Qualitative characteristics of accounting information are divided into: (a) fundamental qualitative characteristics – relevance and faithful representation; and (b) qualitative characteristics for improvement - comparability, verifiability, timeliness and understandability	Does not apply
Recoverability test	Not mentioned.	Assets cannot be accounted for at a value greater than their recoverable value. If there is evidence of depreciation, the estimated loss must be recognized.	Long-term Assets (reduction) and Net Income (reduction)
Cash Flow Statement	Statement not required.	The Cash Flow Statement became mandatory, replacing the Statement of Changes in Financial Position.	New statement
Intangible Assets	Not mentioned.	Non-corporeal assets, as long as they satisfy the criteria established in CPC 4, must be recorded as intangible assets.	Long-term Assets (increase or neutral)
Leasing	Installment payments recorded fully as expense when incurred.	Leasing classified as financial must be accounted for a financed purchase, causing the need for depreciation of the asset and the interest on the transaction. For leasing characterized as operational, the treatment remains the same.	Long-term Assets (increase) and Net Income (increase by depreciation and reduction by installment)
Subsidies and Governmental Assistance	Recognized as Capital Reserve	All subsidies must pass through the Income Statement, with differences at the moment of recognition, according to the conditions of each subsidy.	Stockholders' Equity (reduction) e Net Income (reduction)

Subject	Before Convergence Process	After Convergence Process	Components of the Financial Statements Potentially Affected by the Changes / Potential Effect
Transaction Costs and Premium on the Issuance of Securities	Subscription bonus and premium on issuance of bonds/debentures were recorded as a Capital Reserve. Transaction costs were recognized as expenses.	The transaction cost is now classified, in itemized form, in a rectification account under Capital Stock, or when applicable, in Capital Reserve to record the premium received on the issuance of new shares. Debt securities must be disclosed at net amount available for use, recognized immediately in rectification accounts and appropriated to income in function of the period of the transaction, based on the internal rate of return (IRR).	Stockholders' Equity (reduction), Capital Reserve (increase), Current Liabilities (reduction) and Net Income (increase)
Statement of Value Added	Statement not required.	Mandatory statement for listed companies and companies regulated by ANEEL (National Electric Energy Agency), ANTT (National Land Transport Agency) and ANS (National Health Agency).	New statement
Compensation in Shares/Stock Options	Was recognized in the net income, when the option was exercised.	Must be recognized as expense, measured at fair value, at the moment granted, in counterpart to the Equity Instruments Granted account under Stockholders' Equity.	Stockholders' Equity (increase or reduction)
Adjusted to Present Value	Not required.	Mandatory adjustment to present value under Long-term Assets and Long-term Liabilities, and in case of a relevant effect, also in Current Assets and Current Liabilities.	Long-term Assets (reduction), Long-term Liabilities (reduction) and Net Income (increase, in counterpart of assets, or reduction in counterpart of liabilities).
Deferred Assets	Prepaid expenses such as for construction and pre-operation, expenses to implement systems and methods and reorganization expenses were capitalized and amortized in a period of not more than 10 years.	This group was extinguished. The balances of the items that changed in classification were reclassified. The balances of items that could no longer be classified as assets could be recorded against accrued profits or losses or remain in this group until the final amortization.	Stockholders' Equity (reduction)
Revaluation of Fixed Assets	Revaluation of fixed assets was permitted, in counterpart to Revaluation Reserve.	Spontaneous revaluation was extinguished. The remaining balances in the Revaluation Reserve had to be transferred to accrued profits or losses in the proportion of the write-off of the assets to which they refer.	Stockholders' Equity (reduction)
Equity Pick-up	Relevant investments in affiliated companies over which the firm had management influence, or in which the equity stake was 20% or more of the voting capital and in controlled companies were valued by the equity method.	Investments in affiliates and other companies that are part of the same group or are under common control must be valued by the equity method.	Long-term Assets (increase or reduction) and Net Income (increase or reduction).
Properties for Investments	Recorded and carried at historic cost.	Measured initially at cost, After initial recognition, the entity can opt for the dost method or fair value method. The variations in fair value must be recognized directly in the result in the period they occur.	Current Assets (increase or reduction) e Net Income (increase or reduction)
Financial Instruments	According to Law 6,404/76, credit rights and instruments and any securities classified as investments had to be valued at acquisition cost or market value, whichever is lower.	The initial measurement of financial assets and liabilities must be at fair value. The subsequent measurement will depend on the classification of the financial instruments.	Current and Long-Term Assets (increase or reduction), Current and Long-term Liabilities (increase or reduction), Stockholders' Equity (increase or reduction) and Net Income (increase or reduction).
Initial Adoption of International Accounting Standards	Does not apply	The differences (or adjustments) resulting from the initial adoption of international standards must be recognized directly in accrued profits or losses, or be appropriated in another stockholders' equity account on the transition date.	Stockholders' Equity (increase or reduction)

Source: Data from the study.

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Analysis Of The Property Structure Of Companies Listed On The Corporate Sustainability Index Through The Application Of Social Networks

Abstract

This study is aimed at verifying the configuration of the property structure and relationship network of shareholders in Brazilian companies listed on the BM&FBovespa Corporate Sustainability Index (CSI). Therefore, information was sought about the property structure, the structural configuration of the shareholders' relationships and other characteristics for the 30 companies in the sample, over three consecutive years. As regards the methodological classification, a descriptive and documentary research with a quantitative approach was carried out. Data analysis was divided in two phases: the first involved descriptive statistics and the second the structuring of social relationships, when the configuration of the 1361 board of directors and executive board members' relationships was verified, besides the existence of board interlocking. The results indicate that the structural and corporate configuration of the CSI companies' relationships reveals a shared property structure, as two or more shareholders are in control; they also suggest that the property structure is interdependent, defining what part of investments will be made in according with socially responsible practices/activities, representing the application of this capital. These decisions can be influenced by the members of the company's executive board and board of directors, who participate in other companies that adhere to sustainable practices. Finally, this research contributes to the area, indicating that board interlocking can be considered a driving factor in the transmission of a sustainable culture by board members in different companies.

Key words: Property Structure. CSI. Social Networks. Corporate Social Responsibility. Board Interlocking.

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1. Introduction

Different authors, including Bertoncello and Chang Jr. (2007), have presented corporate social responsibility as an increasingly important theme in the corporate context, revealing impacts on companies' objectives and strategies. According to Silva and Quelhas (2006), the responsible position companies adopt towards social and sustainable conditions is also reflected in investors' global trend, who privilege these companies through the application of their resources.

This situation contributed to the creation of socio-environmental indicators, which signal to the market that companies are committed to social accountability and corporate sustainability. In that direction, in Brazil, the Corporate Sustainability Index (CSI) exists (BM&FBOVESPA, 2011).

According to Teixeira and Nossa (2010), the São Paulo Stock Exchange (BM&FBOVESPA) created the CSI in 2005, in cooperation with other entities. It was structured to serve as a reference for companies, focused on good corporate practices. This index is intended to show the return in a portfolio of companies that adhere to Corporate Social Responsibility (CSI) practices.

Just like companies have reconsidered their position towards issues related to the sustainability of their business, the property structure is also highlighted in the literature in relation to the constant changes that have happened in recent decades. Intense restructuring processes, both abroad and in Brazil, as well as privatizations and the opening of commercial flows influence this corporate change process, leading to the entry of foreign companies and investors in the local economy (Lazzarini, 2007).

The reflections of property structure changes also appear in the cooperative relations between shareholders and board members in different companies, consequently affecting their decisions (Dal Vesco, Dani, Krespi & Ribeiro, 2011). According to Lazzarini (2007) the interlocking of companies in the form of networks indicates the existence of alliances, in the form of strategic bonds, which also influence the accomplishment of corporate restructuring processes. In that sense, the existence of intercompany networks through board interlocking, in which a board member from one company also participates in another, indicates a channel of influence between different companies.

The intent to signal the adoption of corporate social responsibility practices to the market can be characterized as a business strategy. This strategy is linked to companies' adoption of new socio-environmental practices, and can be driven by the existence of alliances with other companies, or even by the transmission of a sustainable culture, involving board members from different companies, characterized in the form of networks.

In that sense, the following research problem is defined: What is the form of the property structure and relationship network in Brazilian companies listed on the CSI? In line with that question, the aim is to verify the configuration of the property structure and relationship networks of Brazilian companies included in the corporate sustainability index (CSI).

Mendes-Da-Silva, Rossoni, Martin and Martelac (2008, p. 2) indicate that "the notion of social networks, as well as the network analysis methods, have attracted considerable interest and curiosity in social research communities in recent decades", although this theme has been hardly explored in Brazil.

According to Leal, Silva and Valadares (2002, p. 1) "the understanding about the control structure is fundamental, as it directly influences market efficiency through corporate control". Siffert Filho (1998) believes that the property and control structure of Brazilian companies takes the form of shared control, that is, two or more shareholders are in control. Hence, decisions related to socio-environmental policies and practices are linked to internal measures, besides pressure by users. The property structure, in combination with the environmental practices, can be understood as a capital mix the company selects to invest, in accordance with Teixeira and Nossa (2010).

In that context, interdependence exists in the property structure, which defines what part of investments will be made in according with socially responsible practices/activities, representing the application of this capital. These decisions can be influenced by the members of the company's executive board and board of directors, who participate in other companies that adhere to sustainable practices. This study

contributes to understand the property structure and network configuration characteristics of Brazilian companies listed on the CSI, with a view to indicating how these characteristics influence a sustainable posture in organizations.

2. Theoretical Background

In this topic, the theoretical framework for this research is presented, highlighting Corporate Social Responsibility aspects related to the CSI, property structure, followed by the owners' social networks and, finally, some earlier related studies with the application of social networks.

2.1 Corporate Social Responsibility and the Corporate Sustainability Index (CSI)

According to Bertoncello and Chang Jr. (2007), corporate social responsibility (CSR) has gained increasing importance in organizational behavior, affecting their objectives and strategies and consolidating the idea that companies need to play a broader role in society than solely in the maximization of wealth.

This theme, addressed in the academic and corporate contexts, includes companies' responsibilities towards the society they operate in (Hartman, Rubin & Dhanda, 2007). In this sense, corporate social responsibility can be defined as:

> (...) the commitment an organization needs to assume towards society, expressed through acts and attitudes that positively affect it, in a broad sense, or some community in a specific sense, acting proactive and coherently with regard to its specific role in society and its accountability. In that sense, the organization takes up moral obligations, beyond those established by law, even if they are not directly linked with its activities, but which can contribute to the sustainable development of the people (Ashley, 2002 p. 6-7).

According to Schroeder and Schroeder (2004), different authors have legitimized this conduct because companies, through the adoption of social causes, return part of the human, natural and financial resources they consume to make profit in the performance of their activities to society.

In the international and Brazilian markets, there is an ongoing trend for investors to apply their resources in socially responsible, sustainable and profitable companies (BM&FBOVESPA, 2011). This investment modality, called socially responsible investment (SRI), assesses not only financial results, but also environmental issues, social responsibility practices and ethical standards (Rezende, Nunes & Portle, 2008).

According to Silva and Quelhas (2006), investors' search for socially responsible investments (SRI) has contributed to the creation of stock indices that are exactly aimed at identifying those companies that incorporate these concepts in their practices.

Following this trend, BM&FBOVESPA, in cooperation with the Brazilian Association of Closed Complementary Pension Fund Entities [ABRAPP], the Brazilian Financial and Capital Markets Association [ANBIMA], the Brazilian Association of Capital Market Investment Analysts and Professionals [APIMEC], the Brazilian Corporate Governance Institute [IBGC], the Institute of Supervision and Control [IFC], the *Instituto ETHOS* and the Ministry of the Environment, created the Corporate Sustainability Index (CSI) in 2005, aimed at reflecting the return in a stock portfolio of companies renowned for their commitment to social accountability and corporate sustainability, as well as to promote good practices in the Brazilian corporate context (BM&FBOVESPA, 2011).

Since the creation of the CSI, many scholars have undertaken research to verify the relation between this index and a wide range of corporate aspects. Some of these studies are presented to achieve further understanding about the theme.

Silva and Quelhas (2006) verified whether belonging to the CSI is somehow related to the cost of

own capital. In that research, the authors confirmed that, when adhering to sustainability standards, the company reduces the systemic risk, thus determinant the reduction of the capital cost and increasing the company's economic value.

Rezende, Nunes and Portle (2008) developed a study aimed at checking whether the CSI return is similar to the other conventional stock indices on the São Paulo Stock Exchange (BM&FBovespa), like the Bovespa Index (Ibovespa), the Brazil Index (IBrx) and the Distinguished Corporate Governance Stock Index (IGC). The research revealed that, although the CSI consists of a differentiated portfolio, focused on social, environmental and ethical issues, its return is similar to the conventional stock indices.

Teixeira and Nossa (2010) investigated the effect of the corporate sustainability index (CSI) as a mechanism that signals corporate social responsibility (CSR) in companies' structure. The results indicates that the CSI influences and potentially determines the capital structure, and also that the index can be a channel for socially accountable companies to improve the relationship with stakeholders.

The above studies revealed the range of research on corporate social responsibility and the importance the authors grant to this kind of study. Nevertheless, no study was located in the investigated data sources to explain the composition of the property structure in CSI companies, which motivated this research.

2.2 Property Structure

In the conflict of interest that exists in the market of relationships between managers and investors, the property structure acts as one of the principles that disciplines these relations, using mechanisms like: "[...] the capital structure; the structure of the Board of Directors; the manager compensation policy; competition in the product market; and the hostile takeover market [...]" (Silveira, Barros & Famá, 2008, p. 52).

The property structure can be defined as the capital mix the company selects to invest (Teixeira & Nossa, 2010). From another focus, Brigham and Houston (1999, p. 354) define that the expected capital structure consists of the "proportion of capital from third parties, preferential and ordinary stock that will maximize the company's stock prices".

It is highlighted that most property structure studies are related to corporate performance, like Galdi and Menezes (2010), Okimura (2003), Silveira (2004), and Okimura, Silveira and Rocha (2007), among others, although others were aimed at presenting a different focus on the determinants of companies' property structure, like Siffert Filho (1998), Himmelberg, Hubbarda and Paliaa (1999), and Leal, Silva and Valadares (2000).

Silveira, Barros and Famá (2008) classified some potential determinant of property concentration used in their study: nature of the operation, company size, free cash flow level, investment rate, risk, performance, industry and the type of controlling shareholders. As regards the type of shareholders, the authors infer that the type of controlling shareholder can influence the property concentration.

About the stock property, Leal, Silva and Valadares (2002) comment that, in Brazil, stocks without voting rights are used intensely. While the share of the total capital represents the cash flow rights, the share of voting capital represents the voting rights.

Concerning the type of controlling shareholder, Okimura, Silveira and Rocha (2007) classify five types: controlling individual or family, institutional investor (like pension funds), financial institution (like banks, insurance companies etc.), the government and investor groups (like corporate holdings, companies with shares in other Brazilian and foreign companies).

For this study, with regard to the property structure, the type of shareholder control was addressed,

using the criteria and definitions of the Magazine Capital Aberto (2010), according to Figure 1.

	Type	Description
1	Foreign	Exercised by a multinational company or foreign investor.
2	Diluted	When the main shareholders identified own less than 25% of the company's voting shares.
3	Family Property	Control by an isolated individual (businessman) or group of individuals with family relations.
4	Public	Exercised by the government.
5	Shared	Exercised by two or more shareholders (without family relations and at least one legal entity), through an agreement among shareholders. None of them exercises control separately.
6	Multi-family	Groups of individuals (private persons) joined through a shareholder agreement.

Figure 1. Type of Property Structure

Source: Adapted from the Magazine Capital Aberto (2010).

Based on the types of stock controls displayed in Figure 1, in this study, similar to the research findings by Siffert Filho (1998), it is highlighted that, in the Brazilian case, shared control has increased in organizations, with Brazilian or foreign institutional investors as the main shareholders.

In that respect, the author explains that this fact is due to the transformations in corporate social control, besides the 100 largest companies' increasing participation in the economy (Siffert Filho, 1998).

2.3 Social Networks of Owners

Tureta, Rosa and Ávila (2006) indicate that a social network can be characterized as a set of people and organizations, joined by a set of social relationships. According to Tomaél and Marteleto (2006), social networks constitute a social structure through the mutual connections in a set of people (or organizations or other social entities), through personal relationships (links), professional relationship or information sharing.

Hence, Tomaél and Marteleto (2006, p. 78) establish that four measures can be applied to the centrality of network actors, according to their functions: "a) Information centrality); b) Degree centrality; c) Betweenness centrality; d) Closeness centrality".

Mendes-Da-Silva et al. (2008) highlight that research on the board structure, that is, which is aimed at verifying board member characteristics through relationship networks, has gained room in international literature, addressing aspects related to board interlocking (links among companies, through members of one company who simultaneously participate in another company's board) and its influence on organizational performance.

In this respect, Santos and Silveira (2007, p. 157) comment that board interlocking, as "one of the issues associated with board members' effectiveness and, consequently, with the proper functioning of the board of directors, refers to the phenomenon of these professionals' cross-participation in other companies".

Wong and Gygax (2009) characterize this network of board members as a relationship created between two companies when they share at least one director. In that sense, Mendes-da-Silva and Vidal (2011) infer that the definition of board interlocking is not unanimous. According to these authors, the most frequent definition is that, if only one member of the board of directors simultaneously occupy a place in at least another company's board, there is a board interlocking.

In addition, the authors comment that the literature presents motivations for the occurrence of board interlocking at three levels, which are: organizational, social and personal (Mendes-Da-Silva & Vidal, 2011).

According to research by Santos and Silveira (2007), boards with high levels of participation by external members tend to be more interconnected with other companies, and larger and more renowned companies tend to have more professionals from other companies on their boards.

Hence, in this study, a network of owners is characterized as a set of owners who are connected through their percentage share in the capital of other companies.

Similarly to the research by Lazzarini (2007), the observation of companies' corporate composition is susceptible to analysis, in view of some factors, such as: the existence of alliances among companies, as a form of strategic bonds; as well as the accomplishment of corporate restructuring processes, according to local networks.

In line with information by the IBGC (2009), board members should inform other members if they are part of other boards, including in service sector organizations, in view of possible conflicts of interest among board members, as well as a lack of time to perform their activities in different organizations. In addition, the IBGC (2009) highlights that, besides the board member's core activities, information should be disseminated and be available in the company's reports and other communication means.

2.4 Related Studies with Network Applications

In this item, some related studies will be presented that used social networks to verify relations in corporate restructuring processes, stockholder participation, associations of boards of directors, besides capital structure. In that sense, the research by Lazzarini (2007), Mendes-Da-Silva et al. (2008) and Dal Vesco et al. (2011) should be highlighted.

Lazzarini (2007) developed a study to verify changes in ownership relations in function of the restructuring events that took place in Brazil between 1995 and 2003 (privatizations and entry of foreign capitals). For that purpose, the social networks of mutually connected owners were analyzed, as well as their joint participation in one or more companies' capital. The research results showed that few central actors exist, who end up connecting different groups due to their position in the network. In addition, the author underlines the increased influence of certain local owners, to the detriment of foreign firms and investors.

In the study by Mendes-Da-Silva et al. (2008) about the role of the board of directors based on social network analysis in Brazil, with a view to checking for associations between centrality levels, coherence of Brazilian company boards and company performance. The research sample consisted of 615 individuals, who served on the boards of directors of the companies listed on Bovespa's New Market in 2007. The analysis was conducted in two phases. In the first, the configuration of the networks of board members and companies was presented and, in the second, associations were verified between network structure and performance. The authors concluded that higher levels of centrality, density and coherence enhance companies' ability to present higher profitability and lower indebtedness.

Finally, the study by Dal Vesco et al. (2011) is highlighted, aimed at verifying the capital structure through corporate and personal relationship networks in the corporate interests of public service and telecommunication (fixed and mobile telephony) companies listed on Bovespa. In methodological terms, the research was classified as descriptive, documentary and quantitative. The study results indicate that corporate interests are related in two distinct forms: companies join diluted stockholders, like other and treasury stock, constituting weak bonds; and show a highly concentrated property structure, in which 100% of the capital social represents a concentrated property structure.

3. Method

The methodological design is classified as descriptive regarding its objectives, documentary regarding its means, and quantitative regarding the approach to the research problem.

It is classified as quantitative, because descriptive statistics will be used and the social network technique will be applied for data analysis. Therefore, all connections will be checked manually before the use of the social network software.

The research universe comprises the 100 companies with the most traded stock on the São Paulo Stock Exchange, as classified in a special issue of the Magazine Capital Aberto, called the Corporate Governance Yearbook of publicly traded companies in 2010. From these 100 listed companies, an intentional sample was drawn, based on the companies' classification in the BM&FBOVESPA CSI. Hence, the research sample consists of the following companies, as shown in Figure 2.

AES Eletropaulo	BRF Foods	Dasa	Even	Natura	Suzano Papel
AES Tiete	Cemig	Duratex	Gerdau	Oi	Tim
Banco Brasil	Cesp	EDP	Itaú Unibanco	Redecard	Tractebel
Bradesco	Copel	Eletrobrás	Itausa	Sabesp	Useminas
Braskem	CPFL	Embraer	Light	Sul America	Vivo

Figure 2. Research sample

Source: Magazine Capital Aberto (2010).

The choice of the Corporate Sustainability Index (CSI) to delimit the sample is due to the fact that this stock index serves as a reference for socially accountable investments, as its portfolio consist of shares from companies renowned for their commitment to corporate social responsibility and corporate sustainability, through the promotion of good practices in the Brazilian corporate context (BM&FBOVESPA, 2011). Several studies have been focused on the CSI, including Rezende, Nunes and Portle (2008), Teixeira and Nossa (2010).

In view of the proposed research objective, which is to verify the property structure and relationship network of Brazilian companies listed on the corporate sustainability index (CSI), the number of companies selected for the research was appropriate to apply the network technique, given the quantity of information demanded and the graphic transposition of the results.

For the first phase of data collection, information was sought about the type of ownership structure and control, using information published in the Corporate Governance Yearbook of publicly traded companies in 2010, published by the Magazine Capital Aberto in a special issue launched in the same year. Then, the names of the members of the board of directors and executive board were collected from all companies over a three-year period (2010, 2011 and 2012), with a view to analyzing the structural configuration of the existing relationships.

Therefore, first, some information was collected to accomplish the study, included in the data collection instrument.

Initially, descriptive statistical analysis was applied to percentage information on the sample companies' percentage interests and characteristics, among others. Then, the social network technique was applied through coded matrices included in the software Ucinet, with a view to demonstrating the sample companies' types of property structures, existing connections among companies with corporate interests and among members of the Board of Directors (BD) and Executive Board members. Therefore, in the matrices, information without percentage interests was score as "0", while information with percentage interests or other percentage information were scored as "1", "2" etc.

The analysis undertaken through the social network techniques was based on Social Network Theory. This theory is aimed at defining and systemizing the use of social networks and their extensions. The networks can be defined as a set of two main elements: the actors/members (individuals, institutions/companies or groups) and their links or inter-relationships (Tureta, Rosa and Ávila, 2006; Won and Gygax, 2007; Mendes-Da-Silva and Vidal, 2011). Based on this theory, the analysis is centered on the owners' social networks, that is, on the links between the majority/controlling shareholders of Brazilian companies in the CSI.

The analysis based on the social network technique permits checking whether larger and socially

more renowned companies with more established corporate governance mechanisms have some kind of preponderant ownership control.

4. Analysis of Results

In this topic, the analysis of the results is presented through descriptive statistics, concerning the characteristics of the research sample. Then, the data will be analyzed through the social network technique, focusing on the composition of the sample companies' social relationships.

4.1 Characteristics of the Research Sample

Initially, in Table 1, the research sample companies from different sectors and segments are described in the form of frequencies.

Table 1
Activity sector of sample companies

Sector	Segment	Absolute Frequency	Relative Frequency
Public services	Electric Energy	10	33,33%
	Sanitation	01	3,33%
Financial and Others	Banks	03	10,00%
	Holding of Interests	01	3,33%
	Insurances	01	3,33%
	Financial Services	01	3,33%
Non-Cyclic consumption	Food	01	3,33%
	Personal Hygiene and Cleaning Products	01	3,33%
	Health	01	3,33%
Industrial Goods	Aviation	01	3,33%
Construction and Transportation	Civil Construction	02	6,67%
Basic Materials	Iron and Steel	02	6,67%
	Paper and Pulp	01	3,33%
	Petrochemical and Rubber	01	3,33%
Telecommunication	Fixed and Mobile Telephony	03	10,00%
Total		**30**	**100,00%**

Source: Research Data.

Based on the data in Table 1, the public service sector was the largest in the sample, with 11 companies, mainly from the electric energy segment, with the highest relative frequency of 33.33%, totaling 10 companies. On the opposite, only one company was present from the industrial goods sector, in the aviation segment, with a relative frequency of 3.33%. The researchers consider that the sectors that would be more prone to inclusion in the index in view of their main activity, like the industrial goods sector, should have an equal/similar share in the index when compared to the electric energy sector, evidencing their socio-environmental concerns to their investors and stakeholders.

In Table 2, the frequencies of the types of property structure are displayed according to the sample

companies' segments.

Table 2
Type of property structure control in sample companies

Property Structure	Absolute Frequency	Relative Frequency
Shared	12	40,00%
Public Control	06	20,00%
Foreign	04	13,33%
Family	05	16,67%
Diluted	03	10,00%
Total	**30**	**100,00%**

Source: Research Data.

In Table 2, it is observed that 40%, that is, 12 sample companies have a shared property structure. In this type, two ore more shareholders are in control, one of which should be a legal entity, in which the practice of control is shared and not isolated.

Silveira, Barros and Famá (2008) define that the controlling shareholder type is one of the determinants of the ownership concentration, or of the type of stockholder control. La Porta, Lopez-de-Silanes, Shleifer and Vishny (1999) underline that, in family-owned companies, a single individual or specific group is in control, in which the property structure is characterized as under concentrated control, or there may be no controlling stockholder, when control is shared.

The researchers consider that the increasing market competitiveness among publicly traded companies motivates a property structure with shared control, which is consequently more diluted. It could also be observed that diluted control was less frequent, corresponding to 10.00%, i.e. only three companies. This is due to the fact that only three of the sample companies possess the main shareholders with less than 25% of the companies' voting stock.

Table 3 displays the frequency list of the sample companies' classification per corporate governance level.

Table 3
Distribution of sample companies' Corporate Governance Levels

Corporate Governance Levels	Absolute Frequency	Relative Frequency
Level 1	11	36,67%
Level 2	02	6,67%
New Market	13	43,33%
Traditional	04	13,33%
Total	**30**	**100,00%**

Source: Research Data.

The analysis of data in Table 3 reveals that 43.33% or 13 of the companies under analysis are part of the New Market corporate governance levels, according to the Bovespa classification, in the following segments: financial (Banco do Brasil, Redecard), food (BRF Brasil *Foods*), public services (CPFL Energia), health (DASA), civil construction (Duratex S.A., Even Construtora e Incorporadora), aviation (Embraer), electric energy (*Light*, Tractebel Energia, EDP – Energias do Brasil), personal hygiene and cleaning products (Natura) and sanitation (Sabesp). On the other hand, only two (6.67%) companies were listed on Level 2, one in the electric energy (AES Eletropaulo) and one in the insurance segment (Sul América).

The property structure is presented as one of the main corporate governance mechanisms (Leal, Silva & Valadares, 2002). In that sense, in the study by Torres, Bruni, Rivera-Castro and Martinez (2010),

a positive association was found between the ownership and control structure, the corporate governance level and the origin of the companies' capital.

In this research, the authors defend that companies with a shared ownership structure, in accordance with Siffert Filho (1998), and companies with a concentrated ownership structure equally have mechanisms that can minimize the agency conflicts, whether between management and shareholders or between controlling and minority shareholders, with a view to good governance practice and corporate sustainability.

In Table 4, the similarities are shown between the persons occupying the functions of CEO (Chief Executive Officer) and Chairman of the Board in the same companies.

Tabela 4

Similarity between functions of CEO and Chairman of the Board in sample companies

Similar	Absolute Frequency	Relative Frequency
Yes	03	10,00%
No	27	90,00%
Total	**30**	**100,00%**

Source: Research Data.

According to the data in Table 4, in 27 or 90.00% of the sample companies, different persons occupy the functions of CEO and chairman of the board. On the other hand, the same person occupies these functions in only three or 10.00% of the companies. Mendes-da-Silva and Grzybovski (2006) highlight that, "independence between the Board of Directors and the Executive Board can guarantee more efficient administrative activities".

In Table 5, the distribution of the members of the board of directors and executive board in the sample companies is displayed.

Table 5

Distribution of members of the Board of Directors and Executive Board in the sample companies

Companies	Members BD			Members EB			Companies	Members BD			Members EB		
	Period (Years)							Period (Years)					
	2010	2011	2012	2010	2011	2012		2010	2011	2012	2010	2011	2012
AES Eletropaulo	10	10	11	06	7	7	Even	07	6	6	04	5	5
AES Tietê	11	10	10	07	8	8	Gerdau	09	8	8	08	7	6
Banco do Brasil	07	7	6	14	10	9	Itaú Unibanco	13	13	12	13	13	14
Bradesco	09	9	8	07	7	7	Itaúsa	06	6	6	04	8	4
Braskem	11	11	11	07	7	7	Light	11	10	12	07	7	8
BRF Foods	11	3	3	08	2	1	Natura	06	9	8	04	4	5
Cemig	09	14	14	03	10	11	Oi (Tele Norte Leste)	09	15	16	05	9	9
CESP	10	10	10	04	4	4	Redecard	05	8	8	04	8	7
Copel	08	9	9	08	9	9	Sabesp	11	10	9	07	6	6
CPFL	07	3	3	06	4	6	Sul América	09	9	9	04	4	4
DASA	06	6	5	10	7	9	Suzano Papel e Celulose	09	9	9	07	7	6
Duratex	09	9	9	09	14	14	TIM	08	8	9	06	7	8
EDP	07	8	8	04	5	5	Tractebel Energia	09	9	9	07	7	7
Eletrobras	09	4	9	06	2	9	Useminas	09	10	10	04	5	7
Embraer	11	13	6	10	7	5	Vivo	09	9	0	07	5	0

Source: Research Data.

Table 5 displays the members of the companies' boards of directors and executive boards, 440 of whom were analyzed in 2010, 466 in 2011 and 455 in 2012, totaling 1361 members (social actors).

The distribution of the members of the companies' boards of directors and executive boards was analyzed over a three-year period, revealing that, independently of the number of members on the board, some members are repeated, within the same company as well as in different companies, and may be serving on the board of directors or on the executive board.

Similarly to the study by Dani, Beck and Beuren (2012), board interlocking is characterized as the concomitant participation of individuals in different companies, occupying strategic functions, on the executive board (EB), board of directors (BD), statutory audit committee (SAC) or as other counselors (OC), among others.

Regarding this practice, the abovementioned study in family-owned companies considered the years 2010 and 2011. The results indicated that not many changes were made in the relations and functions, as the renewal of board members varies among companies, and can also be motivated by a board member's decision. The authors conclude that the large majority of the companies analyzed reveal family relations between the members of the executive board and the board of directors. Also, the members of the board of directors are more numerous than those of the executive board in most of the companies investigated in this study.

4.2 Structural Configuration of Relationships

In this item, the analysis of the sample companies' ownership structure and corporate interests is presented based on the social network technique. According to Rossoni and Guarido Filho (2007, p. 75) "there are different possibilities of network analysis, covering a large number of measures to assess the characteristics of cooperative networks". In Figure 3, the types of ownership structure in the sample companies are displayed.

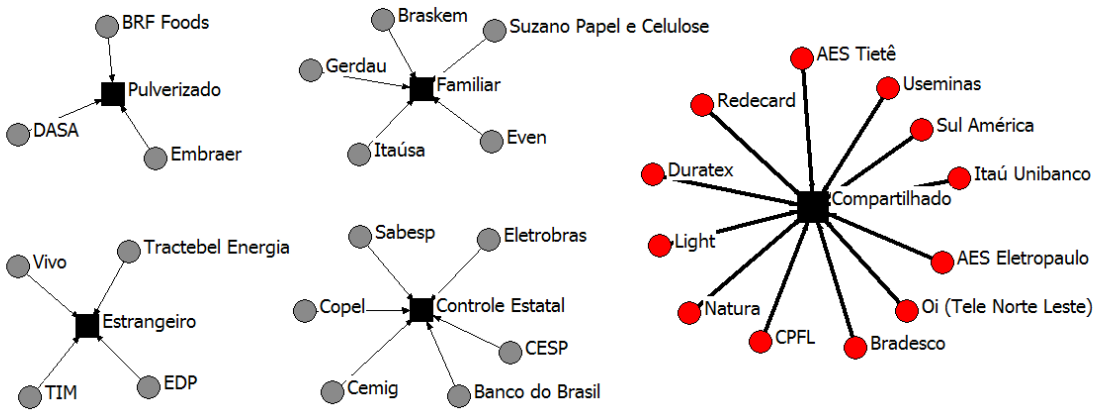


Figure 3. Social networks of ownership structure types in sample companies.
Legend: Red color (highlights the dominant type of ownership structure)

Source: Research Data.

In Figure 3, the structural distribution of relationships is displayed with regard to the sample companies' types of property structures. Among the five classification types used in this research, the shared type was the most concentrated, with 12 bonds, that is, the property structure was shared in 12 out of 30 CSI companies.

This reveals that larger and more renowned companies with more established corporate governance

mechanisms predominantly have a shared property structure. In the other companies, the structure is less concentrated, with the dilated, triad-shaped structure as the least concentrated type.

In line with Lazzarini (2007), it is highlighted that the owners who are most linked with other actors or members are able to maintain or lever their presence in the Brazilian economy. In addition, "an owner who is centrally connected in the network will be capable of using opportunities to purchase stock interests put at sale by other owners (s)he is connected with" (Lazzarini, 2007, p.4).

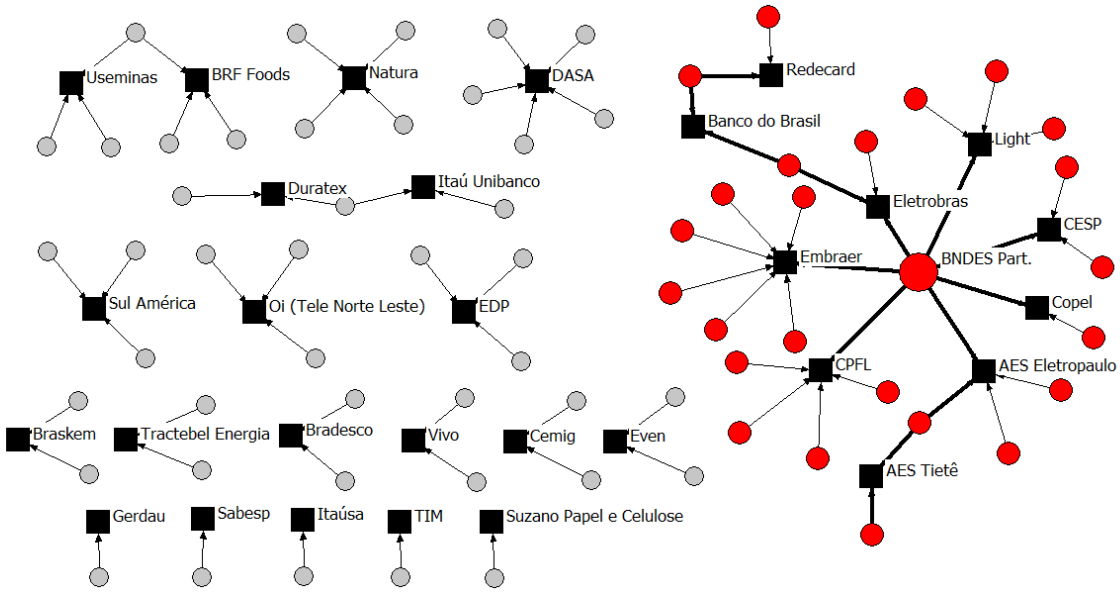


Figure 4. Social networks of sample companies' shareholders.
Legend: Red color (highlights the dominant company in terms of the number of connections)

Source: Research Data.

In Figure 4, the constitution of social structures can be observed, through a set of connections, characterized as centralized and including organizations from different sectors, mutually connected through stockholder interests. As shown in the most concentrated network, these structures are defined by the joint stockholder interest in one or more companies. In this respect, it was observed that BNDS Part. was the company with the largest number of stock interests in other companies, being linked to Embraer, Eletrobrás, Light, Cia. Energética de São Paulo [CESP], Companhia Paranaense de Energia [Copel], AES Eletropaulo and CPFL. In addition, these companies are also linked with Redecard, Banco do Brasil, e AES Tietê. The other companies, on the other hand, are diluted with fewer bonds, less than five in all companies, indicating a low concentration level.

Santos and Silveira (2007) mention that boards with high participation levels by external members tend to show a larger number of interconnections with other companies, and also that larger and more renowned companies tend to have more professionals from other companies on their boards. In this research, the network displays bonds among shareholders, characterized as a set of owners who are interconnected through percentage interests in other companies' capital. In view of these considerations, in Ta-

ble 7, BNDS Part.'s corporate interest is highlighted, as the company with the highest concentration level.

Table 7
Corporate interest of company with greatest concentration of bonds

Companies	Interest %	Nº. Bonds
Eletrobrás	21,08%	03
Light	22,96%	04
Cesp	8,56%	03
Copel	26,41%	02
AES Eletropaulo	0,73%	04
CPFL	8,40%	05
Embraer	5,50%	07

Source: Research Data.

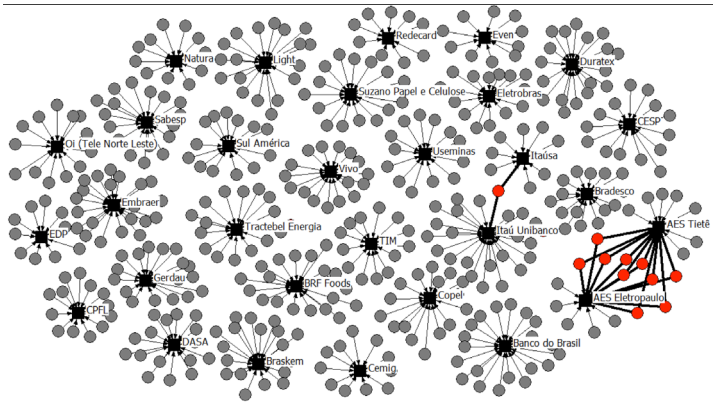
In addition, it is observed in Table 7 that BNDS Part., more predominant in the network and linked to seven other sample companies, also reveals different percentage interests in those companies. The company shows the highest percentage interest in three main companies: Copel, with 26,41%, followed by Light with 22.96% and Eletrobrás with 21.08%. Among these, Embraer showed the largest number of social bonds when considering the other companies.

The results indicate that social and corporate inter-relations, which represent a board interlocking practice, are present in these companies, characterized by public control and working in the electric energy segment. These results indicate that these companies share characteristics that distinguish them from the other companies.

Figure 5 shows the structural configuration of the relationship among the members of the boards

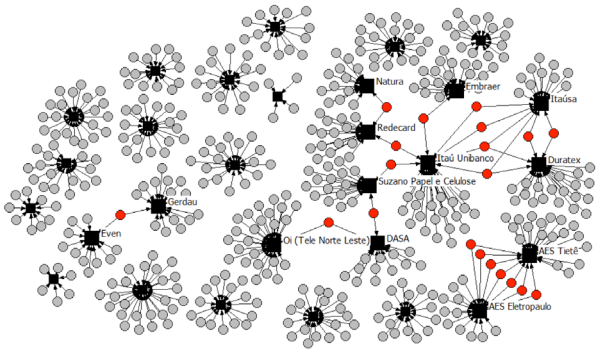
of directors and executive boards in the sample companies over a three-year period.

2010



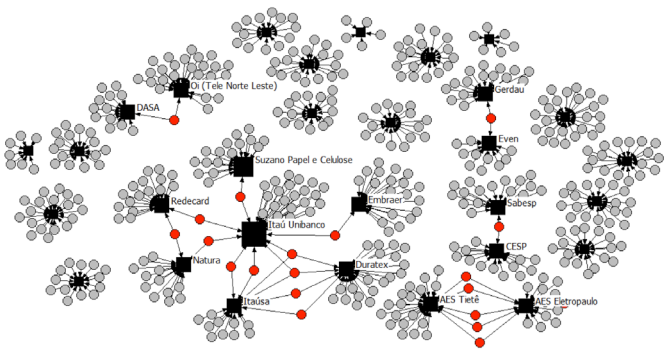
Social bonds – 2010		Board Inter.
Companies		
Itaú Unibanco	Itaúsa	1
AES Eletropaulo	AES Tietê	10

2011



Social Bonds – 2011		Board Inter.
Companies		
Oi	Dasa	1
Gerdau	Even	1
Sabesp	CESP	1
AES Tietê	AES Eletropaulo	5
Itaú Unibanco	Susano Papel e Celulose	1
	Recard	1
	Natura	1
	Itaúsa	2
	Duratex	1
	Embraer	1

2012



Social Bonds – 2012		Board Inter.
Companies		
Gerdau	Even	1
AES Eletropaulo	AES Tietê	7
Redecard	Natura	1
Oi	Dasa	1
Itaú Unibanco	Susano Papel e Celulose	1
	Redecard	1
	Embraer	1
	Itaúsa	4
	Duratex	

Figure 5. Social networks of board of directors and executive board members' interests in sample companies.

Legend: Red color (highlights the board members serving on the boards of more than two companies - Board Interlocking).

Source: Research Data.

In Figure 5, it is highlighted that different structural forms were found, which are strongly concentrated, showing a centralized ownership structure with bonds among the board members, like AES Eletropaulo and AES Tietê, with similarities between the following members: Luiz Gonzaga de Mello Belluzzo, Sergio Silva do Amaral, Cibele Castro, Pedro de Freitas Almeida Bueno Vieira, Rinaldo Pecchio Júnior, Sheilly Caden Contente. In the second network with similar members, Itaú SA and Itaú Unibanco stand out with the board member Roberto Egydio Setubal.

A continuous increase in the number of common board members is found across the three-year period in the boards of directors and executive boards of the companies analyzed. Then, the occurrence of board interlocking was observed in different companies in the same period. In this respect, in the first year, this practice occurred in companies from the same sector/segment. In 2011 and 2012, on the other hand, board interlocking was predominant in companies from different sectors/segments.

It is presupposed that the participation of board members in companies from different segments not only reveals the similarity between the companies' ownership control types (shared), but also demonstrates a market trend that goes beyond family relations and assumes a characteristic of the Brazilian capital market, aiming for the use of similar socio-environmental practices and the constant renewal of decision makers due to constant improvement and competitiveness.

Silveira, Barros and Famá (2008) defend that the use of corporate governance mechanisms like the structure of the Board of Directors and market competition are factors that discipline and condition the relations among board members (managers and investors).

As observed, board interlocking is present in most of the sample companies, due to existing bonds through the simultaneous participation of their board members in the board of directors or executive board of other companies (Mendes-Da-Silva et al., 2008), in this study mostly belonging to different activity sectors or segments.

The results suggest that board interlocking can be considered a driving factor of alliances with other companies, or even of the transmission of a sustainable culture by board members from different companies.

In the same direction as the results Dani, Beck and Beuren (2012) found with regard to board interlocking, it is concluded that the companies listed on the corporate governance levels of the São Paulo Stock Exchange, with shared ownership control, have similar socio-environmental practices that may or may not be related to the degree of family relationship among the members, or even with the transmission of a sustainable culture.

5. Conclusions and Limitations

The general objective in this research was to verify the property structure and relationship networks of Brazilian companies listed on the CSI.

Therefore, 30 companies were analyzed that are listed on Bovespa's Corporate Sustainability Index. Then, information was analyzed about the type of ownership structure, the type of control, stockholder composition, the relationship structure through social relations among the members of the board of directors and executive board, and the companies' practice of board interlocking.

To analyze the ownership and relationship structures, in total, 1361 board members were analyzed over a three-year period. This revealed that they participants mostly in companies from different segments, and less in companies from the same sector. This result reveals that, although the companies are active in different sector, they may have shared interests/activities, like the adoption of socio-environmental practices.

The results found suggest the interdependence of the ownership structure, defining the share of in-

vestments that will be made through socially responsible practices/activities, representing the application of that capital. The company boards and board members, who may participate in other companies that adhere to sustainable practices, can influence these decisions.

Therefore, it is suggested that the intent to indicate the adoption of corporate social responsibility practices to the market can be characterized as a corporate strategy.

As mentioned by Siffert Filho (1998), Brazilian companies predominantly maintain a shared ownership and control structure. Thus, decisions on socio-environmental policies and practices are linked with internal targets, besides pressure from users.

The ownership structure, linked with socio-environmental practices, can be understood as a capital mix the company selects to invest, in accordance with Teixeira and Nossa (2010).

In that sense, board interlocking can be considered a driving factor of alliances with other companies, or even of the transmission of a sustainable culture by board members from different companies.

This research contributes to the literature in the area, as it helps to understand the structure configuration of social relationships and interest among companies with different types of ownership control, whose social reputation represents a preponderant factor in these relations. In addition, it suggests that these characteristics influence organizations to adopt a sustainable posture.

Study limitations relate to the number of companies analyzed and the choice of the data treatment technique.

Finally, for the sake of future research, the company characteristics could be distinguished with regard to the occurrence of corporate restructuring processes, as a factor related to board interlocking, as well as the investment percentage in the CSI. Also, the most common type of ownership control in the boards of Brazilian publicly-traded companies could be verified.

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Executive Remuneration and Financial Performance: a Study of Brazilian Companies

Abstract

The aim in this research was to investigate the relation between executive remuneration and financial performance in Brazilian companies. The research data are secondary and were collected from two databases: a) Study Program on Human Resource Management (PROGEP); b) Institute for Accounting, Actuarial and Financial Research Foundation (FIPECAFI). The non-probabilistic sample consists of 82 non-financial companies. To operate the independent variable "remuneration", besides the mean monthly wage and the mean variable wage, three indices were used that were created especially for this research: benefits, career and development. These indices measured the access to benefits; to career encouragement and support mechanisms and to educational encouragement mechanisms. These are items the companies offer to their directors, vice presidents and presidents, hereinafter called "executives". These remuneration data refer to 2008. As regards the dependent variable "financial performance", three financial indicators were used: sales growth, return on equity and return on assets, for the financial years 2008 and 2009. Company size and activity sector were used as control variables. The results of the Spearman correlation test indicated a significant relation between financial remuneration and financial performance. And the results of the multiple linear regression analysis showed a significant relation between financial remuneration and financial performance and between non-financial remuneration and financial performance.

Key words: executives; financial remuneration; non-financial remuneration; financial performance; Brazil.

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1. Introduction

The theme executive remuneration has attracted media attention. The Enron and WorldCom scandals in 2001 and the subprime crisis in 2007 entailed great repercussion in the main communication means all over the world and revealed flaws in companies' corporate governance structure. Remuneration is one among different governance mechanisms, used to align the interests of shareholders and executives.

Various studies have been accomplished to investigate whether executive remuneration is related with corporate performance. These have been mainly developed in the United States (Kato, Kim & Lee, 2005), where information on executive remuneration is available. These research results vary and are inconclusive. While some studies found weak relations, others observed insignificant relations among the variables (Bálkin & Gómez-Mejia, 1987; Barkema & Gómez-Mejia, 1998).

The most used approach in these studies has been agency theory. According to that theory, the principal (shareholder) hires an agent (executive) to perform some task on his behalf, involving the delegation of authority for decision making. If the parts – shareholder and executive – act to maximize their personal utility, there are reasons to believe that the agent will not always act in the shareholder's best interests (Jensen & Meckling, 1976).

Research in other contexts beyond North America can contribute to a better understanding of this theme (Barkema & Gómez-Mejia, 1998; Kato *et al.*, 2005). In Brazil, due to companies' resistance to disseminate remuneration data, research on the relation between executive remuneration and financial performance remains scarce (Larrate, 2013).

The importance and relevance of the theme, the divergences in earlier research results from other countries and the interest in investigating whether executive remuneration is related with financial performance in Brazilian companies motivated the development of this research. It differs from earlier studies by the use of broader concepts to operate the variables. As regards the independent variable "remuneration", this research considered financial and non-financial remuneration. Financial remuneration included the direct (monthly wage + variable wage) and indirect remuneration (benefits) the executives received. Financial remuneration comprised aspects related to the executives' career, education and personal and professional development. Earlier studies only used direct remuneration.

As regards the dependent variable financial performance, earlier studies only used a financial indicator from a single financial year. In this study, three financial indicators – sales growth, return on equity (ROE) and return on assets (ROA) from two financial years – 2008 and 2009 are used. Except for the studies by Krauter (2009, 2012), this approach has not been used in any other Brazilian or international studies.

The aim in this research was to: *Investigate the relation between executive remuneration and financial performance in Brazilian companies.* In addition, the intent was to get to know the characteristics of the executive remuneration system in Brazilian companies. This research attempted to answer the following question: *What is the relation between executive remuneration and financial performance in Brazilian companies?*

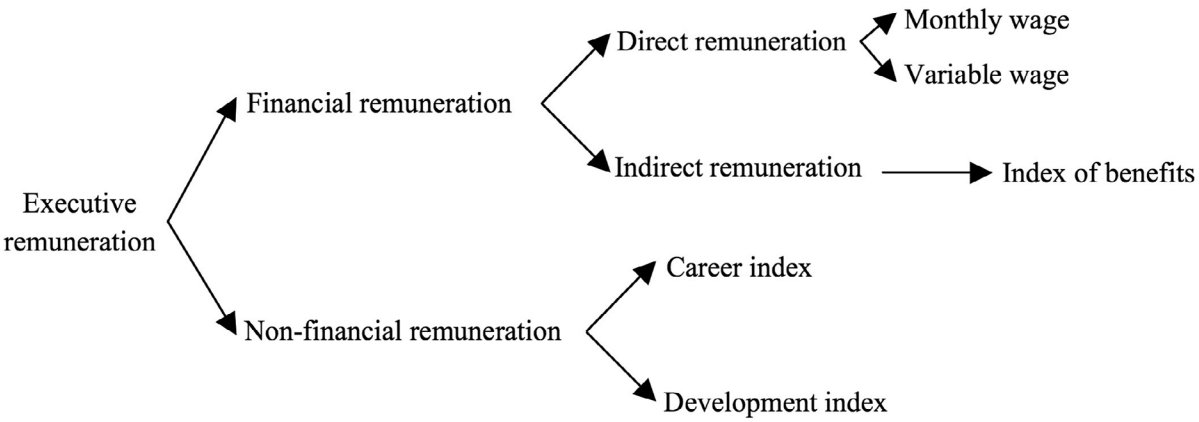
2. Remuneration and Financial Performance

Remuneration is one of the most important and complex Human Resource management systems. At the same time as it stimulates the search for increasingly better performances, the remuneration system aligns people's behavior with the strategic objectives of the business, making the company research higher financial performance levels (Bálkin & Gómez-Mejia, 1987; Gómez-Mejia & Welbourne, 1988). Figure 1 displays the remuneration concept used in this research.

Financial remuneration "is the economic and/or financial counterpart of a person's work" (Hipólito & Dutra, 2012, pp.1-2). It can be divided into direct remuneration and indirect remuneration. The first type refers to the total amount in money the person receives for the work done. It includes both fixed and variable remuneration (Chiavenato, 1989). Fixed remuneration is the cash amount previously agreed

upon between the person and the company, regularly paid for the work done. It is normally linked with the tasks and position the person occupies in the company (Chiavenato, 1989). Variable remuneration, then, is the cash amount received for the achievement of targets previously adjusted between the person and the company.

Indirect remuneration represents the work-related benefits granted to the people involves. Its objective is to offer safety and comfort (Chiavenato, 1989).



Source: Krauter (2009, p. 44).

Figure 1. The remuneration concept

Companies frequently incorporate non-financial remuneration into their executive remuneration packages, and this information was ignored in past research (Carlon, Downs & Wert-Gray, 2006). Career and personal and professional development-related aspects are two of the non-financial factors in question.

According to PROGEP (2012), the aspect people most value is the professional growth perspective. This possibility takes form in the professional career offered. Next rank training and education, which are considered fundamental aspects to sustain personal and professional growth.

As regards the career, organizations' actions cover mechanisms for career planning and monitoring, replacement in case of dismissal, internal recruitment and preparation for retirement.

Concerning personal and professional development, companies have adopted a permanent learning process. The aim is to develop corporate and human competences that are considered critical for the business (Eboli, 2002).

Organizational performance is a frequent theme in many Administration areas. The theme is of interest to academics as well as executives. Although the importance of the performance concept has been widely acknowledged, no consensus exists among research about how to put it in practice (Venkatraman & Ramanujam, 1986). Some authors, like Chakravarthy (1986), Keats (1990) and Venkatraman and Ramanujam (1986, 1987), believe that the "performance" concept comprises multiple dimensions. Therefore, to measure it, more than one indicator is needed.

Venkatraman and Ramanujam (1987) demonstrated that the "financial performance" construct involves at least two distinct dimensions: growth and profitability. Each of these two dimensions can be operated through one or more indicators. Profitability, for example, can be measured by means of indicators like return on equity (ROE), return on assets (ROA) and return on investments (ROI). Growth can be dimensioned by indicators like sales growth.

Studies that focused on the relation between remuneration and performance departed from the premise that the remuneration system is a fundamental mechanism. Through remuneration, individual efforts are oriented towards the strategic objectives of the business. When the remuneration system is appropriately structured, this process can contribute to enhance company performance (Gómez-Mejia & Welbourne, 1988).

The following paragraphs present a short summary of empirical research that investigated the relation between executive remuneration and corporate performance. These studies were undertaken in countries with available information on executive remuneration. In Brazil, companies' resistance against the disclosure of remuneration data hampers research on the theme.

In the research by Attaway (2000), the relation between company performance and the remuneration of the CEO (Chief Executive Officer) in a sample of 42 large computer and electronics companies in the United States was investigated. The secondary data were collected between 1992 and 1996. The following control variables were used: age of the CEO, time on the job, percentage of company shares held by the CEO and education level of the CEO. The ROE was used to measure corporate performance. The results of the correlation and regression analysis showed a weak but positive relation between corporate performance and CEO remuneration.

Ozkan (2007) examined the relation between CEO remuneration and corporate performance in a sample of 390 British non-financial companies, registered on the FTSE index, between 1999 and 2005. The remuneration included: fixed salary, bonus, stock options and long-term incentive plans. Performance was measured using stock returns and ROA. The following governance variables were used as control variables: property concentration and board structure. Company size was used as well, measured by sales and growth opportunities. This was dimensioned using Tobin's Q. The regression test results indicated that a positive and significant relation exists between the cash remuneration received (fixed salary + bonus) and performance. They also revealed a positive but non-significant relation between total remuneration and performance.

In Brazil, Camargos, Helal and Boas (2007) analyzed the existing relation between financial performance and the remuneration of executives in the 29 publicly traded companies with American Depositary Receipts (ADR) listed on North American stock exchanges. The remuneration data were collected from the Report 20-F and included the average remuneration received by members of the board of directors and executive board, and the financial indicators were collected from Economatica®. The data related to the year 2005. The results of the multiple regression analysis indicated a positive and significant relation between remuneration and financial performance.

Krauter (2009) investigated the relation between executive remuneration and companies' financial performance in a sample of 44 industrial companies. The remuneration for 2006 included: fixed salary, variable salary, index of benefits, career index and development index. The financial performance was measured using the following financial indicators: sales growth, ROE and net sales margin, for two years: 2006 and 2007. Pearson's correlation analysis showed weak and negative associations between the following variables: a) career index and sales growth in 2006; b) career index and ROE in 2006; c) development index and ROE in 2006. Spearman's correlation analysis indicated: a) a weak and positive association between the index of benefits and the net sales margin in 2006; b) weak and negative association between the development index and ROE in 2006. Based on the multiple linear regression analysis results, the existence of a positive and significant relation between executive remuneration and companies' financial performance could not be proven.

In another study, Krauter (2012) investigated the relation between executive remuneration and corporate performance in a sample of 79 companies from different sectors. To operate the independent variable were used "remuneration", the monthly wage, variable wage and three indices created for the research: benefits, career and development. The remuneration data related to 2008. The financial performance was measured by means of the financial indicators – sales growth, ROE and ROA for 2008. Size and sector were used as control variables. The results of the multiple linear regression analysis did not provide proof of the existence of a positive and significant relation between executive remuneration and corporate performance.

3. Method

The research is descriptive and the quantitative method is used. Multiple linear regression analysis is applied to test the following hypothesis: *A positive and significant relation exists between executive remuneration and financial performance in Brazilian companies.* This technique has been used in most of the earlier studies.

The data used in the research are secondary. Information related to the independent variables was extracted from the database of the Study Program on Human Resource Management (PROGEP), affiliated with the Institute of Administration Foundation (FIA). Data regarding the independent variables were extracted from the database of the Institute for Accounting, Actuarial and Financial Research Foundation (FIPECAFI).

The PROGEP is responsible for the research that annually selected the best companies to work for in Brazil. And FIPECAFI is responsible for publishing the "500 Best and Biggest" companies in Brazil.

The non-probabilistic sampling method was used. The sample consists of 82 non-financial companies with information available in the two databases mentioned earlier. To process the data, the statistical software Statistical Package for Social Science (SPSS) – version 16.0 for Windows was used.

Remuneration information was related to 2008 and refer to the payment received by directors, vice presidents and presidents, called "executives" in this study. To operate the remuneration variable, the following information was collected from the PROGEP database:

a) Nominal mean monthly of executives in December 2008, in *reais*;
b) Mean value the executives received in 2008 in *reais,* as variable remuneration and/or bonus;
c) Executives' access to 12 benefits: medical care; medical consultations inside company facilities; dental care; medication purchase support; psychological care; group life insurance; educational support; professional specialization support; language study support; child education support; housing support; funding and loans.
d) Executives' access to 27 career support and encouragement mechanisms. These mechanisms include: professional development planning and monitoring; career planning encouragement and support; outplacement for dismissed executives; internal recruitment; information about career possibilities; preparation for retirement.
e) Executives' access to eight educational encouragement mechanisms: educational programs that incorporate the identification of core corporate and human competences; multiple learning forms; programs that reflect the company's commitment to corporate citizenship; managers and leaders involved in the learning process; programs to disseminate the organizational culture; effective systems to assess investments in education and results achieved; knowledge sharing and experience exchange; partnerships with higher education institutions.

Based on this information about benefits, career and education, three indices were created: benefits, career and development, using the method developed by Krauter (2012).

To create the index of benefits, which measures the executives' access to the 12 benefits mentioned above (item c), one point was attributed to each benefit the company offered to all of its executive; 0 points for each benefit not offered. The points were added up and the result represents the organization's index of benefits. The score ranges from 0 to 12, that is, the company that does not offer any of the 12 benefits to its executives scores 0; the company that offers the 12 benefits to all of its executives scores 12.

To create the career index, which measures the executives access to the 27 career encouragement and support mechanisms mentioned earlier (item d), the same criterion was used as for the first index. One point was attributed to each career encouragement and support mechanism the company offered to all of its executives; zero points for each career encouragement and support mechanism not offered.

The points were added up and the result corresponds to the career index. The index score ranges between 0 and 27. The company that does not offer any of the 27 career encouragement and support mechanisms to its executives has a career index equal to zero. On the other hand, companies that offer all 27 mechanisms to all of its executives obtain an index of 27.

To create the development index, which measures the executives' access to the eight educational support mechanisms cited above (item e), the same procedure as applied for the first two indices was used. One point was attributed to each educational support mechanism the company offered to all of its executives; zero points for each mechanism not offered.

The points were added up and the result corresponds to the development index. The index score ranges between 0 and 8. Companies that do not offer any of the eight educational support mechanisms to its executives obtain a development index equal to zero. Companies that offer all eight mechanisms obtain an index equal to eight.

To measure the companies' financial performance, three financial indicators were used – sales growth, return on equity and return on assets, for 2008 and 2009. These indicators figure among those most used in empirical studies (Carton & Hofer, 2006; Lee, Hall & Rutherford, 2003). Although the financial indicators come with some limitations, the researchers chose to use them because the sample included private companies. This option also permits comparisons between the present results and those of research undertaken in other contexts.

Sales growth shows the evolution of the gross revenue from sales in *reais* after discounting the mean inflation, as appointed by the variation in the IGP-M. The indicator is expressed in percentage form. The return on equity results from the division of the net profit, adjusted by the inflation, by the equity, which is updated in view of inflation effects. The product is multiplied by 100 to be expressed in percentage form. The return on assets results from dividing the net profit adjusted by inflation by the total adjusted assets to recognize inflation effects. The product is multiplied by 100 to be expressed in percentage form.

The control variables were selected based on their possible influence on the dependent and independent variables. In the literature, it is highlighted that company size and activity sector are two relevant factors. In this study, the size was defined as the natural logarithm of total assets in 2008. Binary variables were used to represent the different sectors. These variables are scored as one for companies belonging to one specific sector and as zero for the companies belonging to the other sectors.

4. Presentation and Analysis of Results

Table 1 displays the sample companies' size according to the criterion adopted by the PROGEP (2012). Among the 82 sample companies, 48.8% are large, 37.8% medium and 13.4% small.

Table 1
Company size in the sample

Company size	N	%
Small size – between 100 and 500 employees	11	13.4
Medium size – between 501 and 1500 employees	31	37.8
Large size – more than 1500 employees	40	48.8
Total	**82**	**100**

The companies belong to 17 activity sectors. The sectors with the largest number of companies are: Construction industry with 12.2%; Services with 12.2%; Chemistry and oil with 11%; and Retailing with 11% (Table 2).

Table 2
Activity sector of sample companies

Activity sector	N	%
Oil and Chemistry	9	11.0
Electric-electronics	4	4.9
Pharmaceutical	3	3.7
Telecommunication	3	3.7
Paper and Pulp	1	1.2
Mining	2	2.4
Digital industry	1	1.2
Warehousing	1	1.2
Transport	2	2.4
Retailing	9	11.0
Consumption Goods	5	6.1
Energy	6	7.3
Car industry	7	8.5
Construction industry	10	12.2
Iron and Steel	6	7.3
Farming and Livestock	3	3.7
Services	10	12.2
Total	**82**	**100.0**

The abbreviations of the variables used in this research are shown in Figure 2. Table 3 displays the descriptive measures of the remuneration variables. The mean monthly wage and mean variable wage were transformed due to great variations. Two companies did not inform the mean monthly wage and mean variable wage their executives received in 2008.

Name of the variable	Abbreviation
Mean Monthly Wage	wagmon
Mean Variable Wage	wagvar
Index of Benefits	ibenef
Career Index	icar
Development Index	idevel
Sales Growth – 2008	gsal08
Return on Equity – 2008	roe08
Return on Sales – 2008	roa08
Sales Growth – 2009	gsal09
Return on Equity – 2009	roe09
Return on Sales – 2009	roa09
Size	size
Sector	sector

Figure 2. Abbreviation of research variables

Fourteen companies do not pay their executives a variable wage, which is why the minimum value equals zero. Research indices that variable wage positively affects the value creation drivers. Productivi-

ty increase, employee satisfaction increase, product or service quality increase and client satisfaction increase are some of the drivers that are positively affected by the implementation of variable remuneration programs (Krauter, 2007). Hence, there are opportunities for the companies to explore.

Table 3
Descriptive measures of remuneration variables

	N	mean	median	standard deviation	minimum	maximum
ln(wagmon)	80	10.15	10.27	0.61	7.14	11.10
ln(wagvar)	66	11.63	11.78	1.53	7.23	16.57
ibenef	82	7.12	8.00	2.28	0	11
icar	82	11.32	11.50	6.56	0	26
idevel	82	5.78	6.50	2.39	0	8

The index of benefits measures the executives' access to 12 benefits. The higher the index, the better ranked the company will be. This proportion considers a larger number of benefits for a larger number of executives. None of the companies reached the maximum score of 12 points. This means that none of them offers all benefits to all executives. Two companies do not offer any benefit to the executives. Only one company reached the highest score (11 points). The mean index of benefits corresponded to 7.12 points, with 50% of the companies scoring 8 points or less.

The benefits are an important mechanism to attract and retain talents. If well-structured, they can indicate to professionals that the company is a good place for a long-term professional relationship (Hipólito & Dutra, 2012).

The career index measures the executives' access to 27 career encouragement and support mechanisms. Like in the first index, the higher the index, the better ranked the company will be. None of the companies reached the maximum score of 27 points. Only one company reached the highest score (26 points). Six companies do not offer any career encouragement and support mechanism to the executives. The mean career index was 11.32 points, ranging between 0 and 26. Fifty-five percent of the companies scored 11.50 or less. These results indicate that the companies are offering few mechanisms to encourage and support their executives' career.

As mentioned earlier, the career the company offers is an item the executives value highly (PROGEP, 2012). According to Ulrich *et al.* (1991), when organizations give little support to their professionals' career, they start to reconsider their dedication to the organization and may no longer fully engage in the organization's actions. This context signals important opportunities for the organizations to explore.

The development index measures the executives' access to eight mechanisms aiming at stimulating education and professional development. Like in the first two indices, the higher the index, the better ranked the company will be. Twenty-four companies reached the maximum score of eight points. Six companies do not offer any stimulus to their executives' education and professional development.

The mean development index corresponded to 5.78 points, ranging from 0 to 8. Fifty-five percent of the companies indicated 6.50 points or less. Educational programs, training and partnerships with teaching institutions permit the executives' effective personal and professional development, granting them knowledge and appropriate skills to perform their functions in the organization (Fombrun, Tichy & Devanna, 1984).

Although the sample companies are considered benchmarks in human resource management, these results indicate that they are offering few mechanisms to encourage and support their executives' career and personal and professional development. Therefore, the companies should assess these questions. There are opportunities to explore in order to attract and retain the best talents.

Table 4 displays the descriptive measures of the financial indicators. Some companies did not inform all of these. The mean sales growth in 2008 was 16.06%, ranging between -79.05% and 169.81%. The

mean ROE in 2008 equaled 22.46%, ranging between -134.17% and 377.28%. The mean ROA in 2008 was 9.89%, ranging between -13.59% and 167.23%.

The mean sales growth in 2009 corresponded to 0.35%, ranging between -55.31% and 175.61%. The mean ROE in 2009 equaled 21.06%, ranging between -15.02% and 94.68%. The mean ROA in 2009 was 8.51%, varying between -5.06% and 31.56%.

Table 4

Descriptive measures of financial performance variables

	N	mean	median	standard deviation	minimum	maximum
gsal08(%)	77	16.06	5.92	35.34	-79.05	169.81
roe08 (%)	82	22.46	17.70	49.51	-134.17	377.28
roa08 (%)	82	9.89	6.30	19.67	-13.59	167.23
gsal09 (%)	79	0.35	-3.28	26.56	-55.31	175.61
roe09 (%)	78	21.06	19.11	17.11	-15.02	94.68
roa09 (%)	78	8.51	7.37	7.18	-5.06	31.56

Spearman's correlation coefficient was used to check whether a linear association existed between the remuneration variables and the financial performance variables. Table 5 shows the correlation coefficients of the research variables.

A significant correlation at 5% exists between the variables ln(salmen) and roe09. The coefficient is positive and weak ($\rho = 0.239$). The correlation coefficient between ln(salmen) and roa09 is significant at 5%, positive and weak ($\rho = 0.259$).

A positive, weak and significant association at 5% exists between ln(salvar) and roa09 ($\rho = 0.308$).

The variable ibenef is significantly correlated at 1% with gsal09. The coefficient is negative and weak ($\rho = 0.294$). A positive relation was expected, with a positive influence of the companies' supply of benefits on the executives' behavior.

No linear association exists between the other remuneration variables and the financial performance variables. Hence, the analysis of Spearman's correlation coefficient indicated a positive and significant relation between: mean monthly wage (logarithm) and ROE for 2009, mean monthly wage (logarithm) and ROA for 2009, mean variable wage (logarithm) and ROA for 2009. In addition, a negative and significant relation was found between the index of benefits and the sales growth for 2009.

Returning to Figure 1 at the start of this paper, the correlation test indicated a relation between financial remuneration and financial performance. The relation is positive and significant between direct remuneration and financial performance; and negative between indirect remuneration and financial performance. No relations were found between non-financial remuneration and financial performance.

It is interesting to observe the time lag between investments in personnel and the results created. The investments made in 2008 created results in the subsequent year – 2009.

Table 5

Spearman Correlation Matrix

	ln(wagmon)	ln(wagvar)	ibenef	icar	idevel	gsal08	roe08	roa08	gsal09	roe09	roa09
ln(wagmon)	1 80										
ln(wagvar)	0.472** 0.000 66	1 66									
ibenef	0.231* 0.039 80	0.074 0.556 66	1 82								
icar	0.243* 0.030 80	0.150 0.228 66	0.501** 0.000 82	1 82							
idevel	0.158 0.162 80	0.269* 0.029 66	0.287** 0.009 82	0.466** 0.000 82	1 82						
gsal08	-0.046 0.692 75	-0.024 0.851 62	-0.067 0.560 77	-0.064 0.579 77	-0.022 0.850 77	1 77					
roe08	-0.089 0.433 80	0.033 0.791 66	-0.012 0.913 82	-0.006 0.960 82	-0.030 0.789 82	0.159 9.169 77	1 82				
roa08	0.010 0.932 80	0.111 0.374 66	0.073 0.513 82	0.085 0.449 82	-0.020 0.862 82	0.097 0.401 77	0.856** 0.000 82	1 82			
gsal09	0.105 0.365 77	0.045 0.729 63	-0.294** 0.008 79	-0.093 0.414 79	0.035 0.763 79	0.131 0.263 75	-0.154 0.175 79	-0.235* 0.037 79	1 79		
roe09	0.239* 0.039 76	0.173 0.178 62	0.032 0.781 78	0.141 0.217 78	0.114 0.319 78	0.150 0.203 74	0.311** 0.006 78	0.212 0.063 78	0.266* 0.018 78	1 78	
roa09	0.259* 0.024 76	0.308* 0.015 62	0.102 0.376 78	0.143 0.212 78	0.124 0.279 78	0.083 0.484 74	0.473** 0.000 78	0.560** 0.000 78	0.077 0.502 78	0.780** 0.000 78	1 78

** and * correspond to statistical significance at 1% and 5%, respectively. Obs.: The first line represents the Spearman correlation coefficient; the second the p-value of the bilateral significance test; the third the number of observations.

To test the hypothesis about a positive and significant relation between executive remuneration and companies' financial performance, multiple linear regression analysis was used. Multiple regressions were developed, simultaneously using all remuneration variables as independent and financial performance variables as dependent variables. Size and sector were used as control variables. Six models were tested. The following general model was used:

$$DF_i = \beta_0 + \beta_1 \ln(wagmon)_i + \beta_2 \ln(wagvar)_i + \beta_3 ibenef_i + \beta_4 icar_i + \beta_5 idevel_i + \beta_6 size_i + \sum_{j=1}^{17} \delta j \, sector_{ji} + \mu_i$$

Where: *i* represents the *i*-eth company; DF represents the financial performance variables; δ_j represents the coefficient related to the binary variables of the activity sector; μ is the error term.

Table 6 displays the results of the multiple linear regressions estimated with the help of the minimal least squares method, using the natural logarithm of the total assets as a proxy for the size.

Only one of the six models tested showed statistical significance at 1%, which used roa09 (Column 6) as the dependent variable. This model presents an adjusted R^2 of 41.1%. The significance analysis of the parameters indicates that the coefficient of the variable ln(wagmon) is negative and significant at 10%; the coefficient of the variable ln(wagvar) is positive and significant at 1%; that of ibenef is positive and significant at 5%; that of size negative and significant at 1%; and that of the constant positive and significant at 5%.

The analysis of the coefficients in the model that uses gsal08 (Column 1) shows that the coefficients of the variables ln(wagmon) and size are negative and significant at 10%; that of the constant is positive and significant at 1%.

In the model using roe08 (Column 2), the coefficients of ibenef and idevel are negative and significant at 10%; that of icar is positive and significant at 5%; that of size is negative and significant at 1%; and that of the constant is positive and significant at 10%.

In the model that used roa08 (Column 3), the coefficients of the variables icar, idevel and size are significant at 5%, icar being positive and idevel and size negative.

The models that used gsal09 (Column 4) and roe09 (Column 5) as dependent variables showed no significant coefficients.

The results gave evidence of a significant relation between executive remuneration and companies' financial performance. Returning to Figure 1 at the start of this paper, the results indicate that financial remuneration is related with financial performance and non-financial remuneration with financial performance.

The models tested comply with all premises of the multiple regression analysis.

Table 6

Results of multiple linear regression models

Variables	gsal08 (1)	roe08 (2)	roa08 (3)	gsal09 (4)	roe09 (5)	roa09 (6)
ln(wagmon)	-19.234 (-1.706)#	-6.314 (-0.364)	-1.702 (-0.245)	9.521 (0.984)	-4.641 (-0.716)	-3.223 (-1.713)#
ln(wagvar)	1.359 (0.362)	4.523 (0.796)	2.286 (1.004)	4.193 (1.309)	0.927 (0.444)	2.367 (3.908)**
ibenef	-1.338 (-0.465)	-7.338 (-1.749)#	-2.601 (-1.547)	-0.591 (-0.257)	2.253 (-1.500)	1.109 (3.544)*
icar	0.499 (0.386)	4.263 (2.175)*	1.973 (2.512)*	-1.659 (-1.501)	0.765 (1.038)	-0.006 (-0.028)
idevel	-1.177 (-0.420)	-7.563 (-1.817)#	-4.145 (-2.485)*	1.318 (0.555)	0.364 (0.234)	0.094 (0.207)
size	-7.006 (-1.727)#	-16.523 (-2.876)**	-5.157 (-2.240)*	-1.587 (-0.456)	-2.083 (-0.917)	-2.433 (-3.691)**
sector	included	included	included	included	included	included
constant	320.908 (2.845)**	296.917 (1.724)#	89.854 (1.302)	-92.456 (-0.974)	67.447 (1.059)	42.370 (2.291)*
adjusted R^2	0.135	0.074	0.067	0.032	-0.048	0.411
Sig. F	0.165	0.279	0.295	0.391	0.625	0.002
N	60	63	63	60	59	59

The binary variables for the activity sector were included in the regressions. They were omitted from the table due to limited space. Figures between brackets indicated *t* statistics.
**, * and # correspond to statistical significance at 1%, 5% and 10%, respectively.

Figure 3 summarizes the results. The results of Spearman's correlation test and the multiple linear regression indicate a relation between mean monthly wages and return on equity in 2009 and between mean monthly wage and return on assets in 2009. The relation is positive and significant at 5% in the correlation test and negative and significant at 10% in the regression. The relation between mean variable wages and return on assets in 2009 is positive in the correlation test as well as in the regression. Hence, the results indicate that direct remuneration is related with financial performance. They also indicate that investments in staff members may demand some time to present results. Investments made in 2008 created results in 2009.

The results found in this study differ from research results that used the same constructs to operate the remuneration variable. These studies, developed by Krauter (2009, 2012) found no significant relation between executive remuneration and companies' financial performance.

Relations between variables	Spearman correlation	Multiple regression
Mean monthly wage and sales growth in 2008		(−) #
Mean monthly wage and ROE in 2009	(+) *	(−) #
Mean monthly wage and ROA in 2009	(+) *	(−) #
Mean monthly wage and ROA in 2009	(+) *	(+) **
Index of benefits and sales growth in 2009	(−) **	
Index of benefits and ROA in 2009		(+) *
Career index and ROE in 2008		(+) *
Career index and ROA in 2008		(+) *
Development index and ROE in 2008		(−) #
Development index and ROA in 2008		(−) *

Figure 3. Summary of test results

**, * and # correspond to statistical significance at 1%, 5% and 10%, respectively.
(+) indicates a positive relation between the variables; (-) indicates a negative relation between the variables.
Obs.: in the tests, the natural logarithm of the variables wagmon and wagvar were used.

5. Final Considerations

In accordance with agency theory, the remuneration package is considered as one of the most efficient mechanisms to induce risk-averse executives, in the attempt to maximize their own utility, to act to increase corporate performance. The aim in this research was to investigate the relation between executive remuneration and financial performance in Brazilian companies. It differs from earlier studies undertaken in other contexts by adopting broader concepts to operate the variables. While the earlier studies used fixed and variable wages to operate the remuneration variable, in the present research, besides the wages, three indices are used that were created for this purpose: benefits, career and development. In addition, earlier studies used only one financial indicator. In the present study, three financial indicators from two years are used.

The descriptive analysis of the wages indicated that some companies do not pay their executives variable wages. Research has indicated that variable remuneration plans favorable affect company performance, provided that they are appropriately developed, that is, provided that payment is linked to the achievement of goals. The descriptive analysis of the indices, then, showed that companies are offering little stimulus and support to their executives' professional growth. Research has shown that the possibility of professional growth is one of the main factors to attract and retain talents. Hence, there are opportunities for companies to explore.

The analysis of Spearman's correlation indicated a significant association between financial remuneration and financial performance. The multiple linear regression analysis results showed that financial performance is related with financial remuneration and non-financial remuneration. These results indicate that remuneration can help to direct executives' efforts towards the strategic objectives of the business, contributing for the company to achieve higher financial performance levels.

This research's main contributions are as follows: broaden existing knowledge about the relation between executive remuneration and companies' financial performance in Brazil, in view of scarce research on the theme, due to the lack of disclosure of remuneration data; create perspectives for further research, using this broader approach with data from other years; provide support for companies to improve their remuneration systems, increasing their ability to attract, retain, develop and mobilize their executives to achieve their objectives. Hence, aspects were indicated which companies should observe in the structuring of their executive remuneration packages: the inclusion of variable remuneration, benefits, career and educational stimulation mechanisms.

The research comes with some limitations. The non-probabilistic sampling method was employed to select the sample companies. Hence, the results found cannot be generalized to the population. Another limitation is the sample size. Due to difficulties to collect financial and remuneration data in Brazil, the sample consists of 82 companies. The fact that private companies – the predominant category in the Brazilian corporate universe – are not obliged to disseminate their financial statements hampers any research that needs these data. The use of financial information can be another limitation, in view of possible distortions.

As a result of the issuing of Instruction No. 480/09 by the Brazilian Securities Commission (CVM), which established new rules for the dissemination of managers' remuneration by publicly traded companies, additional data about executive remuneration will be available to researchers and can be adopted to operate the variable in future studies.

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A Study on the Accounting Factors Influencing the FIRJAN Municipal Development Index (IFDM) in Brazilian Capitals

Abstract

The impact of public spending on the development of a city can be considered a constant concern for those in charge. In that context, as citizens are obliged to contribute, through taxes, to maintain the municipal administrative structure, this structure takes particular interest in maximizing the human development of society, which can be measured with the help of the FIRJAN Municipal Development Index (IFDM). The aim in this study was to identify the accounting variables that condition the IFDM in Brazilian capitals, with a view to assessing the relevance of the accounting information in that index. Therefore, aspects of accountability and transparency in public management were addressed, as well as the role of accounting disclosure to reduce the information asymmetry that exists in the relation between citizens and elected managers. Concerning the methodological procedures, a panel data model was estimated by crossing the data from the Brazilian capitals' IFDM, which is considered an important public management and democratic accountability tool, for the years 2005 till 2010, using data for 17 accounting variables. The results showed a statistically significant association between the variables Interest and Debt Charges, Capital Expense, Investments, spending on Culture and Social Assistance and Current Transfers on the one hand and the total IFDM of the selected public entities on the other, showing that accounting information is relevant to determine the IFDM of the capitals analyzed. This situation supports the theoretical assertion according to which governmental spending, as registered by accounting, affects city development. Hence, good public account management could culminate in a higher human development level of the cities studied over the years.

Key words: Public Entities. Accountability. IFDM.

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1. Introduction

The State and cities' execution of the activities for which they were created requires the availability of financial resources. In that sense, citizens are called upon to contribute, through compulsory tax payment, in order to maintain the structure of the state and municipal administrative apparatus, as well as to make any investments within their competency area they consider priorities, such as education, health, basic sanitation, transport, infrastructure, public safety, technology and others (Cruz, 2010). At bottom, this tax collection is aimed at supporting spending to maximize the population's wellbeing. In theory, the higher the spending, the higher the level of wellbeing will be (Scarpin, 2006).

In accordance with Santos Filho (2010), traditionally, the growth and development of a society have always been measured based on quantitative economic factors like GDP, per capita GDP, per capita income and investments. Although these indicators could somehow be efficient as a proxy of economic growth, they did not always reflect the society's development level, which normally influences the social wellbeing and quality of life (Santos Filho, 2010). In this context, indicators emerged that are more focused on the social sphere, particularly the Human Development Index (HDI).

In the same sense, Scarpin (2006) emphasizes that the progress of a country or city cannot be measured merely by the money its citizens possess (or lack), but that aspects related to health, quality of medical services and education should also be taken into account, so that these measures should be assessed not just by their availability, but also by their quality. Santana Júnior (2008) adds that, when citizens are obliged to pay taxes, they also start to charge compliance with the social contract from public entities, through their directors and managers. Thus, the citizens aim to guarantee that the resources resulting from their taxes are being employed effectively.

Similarly to what happens in a private, for-profit organization, in the municipal public sphere, although there is no formal owner of the city, different agency conflicts exist. The owner of a city can be considered as its inhabitants, who through free elections choose their mayor, who will administer the city in a given period (Scarpin, 2006). The mayor's interests do not always converge with those of the general population though, a fact that characterizes an agency conflict.

According to Slomski *et al.* (2008), admitting the existence of information asymmetry between agent and principal gives rise to the need to assess whether the agent (public manager) will always make decisions that maximize the interests of the principal (citizens). In line with Scarpin (2006), one of the main interests of the citizens is to maximize the human development of the group, which can be measured through the Municipal Human Development Index (HDI-M) and, similarly, through the FIRJAN Municipal Development Index (IFDM).

Studies that analyze the HDI and link it with accounting/financial aspects are more frequent in the literature than studies on the IFDM, highlighting the work of Anand and Sen (2000), Scarpin (2006) and Ray (2012). Anand and Sen (2000) have analyzed the "Income" component of the Human Development Index, demonstrating bias and punctual inconsistencies in the use of that variable in the model the HDI proposes. The authors proposed some corrections to the method, due to crucial divergences, even in inter-country comparisons, among per capita GDP rankings. Among these modifications, the need for the precise and consistent use of income-related variables and corrections to consider different income distribution scenarios is highlighted.

Scarpin (2006) indicated a mathematical model to determine the future value of the HDI-M for cities in the State of Paraná, based on current accounting data and other variables. The author also analyzed the correlation among the indicators that are part of the HDI-M, checked the relevance of accounting information in the determination of the index, identified the variables related to the HDI-M and measured the time lag between these variables and the index analyzed.

Emphasizing accounting for sustainable development, Ray (2012) proposed a redefinition of the HDI, including information on the environment into the traditional index with a view to a more appropriate representation of sustainability. The new index the author developed, called the Environmentally Stressed Human Development Index (ESHDI), indicates the level of strain a country puts on the environment in the economic development process. Cruz (2010), in turn, used the IFDM and the HDI-M as explanatory variables to test the hypothesis that the public management transparency level of the 100 main Brazilian cities in terms of population is positively related with those cities' performance on the same indices.

To achieve the interests of the city's inhabitants, it is the duty of the administrator the population has elected to manage public finance with a view to maximizing development through the resources spent (Scarpin, 2006). In that context, based on the analysis of the IFDM profile and the possible contribution of public accounting to appropriately register public spending levels, the following research question was formulated: what accounting factors condition the IFDM? To answer the research question, the general aim in this study is to identify the accounting variables that condition the IFDM of Brazilian cities, with a view to permitting inferences about the relevance of accounting information in that same index.

As a contribution, the study aims to encourage the elaboration of further knowledge about the impact of public spending on the formation of the IFDM, considering that more studies have adopted the HDI, while additional research to analyze the IFDM is lacking. In addition, the researchers hope to contribute to the direction of public policies towards more efficient resource allocation.

2. Theoretical Platform

2.1. Accountability in Public Entities

In the accounting context, the main goal of information disclosure is to support internal and external users of accounting to make decisions. Thus, the financial statements provide information about companies' equity, financial and economic position (Colauto *et al.*, 2009). The objective of Public Accounting does not escape from this rule, as it is expected to control public equity and render accounts to society. Hence, for Accounting to achieve that goal, an accounting information system needs to be used that permits due support in the decision making process and transparent public spending (Athayde, 2002).

Like in private companies, users' interest in the information public accounting provides are diverse and wide-ranging, as detailed in Figure 1.

Types of Accounting users	Interests of users
Citizens, Taxpayers or Voters	Exercise political participation and social control, supporting the choice and activities of governments that respond to their anxieties;
Suppliers	Decide on sales to the State through knowledge about demand and payment capacity. Monitoring of public calls for tender and payments by public entities;
Unions	Negotiate on remunerations, work conditions and benefits to public servants, retired people and pension holders;
Businessmen	Decide on the going concern of the business, in view of changes in tax burdens and the State's encouragement of economic activities, as well as opportunities to capture employees and directors for their staff;
Investors (private persons or institutions)	Analyze the risk related to the purchase of public debt bonds, among other investment alternatives affected by the State;
NGOs and Associations	Monitor and supervise governmental actions, according to their objectives, and identify cooperation or support areas or centers for their activities;
Political Parties	Support their criticism and governmental proposals (government plans), also through the allocation of public resources to teaching, research and community services;
Researchers and Students	Develop academic-scientific studies about the State, its management and public finance. Locate opportunities and/or the concentration of potential or actual resources detached to the entity;
Credit institutions	Support their decisions about granting credit to the State;
Governments in other spheres or powers	Supervise the use of resources, decisions on technical and financial help, establishment or changes in standards in force;
Foreign governments	Decide on cooperation and financial help, in the form of loans or donations (transfers);
Media (radio, TV and newspapers)	Disseminate news and investigative pieces.

Figure 1. External users of public accounts and summary of their presumed interests.

Source: Adapted from Platt Neto *et al*. (2005).

According to Pablos, Figueroa and Camou (2007), the interpretation of reality that results from the accountability process of public entities can follow two types of logic: the logic of best practices or the logic of the correct. In line with the authors, the logic of best practices is the logic of intelligent action that produces good results; it is the logic of efficacy, of efficiency and effectiveness. The logic of the correct, on the other hand, is the logic of legislation, compliance with methods, standards and applicable rules. The challenge is to make both logics coincide, that is, to make sure that what complies with the rule is, at the same time, what produces results and solves problems. Pablos, Figueroa and Camou (2007) also add the need for a balance and agreement between administrators' discourse and action; between what is said and done. Hence, the task of democratic governments takes form in the development of a political order that balances the two moments and two ways of addressing reality and, to reach this objective, it is fundamental to develop appropriate mechanisms and institutions for accountability, as well as for the deliberation and judgment of government actions and results (Pablos, Figueroa and Camou, 2007).

In this context, information disclosure appears as a highly relevant process, considering its outstanding role in the reduction of the information asymmetry that exists in the relation between society and its elected rulers. Thus, governments are obliged to account for their actions to society, so as to maintain their legitimacy. These governors, in turn, can only be called upon to account for their actions when a publicity and transparency base exists for an informed and alert citizenship. These characteristics take form when there is an institutional structure that is not limited to the review by a single official supervisor, but also permits the actual cooperation of different independent auditors. Hence, the supervisory function is formally performed by the legislatures, but also by the free press, civil organizations, academics, political analysts and interaction among distinct actors in the governmental policy sphere (Pablos, Figueroa and Camou, 2007). This gives rise to the accountability concept, which according to some authors approaches the concept of the obligation to render accounts for

the results achieved in function of the responsibilities deriving from a delegation of power (authority), consequently producing a responsibility, that is, to render accounts for one's performance and results (Corbari, 2004).

Therefore, power, responsibility and the rendering of accounts are interrelated concepts. Without the delegation of power or a certain ability to do things, accountability cannot be required, as it is manifested, justified and complied with through the appropriate rendering of accounts. This rendering of accounts, in turn, involves the disclosure of the public entity's performance, describing and explaining what has been done (Martinez-González; Martí, 2006).

According to Graciliano *et al.* (2010), accountability can be defined as the action of holding public managers permanently responsible in terms of the assessment of compliance/legality, as well as the economy, efficiency, efficacy and effectiveness of the acts practiced as a result of the use of the power they are granted by society. In that context, Nakagawa, Relvas and Dias Filho (2007) defend that the notion of accountability in the public sector can be divided as follows: (a) giving explanations to all citizens, whether they are voters or not; (b) providing further information about relevant facts when necessary; (c) reviewing and, if necessary, revising systems or practices to achieve citizens' expectations, whether these are voters or not; and (d) granting compensations or imposing sanctions.

According to the Federation of Industries of the State of Rio de Janeiro (FIRJAN), one of the advantages of the FIRJAN Municipal Development Index (IFDM) is that it permits the orientation of public actions and the monitoring of its impacts on cities' development, representing an important public management and democratic accountability tool.

2.2. Public Spending and Development

Accounting plays a fundamental role as an instrument to enhance performance in the public sector (Hood, 1991). According to the National Council on Governmental Accounting – NCGA (1982), the general goal of accounting and financial information in public entities is to: (1) provide financial information that is useful for political, economic and social decision making, demonstrating responsibility and good management, and (2) provide information that can be useful for the assessment of organizational performance and actions. In line with Santos Filho (2010), Accounting Applied to the Public Sector permits the disclosure of public spending in different ways, based on various budget rankings (institutional, function, program structure, expense type). Independently of the disclosure form though, it is responsible for appropriately registering the level of this spending.

Based on consolidated accounting data, one can obtain the volume of public resources spent in specific areas, such as administration and planning, education and culture, housing and urbanism, health and sanitation, assistance and social security, transportation, at any aggregation level. One can also identify in accounting terms the amount spent on interests and debt charges, staff and investments in a given city, state, region or country. Accounting also provides information about the revenues public entities have collected, whether these are ranked as current, tax expenses and/or current transfers. In that context, public accounting attempts to achieve its goals of registration, control, transparency, account rendering and information disclosure.

March and Olsen (1995) highlight, however, that public accounting is not just limited to arithmetic operations of the revenues and expenses made, but mainly represents a proposal to construct and explain the political reality. Hence, this is a process to construct reality in which its interpretation is not imposed top-down, so that the ruler's proposal is revised, observed and assessed by other independent actors, who do not necessarily possess the same interests or values.

Public spending and, consequently, public revenues, should therefore not be analyzed as isolated figures beyond a political context, keeping in mind that they affect the development of a city, whether in the reduction of negative external influences or in the matter of public goods (Scarpin, 2006). According to Kon (1997, p. 35), "positive external influences represent savings in the production costs and benefits for the agents who use them, while negative influences or diseconomies are associated with losses, in-

creased costs, disadvantages". In other words, the negative external influences emerge when one party's actions impose costs on the other (Scarpin, 2006).

Scarpin (2006) highlights that the expansion of public spending is related to its role in the production of public goods and the control of external influences in a market economy. In that sense, governmental intervention through public spending is a two-way process. The first is the public good itself, which cannot be made by the market, like in the case of public safety. There are also public goods for the production of positive external influences, like in the case of a vaccination campaign, considering that, when one immunizes the population against a transmissible disease, this comes with a great implicit benefit, which is the safety that the population will not catch the disease (Scarpin, 2006).

Therefore, as a result of the good management of public accounts, including public revenues and spending registered by accounting, cities' human development level tends to increase over the years. As mentioned, public spending and, consequently, affect the development of a city. One of the functions of municipal controllership is the elaboration of information systems to monitor the municipal revenues and expenses. Such information support, according to Scarpin (2006), is fundamental to eliminate the conflicts of interest between society and elected rulers, considering that public managers may have other interests than the maximization of development, such as the plundering of public equity for their own sake, the directing of spending towards political allies, a future reelection or election for other public offices.

2.3. FIRJAN Municipal Development Index (IFDM)

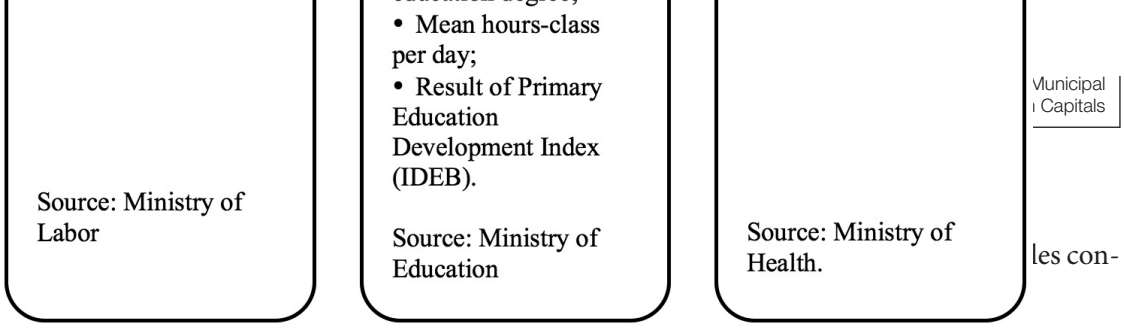
The FIRJAN Municipal Development Index (IFDM) arose from the need to annually monitor the socioeconomic development of a region, in view of the different realities in its smallest federative division: the city (FIRJAN, 2010). With equal weights, the IFDM assesses the three main human development areas: 'Employment and Income', 'Education' and 'Health'. The reading of the results – whether by development areas or by the analysis of the final indices – ranges from 0 to 1, so that indices, closer to 1 indicate higher development levels of the city (FIRJAN, 2010).

Based on this method, the FIRJAN System put forward the following classifications:

a) cities with IFDM between 0 and 0.4: low degree of development;
b) cities with IFDM between 0.4 and 0,6: regular degree of development;
c) cities with IFDM between 0.6 and 0.8: moderate degree of development;
d) cities with IFDM between 0.8 and 1.0: high degree of development.

The index is calculated per year, but only calculations for the years 2000, 2005, 2006, 2007, 2008, 2009 and 2010 are available. As regards the publication of the ranking for 2000, a time lag of eight years is observed, as it was published in 2008 but considered data for 2000. Similarly, the rankings for 2005, 2006, 2007 and 2008 showed a three-year lag, as they were published in 2008, 2009, 2010 and 2011, respectively. Finally, concerning the publication of the rankings for 2009 and 2010, these became available in 2011 and 2012, with a two-year lag.

As highlighted by FIRJAN (2010), these lags derive from the fact that only official statistics are used to calculate the index; hence, in some situations, long periods are needed to join data from the Min-



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sidered

Figure 2. Summary of variables in the calculation of the IFDM.

Source: IFDM 2010. Available from: <www.firjan.org.br>. Accessed on: 23 Sept. 2011.

The first area the IFDM addresses is formal employment and the revenue of the employed population. The IFDM-Employment and Income monitors movements and characteristics of the formal job market, based on the data the Ministry of Labor makes available (FIRJAN, 2010). The second area of the IFDM, Education, represents one of the main pillars for the development of a country. The IFDM-Education was idealized for the supply and quality of primary and preschool education offered in Brazilian cities, in public and private schools, according to the constitutional competences of all cities. It should be highlighted that one can require at least high-quality primary education in all cities, considering that they are not clearly responsible for maintaining secondary education (responsibility of the state) and higher education (FIRJAN, 2010).

The third and final area considered in the IFDM is Health. According to FIRJAN (2010), analyzing health based on the statistics available is a challenge, due to the lack of consensus among researchers about the best indicators of the public service situation. Hence, the IFDM-Health is focused on primary health care and the use of databases experts consider as relevant and reliable, prioritizing data from the Mortality Information Systems (SIM) and the databases on Live Births (Sinasc).

3. Method

3.1. Units of Analysis, Data Collection and Characteristics of Variables

In this descriptive study, documentary analysis and a quantitative approach were used. The research was accomplished by crossing IFDM data for 2005 till 2010, available on the website of FIRJAN, with data for accounting variables from Brazilian companies available on the website of the Brazilian Treasury, using the software *Finanças do Brasil* (FINBRA). The Brazilian Secretary of the Treasury (STN) developed that software to disseminate data on the budget execution of Brazilian cities, including an accounting database that considers the financial years between 1989 and 2011. In this study, data for 2005 till 2010 were used, which were the baseline years considered to calculate the IFDM, while information on the period from 2001 till 2004 was not published on the FIRJAN website.

To achieve the objective, the following hypothesis was tested in the research:

H_1: *The account balances registered by public accounting are explanatory factors associated with the determination of the city's total IFDM.*

This hypothesis was analyzed in the study by Scarpin (2006) of cities in the state of Paraná, but that author used the Education, Longevity and Income dimensions of the Municipal Human Development Index (IDH-M) as the dependent variable. In this study, the decision was made to use the IFDM instead of the IDH-M because the former is annual, while the latter is calculated every decade, based on data from the Population Census, which is currently held in Brazil every ten years (FIRJAN, 2010). Therefore, the IFDM was chosen because it presents more updated data and a larger time series, considering that the

most recent IDH-M ranking of Brazilian cities available in the software Atlas of Human Development in Brazil was held based on information for the year 2000.

It is presupposed that the replacement of the IDH-M by the IFDM, in function of the latter's more updated information and larger time series, will not impair the analysis of the results, in view of similarities between the two indices and the strong positive correlation between both, according to Table 1.

Table 1
Correlation coefficients (*Pearson*)

	IFDM 2000	IDH-M 2000
IFDM 2000	1,000	
IDH-M 2000	**0,793**	1,000

Source: Elaborated by the authors based on data extracted from STATA®.

According to the research hypothesis, in principle, besides the dependent variable total IFDM, 16 independent variables were selected, previously analyzed in the research by Scarpin (2006). Studies like Ferreira (1996), Devarajan, Swarrop and Zou (1996), Ferreira and Milliagros (1998), Rocha and Giuberti (2007), Ghosh and Gregoriou (2008), among others, explored the effects of public capital on economic growth and/or productivity, but the study by Scarpin (2006) stood out because it enhanced knowledge on the impact of public spending, according to a series of accounting variables, on the formation of the IDH-M, an index that goes beyond the measuring of economic development. Therefore, the research by Scarpin (2006) was chosen as the base for this study. That author also analyzed non-accounting variables but, in this research, these were not taken into account, as the intent was to evaluate the isolated contribution of accounting as a possible conditioning factor of the IFDM. As regards the accounting variables, in the study by Scarpin (2006), only the Tax Revenue and Staff Expenses were significant as explanatory factors of the total IDH-M.

The definitions of the independent variables were taken from the study by Scarpin (2006) and the glossary of the software Tax Situation of your City, developed by the Brazilian Secretary of the Treasury (STN):

- Staff Expense: amount corresponding to expenses of all kinds (including social fees) related to staff, except charges for severance pays resulting from court decisions and related to earlier years;
- Interests and Debt Charges: amount corresponding to the expenses due to interest payments, commissions and other charges related to internal and external, hired and domestic public debt;
- Capital Expense: aimed at forming and/or purchasing a capital good to contribute to the enhancement of the production capacity;
- Investments: groups any and all expenses related to the planning and execution of works, purchase of real estate and plants, equipment and permanent material, the capital constitution or increase of non-commercial or non-financial companies;
- Administration and Planning: corresponds to the sum of expenses on administration, science and technology and special charges (internal and external debt refunding, internal and external debt servicing and transfers);
- Education: corresponds to educational spending, disclosed in function number 12 (education);
- Culture: represents spending on culture, characterized in function number 13 (culture) of the public spending budget;
- Urbanism: presents the city's spending on urbanism, as evidenced in function 15 (urbanism);
- Housing: corresponds to the city's spending on housing, as disclosed in function 16 (housing);
- Health: represents the city's spending on health, characterized in function number 10 (health);
- Sanitation: corresponds to sanitation expenses, represented by function 17 (sanitation);
- Social Welfare: presents the city's spending on welfare, disclosed in function 08 (social welfare);

- Social Security: corresponds to social security spending, characterized in function number 09 (social security) of the public expense budget;
- Transportation: presents the city's spending on transportation, disclosed in function 26 of the public expense budget;
- Current Revenues: refers to the revenues that only increase the State's non-permanent equity, that is, which are depleted within the period of the annual budget law. Includes the following groups: taxes, contributions, equity, agricultural, industrial, services, current transfers, other current revenues.
- Tax Revenues: relates to taxes, fees and contributions collected by the city;
- Current Transfers: correspond to the intergovernmental transfers of the State and the Union, related to state and federal taxes, as well as to the City Participation Fund.

3.2. Analytic Model

The statistical technique used to identify the accounting variables related to the IFDM is panel data regression. This method permits the cross-sectional estimation of regressions over a given time period (time series). Hence, panel data involve a spatial and a temporal dimension. Among the advantages of this type of analysis, the possibility to control for individual heterogeneity and the use of further observations are highlighted, increasing the degrees of freedom and reducing the multicollinearity among the explanatory variables (Hsiao, 1986).

According to Baltagi (2005), however, working with panel data entails the following limitations: (1) data collection problems; (2) distortions resulting from measurement errors; (3) selectivity problems resulting from missing data that cause unbalanced panels; and (4) short dimension of the time series.

The general model for econometric analyses using panel data can be represented in a simplified manner as:

$$y_{it} = \alpha + x_{it}\beta + v_i + \varepsilon_{it}$$

Where:

- i = 1,..., N (represents cross-sectional units);
- t = 1,..., N (indicates the time series);
- y_{it} = indicates the dependent variables;
- α = is the model intercept;
- x_{it} = indicates the independent variables in the model (there are k regressors in x_{it});
- β = represents the estimated angular coefficients for each independent variable; and
- $v_i + \varepsilon_{it}$ = are the model errors. According to Baltagi (2005), v_i is the component that indicates the specific non-observable individual effect, which differs among the units and is invariable over time; while ε_{it} is the component that varies with the units and time, called the "usual" regression error. In this study, it is highlighted that, as each entity "i" has the same number of time data, the panel is balanced.

Three types of panel data models can be listed, which are: pooled regression, fixed effects and random effects. The first presupposes that all coefficients are constant over time and among individuals (represented by Brazilian capitals here). According to Gujarati (2006, p. 517), that is the "simplest and possibly naïve manner" of estimation, as it ignores the space and time dimensions of the combined data and estimated the habitual minimal least squares regression.

The fixed effects model is appropriate in situations in which the specific intercept of the individual can be correlated with one or more regressors. One disadvantage of the fixed effects model is the fact that it consumes a large number of degrees of freedom in case of many cross-sectional units (N), as a signif-

icant number of dummy variables needs to be included (Gujarati, 2006). In addition, this type of model may present multicollinearity.

In the random effects model, it is presupposed that the intercept of an individual unit is a random extraction from a much larger population with a constant mean value. One advantage of the random effects model over the fixed effects model is that the former is economic in degrees of freedom, as no N individual intercepts need to be estimated, but only the mean value of the intercept and its variance (Gujarati, 2006).

Given these estimation possibilities, the question that should be asked is: which model should be used? The estimation of the fixed effects model takes into account the "individuality" of the fixed effects model, which can be considered appropriate for this study. It should be highlighted that, in this case, it is presumed that the angular coefficients are constant, while the intercept varies among the entities, although other possible premises can be found about the intercept, the angular coefficients and the error term in Gujarati (2006). Therefore, to detect the convenience of using the pooled method or the panel model with fixed effects, Chow's test was applied. According to Baltagi (2005), this test assesses whether the individual effects are statistically equal to zero, that is, there are no specific individual effects (pooled hypothesis) versus the alternative hypothesis that these effects are statistically different from zero (fixed effects hypothesis).

The estimation alternative using panel data with random effects is another acceptable option for analysis in this research, considering that this method assumes that all cities included in the sample were taken from a larger universe, which includes all Brazilian cities. Therefore, the Breusch-Pagan test was applied to assess the convenience of using the pooled model or the panel model with random effects. This test assesses whether the variance of the non-observable individual effects is statistically equal to zero (pooled hypothesis) versus the alternative hypothesis that this variance is statistically different from zero (random effects hypothesis). Then, the Hausman test was applied to select which panel data model is the most appropriate: the random effects model (H_0) or the fixed effects model (H_A).

It is highlighted that the panel data model can raise several estimation and inference problems, based on the cross-sectional data (heteroscedasticity) and time series (self-correlation). Thus, to test the heteroscedasticity between the panels, the modified Wald test was applied. This test is part of the test set available in STATA®. Modified Wald statistics are calculated, considering the null hypothesis that the error variance is homoscedastic (Gomes, 2007). To test for the presence of serial self-correlation of the errors, Wooldridge's serial self-correlation test was applied. Wooldridge's test departs from the null hypothesis "presence of serial self-correlation" of higher order, against the "absence of self-correlation".

4. Analysis of Results

In view of the three panel data estimation possibilities, and considering that the three models could be applicable to the study, some steps were followed to decide which model should be used. First, the pooled model and the fixed effects model were estimated. To detect the convenience of using the pooled model or the fixed effects model, Chow's test was employed. The p-value found in the test was 0.0000. Hence, considering $\alpha = 0.05$, H_0 ($p < \alpha$) was rejected, which indicates the convenience of using the fixed effects model.

Then, the random effects model was estimated. To detect the convenience of using the pooled model to the detriment of the random effects model, the Breusch-Pagan test was applied. The p-value found in the test was 0.0000. Hence, considering $\alpha = 0.05$, H_0 ($p < \alpha$) was rejected, which implies the convenience of using the random effects model.

Finally, after verifying the inappropriateness of using the pooled method, in view of the rejection of the null hypothesis in the Chow and Breusch-Pagan tests, Hausman's test was applied to select which of the panel data models would be the most appropriate: the random effects model (H_0) or the fixed effects model (H_A). The p-value found in the test was 0.1482. Hence, considering $\alpha = 0.05$, H_0 ($p > \alpha$) was

not rejected, which implies the convenience of using the random effects model.

After defining the most appropriate panel data estimation model for the study (random effects), Wooldridge's serial self-correlation test was applied to test for the presence of serial self-correlation in the errors. The p-value found was 0.0000, indicating the existence of self-correlation problems. Regarding the presence of heteroscedasticity, the modified Wald test was applied. The p-value found was 1.0000, indicating the non-existence of heteroscedasticity problems.

Thus, in function of the self-correlation problems of the model estimated in this study, the methodological procedure used was based on the suggestion by Judge *et al.* (1985 *apud* Bressan, 2009), who indicates the application of the panel data model using Feasible Generalized Least Squares as the alternative that permits estimating panel models in case of self-correlation.

The basic structure of the panel regression model used in this research is as follows:

$$IFDM_{it} = \alpha + \beta PESSOAL_{it} + \beta JUROS + \beta DESPCAP + \beta INV + \beta ADMPLAN + \\ + \beta EDUC_{it} + \beta CULT_{it} + \beta HABIT + \beta URB_{it} + \beta SAUD + \beta SAN_{it} + \beta ASSIST + \\ + \beta PREV_{it} + \beta TRANSP_{it} + \beta RECOR + \beta RECTRIB + \beta TRANSF + v_i + \varepsilon_{it}$$

Where:
i = 1,..., 26 (represents the public entities analyzed);
t = 1,..., 4 (indicates the periods analyzed: 2005 till 2010);
IFDM = total FIRJAN Municipal Development Index (dependent variable in the model);
α = is the model intercept;
β = represents the estimated angular coefficients for each independent variable;
The variables described next serve as the independent variables in the model:
PESSOAL = Staff Expense;
JUROS = Interests and debt charges;
DESPCAP = Capital Expense;
INV = Investments;
ADMPLAN = spending on Administration and Planning;
EDUC = spending on Education;
CULT = spending on Culture;
HABIT = spending on Housing;
URB = spending on Urbanism;
SAUD = spending on Health;
SAN = spending on Sanitation;
ASSIST = spending on Welfare;
PREV = spending on Social Security;
TRANSP = spending on Transportation;
RECOR = Current Revenues;
RECTRIB = Tax Revenues;
TRANSF = Current Transfers, and;
$v_i + \varepsilon_{it}$ representing the model errors.

The results of the estimated panel data model, using Feasible Generalized Least Squares (FGLS), are described in Table 2.

Table 2
Conditioning accounting variables of IFDM of the 26 capitals analyzed in the study

IFDM	Coefficients	Standard error	P-value

PESSOAL	1.64e-11	2.00e-11	0.413
JUROS	**-4.66e-10**	**1.24e-10**	**0.000**
DESPCAP	**-1.19e-10**	**3.86e-11**	**0.002**
INV	**1.37e-10**	**5.60e-11**	**0.015**
ADM	1.95e-11	5.16e-11	0.706
EDUC	5.67e-11	7.44e-11	0.446
CULT	**5.76e-10**	**2.19e-10**	**0.009**
HABIT	1.11e-10	1.13e-10	0.326
URB	-8.43e-13	3.55e-11	0.981
SAUD	3.83e-11	4.06e-11	0.345
SAN	-3.75e-11	6.10e-11	0.539
ASSIST	**-5.23e-10**	**2.08e-10**	**0.012**
PREV	-1.74e-11	2.44e-11	0.475
TRANSP	3.99e-11	7.64e-11	0.601
RECOR	5.05e-11	2.89e-11	0.080
RECTRIB	4.61e-11	4.36e-11	0.291
TRANSF	**-1.17e-10**	**4.01e-11**	**0.004**
Constante	0.7701048	0.0080919	0.000
Nº Obs: 156			Nº groups: 26
Obs.: Estimation using FGLS, assuming the self-correlation problem detected through the operating procedures.			

Source: Elaborated by the authors based on data extracted from STATA®.

The analysis of the model estimation results shown in Table 2 reveals six statistically significant accounting variables as explanatory factors of the total IFDM, as the β related to these variables (Interests and Debt Charges, Capital Expense, Investments, spending on Culture and Social Welfare and Current Transfers) showed p-values below the established α (α = 0.05).

The first statistically significant accounting variable refers to spending on Interests and Debt Charges, showing a negative association between this spending and the total IFDM of the entities analyzed. Hence, the fact that the city allocates amounts to the payment of interests, amounts that could be invested in areas like health, education and employment, tends to worsen the city's human development, measured with the help of the FIRJAN Municipal Development Index in this study.

The second accounting variable that is considered significant as an explanatory factor of the total IFDM is related to Capital Expense which, as mentioned, is aimed at constituting or acquiring a capital good to contribute to the enhancement of the productive capacity. Initially, a positive association was expected between capital expenses and the IFDM, as public spending on capital increases the physical capital inventory, which in principle would further productivity and promote growth (Rocha; Giuberti, 2007). The relation found was negative though. One possible explanation for this situation is the theoretical model proposed by Devarajan, Swarrop & Zou (1996), according to which spending that is normally considered productive can become unproductive in case of excesses. That would be the case for capital spending for example. According to the authors, developing countries allocated their public spending wrongly, privileging capital spending to the detriment of current expenses, while developed countries did the opposite. Consequently, surplus capital spending in developing countries made them unproductive in the margin. The study by Ghosh and Gregoriou (2008) supports this assertion. In the analysis of 15 developing countries, the authors found that current expenses positively affect growth, while capital spending has a negative effect.

The third significant accounting variable was related to Investments, presupposing that higher spending on the planning and execution of works, the acquisition of real estate and plants, equipment and permanent material tend to culminate in the better development of the city.

As regards spending on Culture, it is highlighted that expenses related to this function, in accor-

dance with Teixeira (2002), are part of the group of social expenses, which represent a direct benefit to society. In line with Rezende (2001), social spending contributes to the formation of citizenship and community development, encouraging and committing to the formation of people, providing wellbeing and quality of life to society. The Culture variable presented a positive behavior as an explanatory variable of the analyzed entities' total IFDM, as expected, considering that higher social spending comes with a trend towards better human development.

The Social Welfare variable was also significant as an explanatory variable of the studied public entities' total IFDM. Considering that Social Welfare spending serves distribution purposes and that expenses related to this function are part of the social spending group, according to the classification by Rezende (2001) or of social expenses according to Teixeira (2002), a positive association was expected between this variable and the IFDM, which was not observed. In that sense, the negative association found may signal the exhaustion of welfarism, so that investments in the qualification of the population, for example, could be more efficient in the search to enhance the IFDM.

Finally, concerning the variable Current Transfers, a negative association with the IFDM was verified. Hence, the more dependent on transfers from the Union or the States, the lesser the city's development tends to be. This result is similar to the findings of the *Instituto Paranaense de Desenvolvimento Econômico e Social* (IPARDES), in a study carried out in 2004, based on the IDH-M for 2000 in the State of Paraná. According to that research, cities with the smallest IDH-M also displayed a strong relation of dependency on federal transfers, mainly based on the City Participation Fund. In Paraná, out of 288 cities with a lower IDH-M than that of the country, for 223 this type of transfer was the main source of income. This dependence indicates a weak tax collection (IPTU, ISS, improvement taxes and contribution) and ICMS generation ability – taxes that guarantee greater financial autonomy to the cities (IPARES, 2003).

If α were set at 10%, the Current Revenues variable would be considered significant as an explanatory variable of the total IFDM in the capital analyzed, indicating that the collection of higher amounts in current revenues tends to entail better human development in the city, maximizing the population's wellbeing.

5. Conclusions

The impact of public spending on the development of a city can be considered a constant concern for those in charge. In combination with economic growth, other aspects of human development are involved, such as health and education. The FIRJAN Municipal Development Index (IFDM), similarly to the Human Development Index (HDI), attempts to capture these three dimensions of a population's socioeconomic development.

In that context, the general aim in this study was to identify the accounting variables that condition the total IFDM of Brazilian capitals, with a view to permitting inferences about the relevance of accounting information in that index. Therefore, data for the total IFDM between 2005 and 2010 were crossed with data for accounting variables in Brazilian capitals available on the website of the Brazilian Treasury to develop a descriptive study with documentary analysis and a quantitative approach.

Using a panel data model with random effects, it could be established among the selected accounting variables which of them truly condition the total IFDM of the 26 Brazilian capitals under analysis. Thus, a positive and statistically significant association (considering $\alpha = 0.05$) was found between the variables Investments and spending on Culture and the total IFDM of the selected public entities, inferring that, the higher the spending on these functions, the greater the human development of that city.

The variables Interests and Debt Charges, Capital Expense and Social Welfare spending were also significant as explanatory factors of the entities' IFDM, but with a negative signal. This means that, the higher the spending on these account groups, the lower the city's development tends to be. Finally, the more dependent on Current Transfers, the lesser the city's development tends to be.

Therefore, it is observed that accounting information, and more specifically the variables Interests

and Debt Charges, Capital Expense, Investments, spending on Culture and Social Welfare, Current Transfers (considering α = 0.05) and Current Revenues (considering α = 0.10) are relevant in the determination of the analyzed capitals' IFDM, in line with the theoretical assertion according to which the public spending registered by accounting affect a city's development. Hence, good management of these accounts could culminate in an increased human development level of the cities studied over the years.

As a research limitation, it is highlighted that the situational diagnosis was focused on Brazilian capitals selected by convenience, so that the results cannot be generalized to the other cities in the Federation. For the sake of further research, the following is suggested: develop further analyses to verify whether the impact of the accounting variables on the total IFDM of Brazilian capitals continues to behave similarly; to verify the impact of the accounting variables on the IFDM, separately considering the dimensions Employment & Income, Education and Health; study the theme in other Federal units; and estimate a new model with non-accounting control variables.

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The Role of the Board of Directors in Hiring the Audit Firm: Empirical Evidence from Brazil

Abstract

The purpose of this article is to investigate if there is a relationship between the characteristics of the board of directors and the type of independent audit firm engaged by companies listed on the São Paulo Stock Exchange (BM&FBovespa). We considered three board characteristics: independence, CEO/chair separation and size. In turn, for the audit firms we considered two characteristics: size and level of specialization in the client company's segment, based on two measures (market strategy and market share). The data were obtained from the websites of the companies, the Brazilian Securities Commission (CVM) and Economática, covering the period from 1998 to 2006. The results indicate that CEO/chair separation is associated with larger audit firms (Big N) and specialist firms. These results contribute to the discussion on how the corporate governance structure influences the engagement of the auditor, improving the understanding of the role of the board of directors in monitoring listed Brazilian companies.

Keywords: Corporate governance, auditing, board of directors.

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1. Introduction

The objective of this study is to investigate if the characteristics of the board of directors are related to the type of independent audit firm chosen by listed Brazilian companies.

Agency theory suggests that the board of directors plays a key role in monitoring the actions of managers (agents) in favor of the stockholders (principals) (Jensen & Meckling, 1976). Besides this, the board generally has a major influence on the choice of the independent auditor.

Fama & Jensen (1983) stated that the characteristics of the board influence the form of monitoring. Therefore, it is reasonable to expect that these characteristics can have a direct influence on the type of external auditor hired.

The main role of independent auditors is to narrow the margin for managers to make accounting choices in their own benefit (Watts & Zimmerman, 1986). According to DeFond (1992), the quality of external auditing can be measured by the probability of detecting irregularities and distortions in the financial statements. In this respect, other authors, such as Solomon, Shields & Whittington (1999), state that specialized auditors, due to their better knowledge and experience in the client's sector, are able to perform more precise audits.

Beasley & Petroni (2001) and Lin & Liu (2009) studied the relationship between the board makeup and the engagement of specialized audit firms and found evidence that board traits (independence, separation of position and size) are related to the choice of auditors with particular expertise in the company's sector.

Brazil has different institutional characteristics than the countries where previous studies of this relationship have been carried out. In 1999 the Brazilian Securities Commission (*Comissão de Valores Mobiliários* - CVM) established mandatory auditor rotation every five years by means of CVM Instruction 308, so that the first change of auditor was required as of 2004. However, this obligation was applied in 2002 in the case of companies audited by Arthur Andersen. Therefore, the specific features of the Brazilian context can lead to different results than those found for other countries.

We analyzed the data by means of binary and multinomial logistic regression. The results indicate that only CEO/chair separation, where the CEO and chairperson of the board are different persons, has an influence on the choice of the independent audit firm, tending to cause the hiring of larger firms – one of the Big N (during the period analyzed, the "Big 5" shrank to the "Big 4", prompting our use of "Big N") – and firms more specialized in the client's sector. Therefore, only one of the three board characteristics appears to influence the process of contracting the auditor in Brazil.

2. Theoretical Framework

2.1. Conflicts of Interest

In a corporate setting, conflicts of interest arise from the misalignment of incentives between the principal and agent (Jensen & Meckling, 1976), leading suppliers of capital to seek *ex-ante* protection through the establishment of contractual obligations. However, because these contracts are imperfect and incomplete, contingencies and unexpected events cannot all be covered by their clauses (Zingales, 1998). As a consequence, managers continue having a good deal of flexibility, which can lead to expropriation of the principal (Shleifer & Vihny, 1997).

The information asymmetry between managers and owners, allied to incomplete contracts, can lead to opportunistic behavior by the former (Tirole, 2001). In this respect, the principal tries to assure alignment of interests by implementing corporate governance mechanisms that assure transparency (Shleifer & Vishny, 1997).

Protection of investors is relevant because in many countries, the expropriation of minority shareholders and creditors by controlling shareholders is common (La Porta, Lopes-de-Silanez, Sheifer & Vish-

ny, 2000). According to DeFond (1992) and Beasley & Petroni (2001), policies on shareholding control powers, board composition and external auditor choice are the corporate governance mechanisms most often used to align interests.

The shareholding control structure can lead to agency conflicts, both in situations of high concentration and high dispersion. Anderson (1999) presented evidence of high ownership concentration in Brazil: on average, the three largest shareholders owned 74% of the common shares and 49% of all the shares (although shareholding has become more dispersed in Brazil since then, it is still more concentrated than in many other countries). In companies that have concentrated shareholding, the owner-manager has better knowledge of the corporate affairs, making it easier to expropriate the minority shareholders (Fama & Jensen, 1983). On the other hand, highly dispersed ownership, because of the greater control placed in the hands of managers, allows more space for them to manipulate the results and divert resources from the stockholders (Dey, 2008).

Another common corporate governance mechanism is the structure of the board of directors: independence, CEO/chair duality (when the chief executive officer is also the chairperson of the board) and size (Becht, Bolton & Roell, 2002). According to Fama & Jensen (1983), the board's main duties are to approve the company's projects and monitor their execution. For Becht et al. (2002), the board has the mission of hiring the CEO, monitoring him or her and voting on important decisions, such as mergers and acquisitions and changes in the company's compensation policy and capital structure.

There are three main ways of guaranteeing the integrity of the board of directors according to most researchers of the subject. The first is the presence of independent directors, defined as those free of any connection with management and the majority shareholder, because they have less propensity of being manipulated, and also reduce the freedom of action of managers (Beasley & Petroni, 2001; Becht et al., 2002).

The second form is separation of the position of CEO and chairperson, to diminish the CEO's power and increase the board's capacity to monitor the company (Fama & Jensen, 1983). The third way is the size of the board, because it influences the trust in and agility of the decisions made. While having few members increases the chance of collusion, having many directors can make it harder to reach decisions (Bhuiyan, Roudaki & Clark, 2010).

The association between corporate governance practices and the contracting of specialized auditors has been studied by authors such as Watts & Zimmerman (1986), DeFond (1992), Craswell, Francis & Taylor (1995), Beasley & Petroni (2001) and Lin & Liu (2009). They have concluded that the union of these mechanisms reduces agency conflicts, resulting in better performance and higher probability that the auditor will detect misuse of the company's accounting system.

2.2. Choice of the Audit Firm

Jensen & Meckling (1976) suggest that the demand for auditing originates from the desire to reduce the manipulation of the information provided to suppliers of capital. Therefore, auditing is one of the mechanisms for reducing information asymmetry between providers of funds and the managers responsible for administering these resources, allowing the former to monitor the latter better (Watts & Zimmerman, 1986). According to DeFond (1992), external auditing is a way to signal a higher level of governance to investors, resulting in greater security in the capital market.

Since audit firms can also have conflicts of interest (Antle, 1982), the managers and majority shareholders of companies that do not have an adequate governance structure can more easily expropriate minority shareholders by hiring audit firms that are less independent and/or less competent (Beasley & Petroni, 2001; Lin & Liu, 2009). This governance inadequacy is reflected in the makeup of the board, which is generally responsible for choosing the auditor.

The quality of the services rendered by auditors depends on their skill in detecting distortions and willingness to report any distortions found to the interested parties (De Angelo, 1981). Therefore, the re-

sult of auditing should depend on the interaction between the level of independence between the auditor and client and the competence in carrying out the work (DeFond, 1982).

There are various types of knowledge that determine an auditor's overall expertise. The first is knowledge of accounting, gained by education and professional experience. The second is knowledge of business in general, also acquired by the same two routes. The third is related to specialization in a determined sector and the knowledge acquired by working for specific clients or companies in a given sector. Besides these aspects, an effective auditor must have the ability to resolve problems, including recognizing relationships, interpreting data and applying good sense (Bonner & Lewis, 1990).

Empirical results indicate that certain characteristics of auditors are positively related with better quality of their services, such as propensity to issue opinions with reservations or to detect earnings management (see, e.g., Gramling & Stone, 2001). The level of specialization and size of the audit firm are commonly indicated as characteristics linked to the independence and professional competence of auditors (DeFond, 1992; Craswell, Francis & Taylor, 1995; Francis, 2004).

Contracting a specialized external audit firm can be an important mechanism to reduce agency conflicts. Specialized auditors have greater experience in the client's sector, making them better at finding irregularities and distortions in the financial statements (Defonf, 1992; Beasley & Petroni, 2001). Craswell et al. (1995) used two metrics to identify auditors with specialization in determined sectors: market share and market strategy. In turn, Solomon, Shields & Whittington (1999) concluded that specialized auditors are more precise in their analyses than are auditors without specialization.

Another way of measuring the quality of external audit firms is their size. According to Francis (2004), audit firms that are considered "big", such as the so-called Big N, on average provide better quality to their clients because of their greater independence and concern with maintaining a good brand reputation (De Angelo, 1981; Lennox, 1999). Most empirical evidence indicates that companies audited by one of the Big N firms have lower levels of discretionary accruals (Dechow, Ge & Schrand, 2010).

2.3. Development of the Hypotheses

The independence of the board of directors is related to the presence of external directors. Fama (1980) and Fama & Jensen (1983) believe that the presence of independent board members is an important mechanism to enhance monitoring. In turn, according to Beasley & Petroni (2001) and Carcello, Hermanson, Neal & Riley (2002), the presence of independent directors helps protect investors. Given that audit firms that are more specialized and larger are able to provide better services, our first hypothesis is as follows:

- H1 – Companies with more independent boards of directors have a higher probability of contracting more specialized and larger audit firms (members of the Big N).

The second characteristic is unity of command, where the same person acts as CEO and chairperson of the board. In this case, monitoring power is reduced, because the chairperson's strong influence can cause the board to approve projects that maximize his or her own utility in detriment to that of the stockholders (Beasley, 1996; Imhoff, 2003). The relationship between CEO/chair unification and choice of auditor was studied by Lin & Liu (2009), who presented empirical evidence that when this exists, there is lower probability of hiring a specialized audit firm and a larger one. In this sense, our second hypothesis is as follows:

- H2 – Companies that have CEO/chair separation have higher probability of contracting more specialized and larger audit firms (Big N).

The third characteristic is size of the board of directors, because this can affect the agility and capacity for making decisions. Although Hermalin & Weisbach (1991) suggest that the board size and composition are endogenous to the company, it is unlikely there is an ideal size or composition that is applicable to all markets, Bhuiyan et al. (2010) argue that small boards can have a better overall view of the business, while having many members can make it hard to reach important decisions.

Fama & Jensen (1983) suggest that the ideal number of board members is seven or eight. For Brazil, the Brazilian Corporate Governance Institute (IBGC, 2009) suggests having between five and nine members. Lin & Liu (2009), in a study of Chinese companies, concluded that companies with larger boards are more likely to hire specialized audit firms, resulting in better monitoring and supervision of management actions. Therefore, our third hypothesis is the following:

- H3 – Companies with five to nine of directors have higher probability of contracting more specialized and larger audit firms (Big N).

The joint analysis of these three hypotheses will allow evaluation of whether the characteristics of the board of directors are associated with the choice of more specialized and larger audit firms, the central theme of this study.

3. Methodology

The data were obtained by consulting the websites of the companies in the sample and the Brazilian Securities Commission (CVM) as well as the Economática database. The information on corporate governance was obtained from the same base used by Lopes & Walker (2012) to construct the Brazilian Corporate Governance Index (BCGI). Finally, the base for audit firms was that employed by Pereira (2011). The Economática software was also used to capture the accounting variables.

The data on companies listed on the BM&FBovespa were gathered for the years 1998, 2000, 2002, 2004 and 2006. The reason for using these staggered years was the availability of BCGI data for these years. The sample was composed of 1,393 observations, 273 for 1998, 302 for 2000, 301 for 2002, 334 for 2004 and 183 for 2006. Granted, the reliance on variables from every other year can interfere in the results and must be taken into consideration in the analyses and generalizations. However, governance structures tend not to change significantly in short intervals.

We used binary and multinomial logistic regression to analyze the data. Binary logistic regression is interpreted by the odds ratio (OR), which considers the chance of obtaining a negative result (between 0 and 1) and a positive result (between 1 and ∞). The odds in favor of an event is the probability that the event will happen divided by the probability the event will not happen.

The interpretation of multinomial logistic regression is similar, but uses the relative risk ratio (RRR), which considers the probability that an event will happen in a control group versus other groups analyzed. The RRR indicates, for a change of category of a dependent variable (with the others kept constant), a greater or lesser probability of an association of one category of the independent variable in comparison with the control group (also known as the comparison group).

3.1. Empirical Proxies

In this section we describe the two proxies to measure the type of audit firm.

3.1.1. Proxy for Audit Firm Size

The audit firms known as the Big N are considered to be more specialized by various researchers (Beasley & Petroni, 2001; Fan & Wong, 2005; Francis, 2004), because of their broader knowledge of various market sectors and for having more concern over their reputation. For this reason, the first proxy is audit firm size.

In 1998, 2000 and 2002 there were five audit firms classified as "Big": Arthur Andersen, Deloitte Touche Tohmatsu, Ernst & Young, KPMG and Pricewaterhousecoopers. In 2004 and 2006, after the failure of Arthur Andersen, there were only four Big firms.

3.1.2. Proxy for Level of Specialization

Simunic (1980) and Solomon et al. (1999) suggest that training and specialization in a specific industry increase the efficiency of external auditing. There are two metrics commonly used to measure the level of specialization: market strategy and market share (Gramling & Stone, 2001). Market strategy is the evaluation of how much a determined sector represents in the total revenue of the audit firm. It is calculated by the ratio between the revenue from clients in a particular sector and the overall revenue from all clients. In turn, market share is the representation of the auditor in a determined sector. It is calculated by the ratio between the auditor's revenue from a particular sector and the revenue of all audit firms in that sector

Craswell et al. (1995) classify an audit firm as specialized if the result of at least one of the two yardsticks (market strategy and market share) is greater than 20%. In this study, to evaluate whether the results were sensitive to the 20% level, we also considered the figure of 10%.

3.2. Identification of the Variables

Table 1 presents the variables used and their descriptions. We consider two types of external auditors, first by size, defined as being one of the Big N, and the second by specialization (market share and market strategy). Due to the sensitivity analysis and union of the two ways of measuring specialization, Table 1 presents five dependent variables.

It can be seen in Table 1 that 40% of the companies analyzed chose one of the Big N auditors. With respect to specialization, according to the combination of the market strategy/market share proxies, the percentage of companies engaging a specialized auditor in the years studied was 54%.

Table 1
Description of the variables

Dependent variables	Description	Response	Frequency	Percent	Total
BIG	External auditor considered Big N	0	557	40%	1,393
		1	836	60%	
ESP20%	External auditor considered specialized based on one of the proxies: market share and market strategy (20%)	0	749	54%	1,393
		1	644	46%	
ESP10%	External auditor considered specialized based on one of the proxies: market share and market strategy (10%)	0	419	30%	1,393
		1	974	70%	
BIGESP20%	External auditor considered Big N and specialized based on one of the proxies: market share and market strategy (20%)	0	419	30%	1,393
		1	138	10%	
		2	330	24%	
		3	506	36%	
BIGESP10%	External auditor considered Big N and specialized based on one of the proxies: market share and market strategy (10%)	0	294	21%	1,393
		1	263	19%	
		2	125	9%	
		3	711	51%	
Independent variables					
INDEP	Board independence	0	86	6%	1,393
		1	1,307	94%	
DC	CEO/chair separation	0	495	36%	1,393
		1	898	64%	
TOT	Board size	0	612	44%	1,393
		1	781	56%	
Control variables					
CA	Shareholding concentration	0	975	70%	1,393
		1	418	30%	
EA	Shareholding structure	0	1,051	25%	1,393
		1	342	75%	
ENDIV	Leverage	continuous			1,393
LNAT	Natural log of total assets	continuous			1,393

The variable BIGSP is an extension of the model and combines the proxies for large and specialized firms. Of the companies studied, 21% contracted "non-Big" and non-specialized audit firms, the same percentage that engaged Big and specialized auditors. When the 10% parameter was used to define a specialized auditor, the percentage of such firms increased, as expected.

In relation to the board characteristics, the first independent variable is INDEP, indicating that only 6% of the boards were not considered independent, a figure that can limit the results of the logistic regressions. The second independent variable, regarding the absence of CEO/chair unification (CEO/chair separation, or CCS) indicates that most of the companies had different people occupying the positions of CEO and chairperson. The third independent variable, representing the size of the board (BSIZE), shows a relative balance between companies with between five and nine board members (56%) and those with smaller or larger boards (46%).

3.3. Regression Model

We used equation 1 below to verify the association between the characteristics of the board and the choice of the type of audit firm:

$$Y_{i,t} = \beta_0 + \beta_1 INDEP_{i,t} + \beta_2 DC_i + \beta_3 TOT_{i,t} + \beta_4 CA_{i,t} + \beta_5 EA_{i,t} + \beta_6 ALA_{i,t} + \beta_7 AT_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where:

- Y_{it} = Dependent variables:
- BIG = Measure of audit firm size, assuming the value of 1 for auditors among the Big N and 0 otherwise.
- SP = Measure of specialized audit firm based on the market strategy and market share proxies, assuming a value of 1 for firms considered to be specialized and 0 otherwise.
- BIGSP = Measure of specialized audit firm based on a combination of the BIG and SP variables, assuming the value of 0 for non-Big N and non-specialized firms, 1 for non-Big N and specialized, 2 for Big N and non-specialized, and 3 for Big N and specialized.
- Independent variables:
- INDEP = Independent board, assuming the value of 1 when the presence of insiders is less than 60% and 0 otherwise;
- CCS = CEO/chair separation, assuming the value of 1 when this separation exists and 0 when the CEO is also the chairperson;
- BSIZE = Board size, assuming the value of 1 for companies with boards having between 5 and 9 members and 0 otherwise;
- CONC = Shareholding concentration, assuming the value of 1 when the controlling shareholder owns under 50% of the common stock and 0 otherwise;
- STR = Shareholding structure, assuming the value of 1 when the percentage of common shares in the total shares is greater than 80%, and 0 otherwise;
- LEV = Leverage, the level of indebtedness;
- LNTA = Natural logarithm of total assets;
- ε = Error terms of the regression.

4. Results and Discussion

In this section we describe and comment on the results of the binary and multinomial logistic regressions. The binary regression was used when the dependent variable consisted of the classification of the audit firms based on size (BIG) or specialization (SP). In turn, we used multinomial regression when taking into consideration the combination of these characteristics (BIGSP).

Table 2 presents the results for the association of the board characteristics and the choice of large audit firms. Tables 3 and 4 report the results for the association between board traits and engaging a specialized audit firm (SP). Finally, Tables 5 and 6 present the results for the association between board characteristics and audit firm choice based on a combination of size and specialization (BIGSP).

The first analysis carried out investigated the board characteristics and the engagement of one of the Big N audit firms. Table 2 below shows the results of the binary logistic regression:

Table 2

Binary logistic regression for board characteristics versus contracting a Big N audit firm

BIG	Expected sign	OR	P >|z|
INDEP	+	0.940	0.813
DC	+	1.401	0.012***
TOT	+	0.753	0.033**
CA	-	0.812	0.135
EA	-	0.591	0.000***
ALA	+	0.877	0.397
AT	+	1.867	0.000***
Prob > chi2 = 0.000	**Pseudo R2 = 0.219**	**Number of observations = 1,393**	

** Statistically significant at 5%; *** Statistically significant at 1%.

The results of the odds ratio (OR > 1) for separation of position (β_2) are positive at the 1% level. This suggests that companies that separate the CEO and chairperson positions are more likely to engage a Big N audit firm.

In turn, the board size (β_3) is negatively related (OR<1), suggesting that firms with between five and nine directors are less likely to hire a Big N auditor. This result is not in line with the expectation based on the literature review. A possible explanation is the use of a dummy variable instead of the exact number of board members.

Finally, board independence (β_1) is not statistically significant.

The control variables "shareholding structure" (β_5) and "total assets" (β_7) are significant, indicating a negative relationship in the first case and a positive one in the second. In other words, the larger the company size in terms of total assets, the greater the probability of choosing a Big N audit firm, which is coherent with the literature (e.g., Lennox, 1999). In turn, companies with the majority of the capital represented by common shares have a lower probability of contracting a Big N auditor. The other control variables, such as shareholding concentration (β_4) and leverage (β_6), are not statistically significant.

In summary, there is an association between each of the two board characteristics and the choice of a Big N audit firm, but in one case contrary to that expected. It is only possible to affirm that H1 is corroborated in relation to CEO/chair separation, not in relation to size and independence. This result diverges from the main findings of Lin & Liu (2009), according to which the characteristics of the board of directors interfere in the engagement of large audit firms.

In the second analysis, we defined audit firm specialization in terms of the union of the market strategy and market share proxies, with the threshold parameter of 20%. The results are presented in Table 3.

Table 3

Binary logistic regression for board characteristics and contracting a specialized external audit firm at 20%

ESP	Expected sign	OR	P >|z|
INDEP	+	0.668	0.113
DC	+	1.373	0.014***
TOT	+	1.132	0.315
CA	-	1.014	0.912
EA	-	0.825	0.176
ALA	+	0.932	0.607
AT	+	1.645	0.000***
Prob > chi2 = 0.000	**Pseudo R2 = 0.161**	**Number of observations = 1,393**	

** Statistically significant at 5%; *** Statistically significant at 1%.

The results demonstrate that the separation of positions continues being statistically significant at 1%. The OR > 1 indicates that companies where the CEO and chairperson are different people are more likely to choose specialized audit firms based on market share and market strategy. However, the other board traits are not significant.

As discussed previously, according to Craswell et al. (1995), since the percentage used to define a specialized auditor (20%) can be arbitrary, it is necessary to perform a sensitivity analysis. For this purpose, we ran the same regression as above, except with the parameter set at 10%. The results are shown in Table 4.

Table 4

Binary logistic regression for board characteristics versus contracting a specialized audit firm at 10%

ESP	Expected sign	OR	P >|z|
INDEP	+	0.834	0.502
DC	+	1.216	0.162
TOT	+	1.010	0.938
CA	-	1.044	0.768
EA	-	0.624	0.002***
ALA	+	0.979	0.734
AT	+	1.848	0.000***
Prob > chi2 = 0.000	**Pseudo R2 = 0.210**	**Number of observations = 1,393**	

** Statistically significant at 5%; *** Statistically significant at 1%.

The results in Table 4 confirm the forecast that the parameter chosen defines the results of the regression. In this analysis, none of the board characteristics are significant. In this respect, we recommend caution in interpreting the results, because it is not possible to state that H2 was accepted, given that it depends on the level used for classifying audit firms as specialized.

Table 5 presents the results of the multinomial logistic regression for the combination of auditors considered to be large and specialized (BIGSP), with the 20% parameter. Here we created four combinations: (0) non-Big and non-specialized; (1) non-Big and specialized; (2) Big and non-specialized; and (3) Big and specialized. The comparison group adopted in this comparison is the group of companies that engaged a Big N and non-specialized auditor (0). The results are reported in Table 5.

Table 5

Multinomial logistic regression for board characteristics versus contracting a Big N and specialized audit firm, at 20%

Comparison group = NBIGNESP – Group 0											
NBIGESP – Group 1				**BIGNESP – Group 2**				**BIGESP – Group 3**			
	Sinal	RRR	P >|z|		Sinal	RRR	P >|z|		Sinal	RRR	P >|z|
INDEP	+	0.705	0.366	INDEP	+	1.058	0.867	INDEP	+	0.662	0.219
DC	+	1.140	0.538	DC	+	1.229	0.217	DC	+	1.783	0.001***
TOT	+	1.518	0.055**	TOT	+	0.835	0.279	TOT	+	0.862	0.380
CA	-	1.309	0.210	CA	-	0.919	0.634	CA	-	0.851	0.370
EA	-	0.866	0.531	EA	-	0.590	0.005***	EA	-	0.531	0.001***
ALA	+	1.001	0.982	ALA	+	0.963	0.735	ALA	+	0.515	0.240
AT	+	1.650	0.000***	AT	+	1.826	0.000***	AT	+	2.668	0.000***
Prob > chi2 = 0.000				**Pseudo R2 = 0.163**				**Number of observations = 1,393**			

** Statistically significant at 5%; *** Statistically significant at 1%.

The results for group 1 indicate that companies with boards composed of between five and nine members are more likely to hire non-Big N and specialized audit firms. The other board characteristics are not significant. In turn, for group 2, none of the three board characteristics are statistically significant. Finally, for group 3, the results indicate that companies with separation of CEO and chair position (CCS) have a higher probability of contracting Big N and specialized audit firms.

Table 6 below presents the results considering the same groups, but with the parameter for definition of specialized auditor set at 10%.

Table 6

Multinomial logistic regression for board characteristics versus contracting a Big N and specialized audit firm, at 10%

Comparison group = NBIGNESP – Group 0										
NBIGESP – Group 1				BIGNESP – Group 2				BIGESP – Group 3			
	Sinal	RRR	P>|z|		Sinal	RRR	P>|z|		Sinal	RRR	P>|z|
INDEP	+	1.136	0.715	INDEP	+	1.749	0.282	INDEP	+	0.852	0.632
DC	+	0.849	0.384	DC	+	0.870	0.548	DC	+	1.463	0.036**
TOT	+	1.324	0.137	TOT	+	1.020	0.930	TOT	+	0.830	0.300
CA	-	1.106	0.604	CA	-	0.814	0.409	CA	-	0.861	0.426
EA	-	0.696	0.075	EA	-	0.645	0.087	EA	-	0.435	0.000***
ALA	+	0.975	0.737	ALA	+	0.525	0.246	ALA	+	0.927	0.609
AT	+	1.719	0.000***	AT	+	1.826	0.000***	AT	+	2.817	0.000***
Prob > chi2 = 0.000				Pseudo R2 = 0.181				Number of observations = 1,393			

** Statistically significant at 5%; *** Statistically significant at 1%.

The results indicate that none of the three board characteristics are significant for groups 1 and 2, while for group 3, the result is similar to that for the 20% parameter, indicating that CEO/chair separation is relevant for the choice of Big N and specialized audit firms. Together, the results corroborate hypothesis H3.

Table 7 below summarizes the results found in the regressions. The signs "+" and "–" indicate the direction of the relationship (positive or negative). The statistical significance appears to the right.

Table 7

Summary of the results

	BIG		ESP 20%		ESP 10%		BIGESP 20%						BIGESP 10%					
							Group						Group					
	Sign	%	Sign	%	Sign	%	1	%	2	%	3	%	1	%	2	%	3	%
INDEP																		
DC	+	1%	+	1%							+	1%					+	5%
TOT	-	5%					+	5%										
CA																		
EA	-	1%			-	1%			-	1%	-	1%					-	1%
ALA																		
AT	+	1%	+	1%	+	1%	+	1%	+	1%	+	1%	+	1%	+	1%	+	1%

It can be seen that board Independence was not significant, a finding that differs from the results of Beasley & Petroni (2001). However, this can be explained by the fact that nearly all the companies in the sample were classified as having independent boards (96%), as presented in the descriptive statistics table.

CEO/chair separation has a positive association with hiring a Big N auditor and also for engaging a specialized audit firm. The same results occurs with the combination of Big N and specialized, suggesting that companies with separation of the CEO from the chairperson are more likely to contract auditors that are at the same time larger and that have more specific knowledge of the sector. This result corroborates the findings of Lin & Liu (2009), suggesting that companies that separate the two leadership positions tend to have more intense monitoring of managers.

The shareholding structure control variable has a negative association, in line with the findings of DeFond (1992). Another control variable is the company size measured by total assets, in which case our results are in line with those of DeFond (1992), Beasley & Petroni (2001) and Lin & Liu (2009). In turn, the control variables shareholding concentration and leverage are not significant, not corroborating the previous results of DeFond (1992) and Petronni & Beasley (1996). The peculiar characteristics of the Brazilian capital market can explain this discrepancy of results, particularly the high shareholding concentration.

Finally, as predicted by Craswell et al. (1995), the results are sensitive to the parameter used to classify specialized audit firms.

To sum up, the evidence indicates that only one board characteristic, CEO/chair separation, is consistently related to the hiring of specific types of audit firms ((Big N and specialized).

5. Final Considerations

This study investigated the association between the characteristics of the board of directors and the type of audit firm contracted by companies listed on the BM&FBovespa. We studied three board traits: independence, size and CEO/chair separation.

The results indicate there is an association between separation of the CEO and chairperson positions and the type of auditor contracted, both in the segregated analyses (Big N and specialized) and when combining the two metrics. Therefore, studies of corporate governance that involve the type of auditor should pay attention to the CCS variable.

The results contribute to the assessment of which corporate governance mechanisms are relevant for making decisions in specific contexts. CEO/chair separation appears to motivate the engagement of larger and more specialized auditors in the Brazilian case. For future research, we can suggest triangulation of the board characteristics, type of auditor and quality of the accounting information disclosed.

6. References

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The Relationship Between Auditing Quality and Accounting Conservatism in Brazilian Companies

Abstract

Over time, researchers have been using a set of many different attributes attempting to explain the relationship between the quality of accounting information and other variables, especially in the securities market. In this context, conservatism is indicated as one of the main quality characteristics of accounting information, which can result from factors present in the accounting environment, such as the legal system and accounting standards, among others. The auditing of financial statements influences the quality of accounting information. Previous research of the relationship between audit and accounting information quality has usually used a single feature of the audit, for example, the size of the audit firm. This study aimed to investigate the influence of several audit quality characteristics on the quality of accounting information, measured by conservatism. We evaluated the accounting information produced by Brazilian companies in the period 2000-2011, using the model developed by Ball and Shivakumar (2005). Among the results, we found that the conservatism of accounting information is positively affected by the size of the audit firm and negatively affected by the time of engagement of the auditors, the distance between the date of the opinion and publication date of the financial statements. We also observed that variables such as the existence of an audit committee, the provision of non-audit services, the importance of the client to the auditor and audit specialization does not affect accounting conservatism.

Keywords: auditing; quality of auditing; accounting conservatism; quality of accounting information.

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1. Introduction

Despite numerous studies in the international literature, the quality of accounting information is a matter that needs further investigation in different economic environments (Dechow, Ge & Schrand, 2010), including the Brazilian context. Defining accounting information quality is not a simple task. An event or transaction disclosed or measured according to a particular accounting standard may be considered as good information by one agent and not by another.

The complexity and dynamics of business activities hinder a concrete conceptualization of quality of accounting information. Given this difficulty, the research on the topic (Dechow & Schrand, 2004; Burgstaher, Hail & Leuz, 2006; Dechow et al., 2010) describes various attributes (or characteristics) of the quality of the informational content of accounting.

Conservatism is a major feature of the quality of accounting information, subjective in nature, and is included in most conceptual frameworks of accounting. Several studies have analyzed conservatism in different economic and financial environments (Basu, 1997; Ball, Kothari & Robin, 2000; Ball & Shivakumar, 2005; Paulo Antunes & Formigoni, 2008; Dechow et al., 2010). Overall, these studies consider conservatism as a practice of asymmetric recognition that focuses on the accounting criterion with the lowest assets/revenue of highest liabilities/expenses. More timely recognition of losses (bad news) is usually associated with accounting conservatism (Basu, 1997).

Accounting conservatism can be influenced by the idiosyncrasies of each economic environment. One factor is the set of accounting standards adopted in the country. For example, Ball et al. (2000) observed that the results of accounting firms in countries with common law legal systems are more conservative than those of firms in countries with code law systems. Barth, Landsman & Lang (2008) showed that firms that adopt International Financial Reporting Standards (IFRS) report losses more timely than those that do not adopt them.

According to Dechow et al. (2010), loss recognition is more appropriate when the enforcement mechanisms are stronger, due to the legal system, auditing, corporate governance etc. Among the mechanisms that lead managers to practice conditional conservatism is external auditing. The work of the independent auditors is to check if the financial reports produced are in accordance with the accounting standards that the entity is required to follow.

Dechow et al. (2010) explain that the impact of auditors on the quality of accounting information derives from their role in mitigating the misrepresentation, intentional or unintentional, of the economic and financial reality of the firm. Thus, the financial statements audited by an independent auditor tend to have better information content, leading users to make better decisions and thus generating greater economic benefits.

Many studies have focused on the effect of audit firm size (a proxy for audit quality) on the financial information. For example, Francis & Wang (2008) observed that recognition of losses is more timely in companies that are audited by an independent auditing firm, ranked Big (Big Five or Big Four).

In the current literature, however, there are few studies that analyze the influence of the other audit features on the quality of accounting information, such as length of relationship between the auditor and client, the expertise of the auditor, client type etc. Even when studies have observed these traits, they generally focus on aspects of earnings management.

Despite the relevance of the articles published so far, they have analyze in segregated form the relationship between the quality characteristics of the independent auditor and the level of conservatism in the financial statements. This is particularly true in the Brazilian capital market. Therefore, we posed the following research problem: **Do the characteristics of the quality of independent auditing affect the level of conservatism of financial reports published by the audited companies?** The objective of this study is to verify whether the level of conservatism reflected in the financial statements is influenced by the quality characteristics of independent auditing in the Brazilian capital market.

The current literature suggests a set of attributes to measure the quality of auditing and accounting information quality. But research so far has focused primarily on assessing the quality of earnings and its

relation to the size of the independent auditing firm. The investigation solely of the size of the audit firm and discretionary accruals does not include many of the variables that affect audit quality and the quality of accounting information.

Therefore, this study sought to analyze the set of audit quality characteristics, investigating factors such as client type, length of engagement of the auditor and the time of issuing the audit report, consultancy services provided by audit firms to their clients and importance of the client to the auditor. These characteristics have been studied in other environments and even in the Brazilian context, but very little interest has been paid to the relationship between the quality characteristics of auditing and accounting conservatism, one of the main attributes of accounting information quality.

The second section presents a review of the literature on accounting conservatism and also the relevance of auditing and its characteristics. The third section presents the methodological procedures, followed in the fourth section by presentation and analysis of the empirical results. Finally, we describe the final considerations, limitations and suggestions for future research.

2. Theoretical References

2.1 Accounting Information and Conservatism

Accounting information can influence individual decisions of its users, affecting the allocation of resources and the functioning of markets, and hence the efficiency of the economy. Iudícibus (2004, p. 25) states that "the basic objective of accounting [...] can be summarized as providing economic information to multiple users to enable rational decisions."

Examining agency theory, Lopes & Martins (2005, pp. 32-33) state that the firm's objective "is to reduce the various costs associated with contracts, and its operation depends on the contractual balance established, which can be impaired or disrupted if either party is dissatisfied." Thus, the proper functioning of contracts and, consequently, of the firm depends on good information.

Accounting aims to present useful information to its various users. But the growing volume of transactions and greater complexity of business activities causes the information needs of managers and other users of accounting to become increasingly distinct.

Among the attributes of accounting information quality, conservatism is one of the most discussed by accounting research. Some studies (Basu, 1997; Ball & Shivakumar, 2005, Dechow et al., 2010) conceptualize conservatism as recognition of bad news faster than good news. For Basu (1997, p. 3), conservatism is a result that reflects bad news faster than good news, leading to the "systematic differences between the periods of bad news and good news in timeliness and persistence of results". Therefore, conservatism implies decisions about the moment of timely recognition of gains and losses and therefore influences the accounting choice.

However, the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB), using the Discussion Paper on the Review of the Conceptual Framework (IASB, 2013), state that conservatism is not a desirable quality for accounting information, as this attribute probably generates a bias in financial position and performance reported by companies. Thus, preparers should take a neutral position when dealing with uncertainty.

However, Holthausen & Watts (2001), Watts (2003a, 2003b) and Ball & Shivakumar (2005) argue that conservatism is important in the establishment of contractual relations between the firm and its creditors, in order to ensure minimum guarantees for the fulfillment of obligations and reduce the likelihood that funds will be distributed inappropriately to some agents. In this line, conservatism increases the efficiency of procurement by reducing optimistic management of results (upward) of the firm. This relationship between conservatism and contracts is more evident in environments where the main source of financing of firms is the credit market, particularly in the contracts for public placement of bonds (Ball et al., 2000; Nikolaev, 2010).

However, this importance can be considered relative because, according to Penman & Zhang (2002), conservatism leads to poor accounting numbers when, for example, it creates reserves to mask the true performance of the company.

Thus, the discussion about the benefits of accounting conservatism is still an inconclusive matter. This questioning of the usefulness or not of conservatism is recognized even in the Discussion Paper on the Review of the Conceptual Framework (IASB, 2013).

2.2 Characteristics of the Quality of Independent Auditing

According to Sunder (1997), auditing's main contribution to the company is the verification of the accounting systems. Auditing reduces information asymmetry by examining and validating the accounting information reported. For Ruddock, Taylor & Taylor (2006, p. 4), "auditors can add value to the financial statements by reducing the likelihood of deliberate misrepresentation of accounting information."

Sunder (1997) warns that most decisions of auditors are based on their subjective beliefs and judgments about the financial information reported and the economic and financial aspects of the client. Additionally, this judgment is also related to the experience of the auditor and the relationship with the audited company. Even in the face of subjectivity, the user's perspective is that the audit opinion expresses full confidence in the economic and financial reality of the audited company.

According to DeAngelo (1981, p. 186), the quality of the audit is composed of the joint probability that the auditor can detect and report material errors in the client's accounting system. Detection of material errors is related to technical competence, while the disclosure of these errors refers to the auditor's independence. According to the author, auditor competence is strongly influenced by the technical skill of the professional procedures and scope of the examinations. O'Keefe, King & Gaver (1994, p. 44) describe the following audit quality function:

$$AQ = f(L;ISK;GK;CSK;CC) \quad (1)$$

Where:
AQ = audit quality;
L = effort (labor);
ISK = industry specific knowledge;
GK = general knowledge;
CSK = client specific knowledge; and
CC = client characteristics.

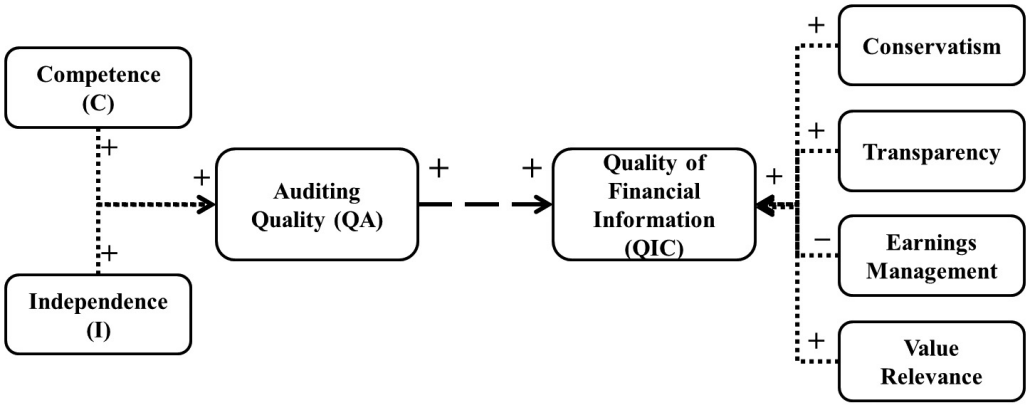
Therefore, the quality of auditing is the result of the most effective labor and the allocation of resources in specific and general knowledge, also being affected by the organizational and institutional characteristics of the client.

2.3 Relationship between the audit quality characteristics and the quality of accounting information

The quality of accounting information is influenced by the quality of the audit, as it restricts the manipulation of accounting numbers. In this line of reasoning, Becker et al. (1998) show that companies audited by larger audit firms have lower levels of opportunistic behavior. Piot (2005), based on a sample of French companies, presents results that corroborate the findings of Becker et al. (1998). Thus, according to the literature, audit quality positively affects the quality of accounting information. With respect to

conservatism, it is expected that accounting conservatism is greater in the financial statements of companies that use the best auditing services.

Figure 1 shows the relationship between the characteristics of the audit and the quality of accounting information:



Auditing characteristics	Effect on the AQ	Effect on the QFI
Size of the independent audit firm (C/I)	+	+
Time of auditor service to the client (C/I)	?	?
Specialization of the audit firm (C)	+	+
Provision of non-auditing services to the client (I)	–	–
Type of client (management or audit committee*)(I)	+*	+*
Importance of the client	–	–
Delay in issuing the audit report		–

Figure 1. Relationship between the characteristics of the auditing quality and the quality of accounting information

Source: authors

As described earlier, audit quality is related basically to two attributes: the competence and independence of audit professionals (DeAngelo, 1981). The literature indicates that the quality of audit services is positively related to these two attributes, i.e., the higher the skill and/or independence of the auditor, the higher the audit quality will be. This relationship can be seen at the top of Figure 1.

Similarly, Dechow et al. (2010) report that several studies show a set of attributes (constructs) to measure the quality of accounting information, although with a certain degree of difficulty. Among these various constructs are conservatism, transparency, earnings management and value relevance. Most of these attributes have a direct relationship with the quality of accounting information, such as conservatism and transparency. For others, however, the relationship is inverse, such as earnings management. For example, more conservative accounting numbers have higher quality than the less conservative ones, i.e., positive relationship. In the case of earnings management, from the opportunistic perspective, the lower the degree of discretionarity, the higher the quality of accounting information.

Despite many attributes and can effectively be used to indicate the quality of accounting information (Figure 1), in this work we opted for conservatism, since it is the attribute most often used in studies of the quality of accounting information.

Finally, better quality of audit services should positively affect the quality of accounting information. Consequently, the competence and independence of the audit firm should affect the quality of the numbers reported by accounting.

The attributes that indicate audit quality, namely: independence and competence, can be measured with the use of various characteristics. Among them, some are related to both competence and independence, while others are associated only to independence, which are analyzed in this study.

a) Size of the independent audit firm:
Competence: The largest audit firms are considered to have more resources (financial and operational) and therefore they can provide better services. Thus, the larger the audit firm, the higher should be the quality of the audit and the better the quality of the accounting information reported (DeAngelo, 1981; O'Keefe et al., 1994; Braunbeck, 2010).
Independence: The larger audit firms are considered to have more financial independence, making them less likely to accept discretionary or aggressive accounting practices. Thus, the larger the audit firm, the higher should be the quality of the audit and the better the quality of the accounting information reported (DeAngelo, 1981 Fargher, Taylor & Simon, 2001; Cupertino & Martinez, 2008; Almeida & Almeida, 2009.)

b) Tenure of auditor engagement:
Competence: A longer the relationship between an audit firm and its client should allow the auditor to obtain more knowledge about the client's activities, leading to better service (learning effect). Thus, the longer the relationship, the higher should be the quality of audit services and better the quality of the accounting information reported (Ghosh & Moon, 2005 Velury & Jenkins, 2008, Azevedo & Costa, 2012).
Independence: On the other hand, many authors consider that a longer relationship causes the auditor to have greater proximity to its client, which negatively affects the quality of services provided. Thus, the longer the relationship, the lower should be the quality of audit services and the worse the quality of the accounting information reported (DeFond & Subramanyam, 1998, Li, 2010).

c) Specialization of the audit firm:
Competence: The more specialized (better knowledge) an auditing firm is in a particular economic sector, the greater should be its knowledge about the activities of the client and the better the services. Thus, the more specialized the audit firm is in a particular sector, the higher should be the quality audit services and the better the quality of the accounting information reported (O'Keefe et al., 1994; Sun & Liu, 2011).

d) Provision of non-auditing services to the client:
Independence: The provision of non-audit services is considered to cause the auditor to become more dependent on its client, which negatively affects the quality of services. Thus, the more non-audit services provided, the lower should be the quality of audit services and worse the quality of the accounting information reported (Kallapur & Chung, 2003; & Ken Francis, 2006; Ruddock et al., 2006).

e) Type of client (management or audit committee):
Independence: Most authors consider that the audit firm may be contracted by the managers or the audit committee, and that the auditor's independence is higher when hired by the audit committee, increasing the quality of the services provided. Thus, when the auditor is engaged by that committee, the quality of audit services should be higher and the quality of accounting information reported should be better (Myers, Myers & Omer, 2003; Chen, Lin & Lin, 2008; Koch, Weber & Wüstemann 2012).

f) Importance of the client:
Independence: it is considered that some customers are important to the audit firm (consulting), such that the auditor may be more prone to accept certain discretions of these customers, adversely affecting the quality of the audit. Thus, the more important the customer, the lower the quality of audit and accounting information reported by your client (DeAngelo, 1982; Kallapur & Chung, 2003; Chin, Douthett & Lisic, 2012).

g) Delay in issuing the audit report:
Some studies show evidence that delay in issuing the audit report is a sign there are problems in the client's accounting. Therefore, it is suggested that the audited company has lower quality of accounting information. This feature cannot be easily attributed to the auditor's competence and/or independence, because, for example, the delay in issuing the opinion may be related or unrelated to the ability to detect flaws in the client's accounts (Lobo & Zhou, 2005; Krishnan & Yang, 2009).

3. Methodology

3.1 Research Type

This work can be classified as a descriptive study regarding its objectives, as our aim is to observe, record, analyze and correlate facts and phenomena without manipulating them. As for the procedures, this work can be classified as a literature review, seeking explanations of the characteristics of independent audit services and the conservative behavior of financial reporting from theoretical frameworks that support the development of research hypotheses. Finally, this study uses the quantitative approach because we employ statistical methods to process the data (Beuren et al., 2006).

3.2 Sample Collection and Composition

The data were obtained from the databases of the Brazilian Securities Commission (CVM), Reuters and published financial statements by listed companies in the period 2000-2011. To avoid bias in the sample and specification problems in the estimation of the models, we excluded from this study: a) companies with missing data and b) companies engaged in financial activities, management of companies and undertakings or that have operating revenues derived exclusively from shareholdings, as their accounting measurement procedures differ substantially from those of other companies, and probably are not adequately captured by the models analyzed (Ball & Shivakumar, 2005).

3.3 Working Hypotheses

To achieve the overall goal of this work, we formulated some research hypotheses.

According to the literature, conservatism is affected by scale (size) of the independent auditing firm, suggesting that larger audit firms provide better audit quality, which positively affects the quality of the accounting information reported (DeAngelo, 1981, DeFond & Subramanyam, 1998; Fargher, Taylor & Simon, 2001; Cupertino & Martinez, 2008; Almeida & Almeida, 2009). Thus, our first hypothesis is:

Hypothesis 1: The level of conservatism contained in the financial statements is greater in companies audited by larger audit firms than by smaller ones.

Given the great concern about the independence of auditing, some companies attribute hiring these services to an audit committee (Myers, Myers & Omer, 2003; Koch, Weber & Wüstemann, 2012). This leads to our second hypothesis:

Hypothesis 2: The existence of an audit committee responsible for hiring the independent auditor positively affects the level of conservatism in the financial statements.

In another aspect, a longer relationship between the auditor and its client can negatively affect audit quality. But it should be noted that some studies in the literature also indicate that a longer relationship between auditor and client can be beneficial because the auditors over time acquire more knowledge about the client and its industry (De Fond & Subramanyam, 1998, Ghosh & Moon, 2005; Jenkins & Velury, 2008; Li, 2010; Azevedo & Costa, 2012). However, starting from the initial assumption, our third hypothesis is:

Hypothesis 3: A longer the relationship between the auditor and the client negatively affects the conservatism of accounting numbers.

The evidence presented in some studies demonstrates that a delay in issuance of the audit report as a sign of problems in the client's accounts (Lobo & Zhou, 2005; Krishnan & Yang, 2009). Therefore, our fourth hypothesis is:

Hypothesis 4: The length of the period between the date of the financial statements and the date of issuance of the auditor's report is inversely related to the level of conservatism found in the financial statements.

As noted earlier, other studies suggest that the provision of non-audit services to the client impairs the auditor's independence, because the auditor may hesitate to criticize colleagues who provide consulting services and the remuneration from non-audit services can be linked to the positive performance of the firm, which creates incentives for opportunistic behavior (Chung & Kallapur, 2003; Francis & Ken, 2006; Ruddock et al., 2006). Therefore, our fifth hypothesis is:

Hypothesis 5: The provision of non-audit services negatively affects the conservatism of accounting figures of the audited company.

Another relevant factor for audit firms is the importance of major clients. Thus, it is considered that some clients are very important strategically to the auditor's business, which increases the likelihood the auditor will acquiesce to less conservative accounting practices. In addition, audit firms with a larger number of clients have less incentive to behave opportunistically, which generates a perception of higher audit quality (DeAngelo, 1982; Gaver & Paterson, 2001; Chung & Kallapur, 2003; Chin, Douthett & Lisic, 2012). Therefore, our sixth hypothesis is:

Hypothesis 6: The importance of the client to the audit firm negatively affects the level of conservatism in the financial statements.

Finally, greater specialization of the audit firm means it has more knowledge about the activities of the client, positively affecting the audit quality and the accounting information reported by the client. With greater knowledge, it is believed that the auditor will be more likely to detect failures/material errors in the financial statements (O'Keefe et al., 1994; Balsam, Krishnan & Yang, 2003; Sun & Liu, 2011). Therefore, our seventh and final hypothesis is:

Hypothesis 7: Greater the specialization of the auditor in a branch of economic activity positively affects the conservatism of accounting numbers reported by the client.

3.4 Definition of the Model Used and Operational Variables

We use the model developed by Ball and Shivakumar (2005) to assess the level of accounting conservatism. However, to capture the effects of the audit, we included an additional variable (C_{it}) to represent each feature of the audit in the original model. Thus, the model used to test the hypotheses is described as follows:

$$\Delta NI_{it} = \alpha_0 + \alpha_1 D\Delta NI_{it-1} + \alpha_2 \Delta NI_{it-1} + \alpha_3 \Delta NI_{it-1} \cdot D\Delta NI_{it-1} + \alpha_4 C_{it} + \alpha_5 C_{it} \cdot D\Delta NI_{it-1} + \alpha_6 C_{it} \cdot \Delta NI_{it-1} + \alpha_7 C_{it} \cdot \Delta NI_{it-1} \cdot D\Delta NI_{it-1} + \varepsilon_{it} \quad (2)$$

Where:

ΔNI_{it} = variation in the net income of firm *i* in year *t-1* to year *t* weighted by total assets at the beginning of year *t*;

ΔNI_{it-1} = variation in the net income of firm *i* in year *t-2* to year *t-1* weighted by total assets at the beginning of year *t-1*;

$D\Delta NI_{it-1}$ = dummy variable to indicate whether there is a negative change in the net income of firm *i* in year *t-1* to year *t*, taking value *1* if $\Delta NI_{it} < 0$, and *0* in other cases;

C_{it} = characteristic of the auditing quality for firm *i* in year *t*;

ε_{it} = regression error.

According to Ball & Shivakumar (2005), for positive results to become a persistent component of accounting income, the coefficient α_2 should be zero ($\alpha_2 = 0$), for the recognition of gains is deferred until such time that the cash flows are realized. When the coefficient α_2 is less than zero ($\alpha_2 < 0$), this implies timely recognition, demonstrating that the gains are transitory components of results in the current period and tend to be reversed in subsequent periods. On the other hand, when the coefficient α_3 is significantly smaller than zero ($\alpha_3 < 0$), it is considered that there is timely recognition of losses.

To capture whether a particular feature of the audit affects conservatism, one must analyze the multiplicative variable between this feature (C_{it}) and the variables of the original model (and $D\Delta NI_{it-1}$ and ΔNI_{it-1}) because it produces distinct slope coefficients, enabling verification of the change in the level of conservatism of the model through the inclusion of a qualitative variable. If these multiplicative variables were not included, the variable C_{it} would only reflect how much the audit characteristic affects the change in net income from period t - 1 to period t (ΔNI_{it}) and not the variation in the level of conservatism.

Therefore, to evaluate the analyzed characteristic of the audit, we assume there is more timely recognition of losses when the coefficient α_7 is significantly smaller than 0 ($\alpha_7 < 0$).

All regressions are estimated by pooling of independent cross sections. Dummy variables were created for each year of the sample, except for 2000, and for each sector of economic activity except for the category 'Other', according to the classification established by the *Economática* database. The goal of this procedure is to minimize the problems of heteroscedasticity. Additionally, seeking better estimates of parameters and, consequently, better inferences about the most appropriate models analyzed, we used the White estimator to obtain the standard robust error in relation to heteroskedasticity (Wooldridge, 2002).

The current literature does not provide a clear and consistent theoretical basis to properly identify the endogenous and exogenous factors in research on auditing, including in respect of the simultaneity of the variables employed (Fargher et al., 2001, p. 409). For each of the audit quality characteristics, we established proxies according to literature, despite their complexity. These proxies represent the variable 'audit quality characteristic' (C_{it}) described above in equation 2.

A. Size of the independent audit firm (*AUDSIZE*$_{it}$)
Research on auditing (DeFond & Subramanyam, 1998; Fargher et al., 2001; Cupertino & Martinez, 2008; Lennox, Francis & Wang, 2012) consider audit firm size (*AUDSIZE*$_{it}$) as a proxy, usually related to reputation, based on whether or not it is one of the Big Four (or Big Five, if appropriate). In this case, if the company's audit was performed by one of the big firms (four or five), the Size$_{it}$ variable assumes value 1, otherwise 0. Here we considered the Big Four to be PricewaterhouseCoopers, Deloitte Touche Tohmatsu, KPMG and Ernst & Young, with the Big Five including Arthur Andersen as well. Additionally, due their presence in Brazil, we also considered BDO Trevisan Auditores Independentes, and Grant Thornton and Chaplet, here called Middle firms.

B. Client Type (*AUDCOM*$_{it}$)
Studies of auditing, such at Koch et al. (2012), consider that the existence of an audit committee in the client company can contribute to the independence of the audit. Thus, if the audited company had an audit committee within its governance structure, the variable *AUDCOM*$_{it}$; takes the value 1 and 0 otherwise.

C. Tenure of auditor engagement (*TENURE*$_{it}$)
Consistent with the work of Jenkins & Velury (2008), Li (2010) and Chin et al. (2012), we used as a proxy for the time of service to the client (*TENURE*$_{it}$) the number of consecutive years in which the audit is performed by the same firm.

D. Delay to issue the audit report (*DELAY*$_{it}$)
The variable *DELAY*$_{it}$ represents the time to issue the audit report, defined as in Ng & Tai (1994) by the number of days between the end of the year and date of the auditor's report.

E. Provision of non-audit services to the client (*NASit*)
To indicate whether the audit firm provided other services to the client, we created the NAS*it* variable, which takes value 1 when in that year there were such services, and 0 otherwise (Chung & Kallapur, 2003, Ken & Francis, 2006). Information on the provision or not of other non-audit services to the client was obtained through the notes and management report.

F. Importance of the client (*IMPCLI*$_{it}$)
To indicate if a particular client is important in the client portfolio of the independent audit firm, we created a proxy (*IMPCLI*$_{it}$) that takes value 1 if the natural logarithm of the auditor's net revenue from the client in question accounts for over 15% of the total revenue from all clients of the audit firm, and 0 otherwise (Li, 2010; Sun & Liu, 2011).

G. Specialization of the audit firm (*AUDEXP* $_{it}$)
To indicate the specialization, or expertise, of the independent auditor, we created a proxy (*AUDEXP*$_{it}$) that takes value 1 if the audit firm has a portfolio of clients from the same economic sector representing more than 15% of its net revenue from clients in the same economic activity, and 0 otherwise. This is consistent with the metric used by O'Keefe et al. (1994) and Liu & Sun (2011).

H. Control variables
Audit studies often use several variables to minimize the effects of endogeneity on the results (Lennox et al., 2012). In this study we used the following variables:

a) Logarithm of the total assets of client ($LnTA_{it}$), according to Weber & Willenborg (2003), Chaney, Jeter & Shivakumar (2004) and Pittman & Fortin (2007);
b) Dummy variable for losses of the client ($DLoss_{it}$), according to Chaney et al. (2004), Fortin & Pittman (2007) and Behn, Choi & Kang (2008);
c) Return on assets of the client (ROA_{it}), according to Lennox et al. (2012) ;
d) Leverage the client (Lev_{it}), according to Lennox et al. (2012); and
e) Operating cash flow (OCF_{it}), according to Lennox et al. (2012) ;

The variable logarithm of total assets aims to control for the size of the audited company, as the variables $DLoss_{it}$ ROA_{it} and seek to control fro the effects of profitability, while Lev_{it} and OCF_{it} control, respectively, for debt and cash flow. For all the audit quality characteristic we collected data for every year throughout the study period. The variable OCF_{it} is calculated by operating cash flow in period *t* scaled by total assets in period *t-1* of firm *i*.

4. Presentation and Analysis of the Results

4.1 Descriptive analysis of the variables

To attain the goal of this study, we assessed information from 2805 financial statements in the period from 2000 to 2011, observing growth in the number of reports, from 177 in 2000 to 280 in 2011 (Table 1).

Table 1
Number of audited financial statements – auditing firm X year

Year	DL	PWC	EY	KPMG	AA	BDO	TGT	OUT	Total
2000	17	29	20	9	43	14		45	177
2001	19	33	21	8	40	16		45	182
2002	46	47	19	10		14		52	188
2003	48	37	23	11		12	1	60	192
2004	55	29	20	16		14	1	64	199
2005	64	28	22	19		15	1	70	219
2006	79	26	27	29		17	8	69	255
2007	56	35	33	44		21	15	68	272
2008	53	36	35	45		27	18	60	274
2009	51	36	45	46		27	19	57	281
2010	53	45	66	45		28	1	48	286
2011	52	47	70	59		3	2	47	280
Total Geral	**593**	**428**	**401**	**341**	**83**	**208**	**66**	**685**	**2,805**

Key: DL = Deloitte; PWC = PWC; EY = Ernst & Young; KPMG = KPMG; AA = Arthur Andersen; DBO = DBO Trevisan; TGT = Terco Grant Thornton; OUT = Other Auditing Firms.

Source: authors

In Table 1, there is also a high concentration of companies' financial statements audited by the group of major international auditing firms, called the Big Four (or Big Five, when including Arthur Andersen), which issued 65.8% (1846/2805) of the reports analyzed in this study throughout the period. If one considers the firms BDO Trevisan and Chaplet Grant Thornton (Middle), this participation is approximately 75%. Additionally, the high concentration of companies audited by Big firms grew over time, from 66.7% in 2000 to 81.4 % in 2011.

Table 2 shows that during the study period on average 90% of the reports of the independent auditor on the financial statements and independent auditor's opinion, as it was called until the repeal of NBC T 11, was unmodified, previously known as unqualified opinion. Over the years, the number of unmodified opinions increased in percentage terms. This may suggest that public companies improved their internal control and accounting procedures in response to various financial scandals in 2001 and 2002.

However, it is noteworthy that these data may also suggest a reduction in attention on the numbers of public companies by the audit firms after a temporary response to these scandals.

Table 2

Percentage of audited financial statements – auditing firm X year

Year	Type of Auditing Report									
	Unmodified Opinion (Without Reservation)		Unmodified Opinion						Total	
			With reservation		Negative Opinion		Adverse			
	Qty.	%	Qty.	%	Qty.	%	Qty.	%	Qty.	%
2000	151	85.3	24	13.6	1	0.6	1	0.6	177	100
2001	153	84.1	27	14.8	1	0.5	1	0.5	182	100
2002	161	85.6	25	13.3	1	0.5	1	0.5	188	100
2003	160	83.3	30	15.6	1	0.5	1	0.5	192	100
2004	167	83.9	31	15.6	1	0.5		0.0	199	100
2005	196	89.5	23	10.5		0.0		0.0	219	100
2006	236	92.5	17	6.7	2	0.8		0.0	255	100
2007	257	94.5	14	5.1	1	0.4		0.0	272	100
2008	252	92.0	20	7.3	2	0.7		0.0	274	100
2009	266	94.7	12	4.3	3	1.1		0.0	281	100
2010	264	92.3	19	6.6	3	1.0		0.0	286	100
2011	261	93.2	16	5.7	3	1.1		0.0	280	100
Total	**2,524**	**90.0**	**258**	**9.2**	**19**	**0.7**	**4**	**0.1**	**2,805**	**100**

Source: authors

Table 3 shows an increase in the deployment of the audit committee by the companies listed on the BM&FBovespa, probably motivated by the search for improvements in their corporate governance systems. Moreover, it appears that gradually there was a reduction in the amount of other services rendered by the audit firms (NAS). This fact can also be explained by the search for improvement of corporate governance systems, whether voluntary or coercive through market regulation (e.g., Sarbanes-Oxley in the United States). The mere disclosure that the audit firm obtains other income other than from audit services may lead the reader of financial statements to consider that such a relationship may have affected the audit quality and consequently the quality of information reported by the company.

Note that only since 2002 was there information on non-audit services rendered to Brazilian companies.

Table 3

Evolution of Audit Committee and Non-Auditing Services (NAS)

Year	Audit Comittee						Non-Auditing Services (NAS)					
	No		Yes		Total		No		Yes		Total	
	Qty.	%	Qty.	%	Qty.	%	Qty.	%	Qty.	%	Qty.	%
2000	175	98.9	2	1.1	177	100.0						
2001	179	98.4	3	1.6	182	100.0						
2002	179	95.2	9	4.8	188	100.0	160	85.1	28	14.9	188	100.0
2003	180	93.8	12	6.3	192	100.0	169	88.0	23	12.0	192	100.0
2004	180	90.5	19	9.5	199	100.0	183	92.0	16	8.0	199	100.0
2005	190	86.8	29	13.2	219	100.0	200	91.3	19	8.7	219	100.0
2006	218	85.5	37	14.5	255	100.0	235	92.2	20	7.8	255	100.0
2007	220	80.9	52	19.1	272	100.0	251	92.3	21	7.7	272	100.0
2008	216	78.8	58	21.2	274	100.0	248	90.5	26	9.5	274	100.0
2009	220	78.3	61	21.7	281	100.0	253	90.0	28	10.0	281	100.0
2010	221	77.3	65	22.7	286	100.0	245	85.7	41	14.3	286	100.0
2011	207	73.9	73	26.1	280	100.0	234	83.6	46	16.4	280	100.0
Total	**2,385**	**85.0**	**420**	**15.0**	**2,805**	**100.0**	**2,877**	**91.5**	**268**	**8.5**	**3,145**	**100.0**

Source: authors

Table 4 presents the descriptive statistics of the continuous variables used in this study. None of the variables have normal distribution, according to the Jarque-Bera test. Although on average earnings of the period are positive, the sample shows a negative average change in profit, with an also negative return on assets (ROA). On the other hand, companies had positive average operating cash flow in the period.

Table 4

Descriptive Statistics of the Continuous Variables

	NI_{it}	ΔNI_{it}	$LnTA_{it}$	ROA_{it}	Lev_{it}	OCF_{it}
Mean	0.0092	-0.4973	14.2929	-0.5315	0.3250	0.0676
Median	0.0458	0.0100	14.3528	0.0550	0.2856	0.0815
Standard-Deviation	0.6339	20.1161	1.9003	21.6813	0.6218	0.1656
Jarque-Bera	74639772 (0.000)	139000000 (0.000)	89 (0.000)	139000000 (0.000)	16011858 (0.000)	67879 (0.000)
Observations	1,502	1,502	1,502	1,502	1,502	1,502

Where: NI_{IT} = net profit of company *i* from year *t* weighted by total assets at the beginning of year *t*; ΔNI_{it} = change in net income of firm *i* in year *t-1* to year *t* weighted by total assets at the beginning of year *t*; ΔNI_{it-1} = change in net income of firm *i* in year *t-2* to year *t-1* weighted by total assets at the beginning of the year *t-1*; $D\Delta NI_{it-1}$ = dummy variable to indicate a negative change in net income of firm *i* from year *t-1* to year *t*, taking value 1 if $\Delta NI_{it} < 0$, and 0 in other cases; C_{it} = quality characteristic of audit firm *i* in year *t*; $LnTA_{it}$ = logarithm of total assets of the audited firm; $DLoss_{it}$ = dummy variable to indicate whether the net profit of firm *i* in year *t* was negative, assuming value 1 if $NI_{IT} < 0$, and 0 in other cases; ROA_{it} = return on assets of the audited company *i* in year *t*; Lev_{it} = leverage of firm *i* in year *t*; (OCF_{it}) = operating cash flow of firm *i* in year *t* weighted by total assets at the beginning of year *t*.

Source: authors

4.2 Analysis of Research Hypotheses

To analyze the effect of each audit firm characteristic, we first estimated the parameters for the original model described by Ball and Shivakumar (2005), named in this work as Original. Then we estimate the parameters of the equation in which a dummy variable was included to indicate each characteristic for company-year, in order to test the hypotheses of this research.

The first hypothesis seeks to analyze whether the level of conservatism in the financial statements is affected by the size of the audit firm.

Initially, based on the data shown in the column Original, it appears that the results presented in Table 5 indicate that the coefficient α_2 is statistically equal to zero (*p-value* > 0.05), confirming the expectation that positive results are not reversed in subsequent periods, becoming a persistent component of income. In contrast, the coefficient α_3 was negative and significant, indicating that the negative changes in accounting earnings are more transitory. This suggests that losses are recognized faster than gains. Moreover, we observe that the sum of the coefficients α_2 and α_3 (0.5416 to 0.9712 = -0.4296) is, according to the Wald test, significantly less than zero ($\alpha_2 + \alpha_3 < 0$), which corroborates the hypothesis of timely recognition of losses. This evidence suggests that Brazilian companies have significant differences in timely recognition of accounting losses, i.e., they have conservative behavior.

Table 5

Relationship of Conservatism with Size of the Audit Firm and the Type of Client

	Original		Size of the audit firm (BIG)		Size of the audit firm (BIG + Middle)		Type of client (AUDCOM)	
	coefficient	*p-value*	coefficient	*p-value*	coefficient	*p-value*	coefficient	*p-value*
Intercept	-0.018	0.928	0.150	0.387	0.128	0.461	-0.031	0.870
$D\Delta NI_{it-1}$	0.064	0.020	0.036	0.350	0.063	0.154	0.074	0.010
ΔNI_{it-1}	0.541	0.127	-0.184	0.027	-0.127	0.143	0.544	0.000
$\Delta NI_{it-1} * D\Delta NI_{it-1}$	-0.971	0.041	-0.188	0.151	-0.083	0.557	-0.969	0.000
C_{it}			0.003	0.922	0.009	0.793	0.092	0.075
$C_{it}*D\Delta NI_{it-1}$			0.013	0.781	-0.014	0.792	-0.101	0.198
$C_{it}*\Delta NI_{it-1}$			0.762	0.000	0.700	0.000	-1.089	0.063
$C_{it}*\Delta NI_{it-1}*D\Delta NI_{it-1}$			-0.506	0.000	-0.747	0.000	1.071	0.229
$LnTA_{it-1}$	-0.007	0.650	-0.019	0.008	-0.019	0.011	-0.008	0.261
$DLoss_{it-1}$	-0.109	0.000	-0.082	0.004	-0.086	0.003	-0.108	0.000
ROA_{it-1}	0.030	0.012	0.008	0.144	0.018	0.000	0.030	0.000
$ALAV_{it-1}$	0.003	0.748	0.000	0.654	0.004	0.055	0.003	0.053
OCF_{it-1}	0.271	0.058	0.260	0.000	0.252	0.000	0.281	0.000
R^2	0.291		0.321		0.316		0.295	
Adjusted R^2	0.276		0.305		0.300		0.278	
F-statistic	20.087	0.000	20.989	0.000	20.514	0.000	17.786	0.000
White Test	23.849	0.000	38.133	0.000	32.106	0.000	20.722	0.000
Serial Correlation LM	83.722	0.000	127.168	0.000	124.300	0.000	80.358	0.000
Jarque-Bera	1.4E+7	0.000	1.4E+7	0.000	1.4E+7	0.000	1.1E+7	0.000
Observations	1.998		1.998		1.998		1.871	

Adapted model (equation 2) $\Delta NI_{it} = \alpha_0 + \alpha_1 D\Delta NI_{it-1} + \alpha_2 \Delta NI_{it-1} + \alpha_3 \Delta NI_{it-1} * D\Delta NI_{it-1} + \alpha_4 C_{it} + \alpha_5 C_{it} * D\Delta NI_{it-1} + \alpha_6 C_{it} * \Delta NI_{it-1} + \alpha_7 C_{it} * \Delta NI_{it-1} * D\Delta NI_{it-1} + \varepsilon_{it}$
Where: NI_{IT} = net profit of company *i* from year *t* weighted by total assets at the beginning of year *t*; ΔNI_{it} = change in net income of firm *i* in year *t-1* to year *t* weighted by total assets at the beginning of year *t*; ΔNI_{it-1} = change in net income of firm *i* in year *t-2* to year *t-1* weighted by total assets at the beginning of the year *t-1*; $D\Delta NI_{it-1}$ = dummy variable to indicate whether a negative change in net income of firm *i* year *t-1* to year *t*, taking value 1 if $\Delta NI_{it} < 0$, and 0 in other cases; C_{it} = audit quality characteristic of firm *i* in year *t*; $LnTA_{it}$ = logarithm of total assets of the audited company; $DLoss_{it}$ = dummy variable to indicate whether the net profit of firm *i* in year *t* was negative, assuming value 1 if $NI_{IT} < 0$, and 0 in other cases; ROA_{it} = return on assets of the audited company *i* in year *t*; Lev_{it} = leverage of firm *i* in year *t*; (OCF_{it}) = operating cash flow of firm *i* in year *t* weighted by total assets at the beginning of year *t*.

Analyzing the model parameters for the proxies size of the audit firm (Big 4, Big 5 and Big 5 + Middle), we found that the coefficients α2 and α3 are not significantly different from zero, but the same variables multiplied by $AUDSIZE_{it}$ are relevant in the expanded model (equation 2).

The sum of the coefficients α2, α3, α6 and α7 is less than zero, indicating that the financial statements of public companies have timely recognition of losses. Assessing the behavior of conservative accounting numbers on the size of the audit firm, the coefficient α7 is negative and significant (for all samples), indicating that negative variations in results are less persistent than earnings. This evidence suggests that Brazilian companies have a higher level of accounting conservatism when they are audited by one of the large audit firms.

Thus, the results support the first research hypothesis, which posits that the level of conservatism contained in the financial statements is greater in companies audited by large independent audit firms than by smaller audit firms.

The literature on the topic describes indicates that the type of client affects audit quality. The type of client refers to the person administrative body of the company that is responsible for hiring the independent auditor. With the implementation of audit committees by the companies, the engagement of the auditor has become the responsibility of this committee, increasing the independence of the audit firm and, consequently, improving the quality of their services.

It can be noted in the last column of Table 5 that the coefficients α4, α5, α6, and α7, which represent the variable $AUDCOM_{it}$ (audit committee) and the interactions of this variable with the others in the original model are not significantly different from zero (*p- value* > 0.05). The sum of the coefficients α2, α3, α6, and α7 is equal to -0.4424, indicating timely recognition of losses, sine it is less than zero. However, this sum is not significantly different from the sum of the coefficients α2 and α3 (-0.4248), corroborating previous evidence. These results suggest that the creation of the audit committee does not significantly affect the conservative accounting behavior of the firms surveyed. Therefore, this confirms the hypothesis that the existence of an audit committee responsible for hiring independent auditors positively affects the level of conservatism in the financial statements.

Another hypothesis in the research is that the relationship time reduces accounting conservatism, since it can affect the quality of auditing and accounting information.

Table 6

Relationship between Conservatism and Tenure, Rotation and Audit Delay

	Original		TENURE		Rotation		Audit Delay	
	coefficient	*p-value*	coefficient	*p-value*	coefficient	*p-value*	coefficient	*p-value*
Intercept	-0.018	0.928	-0.232	0.328	-0.114	0.528	0.286	0.203
$D\Delta NI_{it-1}$	0.064	0.021	0.200	0.030	0.032	0.088	-0.116	0.120
ΔNI_{it-1}	0.542	0.128	2.012	0.040	0.769	0.000	-1.957	0.025
$\Delta NI_{it-1} * D\Delta NI_{it-1}$	-0.971	0.041	-2.667	0.007	-0.570	0.000	2.168	0.048
C_{it}			0.029	0.066	0.008	0.601	-0.003	0.010
$C_{it} * D\Delta NI_{it-1}$			-0.023	0.184	-0.024	0.390	0.002	0.042
$C_{it} * \Delta NI_{it-1}$			-0.323	0.099	0.122	0.025	0.021	0.005
$C_{it} * \Delta NI_{it-1} * D\Delta NI_{it-1}$			0.467	0.044	-0.392	0.029	-0.026	0.004
$LnTA_{it-1}$	-0.007	0.651	-0.003	0.841	-0.006	0.675	-0.018	0.256
$DLoss_{it-1}$	-0.109	0.000	-0.132	0.000	-0.044	0.033	-0.074	0.008
ROA_{it-1}	0.031	0.013	0.015	0.348	-0.164	0.000	-0.001	0.973
$ALAV_{it-1}$	0.003	0.748	0.009	0.334	-0.022	0.003	0.004	0.645
OCF_{it-1}	0.272	0.058	0.327	0.039	0.274	0.053	0.283	0.061
R^2	0.291		0.369		0.593		0.420	
Adjusted R^2	0.277		0.353		0.584		0.406	
F-statistic	20.088	0.000	24.294	0.000	65.194	0.000	30.020	0.000
White Test	23.849	0.000	12.926	0.000	8.181	0.000	7.426	0.000
Serial Correlation LM	83.722	0.000	63.931	0.000	17.869	0.000	1597.80	0.000
Jarque-Bera	1.4E+7	0.000	8E+06	0.000	5E+07	0.000	1.5E+8	0.000
Observations	1,998		1,872		1,872		1,866	

Adapted model(equation 2) $\Delta NI_{it} = \alpha_0 + \alpha_1 D\Delta NI_{it-1} + \alpha_2 \Delta NI_{it-1} + \alpha_3 \Delta NI_{it-1} * D\Delta NI_{it-1} + \alpha_4 C_{it} + \alpha_5 C_{it} * D\Delta NI_{it-1} + \alpha_6 C_{it} * \Delta NI_{it-1} + \alpha_7 C_{it} * \Delta NI_{it-1} * D\Delta NI_{it-1} + \varepsilon_{it}$
Where: NI_{iT} = net profit of company *i* from year *t* weighted by total assets at the beginning of year *t*; ΔNI_{it} = change in net income of firm *i* in year *t-1* to year *t* weighted by total assets at the beginning of year *t*; ΔNI_{it-1} = change in net income of firm *i* in year *t-2* to year *t-1* weighted by total assets at the beginning of the year *t-1*; $D\Delta NI_{it-1}$ = dummy variable to indicate whether a negative change in net income of firm *i* year *t-1* to year *t*, taking value 1 if $\Delta NI_{it} < 0$, and 0 in other cases; C_{it} = audit quality characteristic of firm *i* in year *t*; $LnTA_{it}$ = logarithm of total assets of the audited company; $DLoss_{it}$ = dummy variable to indicate whether the net profit of firm *i* in year *t* was negative, assuming value 1 if $NI_{iT} < 0$, and 0 in other cases; ROA_{it} = return on assets of the audited company *i* in year *t*; Lev_{it} = leverage of firm *i* in year *t*; (OCF_{it}) = operating cash flow of firm *i* in year *t* weighted by total assets at the beginning of year *t*.

In the column Tenure in Table 6, the coefficient α7 is positive and statistically significant for the model. Moreover, the coefficient α2 became statistically significant, indicating timely recognition of gains. These results are confirmed by the sum of the coefficients α2, α3, α6 and α7, equal to -0.5103, greater than the coefficients α2 and α3 (-0.6545). Such evidence suggests that longer provision of audit services negatively affects the quality of audit services, reducing the level of conservatism of accounting numbers.

Based on these results, we decided to check additionally if in the year prior to the change of audit firm there was an increase in the level of conservatism in the statements reported by Brazilian companies. To this end, we created a dummy variable to indicate the year in which the change occurred, assuming a value of 1, and 0 for the other years. The parameters in this analysis are also shown in Table 6 in the rotation column.

The statistics presented indicate that the coefficients α2, α3, α6 and α7 are statistically significant, adding to -0.0712. The coefficient α7 (-0.3924) and it plus the coefficient α6 (-0.3924 +0.1228 = -0.2616) are negative, which indicates that in the year of changing the auditing firm, Brazilian companies report more conservative results.

With regard to the delay in issuing the auditor's report, the literature indicates that the longer this takes, the lower will be the quality of accounting information. Thus, as in the previous analyses, the inclusion of a proxy to indicate the time between the end of the year and issue date of the auditor's report changed the coefficients of performance measurement and accounting numbers (α2 and α3). In this analysis, the coefficients are statistically significant, and the predictive signs were reversed compared to the

original model. In turn, the parameters of the coefficients α6 and α7 assume positive and negative signs, respectively, and both are statistically significant. But the sum of the coefficients is negligibly low (-0.0048).

One of the most discussed topics in academic and professional circles refers to impaired independence when the audit firm provides other services to the client. According to the parameters described in Table 7, the coefficients α2 and α3 did not vary significantly and remained as expected for the original model. However, the coefficients α6 and α7 are not significantly different from zero, which indicates that the provision of non-audit services does not significantly affect the level of conservatism of financial statements of listed companies in Brazil.

Table 7

Relationship between Conservatism and Tenure, Rotation, Audit Delay, Audit Firm Size and Type of Client

	Original		Non-Auditing Services (NAS)		Client Importance (IMPCLI)		Specialization of the Auditing Firm (AUDEXP)	
	coefficient	***p-value***	**coefficient**	***p-value***	**coefficient**	***p-value***	**coefficient**	***p-value***
Intercept	-0.018	-0.031	0.882	-0.031	0.882	0.882	-0.007	0.973
$D\Delta NI_{it-1}$	0.064	0.067	0.023	0.067	0.023	0.023	0.072	0.019
ΔNI_{it-1}	0.542	0.544	0.127	0.544	0.127	0.127	0.543	0.128
$\Delta NI_{it-1} * D\Delta NI_{it-1}$	-0.971	-0.967	0.043	-0.967	0.043	0.043	-0.966	0.043
C_{it}		0.062	0.015	0.062	0.015	0.015	0.056	0.121
$C_{it}*D\Delta NI_{it-1}$		-0.084	0.019	-0.084	0.019	0.019	-0.067	0.077
$C_{it}*\Delta NI_{it-1}$		-0.666	0.078	-0.666	0.078	0.078	-0.702	0.130
$C_{it}*\Delta NI_{it-1} * D\Delta NI_{it-1}$		-0.021	0.963	-0.021	0.963	0.963	0.850	0.171
$LnTA_{it-1}$	-0.007	-0.008	0.634	-0.008	0.634	0.634	-0.009	0.626
$DLoss_{it-1}$	-0.109	-0.111	0.000	-0.111	0.000	0.000	-0.111	0.000
ROA_{it-1}	0.031	0.030	0.016	0.030	0.016	0.016	0.030	0.015
$ALAV_{it-1}$	0.003	0.003	0.740	0.003	0.740	0.740	0.003	0.743
OCF_{it-1}	0.272	0.281	0.058	0.281	0.058	0.058	0.283	0.056
R^2	0.291	0.294		0.294			0.293	
Adjusted R^2	0.277	0.277		0.277			0.277	
F-statistic	20.088	20.224	0.000	20.224	0.000	0.000	17.954	0.000
White Test	23.849	7.426	0.000	7.426	0.000	0.000		
Serial Correlation LM	83.722	81.114	0.000	81.114	0.000	0.000		
Jarque-Bera	1.4E+7	1.1E+7	0.000	1.1E+7	0.000	0.000	1E+07	0.000
Observations	1,998	1,871		1,871			1,947	

Adapted model (equation 2) $\Delta NI_{it} = \alpha_0 + \alpha_1 D\Delta NI_{it-1} + \alpha_2 \Delta NI_{it-1} + \alpha_3 \Delta NI_{it-1} * D\Delta NI_{it-1} + \alpha_4 C_{it} + \alpha_5 C_{it} * D\Delta NI_{it-1} + \alpha_6 C_{it} * \Delta NI_{it-1} + \alpha_7 C_{it} * \Delta NI_{it-1} * D\Delta NI_{it-1} + \varepsilon_{it}$
Where: NI_{IT} = net profit of company *i* from year *t* weighted by total assets at the beginning of year *t*; ΔNI_{it} = change in net income of firm *i* in year *t-1* to year *t* weighted by total assets at the beginning of year *t*; ΔNI_{it-1} = change in net income of firm *i* in year *t-2* to year *t-1* weighted by total assets at the beginning of the year *t-1*; $D\Delta NI_{it-1}$ = dummy variable to indicate whether a negative change in net income of firm *i* year *t-1* to year *t*, taking value 1 if $\Delta NI_{it} < 0$, and 0 in other cases; C_{it} = audit quality characteristic of firm *i* in year *t*; $LnTA_{it}$ = logarithm of total assets of the audited company; $DLoss_{it}$ = dummy variable to indicate whether the net profit of firm *i* in year *t* was negative, assuming value 1 if $NI_{IT} < 0$, and 0 in other cases; ROA_{it} = return on assets of the audited company *i* in year *t*; Lev_{it} = leverage of firm *i* in year *t*; (OCF_{it}) = operating cash flow of firm *i* in year *t* weighted by total assets at the beginning of year *t*.

Still referring to concerns about the independence of the audit firm, we analyzed if the importance of the client affects the conservatism of accounting numbers reported by public companies in the Brazilian capital market. According to Table 7, the coefficient α2 is positive and not significantly different from zero, while α3 is negative and significant, as predicted for the original model. But the coefficients α6 and α7, which analyze the importance of the client, are not significant, implying that this feature does not affect the level of conservatism of financial statements of listed companies in Brazil.

Regarding the competence of the audit, we analyzed whether the expertise of the audit firm affects the quality of accounting information, specifically accounting conservatism. The evidence shown in Table 7 indicates that the coefficients α2 and α3 are respectively positive and negative, and only the latter is significant, confirming the expectation from the model specification. On the other hand, the coefficients α6 and α7, which seek to capture the expertise or not the audit firm, are not significant. Thus, these results suggest that greater specialization in the client's activity does not influence the conservatism of the accounting numbers reported by Brazilian companies.

With respect to the assumptions of regression analysis, linearity was satisfied as was exogeneity, because the regressors of the specifications of the models do not have a strong correlation with the residuals of the regression (Greene, 2003). The presentation of the correlation analysis was removed from the text because of space limitation. As regards homoscedasticity, we used the White estimator for robust standard errors. Furthermore, the statistics presented in Tables 5-7 indicate that the residuals are not normally distributed there is sample autocorrelation, but these can be relaxed in the inferences about the model parameters, since according to Wooldridge (2002) and Greene (2003), its coefficients are consistent and asymptotically unbiased, but fail to be the best unbiased linear estimators. Finally, the degree of multicollinearity, by the variance inflation factor, is not considered problematic in the model employed.

The coefficient of determination (adjusted R^2) ranged from 0.27 to 0.58, depending upon the specific audit quality characteristic examined. Therefore, with regard to the predictive power of the estimated equations, it can be considered that they have adequate adjustment of the conservative behavior of financial results. Therefore, the results are relevant to explain the cause and effect of past events, but should not be used to estimate or predict future phenomena. Due to limited size of the article, more detailed presentation of this information cannot be shown in this text.

5. Final Considerations

We examined whether these characteristics (or attributes) of audit quality affect the quality of financial reporting, specifically accounting conservatism. Initially we found that accounting numbers reported by Brazilian companies have conservative behavior.

One of the research hypotheses is about the size of the audit firm and the level of conservatism. Based on the evidence presented, we can confirm that the level of accounting conservatism is greater in the numbers reported by companies audited by major independent auditing firms (Big) than smaller ones. Thus, the largest independent accounting firms, now called Big Four, have higher audit quality, which positively affects the level of conservatism. The evidence presented in this paper indicates that the existence of an audit committee did not influence the conservatism of accounting numbers. Thus, this corporate governance mechanism does not contribute to the quality of the audit and, consequently, the management of firms.

One of the points widely discussed among academics and practitioners is about the time of the audit engagement. The results presented here indicate that accounting conservatism is strongly affected by the number of consecutive years during which the client company is audited by the same audit firm. Additionally, we found that the level of conservatism is greater in the year a change occurs. Given this scenario, it appears that longer auditor tenure negatively affects the quality of audit services, likely because it interferes with the auditor's relationship with the client.

With regard to the relationship between the time taken to issuance the audit and accounting conservatism, the evidence presented in this work confirms that the longer the time between the date of the financial statements and the date of the auditor's report is inversely related to accounting conservatism. Thus, the delay in the issuance of the audit report may indicate lower quality in the accounting results, in this study less conservatism in accounting numbers.

On the influence of non-audit services provided, the results demonstrate that the level of accounting conservatism is not adversely affected by the provision of additional services. However, there is also no evidence that the provision of other services by the auditor increases the knowledge about the business of the audited company.

Another hypothesis is that the importance of the customer affects the relationship between the auditor and the audited company and therefore negatively affects the quality of financial reporting and auditing. However, the evidence found does not confirm this theory. Finally, regarding the last hypothesis, this paper presents evidence that does not confirm that the greater specialization of the auditor in the client's economic sector influences the audit quality.

Based on the current literature, we applied other accounting variables used in empirical research on auditing. The results presented indicate that some of them, such as the size of the audited company, accounting losses and operating cash flow, may be relevant for the proper estimation of the parameters of interest. Briefly, therefore, the results indicate that accounting conservatism is directly affected by the size of the audit firm, while the tenure of the engagement and the delay in the issuance of the audit report have an inverse relationship with the quality of accounting information.

Overall, the results of this study contribute to understanding the efficiency of some corporate governance instruments, in particular when applied to companies operating in emerging markets such as Brazil.

According to the results presented, the creation of an audit committee did not contribute to improving the quality of information reported, in particular conservatism. Thus, one might question whether this governance mechanism really enhances the independence of the auditor hired.

Another discussible point is about the pros and cons of the rotation of the audit firm (or auditor). The results presented here suggest that conservatism is significantly affected by this rotation and decreases along the length of the relationship between the client and the audit firm. Thus, the results indicate that the rotation of the audit firm is an efficient mechanism for improving the quality of reported numbers, despite the possible loss of knowledge of the client's activities.

Despite being among the main points raised when financial scandals at the beginning of this century, in the sample of this study the provision of non-audit services and the importance of the client did not affect the quality of accounting numbers.

It should be noted that this study has some limitations, such as the use of proxies to measure each of the audit quality characteristics, which may or may not adequately measure the attribute analyzed. In addition, this study evaluated only the relationship between the audit characteristics and accounting conservatism. However, there are other attributes described in the literature that well represent the quality of accounting numbers reported by companies.

Finally, we can suggest as future research a larger sample of firms with other types of corporate legal structures, such as private companies or limited liability companies. Other attributes of audit quality can also be investigated, or even the quality of accounting information such as earnings management, value relevance, etc. Other forms of statistical estimates would also be relevant to determine more adequately the parameters of the models in research that deals with the auditing. Also, use of other methods of data collection, such as questionnaires and interviews with analysts, auditors and professionals involved with the audit work could be used to verify that these professionals contribute to better quality of information.

We hope this study will contribute to a better understanding of the various factors that affect audit quality, and the relationship of these with the presence of accounting conservatism in the financial statements. In addition, we hope this work will encourage the development of new studies on the characteristics of the financial information and quality of auditing in Brazil.

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