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Recommendations for audit committees in Brazilian companies

Recomendações aos comitês de auditoria em empresas brasileiras

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Keywords
The audit committee characteristics.
Internal control deficiencies.
Brazilian companies.

Abstract

The study analyzes the relationship between the characteristics of the audit committee and deficiencies of internal control in Brazilian companies. The study sample comprised about 80 companies that adopted audit committees from 2010 to 2015. We applied information entropy analysis, descriptive statistics and multiple linear regression. The results showed that companies that have at least three members in the audit committee, in relation to those with less than three members, have significantly reduced internal control deficiencies. This result strengthens the prerogative of regulatory bodies to adopt a minimum of three members for the audit committee for Brazilian companies, contributing to the reduction of deficiencies in internal control.

Palavras-chave
Características do comitê de auditoria.
Deficiências de controle interno.
Empresas brasileiras.

Resumo

O presente estudo analisa a relação entre as características do comitê de auditoria e as deficiências do controle interno em empresas brasileiras. A amostra do estudo envolveu cerca de 80 empresas que possuíam comitês de auditoria, no período de 2010 a 2015. Foram utilizadas a análise de entropia da informação, a estatística descritiva e a regressão linear múltipla. Os resultados demonstraram que empresas que possuem no mínimo três membros no comitê de auditoria, em relação àquelas que possuem menos que três membros, apresentaram menores deficiências no controle interno. Este resultado fortalece a prerrogativa de organismos regulatórios de ser adotado um mínimo de três membros para o comitê de auditoria para empresas brasileiras, contribuindo para a diminuição das deficiências do controle interno.

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Practical implications

Audit committees, mandatory for some segments in Brazil, adopted by listed companies are made up by a larger proportion of members with low expertise. In the almost 80 cases analyzed, committees with the recommended minimum of three members tend to have fewer instances of control deficiencies identified, despite the members' low expertise.

1 INTRODUCTION

Corporate governance and its control mechanisms are intended to ensure compliance of the company procedures to accounting principles, giving credibility to the company's financial statements. This helps also in mitigation of opportunistic behavior within the company, due to the creation and management of committees, in which audit stands out (Inaam & Khamoussi, 2016). In 1940, the Securities and Exchange Commission (SEC), of the United States, audit companies and some organizations began to recommend the creation of audit committees in companies.

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According to these organizations, the implementation of an Audit Committee assists the independence and effectiveness of a company, considered as an important mechanism of corporate governance to assist on information transparency. In the Brazilian market, the Comissão de Valores Mobiliários [Brazilian Securities Commission] (CVM) in spite of encouraging companies, mostly financial ones, to deploy audit committees, does not impose it. The committees are mandatory since 2004 for financial institutions and insurers[1].

Bodies such as the Novo Mercado of B3 and the Instituto Brasileiro de Governança Corporativa [Brazilian Institute of Corporate Governance] (IBGC) have recommended the adoption of audit committees. However, there is no obligation of implementation of the Audit Committee to all companies, only specific groups governed by instructions such as the New Market, State companies, and Financial companies (IBGC, 2017). Thus, according to Peleias, Segreti and Costa (2009), companies not governed by specific instructions can voluntarily adopt the Audit Committee, or just improve the tasks of the Fiscal Committee.

The Audit Committee, together with the board of directors, has as one of its tasks the monitoring of internal controls of companies for them to operate with effectiveness and to not demonstrate deficiencies (Krishnan, 2005). However, even though Audit Committee are implanted in companies, its adoption alone does not guarantee the effectiveness of its functions, namely, companies may continue to face problems in their internal controls, potentially damaging the reliability of financial statements.

The reduction of problems of internal controls in companies depends on the existence of a committee with specific characteristics (independence, size, expertise). Empirical studies point as characteristics of the audit committee, which favor the reduction of control problems in American companies: the size of the committee (Krishnan, 2005; Goh, 2009), financial experience (Krishnan, 2005; Zhang, Zhou & Zhou, 2007; Goh, 2009), independence (Krishnan, 2005; Goh, 2009), and the education level of members (Lin, Pizzini, Vargus & Bardhan, 2011). The committee of American companies must still meet the requirements of SEC to disclose information on the internal control in accordance with sections 302, 404 and Law SOX – Sarbanes Oxley (Hogan & Wilkins, 2008).

With this new regulation, several studies investigated the effects of SOX in internal control, with a predominance of studies that evaluated the matter of internal control deficiencies (Ge & Mcvay, 2005; Doyle, Ge & Mcvay, 2007; Zhang et al. 2007; Goh, 2009; Kim & Park, 2009; Bedard & Graham, 2011; Lin et al. 2011; Teixeira, 2015). However, such studies are not common to the Brazilian scenario. For example, the characteristics of the Audit Committee that can inhibit control deficiencies have not been investigated yet.

Considering the aspect of voluntary training of such committees for the Brazilian market, this study examines the relationship between the characteristics of the existing audit committee and internal control deficiencies concerning the companies that chose to have such committees.

We analyzed a sample of 73 companies listed in the Brazilian market from 2010 to 2015, which have an audit committee. Internal control deficiencies were identified by content analysis in the companies reports, following the method employed in Teixeira (2015).

The results showed that companies that have at least three members on the audit committee presented a reduction of internal control deficiencies. This finding demonstrates the importance of the adoption of prerogatives of bodies such as NYSE, NASDAK, SEC, and IBGC of having at least three members on the audit committee, in the scenario of Brazilian companies, since, in addition to reporting on the efficiency of the committee, contributed to the reduction of internal control deficiencies.

Although some information about the characteristics of the audit committee are not usually available to external users (Krishnan, 2005), the audit committee can be able to reduce control deficiencies (Stefaniak, Houston & Cornell, 2012). The absence of an internal control may encourage fraudulent acts, negligence, distraction, or failures in organizational processes (Teixeira, 2015). Some iconic examples can be given. Enron Corporation, one of the leading companies in the field of energy in the world, was marred by frauds, probably associated with failures in controls, contributing to the discontinuance of the business.

[1] The Statutory Audit Committee is detailed in CVM Instruction. 509, from 2011, being mandatory only for financial institutions and insurers since 2004 (IBGC, 2017).

2 AUDIT COMMITTEE AND INTERNAL CONTROL

Corporate governance has a set of mechanisms and practices aimed at the harmonization of relations among users of accounting information, as well as the development of the company. It is required that the company management define the organs responsible for directing and monitoring organizational actions and the responsibilities of each body. Such organs correspond mainly to the board of directors and independent auditors.

The board of directors delegates tasks to executives to manage the company, as well as to specific committees, which must oversee certain areas of the company (Peleias et al., 2009). Despite the responsibility of properly establishing and maintaining the internal control, in SEC's view, the board of directors should delegates this function to the audit committee (Krishnan, 2005). The audit committee is formed by members of the board of directors, being responsible for overseeing the organizational processes and financial disclosure to capital markets (Peleias et al., 2009).

This committee analyzes the integrity of internal controls, acts as a means of communication between the external audit and the company, and seeks to ensure the interests of the users of accounting information. Yet, it is responsible for supervising the process and disclosing the company's financial information (Klein, 2002). To this end, the committee must meet regularly with the external auditors and managers of the company, reporting information, reviewing financial statements, audit processes, as well as the company's internal controls.

The Audit Committee, virtually did not exist until the publication of the SOX in the United States. After the publication of this law, the committee gained prominence and is considered an important mechanism, as it acts on the company's risk management, monitors the organizational processes, and mediates contact between company, independent auditors, and other users of accounting information (Silva, Oliveira, Mendes & Araújo, 2009). It became an important element of corporate governance to SEC, and essential to ensure the quality of the accounting information disclosed to the capital market (Goh, 2009).

On the other hand, internal controls, monitored by the audit committee, may have deficiencies that can hinder organizational procedures. According to Zhang et al. (2007), internal control problems are classified according to seriousness as, for example, material weakness, significant deficiency, and internal control deficiency.

First, material weakness is associated with significant deficiencies that occur in the company, and which prevent with high probability the recognition of a relevant distortion in the financial statements (Doyle et al., 2007; Lin et al., 2011). As for significant deficiency, or combination of control deficiencies, it affects the processing and disclosure of financial information in accordance with accounting principles and standards. Finally, internal control deficiency occurs when agents of the company, through the controls, are unable to prevent or detect distortions in a timely manner (Zhang et al., 2007).

In the Brazilian context, the Audit Standard NBCTA 265 item 6, argues that internal control deficiency exists when "the control is planned, implemented, or operated in such a way that it is unable to prevent, or detect and repair timely, distortions in financial statements" or when there is a lack of a control that prevents, detects, or corrects distortions (NBCTA 265, item 6). The standard also states that "significant deficiency or the combination of internal control deficiencies, is important enough to deserve the attention of those responsible for governance", according to the professional judgement of the auditor (NBCTA 265, item 6).

Internal control deficiencies, in general, are associated with inadequate resources applied to the accounting function, such as: lack of qualified personnel in accounting; deficient policies for the recognition of revenue; lack of segregation of duties; inadequate reconciliations of ledger accounts; control deficiencies in subsidiaries (if the company has them); and control problems in complex accounts – financial instruments, derivatives, income tax (Ge & Mcvay, 2005).

The American legislation, through SOX, requires companies to disclose information about the internal control by means of reports, ensuring that the control processes and procedures are applied in accordance with section 302 of the Law. Also, through section 404, SOX requires companies to disclose a report on the effectiveness of the company's internal controls and that the external auditor audit and evaluate this effectiveness (Hogan & Wilkins, 2008). As there is no requirement of compliance with SOX or similar to companies listed only in the Brazilian market, the information regarding internal control failures are restricted. Fact that can reduce the development of empirical studies on this theme. However, the construct of internal control deficiencies, developed by Teixeira (2015), allows the identification of several dimensions of internal control deficiencies in Brazilian companies, through the analysis of the reports of these companies.

The author conducted a wide research with content analysis of standards NBCTA 265 and NBCTA 315, as well as Ge and Mcvay (2005), who identified some types of deficiencies, proposing how to identify them in the reports. The dimensions of internal control deficiencies proposed by Teixeira (2015) are as follows: deficiency in a specific ledger account, deficiency in the preparation of financial statements, deficiencies in subsidiaries, deficiency in the technology, deficiency of the senior management, deficiency of litigation, and general deficiencies.

Internal control deficiency in specific account relates to deficiencies that happened in operations with complex regulations, unusual and international transactions, and uncertainty of measurement of accounts and complex accounts. Deficiencies with the financial statements refer to problems with the non-registration of financial instruments, with the accounting staff, accounting standards, and past and future distortions. Concerning the deficiencies with subsidiaries, problems are understood as relating to shared control, acquisitions, reorganizations, and transactions between the parties (Teixeira, 2015).

Also, deficiency of technology refers to the mismatch between information technology (IT) and business, systems changes, and the use of new systems. Deficiencies with the senior management are related to unstable operations, problems with the continuity of the company, change in activities and products, change of location and management. Deficiency of litigations are problems concerning the regulator bodies and contingent obligations. And, finally, general deficiencies are related to problems in the company's monitoring, review, or implementation of new control, segregation of duties, reconciliation of accounts, errors, or fraud (Teixeira, 2015). According to the author, the classification of deficiencies in dimensions assists in analyzing the nature of each problem.

2.1 Relationship between the characteristics of the audit committee and internal control deficiencies

The audit committee possesses certain characteristics associated with quality, such as having members with experience in finance, accounting, or audit (Carcello & Neal, 2003; Goodwin-Stewart & Kent, 2006), having independent members (Abbott, Parker & Peters, 2004), as well as having frequent meetings on the company's performance and its functions, with the purpose of designing improvements (Goodwin-Stewart & Kent, 2006; Barua, Rama, & Sharma, 2010).

It can be inferred that the characteristics of the audit committee are related to the quality of the companies internal controls. The effect of the committee is felt with greater supervision, in the review of accounting procedures, and in discussion with the auditors to correct the deficiencies. Also, the audit committee leads the administration of the company to invest resources in the correction of control problems (Goh, 2009).

For Krishnan (2005), the quality of the audit committee (size, experience, and independence) reduces internal control problems (reportable conditions and material weaknesses). This effect arises from the greater independence and financial experience, able to reduce the incidence of control problems.

The effect of the quality of the audit committee, the independence of the auditor and the disclosure of internal control deficiencies, after the enactment of SOX were also investigated by Zhang et al. (2007). For companies segregated in two samples (with and without internal control deficiency), the authors found that companies are more likely to present deficiencies when the audit committee has little financial experience, when the external auditors are more independent, and when there is change of recent audit. The specialization of the committee also appears in the study by Goh (2009), in which companies with bigger audit committees, with greater financial experience, and independence are more likely to correct internal control deficiencies in a timely manner.

Specifically on the size of the audit committee, Goh (2009) suggested that companies can improve the monitoring of internal controls, expanding their audit committees, with the hiring of more members, although the requirement of the main American stock exchanges is for audit committees to be formed with at least three directors. SEC and other normative bodies recommend the formation of an audit committee with a minimum of three members.

In 1999 and 2003, SEC approved requirements of composition and structure of audit committees, introduced by the major stock exchanges such as NYSE and NASDAK. Thus, all companies should have their audit committees consisting of at least three members, as well as requiring from them characteristic of independence and expertise (SEC, 2003; Krishnan, 2005).

Krishnan (2005) analyzed the composition of audit committees in American companies, considering the minimum size of three members, independence, and expertise as proxies for the quality of the committee. The author found that the greatest propensity is companies with committees formed by three or more members, and a higher proportion of independent members with expertise.

In Brazil, CVM ,the Central Bank, and B3 also recommend the prerogative of audit committees with at least three members, with adoption for some sectors and markets being mandatory. CVM regulates it through instruction No. 509/11, State companies by law No. 13,303, the Central Bank of Brazil with resolution No. 3,198, and B3 by the regulation of the New Market. The recommendation issued by these bodies differ in the composition of these three members, ranging in the demand for independence and expertise (IBGC, 2017).

According to IBGC (2017), the minimum size recommended for the audit committee varies according to the size of the organization or business complexity. However, the general recommendation is of a minimum of three members. In the case of more members, an odd number of members must be adopted. For the IBGC, such composition facilitates diversity on the committee, promoting differentiated world visions of professionals with different profiles and experiences. The diversity in the audit committee, according to IBGC (2017), encourages the diversity of communication and arguments, generating a higher quality and safety decision-making process, in which ideally all members have knowledge in the area of business to assist in this process.

In addition to the characteristics of the audit committee, which provide higher quality of operation and can also assist in minimizing control problems, Lin et al. (2011) identified that the education level of members of the internal audit significantly influence on the disclosure of internal control deficiencies and material weaknesses, reported in accordance with section 404 of SOX.

Thus, the characteristics of the audit committee, especially the size of the committee, the financial experience, and independence of internal auditors (Krishnan, 2005; Goh, 2009) are associated with the reduction of internal control problems (Krishnan, 2005; Zhang et al., 2007; Goh, 2009; Lin et al., 2011).

Thus, to evaluate these assumptions in the scenario of Brazilian companies, we designed the following research hypotheses.

H_1: The size of the audit committee is negatively associated with internal control deficiencies.

H_2: The minimum of three members in the audit committee is negatively associated with internal control deficiencies.

H_3: The financial experience of the audit committee is negatively associated with internal control deficiencies.

H_4: The independence of the audit committee is negatively associated with internal control deficiencies.

3 METHODOLOGICAL PROCEDURES

Our goal is to analyze the relationship between the characteristics of the audit committee and internal control deficiencies in Brazilian companies. The selection of the research sample used the list of companies by B3[2]. In the end, the sample was composed by 71 to 80 companies listed on the stock exchange which possessed an Audit Committee for each analyzed year (71 in 2010, 71 in 2011 to 2013, 75 in 2014, and 80 in 2015).

For these companies, the valid information in all analyzed variables were available throughout the analyzed period. The analysis period (2010 to 2015) gathered 439 observations. The data are not balanced, i.e., the sample has different companies in different years. We used this approach to achieve a greater amount of observations. We adopted the methodology by Teixeira (2015) for the identification of internal control deficiencies in the Brazilian companies analyzed. The content analysis of the companies' reports was organized in seven groups of internal control deficiencies (Chart 1).

The content of the following documents were analyzed: Reference Form 10.6 – Internal Controls (B3); Standardized Financial Statements – Opinions and Declarations (B3); and Redo Official Letter (CVM). The occurrences identified in these reports were extracted for each dimension of deficiency (Chart 1) and a number of deficiencies identified in each dimension was given, or 0 (zero) if no internal control deficiencies were identified.

[2] Created in March 2017 from the integration of BM&FBOVESPA and Cetip, B3 is consolidated as one of the leading companies of the financial market infrastructure in the world, with operations in the stock market and branches (BM&FBOVESPA, 2018).

Variables	Description of each type of deficiency
Specific Account	Operations with complex regulations; Non-routine and systematic transactions; International transactions from the management; Uncertainty of measurement; Complex accounting measurement.
Financial Statements	Unregistered financial instruments; Accounting staff; History of past mistakes; Accounting standards; Future accounting distortions.
Subsidiaries	Shared control; Transactions with related parties; Acquisitions and reorganizations; Sales or chances of sales.
Technology	Incompatibility of technology and business; Change in technology environment; New technological systems.
Senior Management	Unstable and volatile operations; Business continuity and liquidity; Activities, products and other changes; Local changes and/or expansion; Changes in senior management.
Litigation	Regulatory and governmental bodies; Contingent obligations.
General	General monitoring; Review or implementation of internal control system; Segregation of duties; Accounting reconciliations; Deficiencies, errors and fraud.

Chart 1. Variables for the composition of the internal control deficiency index

Source: Adapted from Teixeira (2015).

Note: The deficiency was identified by the content analysis of the following documents: Reference Form 10.6 – Internal Controls (B3); Standardized Financial Statements – Opinions and Declarations (B3); and Redo Official Letter (CVM). Through the content analysis of reports, each variable was pointed to as 1 when there was incidence of internal control deficiency in that dimension, the number of incidences, when greater than one, or 0 when an incidence was not identified.

Then, we applied information entropy analysis. An entropy index was generated for each observed deficiency, and multiplied in the end by the deficiencies encountered for each company with the weight/entropy index of each dimension of deficiency. The information entropy, according to Zeleny (1982) creates the 'information weight', which is a measure of relative importance related to the amount of information. The more distinct and differentiated are the scores of a particular variable, for example, the higher tends to be its weight. Information entropy refers to a multi-criteria analysis and assigns weights to the information, demonstrating the more relevant ones.

This technique has been applied in the study by Teixeira (2015), who also observed a deficiency index. The author also noted the weight of each analyzed information and generated an indicator after the sum of these information. This technique was used in national studies, such as those by Rocha, Hein, Lavarda and Nascimento (2011) and Moura and Beuren (2011). In the end, an internal control deficiency index was generated for each company. The deficiency index is shown in Chart 2, as well as the other variables of the study.

Variable	Description	Data source	Reference
Dependent Variable			
Internal control deficiency index	Index formed from the deficiencies variables, in which, after applying the exponential numbers, variables data of entropy was applied to observe the weight, then multiplying it by the the absolute value of the deficiency, and later by the sum a single indicator was obtained.	Data from the internal control deficiencies variables.	Teixeira (2015)
Independent Variables of Audit Committee Quality			
Audit Committee size (number of members)	Quantity of members in the audit committee.	B3: Reference Form 12.7 – Committees Composition.	Krishnan (2005); Goodwin-Stewart and Kent (2006).
Audit Committee with 3 or more members	Dummy variable for the size of the audit committee, in which 1 represents three or more members on the committee and 0 less than three members (SEC guidance, to have at least three members).	B3: Reference Form 12.7 – Committees Composition.	Krishnan (2005); Goodwin-Stewart and Kent (2006), Goh (2009).
Independence of the Audit Committee	Proportion of members of the audit committee that are independent.	B3: Reference Form 12.7 – Committees Composition.	Krishnan (2005); Goodwin-Stewart and Kent (2006); Goh (2009).
Audit Committee Expertise	Proportion of members of the audit committee with financial experience: accounting, finance, and economics.	B3: Reference Form 12.7 – Committees Composition.	Krishnan (2005); Goodwin-Stewart and Kent (2006); Goh (2009); Barua *et al*. (2010).
Independent Control Variables			
Type of audit company	Companies audited by Big Four = 1; companies that are not audited by Big Four = 0.	B3: Reference Form 2.1/2– Identification and Remuneration Independent Auditors.	Krishnan (2005); Ge and Mcvay (2005).
Company size	Natural logarithm of the total assets of the companies	Economatica	Krishnan (2005)
Profitability of the Asset	Fraction between net profit and total assets	Economatica	Ge and Mcvay (2005)

Chart 2. Description of variables
Source: Research data.

We highlight that the size of the audit committee was observed by two variables, the first being the total size of the audit committee and the second a dummy variable to capture companies with audit committees composed of at least 3 members. These two variables are justified since Krishnan (2005) found that the committee with 3 members can introduce greater efficiency of operation, and by the total amount it is not possible to observe this prerogative. In addition, the independence of the audit committee was evaluated by committee members who did not present current and past relations with the company, not being, for example, former employees or suppliers.

$$IDCI_{it} = \varphi_0 + \varphi_1 ACSIZE_{it} + \varphi_2 ACSIZED_{it} + \varphi_3 ACINDEP_{it} + \varphi_4 ACEXP_{it} + \varphi_5 BIGFOUR_{it} + \varphi_6 LASSET_{it} + \varphi_7 ROA_{it} + \varepsilon_{it}$$

Em que:

IDCI: Internal Control Deficiency Index;

ACSIZE: size of the audit committee (number of members);

ACSIZED: audit committee with 3 or more members;

ACINDEP: independence of the audit committee;

ACEXP: expertise of the audit committee;

BIGFOUR: type of audit company;

LASSET: company size; ROA: profitability of the asset.

Table 1 presents the descriptive statistics of the analyzed variables.

Table 1. Descriptive analysis of the study's variables

Variables	Minimum	Maximum	Mean	Standard Deviation
Internal Control Deficiency Index	0.00	32.81	0.34	1.68
Audit Committee Size	1	9	3.30	1.14
Committee with 3 or more members (0/1)	0	1	0.84	0.36
Independent Members	0	9	2.79	1.41
Members with Expertise	0	6	1.64	1.21
Audit by BigFour (0/1)	0	1	0.96	0.19
Company size (total assets in thousands of R$)	49	1,437,485	70,306	224,098
Profitability of the Asset (%)	-179.70	199.30	3.23	18.98

Source: Research data.
Note: Big Four - Deloitte; Ernst & Young; KPMG and PricewaterhouseCooper.

According to Table 1, it is possible to observe that the internal control deficiency index ranged from 0 to 32.81, demonstrating that some of the analyzed companies did not present internal control deficiencies in the analyzed period, while others showed great deficiencies, as is the case of the company BRB Banco, which, in the fiscal year of 2014, showed many internal control deficiencies. In general, companies have a low mean of internal control deficiencies (0.34), which is corroborated by the low standard deviation of the data (1.68). We observed a low internal control deficiency (on average) in the analyzed companies, which shows few weaknesses in the internal control structure of the companies.

Due to Brazilian companies demonstrating a low level of internal control deficiencies, according to Ge and Mcvay (2005), it can be inferred that they are ensuring skilled professional work in accounting, policies on revenue recognition, segregation of duties, and reconciliation of ledger accounts.

The committees deployed in these companies range from 1 to 9 members, with a mean of 3.3 members. Also, contrary to the recommendation of regulators, committees with even number of members were found. Therefore, part of them (63 companies – 2010 and 2011; 62 companies – 2012; 61 companies – 2013 and 2014; and 60 companies – 2015); follow the recommendation of SEC, IBGC, and CVM. As shown in the dummy "committee with 3 or more members", 84% of companies meet this recommendation. In addition, some companies do not have any independent member on the committee, while others structure the committee with up to 9 independent members.

The expertise in finance, economics, or accounting of the members of the committee varies from 0 to 6 members, with a mean of 2 members. The low standard deviation shows a lower quantity of members specialists in accounting, finance, or economics. Regarding the type of external audit, it can be seen by the mean (0.96), that the majority is audited by Big Four (Deloitte; Ernst & Young; KPMG; and PricewaterhouseCooper). The sample is formed by companies with billion of reais in assets, while one of the cases has assets valued at R$ 49 thousand in 2010 (Nutriplant Industria e Comercio S.A.).

To deepen the descriptions of the internal control weaknesses, Table 2 shows the descriptive analysis of the seven dimensions of control deficiencies, which make up the control deficiencies index (as presented in Table 1).

Table 2. Descriptive analysis of the dimensions of internal control deficiencies

Variables	Minimum	Maximum	Mean	Standard Deviation
Specific Account	0.00	32.67	0.13	1.55
Financial Statements	0.00	0.81	0.03	0.12
Subsidiaries	0.00	0.05	0.00	0.00
Technology	0.00	1.53	0.04	0.14
Senior Management	0.00	0.05	0.00	0.00
Litigation	0.00	0.00	0.00	0.00
General	0.00	0.64	0.02	0.07

Source: Research data.

The dimension of greater representativity in the composition of the internal control deficiencies index is ‘Deficiencies with Specific Account’ (mean of 0.13). This dimension refers to problems with Operations with complex regulations; Non-routine and systematic transactions; International transactions from the management; Uncertainty of measurement; Complex accounting measurement (Teixeira, 2015). Deficiencies in Specific Account in the analyzed period (2010 to 2015) may be associated with the period of adaptation of Brazilian companies to the new standards brought by international accounting standards.

The companies had to register complex accounts, such as Financial instruments and others non-existent until then, as Intangible and Biological Assets. In addition, other changes were implemented in accounting, as methods of measurement such as fair value, net realizable value, and current cost. Such changes may have increased instances of deficiencies in the adjustment period. We also observed, as shown in Table 2, that Litigation has not suffered any mention, since, according to Teixeira (2015), it refers to the law suit or judicial controversy with regulator and Government bodies or contingent obligations. Thus, we infer that the analyzed companies did not have any problem with litigation in the analyzed period. The other dimensions of internal control deficiencies behaved similarly, demonstrating problems in the companies, but not many.

4 DESCRIPTION AND ANALYSIS OF THE RESULTS

Table 3 presents a summary of the multiple linear regression, in which we used the variable observing the proportion of members with the asset logarithmized, i.e., the variables shown in Table 1. Multiple linear regression was carried out by steps, having at the end of the model only the significant variable(s).

It can be noted, based on Table 3, that, by the stepwise multiple regression, only the size of the audit committee – with 3 or more members – remained with significant negative influence on the occurrence of internal control deficiencies. Other variables, such as the total number of members in the audit committee, the independence of the audit committee, the expertise of the members of the audit committee, audit by Big Four, the company’s size, and profitability of the asset, are not all significantly associated with the occurrence of internal control deficiencies, thus being excluded from the model.

The use of regression by steps corrects the low degree of freedom that would undermine the significance of the Partial Least Squares Regression (PLS[3]). In this stepwise model, the audit committee with three or more members (R2 of 0.011, -0.472) indicates that a small committee (2 members) would have greater propensity for the occurrence of internal control weaknesses in the analyzed sample[4].

[3] PLS– Partial Least Squares Regression refers to a technique of estimation of the linear regression model indicated for large samples (Morellato, 2010).

[4] We analyzed the assumptions of the multivariate analysis as a normality test, Durbin Watson and collinearity, demonstrating compliance to such tests, if the normality test showed itself not to be significant (Corrar, Paulo & Dias Filho, 2014), Durbin Watson around 2 (Hair, Anderson, Tatham, & Black, 2005), and collinearity below 10 for all variables (Corrar, Paulo & Dias Filho, 2014).

Table 3. Summary of the multiple linear regression

Variables	Coef.	Sig.	VIF
(Constant)	0.735	0.000	-
Audit Committee with 3 or more members	-0.472	0.032*	1.000
Durbin Watson	1.987		
R² equation	0.011		
Sig equation	0.032*		
Variables excluded from the model by the stepwise multiple linear regression.			
Variables	**Coef.**	**Sig.**	**VIF**
Committee size (number of members)	0.002	0.977	1.478
Independence of the Audit Committee	-0.040	0.404	1.011
Audit Committee Expertise	0.040	0.399	1.000
Audit by BigFour	0.034	0.479	1.000
Company size	-0.015	0.751	1.007
Profitability of the asset	0.000	0.998	1.017

Source: Research data.

Note: * Significant at 5%. Stepwise multiple linear regression presents a model that has only variables with significant parameters for the explanation of the dependent variable. Thus, as the parameters of the variables are tested, they are added (or not) to the model. The inclusion in the model depends on the variable presenting statistical significance and influence on the dependent variable (Fávero, Belfiore, Silva & Chan, 2009, pg. 365 and 366).

To confirm the effect of the minimum of 3 members in the committee, Table 4 presents the differences of the mean of internal control deficiencies occurrences among groups of committees: formed by 3 or more members (or not), with (or without) independence, and with (or without) expertise.

Table 4. Mean difference of internal control weaknesses level between groups of committees formed by 3 members, independence, and expertise of the members

T test for occurrences of internal control deficiency				
Group	**n**	**Mean**	**Levene's Test**	**Sig.**
Less than 3 members (0)	69	0.74	0.00*	0.32
Equal to or greater than 3 members (1)	370	0.26		
Without independence (0)	29	0.23	0.50	0.73
With independence (1)	410	0.34		
Without expertise (0)	76	0.27	0.45	0.70
With expertise (1)	363	0.35		

Source: Research data.

Note: Members were considered "With" expertise and independence when presenting some degree, and "Without" expertise and independence those who did not present any degree.

* The correlation is significant at the 0.05 level (2 ends).

** The correlation is significant at the 0.01 level (2 ends).

Levene's test reveals whether the assumption of equal variances was respected ($p > 0.05$) or violated ($p<0.05$), which suggests the significance of the t test to be analyzed.

It is confirmed that the level of internal control deficiencies did not present statistically significant mean difference between the groups of committees formed by 3 members, expertise, and independence (thus rejecting hypotheses 1, 3, and 4). The results do not corroborate the findings of international studies concerning expertise and independence. These two factors are relevant in Krishnan (2005) and Zhang et al. (2007) in reducing the incidence of internal control problems. In the tests presented for Brazil, we did not observe the effect of expertise and independence of the members. The effect noted previously (Table 3) for committees with at least 3 members allow us to accept hypothesis 2.

The audit committee is responsible for overseeing the auditing process, disclosing information, reviewing accounting procedures, and fixing problems (Goh, 2009; Peleias et al., 2009). For the NYSE, NASDAK, SEC, IBGC, and other bodies, audit committees, to effectively carry out their activities, must have at least three members. According to IBGC (2017) this odd number of members facilitates the plurality of arguments. Based on the results, the proposition of these regulators gains strength, since, at least in Brazil in the analyzed period, a committee with many members would not be necessary to mitigate the occurrence of deficiencies, with three members being ideal. This finding corroborates the findings of Krishnan (2005), who found, for American companies, that a propensity to have committees consisting of three or more members demonstrated greater quality of performance. According to IBGC (2017), this composition of three members on the committee assists the diversity of profiles and experiences, promoting different visions for the decision-making process, which assists the debate and reflection. Thus, a minimal plurality on the committee would encourage communication and decisions of greater quality and safety in the organizational processes.

Finally, Table 5 shows that greater expertise and independence are observed in committees formed by 3 or more members. This result has a relevant meaning. When not meeting the minimum recommendations of regulators, companies also make no effort in providing the committees with resources (expertise) and autonomy (independence). This causes such committees to be merely ceremonial. Another interesting effect, is to note that among the committees with 3 or more members (reaching 9 members), the mean of independent members is also of 3 (3.05), and also, the mean of expert members does not reach 3 (1.79).

Table 5. Mean difference of level of expertise and independence among committees with less than 3 members vs. 3 or more members.

T test					
	Group	**n**	**Mean**	**Levene's Test**	**Sig.**
with expertise	Less than 3 members (0) Members	69	0.83	0.00*	**0.00***
	Equal to or more than 3 members (1)	370	1.79		
with independence	Less than 3 members (0) Members	69	1.40	0.31	**0.00***
	Equal to or more than 3 members (1)	370	3.05		

Source: Research data.
Note: *The correlation is significant at the 0.05 level (2 ends). **The correlation is significant at the 0.01 level (2 ends).

As only a part of Brazilian companies are not listed in SEC and, therefore, do not follow the compulsory requirements regarding the audit committee, the analysis of the companies listed only in Brazil observes the adoption of the committee in a voluntary character. Except for companies of sectors/segments regulated by specific instructions, as is the case of financial and State companies, which participate in B3 New Market. For these companies, the recommendation is to adopt the audit committee.

Based on these results, we suggest attention from regulatory, auditing and corporate governance bodies, to the composition of the committees in the range of 3 members, regarding its composition in terms of independence and expertise. Low expertise employed (less than the recommended minimum 3) shows that the committees meet the minimum of regulation, but not adding members with expertise. The least propensity to control deficiencies may arise from the existence and composition of the committee. In addition, external users to the company can approach and anticipate the level of efficiency of their internal control, knowing that there is a strong relationship between small committees and control deficiencies.

5 CONCLUSIONS

This study analyzed the relationship between the characteristics of the audit committee and internal control deficiencies in Brazilian companies. In total, we considered 80 committees and 439 observations in the period from 2010 to 2015, in a non-balanced sample. We built an index for internal control deficiencies, as in Teixeira (2015), collecting incidence of deficiencies in various dimensions through content analysis of the companies' reports. Finally, information entropy was used to weigh the amount of deficiencies reported by the companies.

The results show that among the characteristics of the audit committee (size, independence, and expertise), the formation of an audit committee of at least three members is associated with the reduction of internal control deficiencies. Still, internal control deficiencies in the analyzed companies did not vary according to the independence or expertise of their audit committee, neither with the size or profitability of the companies' asset.

We observed that this indication of at least three members in the committee (by NYSE, NASDAK, SEC, and IBGC), can be indicative for the Brazilian companies that chose to adopt the audit committee to improve internal control, since it facilitates the plurality of profiles, experiences, and arguments, which corroborates to the quality of the decision-making process. These results may be of interest to users of accounting information, since a greater role of the audit committee could be associated with the reliability of accounting information. The study has some limitations. First, we considered only the Brazilian companies that possessed an audit committee in 6 fiscal years. Finally, we did not consider companies with fiscal committee, which also engaged in corporate governance function, but not directly associated with the internal control.

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