Mission

Revista Catarinense de Ciência Contábil is a quarterly publication by Santa Catarina State Board of Accountancy whose mission is to disseminate the scientific production, in the area of Accounting, of professors, researchers, students and professionals from Brazil and abroad, who are selected according to the quality and contribution to the development and dissemination of knowledge in this field.

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Summary

Editorial

We are walking towards the end of another year, which brings us the last edition for the period. A year marked by uncertainty, challenges and countless struggles for the society and for our profession. In this sense, our belief on the qualified debate, the research and the learning is only reinforced. And this commitment e have once again fulfilled in this journal, which we know to be the differential of the state of Santa Catarina on the national scene.

This edition brings a total of seven articles with several approaches on aspects relevant to our practice and that directly impacts the lives of millions of Brazilians. After all, when we discuss mergers, tax burdens, stock exchange and socioeconomic indicators, we must never forget how it affects the families of our immense Country with so many inequalities.

The first article addresses the tax burden issue and its aggressiveness in Brazil, evidencing how it affects the business sustainability. The research has analyzed companies between 2010 and 2014 aimed at determining whether their inclusion in the Business Sustainability Index (ISE) defines any behavior regarding the aggressive taxation.

The second text, however, points to a study that assesses the characteristics related to size, independence and expertise of audit committees of companies listed on BM&FBovespa between 2010 and 2013. This edition also brings the report of a study on the performance of companies that carried out mergers and acquisitions through the performance evaluation using Graham Filters.

Within the socioeconomic sphere, another article presents a study that has analyzed the relation between the budgetary efficiency of the 223 municipalities of the State of Paraíba and the socioeconomic conditions referenced by the social and economical indicators from 2005 to 2013.

The readers are further provided with a study assessing the self-sufficiency of the operational activities of the *Federal Data Processing Service* (Serpro) in cash generation that are necessary to ensure its maintenance as independent state-owned company.

Moreover, we bring an article addressing the level of *disclosure* in sustainability reports, as per the *Global Reporting Initiative* (GRI), in all 93 companies listed at BM&FBovespa in 2014, and, finally, a study aimed at assessing the accounting and tax impacts in the use of the transfer price in the import and export of goods for a automotive company.

We are certain that this edition brings great knowledge to all. Good reading!

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TAX AGGRESSIVENESS AND CORPORATE SUSTAINABILITY IN BRAZIL

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ABSTRACT

The present research aims to observe whether the participation of companies in the Corporate Sustainability Index (ISE) listed in BM & FBovespa defines behavior regarding tax aggressiveness. The companies listed or not in ISE were evaluated in the period from 2010 to 2014 through two measures of tax aggressiveness: the effective tax rate ETR (Effective tax Rate) and the difference between Book Tax Differences - BTD). By hypothesis, it was speculated that the companies listed in the index would be less tax aggressive to signal a behavior consistent with a social concern. However, a rational theory was not found to justify this anticipated relationship, and in fact, corporate sustainability, to a certain extent, could even be related to more efficient tax planning. Fiscal aggressiveness involves the use of techniques that privilege tax planning to reduce its explicit taxation, and in certain circumstances legal techniques (elision) and other illegal techniques are used, either because of their abusiveness in form or even because they have character to reduce the tax burden. The results documented in the research indicated that the companies that make up the ISE tend to be less tax aggressive those that do not participate in the ISE. This finding serves to anticipate the tax behavior of a company in function of the values that it prestige.

Keywords: Tax aggressiveness. Accounting profit. Sustainability. Tax planning.

1 INTRODUCTION

Our growing concern with a more sustainable corporate performance is noticed in our everyday policies. In a general way, the sustainability is associated to the practice that looks after the community's interests, which involve social and environmental aspects. However, there is still the doubt about how those companies, the ones that have a speech guided for the society, behave themselves on the taxation aspect, or, even better, how they behave in what concerns their tribute's payment. Would there be an association between the companies' corporate sustainability and their fiscal behavior?

With this in mind, this research's proposal is to appreciate the fiscal aggressiveness of the companies that are considered sustainable and listed on the Corporate Sustainability Index (CSI) at BM&FBovespa. The CSI was created in 2005 by BM&FBovespa and by a group of institutions. This index became a reference for socially responsible investments in Brazil, with the goal to show the return of a portfolio that has a composition, companies' stocks with a behavior that promote the external and internal public well-being, and that also adopt good practices on the corporate management in Brazil.

The CSI participants are companies that highlight themselves with the sustainable development, jointly with the strategic corporate actions in Brazil. BM&FBovespa discloses this index as a reference of the best sustainability practices. It searches for an investment relationship that adjust itself with the demands that refers to a sustainable growth of the current society (Bovespa, 2016).

According to Dias (2006), the promotion of good environmental practices became important. It constitutes an strategic objective of several organizations. Also, in an indirect way, when harmful environmental impacts are perceived, which the companies provoke for their development, this makes a higher awareness arise for this kind of problem.

Lima (2014) describes that the company must suffer alterations before the administration standards and on the application of the company's deliberations. it is not only the financial economic performance that's the relevant part, but it is also considered the area turned for the society and for the environment.

The companies' behavior is reflecting a growing awareness in which concerns the depleting of the resources considered natural. According to Coral (2002), the company shall modify its management and decision taking models, considering not only the economic aspects, but also the social and environmental ones.

Up next, we will present the theoretical framework and the research hypothesis. Up next, it'll be discussed the methodological aspects of the study to be developed. During its course, it'll also be presented the results and analyzes made. Finally, it'll be presented the conclusion, which points out the main findings.

2 THEORETICAL FRAMEWORK

The theoretical framework will be briefly exposed. First, the Corporate Sustainability Index – CSI will be discussed, and furthermore, the issue regarding the fiscal aggressiveness.

2.1 Corporate Sustainability Index – CSI

Measuring the average return of a composition of the companies' stocks that operate in Brazil and with open capital, present on BM&FBovespa, the ISE regulates the sustainability practices and also directs better approaches for a more corporate performance in relation to the effects over the economy and the environment balance.

Notwithstanding, the companies started to emphasize the criteria turned for the society, for the environment and started to adopt ecological criteria more carefully. The corporate sustainability gains strength from the moment the entrepreneur comprehends that only the profitability indexes aren't enough for long term strategic planning.

Lima (2014) describes that the way to alter the users' procedures, from the people, is to remotely direct an alteration of the company's internal group, establishing that it becomes favorable to adapt itself to the moment of demand and supply before the society, aiming not just the financial value of the products to evaluate over the competition.

Dealing with a consumerist world, the analyzes goes even further about the products' attributes and value when you consider the environment and its influences for the final consume.

To be a part of the CSI portfolio, the companies will have to attend a cumulatively criteria, to the extent where they can be classified accordingly to the specific Counsel, headed by BMF&Bovespa, which is responsible for the facts that generate a development by the Index's part. Thus, the companies listed in a higher negotiation for the issuance of 200 stocks over the last 12 (twelve) months will be evaluated accordingly with their performance, showing if the

company publish its social balances, considering the product they offer, if it does not result in risks or damage to the health of its consumers. it is also considered the way that the companies search the alignment of concerns and the improvement on the decision takings on the company over a sustainable environment. The negotiation must be made in at least 50% of the focused trade sessions in the previous 12 months to the revaluation process beginning, also as a criterion for the evaluation and inclusion on the CSI (Bovespa, 2016).

It will no longer be a part of the CSI the company that fails to comply with any one of the inclusion criteria; while the portfolio is valid, to enter in a bankruptcies management or legal recovery; in case of the public offer, proceed in a retake of movement in a portion that's significantly composed by market's stocks or suspension of what is negotiated by the referred action by more than 50 days.

2.2 Fiscal aggressiveness

Taxes became motivation factors in a lot of corporate decisions. Management actions exclusively aimed to minimize the corporate taxes through fiscal aggressiveness practices are becoming each time more common in the worldwide corporate panorama. Notwithstanding, a planning that contain a fiscal aggressiveness might generate costs and benefits. From the social perspective, the payment of corporate taxes ensures the financing of public assets (Freise, Link, & Mayer, 2008). Thus, a company's policies with more aggressive fiscal practices might have a negative impact on society (Freedman, 2003; Slemrod, 2004; Landolf, 2006).

For Freedman (2003), Freise *et al.* (2008) e Gilders, Taylor, Richardson, & Walpole (2004), the fiscal aggressiveness is strong in a company whose tributary planning aims the reduction of taxes' payment, affecting the on lending of resources to the government, which is the main interested party. It may cause future prejudices when related with the society, such as the return of public assets.

According to Williams, (2007), when a company has an ethic attitude related to its operational activities and shows this attitude on the economic and financial conjuncture, this produce a positive result over the business with the investors and it also reflect a better relation with society in a general way.

For Chen, Chen, Cheng and Shevlin (2010), the fiscal aggressiveness is a group of activities that direct the reduction of the taxes' payment upon a tributary planning. According to Slemrod and Yitzhaki (2002) and Slemrod (2004), fiscal aggressiveness is conceited as a wide range of operations with the unique goal to reduce the total tributary debt.

In Brazil, there are two ways that the companies can use to reduce their expenses with taxes: tax avoidance (legal way) or through evasion (illegal way). However, a couple of years ago, with the anti-elision mechanisms institution in the Brazilian Tributary Code, the fiscal authorities have been able to contain or deconstruct some acts used by the taxpayers under the argument of the utilization of artificial fiscal elision techniques (or elusive) However, it is common to find divergences of comprehensions between the legislators and jurists in what concerns the application of these mechanisms, as exposed in Schoueri (2010).

Fiscal elision (tributary planning)	Fiscal evasion
* Legal	* Illegal (contrary to the laws)
* Not liable of repression	* Liable of a repressive measure (fiscal evasion crime)
* Measure adopted before the occurrence of the generator fact	* Measure adopted after the occurrence of the generator fact
* Needs to be stimulated	* Needs to be prevented

Figure 1. Fiscal elision and tax evasion
Source: Adapted from Amaral, G. L. (2007). *Seminário nacional de excelência na gestão tributária*. Instituto Brasileiro de Planejamento Tributário – IBPT, Curitiba, PR, 18.

The taxes are motivation factors in certain corporate decisions. Management actions directed to minimize taxes through fiscal aggressiveness are becoming common ordinary practices on the global corporate scenery. Despite the suggested theme, a planning that contain a fiscal aggressiveness might generate costs and benefits. From the social perspective, the payment of corporate taxes ensures the financing of public assets (Freise *et al.*, 2008).

2.2.1 Effective Tax Rate - ETR

As a proxy to measure the companies' fiscal aggressiveness, it'll be used an ETR - Effective Tax Rate. This metric involves the expenses with income taxes and social contribution over the net profit (IR/CSLL) over the LAIR, the profit before the income tax.

Based in this motivation, the ETR will also be used as a metric for the measurement of fiscal aggressiveness on companies. Giannini and Maggiulli (2002) states that the ERT can be adopted to evaluate the real impact of the tributary rate of companies, besides to explain its effects on the decision taking.

2.2.2 Book-Tax Differences - BTD

As a fiscal aggressiveness proxy, the BTD will be used to measure the aggressiveness levels on the companies.

The usage of this *proxy* is based on the research made by Dunbar, Higgins, Phillips, & Plesko (2010), which define *Book-Tax Differences* as one of the means to measure the fiscal aggressiveness.

BTD's are the differences between the books profits and taxable income. These differences arise from several ways on the verification. While the books profit is obtained through the result of revenues minus the costs and expenses, the taxable income is verified from the books profit, adjusted by the additions and exclusions demanded and allowed by the income tax law. (Dalfior, 2015). Motivated by the existing literature, the BTD will be used as the fiscal aggressiveness measure.

Regardless if it is pertinent acknowledged, the argument that a company has a taxable income lower than the books profit, the legal mechanism (elision) are applied, and it means that the company has a planning and it is not aggressive from the fiscal perspective. The reality is that this metric is extensively used by the international literature as a measurement of fiscal aggressiveness.

2.3 Research hypothesis

On behalf of the referential presented, it is desired to investigate if the companies listed on the corporate sustainable index are more conservative and if they have a fiscal behavior less aggressive than the companies that does not belong in there. With this, the following hypothesis to be tested will be presented:

H1: Companies listed on the Corporate Sustainable Index are taxable less aggressive than the companies that does not belong in this group.

it is aimed to verify if a listing mode on the special segment imply in any kind of behavior in terms of tax aggressiveness in these companies.

3 METHODOLOGY

The research consists in a descriptive analysis. It takes as basis the quantitative method for analysis and use instruments of statistics information.

The data collection and analysis will be based in countable information through a sample from the years from 2010 to 2014, with companies listed on the São Paulo Stock Market – Bovespa.

By hypothesis, it is assumed that the BTD and ETR are usable indicators on the fiscal aggressiveness analysis. This hypothesis is sustained in the study conclusion of Chen *et al.* (2010), Hanlon *et al.* (2012) and Ferreira, Martinez e Moraes (2012).

3.1 Sample selection

The data were extracted from the Economática® database for the researched population and other companies listed at BM&FBovespa, whose period was from 2010 to 2014. Before the selection process, the companies that did not had information during this period were excluded.

Initially, the choice for 2010 is justified due the fact it was the period in which the countable regulations were already standardized with the international regulations. The

selection until 2014 was chosen because it was the most recent period in what concerns the data published for analysis. Two measures were used to calculate the fiscal aggressiveness. They are: BTD and ETR.

METRICS	CALCULATION	DEFINITION
ETR – effective tax rate	Total expense with the income tax and social contribution over the net profit / profit before the income tax.	It reflects the effective paid tax, tied to the profit before the tax.
BTD – book tax difference	BTD= LAIR – (desp IRPJ e CSLL/0,34)	It reflects the countable profit minus the taxable income for the assets of each company.

Figure 2. Fiscal aggressiveness metrics
Source: Authors.

Collecting these data will be relevant to justify the expected research hypothesis, which shows the evaluation of fiscal aggression and expects companies participating in the business Sustainability Index to be less aggressive with regard to taxes.

Table 1
Identification and composition of the sample

Definition	Quantity
General numbers of the companies	389
(-) Exclusion of companies without information	(170)
(-) Exclusion of companies with negative ETR	(112)
(=) Total after exclusion	107
(X) Number of periods (years)	5
(=) Number of Observations Used	535

Note. Source: Research information and Authors.

3.2 Regression models

To indicate the existing relation between the companies listed at the CSI with the fiscal aggressiveness, it was used a multiple linear regression, according to the model below. Different explanatory variable can be used on the sense to prevent the value of a dependent variable.

The model presented will be used to visualize the fiscal aggressiveness for the companies listed at the CSI, using the control variables.

$$Taxa\ Aggr = \beta 0 + \beta 1 SUST + \beta 2 ROA + \beta 3 LEVERAGE + \beta 4 PPE + \beta 5\ INTANG + \beta 6 SIZE + \varepsilon$$

Measure	Calculation
SUST	Companies participating in the Corporate Sustainable Index – CSI, 1 for companies listed at the CSI and 0 for the other companies.
ROA – return on assets	Operational profit divided by the asset
LEV – leverage	Leverage, measured as the long-term debt.
PPE – plant, property and Equipment	Fixed assets divided by total assets
INTANG	Intangible assets; divided by total assets
SIZE	Natural logarithm of the market value of the company.
ε	Residual factors and measurement error

Figure 3. Control variables
Source: Authors.

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4 RESULTS ANALYSIS

The descriptive statistics and analysis of the results of the proposed regression model will be presented in this item.

4.1 Descriptive statistics

In this chapter, it'll be addressed the results documented in this research, exposed on the table below, in which the descriptive statistic from the variables is presented for a sample of 535 observations, with a total of 107 companies for the period from 2010 to 2014.

it is highlighted from table 2 the descriptive statistic from all of the collected observations. The resulting counting in 535 was obtained for the period of five years, in other words, referred to the 107 companies per year, including the ETR – *Effective tax rate* as a tax aggressiveness metric, with the goal to use this metric in relation the other control variables.

Table 2
Descriptive Statistics

	ETR	SUST	ROA	LEV	PPE	INTANG	SIZE
Average	0.3746	0.1477	3.8471	29.9091	0.2432	0.1259	14.4829
Standard error	0.0477	0.0154	0.5494	0.7005	0.0094	0.0083	0.0777
Medium	0.2644	0.0000	4.6016	29.9675	0.2073	0.0292	14.7025
Standard deviation	1.1030	0.3551	12.7067	16.2018	0.2170	0.1930	1.7973
Sample variance	1.2165	0.1261	161.4597	262.4999	0.0471	0.0372	3.2303
Count	535	535	535	535	535	535	535

Note. Source: Research data and Authors.

On table 3, shown below, the companies that compose the Sustainable Index portfolio were separated from those that does not compose it, with the goal to present the variables' average. It was used the *dummy* variable, to the extent where it was identified by 0 those companies that are outside the CSI portfolio and identified by 1 those companies that belong to the Index.

Table 3
Averages of Variables

VARIABLES	OUTSIDE ISE – 0	AT ISE - 1	Total
ETR	0.3497	0.5182	0.3746
ROA	3.6240	5.1348	3.8471
LEV	29.7287	30.9503	29.9091
PPE	0.2400	0.2614	0.2432
INTANG	0.1129	0.2005	0.1259
SIZE	14.2301	15.9421	14.4829

Note. Source: Research data and Authors.

4.2 Results of the regression model

4.2.1 ETR results

For the regression model results, it was presented the correlation matrix, according to table 4, indicating a positive correlation between the companies that are listed at the CSI and the ETR – *effective tax rate*. As far as the company is less taxable aggressive (higher ETR), it has the tendency to be listed at the CSI (Dummy = 1). With this, the interpretation enables the

fiscal aggressiveness to be related with the CSI listing – corporate sustainable index, having the ETR as used metric.

Table 4
Correlation matrix – ETR

	ETR	*SUST*	*ROA*	*LEV*	*PPE*	*INTANG*	*SIZE*
ETR	1						
SUST	0.0542	1					
ROA	-0.0172	0.0422	1				
LEV	0.1522	0.0268	-0.1250	1			
PPE	-0.0193	0.0350	-0.1181	0.0831	1		
INTANG	-0.0055	0.1611	0.0334	0.0607	-0.3391	1	
SIZE	-0.0859	0.3382	0.3202	-0.0441	-0.1805	0.2598	1

Note. Source: Research data and Authors.

All observations that contributed for this research were submitted to metrics that were present in other works, such as the ones performed by Chen *et al.* (2010) and Martinez e Ramalho (2014), with the intent to analyze its hypothesis. The result confirms what was expected by the research. It shows that the companies listed on the CSI segment are less taxable aggressive.

According to table 5, the SUST coefficient is positive and significant on the value of 0,3026 with the *p-value* of 0,0345. This implies that the companies that are part of the CSI portfolio tend to determine a higher ETR. It means that They are less aggressive in taxable terms.

Table 5
Regression in relation to ETR

VARIABLE	COEFFICIENTS	T-STATISTIC	*P-VALUE*
INTERCEPT	1.2374	2.7709	0.0058
SUST	0.3026	2.1201	0.0345
ROA	0.0028	0.7141	0.4755
LEV	0.0105	3.5629	0.0004
PPE	-0.3116	-1.3237	0.1862
INTANG	-0.1087	-0.4043	0.6862
SIZE	-0.0789	-2.5999	0.0096

Note. Source: Research data and Authors.

The result presented by *LEV* variable had a positive and significant coefficient of 0,0105, with a *p-valor* of 0,0004. This result showed that the more leveraged companies tend to be less aggressive. The result from the SIZE variable is negative and significant with a *P-value* of 0,0096. This indicates that higher the company's size, lower the ETR will be and the fiscal aggressiveness will be consequently higher. The ROA, PPE and INTANG coefficients weren't significant in relation to the ETR.

4.2.2 BTD Results

According to the BTD analysis, table 6, the results obtained in this metric weren't conclusive, considering that it was not found any kind of significant relation.

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Table 6
Regression in relation to the BTD

VARIABLE	Coefficients	Standard error	T-STATISTIC	*P-VALUE*
INTERCEPT	-0.0301	0.0188	-1.5983	0.1105
SUST	0.0017	0.0066	0.2574	0.7969
ROA	0.0088	0.0002	51.0145	0.0000
LEV	0.0003	0.0001	2.8390	0.0047
PPE	-0.0054	0.0104	-0.5159	0.6061
INTANG	-0.0294	0.0123	-2.3969	0.0168
SIZE	0.0007	0.0013	0.5722	0.5674

Note. Source: Research data and Authors.

The result presented by the ROA variable had a positive coefficient of 0,0088, ensuring a *p-value* of 0,0000. It expresses a positive and significant relation between the ROA and the BTD.

The coefficient presented by the ROA variable was of a positive coefficient of 0,0003, ensuring a *p-value* of 0,0047. The relation is inversely proportional between the highlighted leverage metric and the BTD. For the INTAG variable, the coefficient was of -0,0294, ensuring a *p-value* of 0,0168.

For the SUST, PPE and SIZE variables, despite the coefficients being inside the interval of 95% confidence, the p-vale of these variables stayed above 5%. It indicates that they aren't significant in relation to the BTD.

This indicator presents the percentage of tributary economies, a *priori*. However, it is recommended caution on the interpretation of results, because the differences might represent temporary tributary economies; they might be resulting from temporary taxable or deductible differences. There's, thus, only one intertemporal fiscal benefit for the company – postponement or anticipation of taxes.

it is important to remind that the book-tax differences occur not only because of the different goals of the financial accountable standards and from fiscal rules. Therefore, it is important to investigate, in alternative studies. other motives that might conduct these differences. The most important reasons for this are the management of results, the tributary management, management strategies and the consolidation of standards.

5 CONCLUSIONS

The research highlighted the commitment with the sustainable development performed by the companies listed on the Corporate Sustainable Index (CSI) of BM&FBovespa, aiming to evaluate if They are more or less tributary aggressive, in other words, if they aim for a reduction of the explicit tax burden through the practice of tributary planning practices. The participation of companies on the CSI portfolio was, by hypothesis, evaluated as a marker that these companies, listed in this segment, would be less tributary aggressive. The results proved this relation with 95% confidence in relation o the Effective Tax Rate (ETR). The findings still show, in a specific way, the significant present of the companies listed at the CSI with characteristics of a lower tributary aggressiveness.

With this in mind, the research demonstrated that the companies involved with the sustainability are less subject to fiscal liabilities and, thus, are prone to lower risks than the others. it is important to emphasize that the stocks' prices are sensible to accounting information and risks. Sustainable companies would be less risky, positively impacting on the capital cost and on its own value.

It was not found a robust rational theory to justify this anticipated relation. The fiscal aggressiveness involves the use of techniques that favor the tributary planning aiming the reduction of its explicit taxation. In certain circumstances, it is used legal techniques (elision) and other illegal, being due its misuse on the form or even due the fact if has an evasive character aiming to reduce the tax burden.

The results documented on the research indicated that the companies that compose the CSI tend to be less tax aggressive in relation to those that do not participate of the CSI. It constitutes an important finding. For regulators, investors and the general community, it is useful to anticipate the tax behavior of a company.

Future researches must deepen the analysis of criteria that define a company as a participant of the CSI special segment BM&FBovespa, and to identify if there's a correlation between the tax aggressiveness and the several dimensions about how the portfolio of the companies that participate of the Corporate Sustainable Index (CSI) are defined. it is expected that in some segments, the concern regarding the aggressiveness signaling be remarkable, while, in others, a reverse signal might be identified.

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CHARACTERISTICS OF AUDIT COMMITTEE: A STUDY IN LISTED COMPANIES AT BM&FBOVESPA

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ABSTRACT

The study aimed to verify the characteristics of size, independence and expertise of the audit committees of companies listed on the BM&FBovespa in 2010 to 2013. Among the 407 companies listed on the stock exchange, only 68 of them have audit committee trained in some period analyzed. The year 2013 had 59 companies with the audit committee, which is the largest number found, representing only 14.50% of the population. The main results showed that compared to most size complies with the precepts of best practices, have three participating members of the audit committee. However, companies have heterogeneous practices in this feature, existing both those with only one or two members as others that have more than six members. In 2013 there were 192 members of 59 committee's companies, and of these, 48 are engineers, 45 economists, 41 managers, 26 accountants and one auditor. Overall, it is concluded that the creation of the audit committee is not yet an established practice by Brazilian companies and that this manifests itself in different ways across organizations.

Keywords: Audit Committee. Size. Independence. Expertise.

1 INTRODUCTION

The corporate governance is a monitoring, direction and incentive system that relates all interests from the organization's agents. It separates property and control (Instituto Brasileiro de

Governança Corporativa [IBGC], 2009a). It has the goal to create a group of efficient mechanisms to ensure the alignment of the executives' behavior with the interests from the shareholders (Viana, 2010). The action of the Administration Board on the management of organizations is one of these mechanisms, and one of its main goals is to ensure the transparency of generated information and to design other support committees (Silveira, Barros, & Famá, 2003).

According to IBGC (2009b), the Administration Board can establish the creation of committees to support it on the execution of activities. One of these subsidized committees is the Audit Committee, which is responsible to supervise and administer issues referring to the accounting demonstrations, finances, internal controls and to follow the works of internal and independent audits. The institutionalization of the Audit Committee aims to provide a higher transparency to the information and to ensure a legit provision of accountability to the interested persons and investors (Oliveira & Costa, 2005).

Baioco and Almeida (2017) evaluated the effects of the Audit committee and the fiscal board with their different characteristics on the quality of the Brazilian accounting information. The results evinced that the different arrangements of the fiscal board and the existence of an audit committee had different impacts on the accounting information properties. Felo, Krishnamurthy and Solieri (2003) examined the relation between the audit committee's characteristics (composition – expertise and independence; and size), with the quality of the financial reports. The authors suggest that the companies could improve their presentation quality of the financial reports and to properly structure the audit committees, reducing their capital cost.

This way, the audit committee is constituted by a descending department of the administration board, instituted to ensure the quality and fidelity of the reports and that has characteristics that collaborate for the good practices of corporate governance, such as the size, independence and expertise. This, the question that guides this research is: *Which are the prevailing characteristics on the audit committees from the companies listed at BM&FBovespa?* In this sense this study has the goal to verify the size, independence and expertise characteristics of the audit committees from the companies listed at BM&FBovespa.

The size is related to the number of members that compose the committee; the independence is determined by the quantity of members that do not have a bound or subordination to other levels on the same organization. On the other hand, the expertise is a characteristic that aims to identify the members that have a formation of professional experiences that enable the analysis and approval of accounting and financial reports from the organization in an effective way (Teixeira, Camargo, & Vicente, 2016; Felo *et al.,* 2003).

Studies about the audit committee had been performed in national and international scope. Such studies have, as the investigation focus, the relation between the characteristics of the audit committee with the management of results (Cunha, Hillesheim, Faveri, & Rodrigues Junior, 2014; Habbash, Sindezingue & Salama, 2013; Klein, 2002) and with the quality of independent audit (Teixeira *et al.,* 2016; Lary & Taylor, 2012); the comparison of the characteristics proposed for the audit committee on the corporate governance code of Brazil and other countries (Beuren, Nass, Theiss, & Cunha, 2013); The analysis of the audit committee's characteristics on the corporate governance of the Brazilian companies with open capital (Oliveira & Costa, 2005); the relation between the audit committee's characteristics (independence, expertise and frequency of meetings) with the audit honoraries (Adelopo, Jallow, & Scott, 2012); the relation between the company's characteristics, of the audit committee and the independent auditor with the deadline to publish the financial reports (Cunha, Pletsch, & Silva, 2015**)**and the relation between the audit committee's characteristics and the audit delay(Cunha, Lunelli, Santos Faveri & Rodrigues Júnior, 2015).

This research focus on the diagnosis of characteristics from the audit committees. This diagnosis is useful because it can help the companies in what concerns the structure of their audit committees, since it presents the main existing and needed characteristics to ensure the efficacy of this mechanism, which contributes to improve the good practices of corporate governance. Another point that justify the work is the contribution for the investors' decision taking, who might have a deep knowledge about the audit committees and to comprehend their main characteristics. The existence and employability of these characteristics influence the

quality and transparency of the reports and statements generated by the audit committee. According with Cunha, Sant´Ana, Theiss and Krespi (2013) when presenting the guidelines assigned to the audit committee, associated to the characteristics of their components, it contributed for the organizations when reflecting a higher quality of the accounting reports and a higher safety to the shareholders and investors.

2 AUDIT COMMITTEE

The Corporate Governance has the goal to settle the agency's conflict, which appears when there's a separation between the property and control (Viana, 2010). it is the system by which the organizations are conducted, monitored and stimulated. It involves the owners, the administration board, the board and the control departments (IBGC, 2009a). For Viana (2010) and Silveira, Barros and Famá (2003), the corporate governance is oriented to created an efficient group of mechanisms, as mush as of incentives as of monitoring, to ensure that the executives' behavior is always aligned with the shareholders' interests. Among the mechanisms, there's an emphasis on the action of the Administration Boards and the transparency on the information through the obligation to publish information about the company (Silveira et al., 2003).

According with IBGC (2009b), the Administration Board can establish several committees to support it on the execution of its activities, decision taking and deconcentrating of some points from the management. Among the committees that can be formed, there's the audit committee, responsible to supervise the accounting reports, internal controls, financial area, internal audit and independent audit. The Guide of Corporate Governance Guidelines of BM&FBovespa (2015), states that the audit committee is a mechanism of Corporate Governance that has the responsibility to manage the internal procedures, as well as to ensure that such procedures are worthy and effective to produce quality financial reports, aiming the protection of the shareholders and of other users of the accounting information.

The Law *Sarbanes-Oxley*, in its section 301, establishes that the audit committee must be composed by at least three members of the administration board. Equally, the Resolution n. 3.198/04 of the National Monetary Board [CMN] (2004) states that the audit committee must be composed by at least three members with non-delegable activities that must be described on the organization's social statute. The Commission of Furnishing Values [CVM] (2002) recommends that the audit committee must include at least one adviser that represent the minority among the company's members. According to Yang and Krishnan (2005), higher the Audit Committee, higher the variety of existing knowledge for an effective performance of the committee's activities.

The Resolution n. 3.198/04, on art. 12, CMN (2004) establishes that the term of the audit committee's members must have a maximum duration of five years. it is excluded the companies of closed capital that do not need a fixed term for the board's members; and that the member of the audit committee can only integrate again such department on the same institution after at least three years, counting from the term's ending. Yang and Krishman (2005) verified that the committee members that have more than one term obtain experience and contribute on the reduction of the management of results.

The audit committee will have to keep its dependence to not suffer an internal influence and to not have a negative reflection on the effectiveness of the accounting report analysis (Beuren *et al.,* 2013). According with IBGC (2009b), the members of the audit committee will have to independent, or at least the majority of them. Klein (2002) determined that higher the number of independent members in a committee, better the quality of the information available to the user.

The Code of the Best Corporate Governance Practices (IBGC, 2009b), in its item 2.16, dispose that the number of independent advisors will depend on the degree of maturity from the organization, from its life cycle and from its characteristics; The same code recommends that the majority be composed by independent advisors, hired through formal processes and with a well-defined scope of acting and qualification.

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The *Sarbanes-Oxley* law defines the section 301 that the independent member is the one that does not receive, except by the provision of services on the board, any honorary referring to consulting or other kind of compensation by the company, and that is not an affiliated person and neither of its subsidiaries. This fact is ratified by IBGC (2009a) on item 3.3 of the Guide for the Orientation of Better Practices on the Audit Committee, which mention that, to keep their independence, the committee's members must not receive any kind of remuneration from the organization or from its related parties that is not the one relative to the function of advisor and member of the committee. The independence involves the capacity to exercise judgments and show itself on the way it performs the role (IBGC, 2009a).

The independence on the analysis and issuances from the audit committee opinion is not enough to ensure that there's a transparency on the generated information. The committee must support the administration board and the executive board in what concerns the transparency, reliability and effectiveness of the performance of its roles and responsibilities (Beuren *et al.* 2013).

In order to keep the independence of the audit committee, the administration board must fix attributions and responsibilities for this committee, besides looking after these designations to ensure They are duly fulfilled. These attributions must be expressed on the statute or on the company's social contract (CMN, 2004).

Figure 1 presents the basic attributions from the audit committee contained on the international text of the *Sarbanes-Oxley* law and in the national scope on the Resolution 3.198/04 do CMN (2004):

Sarbanes-Oxley Law	• hiring, replacement and supervision of the independent or external audit, including the resolution of any conflicts between the administration and independent auditors;
	• creation of procedures to receive, process and deal with complaints and/or complaints against the administration, including mechanisms to receive anonymous and confidential reports by part of the employees.
	• interaction and communication with the external and internal auditors, administration board, executive board, controllers, lawyers, among other agents of the elaboration process of the accounting reports;
	• identification of critical accounting aspects and the analysis of a proper application from the accounting principles generally accept;
	• evaluation of the internal control and corporate risks.
Resolution No. 3.198/04	• establish the operational rules for its own functioning, which must be approved by the administration board or, if there is none, by the board of the institution formalized in written and put at the disposal of the respective shareholders;
	• recommend, along with the institution's administration, the entity to be hired for the provision of the independent audit services, as well as the replacement of the provider of these services, if it is considered necessary;
	• to review, prior the publication, the biannual accounting reports, including explaining notes, administration reports and opinions from the independent auditor;
	• evaluate the effectiveness of the independent and internal audit, including in what concerns the verification of the compliance of legal and normative devices applicable to the institution, besides internal and independent auditors;
	• evaluate the compliance, by the institution's administration, of the recommendations made by the independent or internal auditors;
	• to establish and disclose procedures for the receipt and treatment of information about the non-compliance of legal and normative devices to the institution, besides the internal regulations and codes, including with the provision of specific provisions for the protection of the provider and from the information confidentiality;
	• recommend, to the institution's board, the correction or improvement of policies, practices and procedures identified on the scope of their attributions;
	• gather, at least quarterly, with the institution's board, with the independent audit and with the internal audit to verify the compliance of their recommendations or inquiries, inclusive in that refers to the planning of the respective audit works, formalizing the content of such meetings in minutes;
	• verify, by the occasion of meetings, the fulfilling of its recommendations by the institution's board;
	• reunite with the fiscal council and with the administration board, through their request, to discuss about policies, practices and procedures identified on the scope of their respective competences;
	• other attributions determined by the Central Bank of Brazil.

Figure 1. Responsibilities of the Audit Committee
Source: Own elaboration through the precepts of the Sarbanes-Oxley law and from the resolution 3.198/04, CMN (2004).

For Oliveira and Costa (2005), the attributions presented by both legislations are similar, but the Brazilian resolution contain more details, such as the participation in meetings of the fiscal counsel and the obligation to elaborate a bi-annual report. Sorrentino, Teixeira and Vicente (2016) investigated the adequacy level of the audit committees from the companies of the differentiated levels at BM&FBovespa in relation to SOX, Bace, Susep and IBGC rules. For such, the elaborated an index through the application of a checklist based on the rules that affect the Brazilian companies. The authors observed that the companies subject to the rules from BACEM and SUSEP formed the group with a higher adequacy while the companies that were submitted to the SOX and the ones that are not-obligated to built the audit committee presented the lower indexes of the sample.

In relation to the expertise of the audit committee's members, the Sarbanes-Oxley law, in its section 407, demands that the audit committee be formed by at least one financial expert – *Audit Committee Financial Expert (ACFE).* For *Securities and Exchange Commission* – SEC (2003), an ACFE is defined as a person that have an academic or professional knowledge in accounting, audit, controllership, such, for instance, the CEO (*Chief Executive Officer*), the CFO (*Chief Financial Officer*) or other similar that have qualification and comprehension about elaborations, audit, evaluation and analysis of the accounting demonstrations, computation of provisions and reserves, comprehension about the internal control and about the functions that involve the audit committee (Oliveira & Costa, 2005).

According to the *New York Stock Exchange* – NYSE (2003), each member of the audit committee must have knowledges about finances as interpreted by the administration as necessary for the comprehension about the business. Other point considered by the institution is that at least one of the committee's members must be an expert in accounting or financial administration.

The Guide for the Orientation of Better Practices on the Audit Committee IBGC (2009a) presents that at least one of the committee's member must have knowledge about accounting, audit and financial management, besides gathering experience in management of risks about financial and accounting business. The item 2.30 of the Guide for the Orientation of Better Practices on the Audit Committee IBGC (2009b) also deals with the expertise of the committee's members presenting that at leas one of the members must have proven experience on the accounting or audit area. This way, an efficient audit committee starts on the choice of its members, that must be prepared to support these qualifications (Oliveira & Costa, 2005).

In a study made by Ika and Ghazali (2012), it was observed that the formation and experience on the accounting, audit and finances area has an influence over the audit committee. In another research performed by Dezoort, Hermanson and Houston (2003), it was emphasized that the audit committees with a higher experience offer better results on the moment to supervise the process, to ensure an integrity of the values generated. They evince, thus, the importance of the committee's members to have a finance experience (Cunha, Pletsch, & Silva, 2015). Therefore, it is noted that the expertise does not refer just to the academic formation, but also to the professional experience.

Felo *et al.,* (2003) evinced that after the control of the company's size, composition of the board, commitment of the administration with transparency (the existence of an ethic program) and the institutional appropriation, the percentage of members from the audit committee experienced with accounting or financial management is positively related to the quality of the financial report. it is even observed a positive relation between the committee's size and the quality of the financial reports. However, they noticed that the independence of the audit committee is not related to the quality of the financial report. The results from the research of Felo *et al.,* (2003) suggests that to demand a higher expertise in audit committees instead to simply demand an expert on the audit committee can be beneficial for the investors.

From what is exposed, it is denoted that the main characteristics of an audit committee are guided about its size, which deals with the number of members that compose it; independence when it' composed by members without any kind of bond or subordination to other levels within the organization and expertise, which cover the academic formation and the professional experience needed to comply with the credibility from the roles determined by the members of the audit committee. All of these characteristics contribute to improve the

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transparency quality of the information generated, which increases the investor's reliability and improves the corporate governance adopted by the organization.

3 RESEARCH METHODS AND PROCEDURES

It was made a study with a descriptive nature through a documental research with a quantitative approach.

3.1 Population and sample

From the site of BM&FBovespa (www.bmfbovespa.com.br), it was researched all companies listed according with its level of corporate governance. Initially, the collection of data resulted in 739 companies. This is the constitution of the population within the research. From this population, 332 companies from the financial sector were excluded, since they present peculiarities that can't be applied to this research, leaving 407 companies.

The subsequent procedure was to verify which companies had an audit committee between 2010 and 2013, which resulted in a sample composed by 68 companies, as evinced on table 1. it is appropriate to emphasize that the sample's selection criteria considered that, at least during a certain period, the companies should have an audit committee. This way, it composed the sampling companies that created an audit committee only in 2013, as well as companies that had a committee in 2010 and eliminated it in subsequent periods.

Table 1
Number of companies considered for data analysis

Economic Sector	Number of companies	Without the Audit Committee	Participation %	With the Audit Committee	Participation %
Industrial Goods	36	34	94.44%	2	5.56%
Construction and transportation	71	62	87.32%	9	12.68%
Cyclical Consumption	74	63	85.14%	11	14.86%
Non-cyclical Consumption	59	48	81.36%	11	18.64%
Basic Materials	42	33	78.57%	9	21.43%
Oil, Gas and Biofuels	12	8	66.67%	4	33.33%
Information technology	25	21	84.00%	4	16.00%
Telecommunications	13	9	69.23%	4	30.77%
Public Utility	75	61	81.33%	14	18.67%
TOTAL (without considering the financial industry)	**407**	**339**	83.29%	**68**	16.71%

Note. Source: Research data.

Most of the companies are focused on the sectors of Public Utility with 75 companies, Cyclical Consumption with 74 companies and Construction and Transportation with 74 companies. However, when analyzing the percentage of participation with companies that have an audit committee, we see that the oil, gas and biofuels and telecommunications are the most representative, with 33,33% and 30,77%, respectively, in other words, there are the sectors that have a higher representativeness in percentage terms of the audit committee. They are subject to specific regulations, which might contribute for the constitution of the audit committees. In a general way, we observe that the presence of the audit committee is still on early stages in the companies listed at BM&FBovespa. According to the IBGC (2009a), the institution with the audit committee is recommended to analyze the financial reports and to promote the supervision of the financial area, ensure the development of reliable internal controls, confirm that the internal audit perform its role and that the independent auditors evaluate the practices from the board and from the internal audit.

3.2 Variables analyzed

The characteristics of the audit committees analyzed were measured using the variables exposed in Figure 2 below.

Features	Form of calculation and measurement	Authors
Size	Number of members of the Audit Committee.	CVM (2002); Resolution 3.198 (2004); Yang and Krishnan (2005)
Independence	Number of independent members. The independence was considered when the member was not found in other committee or a board within the organization. These data were researched on the Reference Form (item 12.7 – Composition of committees and 1.1 – Statement and identification of the responsible for the form).	Beuren et al. (2013); CVM (2002); IBGC (2009a).
Expertise	Quantity of members with knowledge in accounting, audit and finances. The knowledge was considered when the profession found on the Reference Form (item 12.7 – Composition of committees) from the members of the audit committee was equal to: Auditor, accountant and/or economist/finances.	Dezoort, Hermanson e Houstn (2003); IBGC (2009a); Ika e Ghazali (2012); NYSE (2003); Cunha, Pletsch, & Silva, 2015).

Figure 2. Characteristics reviewed
Source: Own elaboration.

After the delimitation of the variables selected for the study and the way to measure them, it started a collection and analysis of data.

3.3 Procedures of collection and analysis of data

It was used the site of BM&FBovespa to research the companies listed between 2010 and 2013, according with their acting sector and their level of corporate governance. The data related to the audit committee's characteristics were collected at BM&FBovespa site, more specifically on the Reference Form, subsection 12.7 (composition of committees), which describes the composition of all committees connected to the administration board. In this form, it was researched the information about size, independence and expertise of the audit committee.

The data in what concerns the characterization of companies of the sample were taken from the institutional pages of the own organizations, as well as the publication on the site Valor Econômico® da Revista Valor 1000, in 2013. For the analysis of data, it was used the descriptive statistic, where it was determined the minimum and maximum value, averages, trend, standard deviation and variable coefficient of the variables; Size, independence and expertise in each period.

4 DESCRIPTION AND ANALYSIS OF DATA

In this section, it is primarily presented the profile of companies that had an audit committee in any one of the years investigated, which was between 2010 and 2013. Up next, it is presented the characteristics from the audit committees in terms of size, independence and expertise. Finally, with the goal to identify any tendency through the descriptive statistic, it was analyzed the characteristics over the analyzed period.

4.1 Companies' profile

Data were collected from 68 companies listed at BM&FBovespa and that had an audit committee between the years of 2010 and 2013. The profile of these companies was delimited based on the sectors, corporate governance level, number of employees and net profit of the year 2013, whose information is synthesized in table 2.

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Table 2
Profile of the companies analyzed

Sector	Quantity	%	Number of employees	Quantity	%
Industrial Goods	2	2.94%	From 0 to 500	11	16.18%
Construction and transportation	9	13.24%	From 501 to 1,000	4	5.88%
Cyclical Consumption	11	16.18%	From 1,001 to 1,500	3	4.41%
Non-cyclical Consumption	11	16.18%	From 1,501 to 3,000	7	10.29%
Basic Materials	9	13.24%	From 3,001 to 6,000	9	13.24%
Oil, Gas and Biofuels	4	5.88%	From 6,001 to 16,000	21	30.88%
Information technology	4	5.88%	From 16,001 to 40,000	8	11.76%
Telecommunications	4	5.88%	From 40,000 to 100,000	3	4.41%
Public Utility	14	20.59%	Over 100,001	2	2.94%
Total	**68**	**100%**	**Total**	**68**	**100%**
Level of governance	**Quantity**	**%**	**Net result (million)**	**Quantity**	**%**
Traditional Organized Counter	1	1.47%	Loss	14	20.59%
BDR Level 3	2	2.94%	From 01 to 250	25	36.76%
Bovespa Mais	2	2.94%	From 251 to 500	9	13.24%
Level 1 of Corporate Governance	4	5.88%	From 501 to 750	7	10.29%
Level 2 of Corporate Governance	4	5.88%	From 751 to 1,000	4	5.88%
New Market	44	64.71%	From 1,001 to 2,000	7	10.29%
Traditional-Bovespa	11	16.18%	Over 2,001	2	2.94%
Total	**68**	**100%**	**Total**	**68**	**100%**

Note. Source: Research data.

It is observed that the industry with higher representativeness is the Public utility one. In this group, it is reunited all open capital companies that have activities related to the provision of basic needs services for the population in general: electrical energy, natural gas and water supply, with 20,59% of the analyzed companies, followed by the sectors of Cyclical Consumption representing the wholesale and retail markets, and the Non-Cyclical Consumption, representing all companies that has the agriculture, cattle, forest production, hunt, fishing and nourishing and textile industrial transformation as main activity, with 16,18% each. The sector of industrial goods, which encompass all the companies that produces metal, machinery, wood, paper and chemicals, is the sector that have the lower index with audit committees on the years researched, with 2,94%.

When analyzing by the level of corporate governance, we see that 64,7% of them are regulated on the New Market level. According to BM&FBovespa (2014), this is the group that conducts the companies to the most elevated standard of Corporate Governance, which explains the concerns to keep the audit committees in their organizational structures. The lowest representativeness in this index is on the level of the traditional organized counters, with 1,47% of the companies analyzed. In this groups, it is grouped the lower companies that does not have all requirements to fit in other levels. According with the information contained at BM&FBovespa (2014) site, the rules that are applied to the segments of the listed companies define not only the governance level, but they also attract investors when they ensure rights and warranties to the shareholders and there's the reduction of risk when disclosing more complete information to the controllers, managers of the companies and participants of the market. However, Sorrentino, Teixeira e Vicente (2016, p. 241) did not fund a "relation" between the different levels of corporate governance and the index of adequacy from the committees, in other words, to have the classification on the new market does not ensure a good adequacy to the standards referring to the audit committee".

When evaluating the distribution of companies by the number of employees, it is verified that the highest concentration is on the averages that have between 6.001 and 16.000 and 0 to 500 employees in their productive framework. And only 02 companies from the sample had more than 100.000 collaborators in 2013. These companies belong to the non-cyclical consumption sector, more precisely to the nourishing industrial transformation and the net profit of both of them in 2013 was superior to R$1 billion. Still talking about the number of employees, the lowest number found was 12 in a company on the basic materials area, and the highest number was 216.693 employees.

Considering the result presented by the companies in 2013, the highest portion is focused on organizations that had from 01 to 250 million in net profit (36,76%), followed by 20,59% that represent the companies that showed a negative result within the period. The highest prejudice was of R$17.4 billion from a company in the oil, gas and biofuels segment, to the extent that the higher result found was of R$23 billion in the same sector, which evince the heterogeneity from the analyzed sample.

it is denoted, in a general way, that the companies with an audit committee focus on the public utility sector; in what concerns the level of corporate governance, the majority belongs to the New Market. They have between 6.001 to 16.000 employees and most of them presented a net profit in 2013 in an average of up to R$250 million.

4.2 Audit Committees Characteristics

With regard to the characteristics of the Audit Committee, a general analysis of the data raised in the survey was initially conducted.

A) Audit Committee Size

Table 3 shows the number of members of the Audit Committee and the respective amount of companies in the period from 2010 to 2013.

Table 3
Numbers of members of the Audit Committee and the respective number of companies

Numbers of members of the Audit Committee	2010		2011		2012		2013	
	Number of Companies	%	Number of Companies	%	Number of Companies	%	Number of Companies	%
Without Committee	12	17.65%	12	17.65%	10	14.71%	9	13.24%
1 member	0	0.00%	1	1.47%	2	2.94%	1	1.47%
2 members	10	14.71%	9	13.24%	9	13.24%	11	16.18%
3 members	29	42.65%	29	42.65%	34	50.00%	31	45.59%
4 members	9	13.24%	10	14.71%	7	10.29%	9	13.24%
5 members	3	4.41%	3	4.41%	3	4.41%	4	5.88%
6 members	4	5.88%	3	4.41%	2	2.94%	2	2.94%
7 members	0	0.00%	0	0.00%	0	0.00%	0	0.00%
8 members	0	0.00%	1	1.47%	1	1.47%	1	1.47%
9 members	1	1.47%	0	0.00%	0	0.00%	0	0.00%
TOTAL	**68**	**100%**	**68**	**100%**	**68**	**100%**	**68**	**100%**

Note. Source: Research data.

In relation to the number of members that compose the audit committee, it is noted that in all years where the majority of companies kept between 03 to 04 members, with a representativeness between 55,89% and 60,29% on the period. The companies that presented more than 05 members in their composition correspond to an average of 10,29% on the researched years. It was also identified 12 companies that did not had an audit committee in 2010 and 2011, number that was reduced in 2012 to 10 companies, and for 09 companies in 2013. There were companies that, during the period where they instituted the audit committee in their organizational framework, fact that might confirm the hypothesis of the companies being

more worried about the transparency and reliability of the generated information. By contrast, there were 09 companies that had the audit committee instituted in at least one of the first analyzed years, reaching in 2013 without this established department.

When analyzing the disposal of *Sarbanes-Oxley law* and the Resolution n. 3.198/04, that establish that the audit committee must be compose by at least 03 members, it is verified that among the companies with the instituted committee, there are those that present members in an inferior number than the recommended practice. it is noticed that in 2010 there were 56 companies with a constituted audit committee, being 10 of them with only two members. Such panorama did not suffered alterations on the subsequent periods. In 2013, for instance, there were 59 companies with an audit committee. From those, 11 of them had only two members and one of them with a unique member. Therefore, these companies kept an audit committee with an inferior number of members proclaimed by the legislation. it is even observed that just one single company had eight and/or nine members in its audit committee. This company belongs to the telecommunication sector from the New Market (governance level) and has 10.300 employees.

B) Audit Committee Independence

Table 4 shows the number of independent members on the Audit Committee and the respective amount of companies.

Table 4
Numbers of members of the Audit Committee and the respective number of companies

Independent members of the Audit Committee	2010		2011		2012		2013	
	Number of Companies	%	Number of Companies	%	Number of Companies	%	Number of Companies	%
No Member	12	17.65%	12	17.65%	10	14.71%	9	13.24%
1 member	0	0.00%	1	1.47%	2	2.94%	1	1.47%
2 members	15	22.06%	14	20.59%	14	20.59%	14	20.59%
3 members	29	42.65%	28	41.18%	33	48.53%	32	47.06%
4 members	7	10.29%	8	11.76%	5	7.35%	7	10.29%
5 members	3	4.41%	2	2.94%	1	1.47%	2	2.94%
6 members	1	1.47%	2	2.94%	2	2.94%	2	2.94%
7 members	1	1.47%	1	1.47%	1	1.47%	0	0.00%
8 members	0	0.00%	0	0.00%	0	0.00%	1	1.47%
TOTAL	68	100%	68	100%	68	100%	68	100%

Note. Source: Research data.

it is noticed that the number of independent members is also focused on the average of 03 members, with 44,85% followed by the average of 02 members, with 20,96% of them supporting the CVM determinations (2002) and the IBGC (2009a), to keep the majority of their independent members so that there's no influence capable to be impartial on the analysis of accounting and financial reports and opinions about the company's management. The data presented as "neither member" represents the same number of companies that do not have an audit committee, as evinced on table 3, which represents that all audit committees found on the researched years counted with at least 01 independent member, as the IBGC recommendation. This fact was corroborated by the research performed by Cunha *et al.* (2014), in which it was identified the reflexes from the audit committee's characteristics and the management of results. In this study, the authors verified that in the years of 2010 and 2011, more than 50% of the researched companies had audit committees composed by a majority of independent members.

c) Audit Committee Expertise

In order to characterize the members of the Audit Committee for its professional qualification, defining its expertise, table 5 presented in the sequence was drafted.

Table 5
Qualification of the Audit Committee members

Qualification	2010		2011		2012		2013	
	Qty.	%	Qty.	%	Qty.	%	Qty.	%
Administrator	37	19.37%	39	20.86%	33	17.84%	41	21.35%
Lawyer	16	8.38%	14	7.49%	15	8.11%	16	8.33%
Systems analyst	0	0.00%	1	0.53%	0	0.00%	1	0.52%
Architect	0	0.00%	1	0.53%	1	0.54%	1	0.52%
Auditor	0	0.00%	0	0.00%	0	0.00%	1	0.52%
Banker	3	1.57%	3	1.60%	2	1.08%	3	1.56%
Consultant	0	0.00%	2	1.07%	1	0.54%	1	0.52%
Accountant	26	13.61%	23	11.76%	24	14.05%	26	13.54%
Judge of Justice	1	0.52%	0	0.00%	0	0.00%	0	0.00%
Economist/Finance	46	24.08%	46	24.60%	45	24.86%	45	23.44%
Engineer	51	26.70%	50	26.74%	51	27.57%	48	25.00%
Physicist	0	0.00%	1	0.53%	1	0.54%	1	0.52%
Civil servant	0	0.00%	0	0.00%	0	0.00%	1	0.52%
Statistician	3	1.57%	0	0.00%	0	0.00%	0	0.00%
Investor	1	0.52%	1	0.53%	0	0.00%	0	0.00%
Journalist	1	0.52%	1	0.53%	1	0.54%	1	0.52%
Mathematician	0	0.00%	0	0.00%	1	0.54%	0	0.00%
Physician	1	0.52%	1	0.53%	2	1.08%	1	0.52%
Military	1	0.52%	1	0.53%	1	0.54%	1	0.52%
Professor	4	2.09%	4	2.14%	4	2.16%	4	2.08%
Total	**191**	**100%**	**187**	**100%**	**185**	**100%**	**192**	**100%**

Note. Source: Research data.

On table 5, it is observed that the quantity of members presented on the audit committees of the companies did not suffered significant alterations over the period. it is number was between 185 to 192 members. it is noticed that the highest concentration has formation in engineering, with an average of 50 members, economy/finances, with nearly 45 members by year and per administration, with an average of 37 members. The highest number of members was identified in 2013, with the participation of 192 members on the audit committees from the 59 companies that had committees instituted in this period.

According to Dezoort, Hermanson and Houston (2003), IBGC (2009a), Ika and Ghazali (2012), NYSE (2003) and Cunha, Pletsch and Silva (2015), the expertise needed to keep the discernment on the audit committee must come from knowledges about accounting, finances or audit. At least one member of the committee must be an expert in one of these areas. In the case of knowledges about accounting, it is noted that it was possible to find members with this expertise in all years. In 2010, they represented 14,29% from the total of members found. This participation was reduced to 13,56% of the cases in 2013, but the quantity of professionals in this area of acting did not suffered alterations. About the knowledges about finances, it was considered the members with a profession related to economy. In 2010, these professionals represented 24,08% from the total of members, passing to 23,44% in 2013. By contrast, in 2013 it was found only 01 professional with knowledges about audits.

Therefore, it is noted that in 2010 only 37,7% of the audit committee members had the mentioned needed expertise to ensure the quality and efficiency of the committee. In 2011, it

was 36,9%, passing to 37,3% in 2012 and increasing in 2013, when 72 of the 192 members (37,5%) were experts in some of these areas.

The expertise can be obtained through professional experiences or academic formation, but, in this research, it was considered just the information of professions described on the Reference Form of each member of the audit committee. Therefore, it might exist professionals with the needed expertise and that aren't faced on the data collected by this research.

However, as seen on the theoretical referential of this work, it is appropriate to emphasize that the audit committee's function is to ensure the transparency and the probity of accounting and financial information that'll be used as a management tool for the investors. This way, it is important for the companies to have at least one member constitute with the formation and/or experience in accounting.

4.3 Descriptive statistics of the characteristics of the audit committees between 2010 and 2013

The descriptive statistic (minimal, maximum, medium, average, trend, standard deviation ad variation coefficient) was applied on the variables size, independence and expertise with the goal to analyze the tendencies of the audit committees from the investigated companies over time, whose results are summarized on tables 6. These data refer to the companies that effectively have an audit committee formally constituted, in other words, 56 companies in 2010 and in 2011, 58 companies in 2012 and 59 companies in 2013.

Table 6
Descriptive statistics applied in the variables

				2010			
Variable	**Minimum**	**Maximum**	**Average**	**Medium**	**Fashion**	**Standard Diversion**	**Variation Coefficient**
Size	2	9	3.41	3.00	3.00	1.30	38.2%
Independence	2	7	3.09	3.00	3.00	1.03	33.4%
Expertise	0	6	1.25	1.00	1.00	1.12	89.3%
				2011			
Variable	**Minimum**	**Maximum**	**Average**	**Medium**	**Fashion**	**Standard Diversion**	**Variation Coefficient**
Size	1	8	3.34	3.00	3.00	1.21	36.2%
Independence	1	7	3.11	3.00	3.00	1.11	35.6%
Expertise	0	4	1.23	1.00	1.00	1.04	84.8%
				2012			
Variable	**Minimum**	**Maximum**	**Average**	**Medium**	**Fashion**	**Standard Diversion**	**Variation Coefficient**
Size	1	8	3.19	3.00	3.00	1.16	36.4%
Independence	1	7	2.98	3.00	3.00	1.07	35.8%
Expertise	0	4	1.19	1.00	1.00	1.00	84.0%
				2013			
Variable	**Minimum**	**Maximum**	**Average**	**Medium**	**Fashion**	**Standard Diversion**	**Variation Coefficient**
Size	1	8	3.25	3.00	3.00	1.17	35.9%
Independence	1	8	3.10	3.00	3.00	1.14	36.8%
Expertise	0	4	1.22	1.00	1.00	1.07	87.5%

Note. Source: Research data.

It is observed on table 6 that the size of the audit committee varies between the companies that have 02 members on the referred committee and the companies that have up to 09 members in 2010 and from 01 to 08 members on the previous years. Considering the

average, it is noticed that most organizations have an audit committee with nearly 03 members. The *Sarbanes Oxley* law, CVM instructions (2002), CMN instructions (2004) and the studies performed by Yang and Krishnan (2005) states that the audit committee must be composed by at least 03 members indicated by the Administration Board. However, when analyzing the standard deviation and the variation coefficient presented during the period, it is observed that the sample is heterogeneous, in other words, there's a great dispersion and low concentration of data around the average. Therefore, there's a great quantity of values that differs from the average. With the average fragility in mind, it is confirmed that the number of members on the committee through average and trend analysis. All years researched point out that the size f the committee is of 03 members, as recommended by the legislation presented. So, dealing with the characteristics, we have: size, a conformity and an adherence to the current legislations and recommendations.

About the independence variable, it is noticed that there are organizations with up to 07 independent members in their audit committees from 2010 to 2012, and up to 08 members in 2013. The independence of members in the committee is recommended by departments such as IBGC and CVM. Klein (2002) determined that higher the number of independent members in a committee, better the quality of the information available to the user. When analyzing the average of the period, it is possible to see that in all of the researched years there's been around 03 members with independence from other committees or departments bonded to the company. However, this perception is not homogeneous, since the variation coefficient was higher than 30% and the standard deviation practically did not suffer any alteration over the researched years, linking a high dispersion to these samples and a distance of close information to the average found. However, it is observed that three members was the number found in most of the companies investigated.

Analyzing the expertise of the audit committee's members, it is noticed that most companies have at least one member with expertise in accounting, finances or audit, as the IBGC (2009a) recommendations. Ika and Ghazali (2012) also state that the formation and experience on the accounting, audit and finances area has an influence over the audit committee. The dispersion on the number of members with this expertise vary from zero to six members in 2010, and four members over the next years. The average presented in all periods confirms that there's at least one member with the needed knowledge on the composition of the audit committees. However, the descriptive statistic evinces a heterogeneous sample when presenting a standard deviation and a high variation coefficient. Thus, the sample is heterogeneous in this point. From the trend, it is noticed that one member was the most found value on the researched years. This way, it is noticed that, in what concerns the expertise, some companies aren't in conformity with the recommended practices.

When verifying the obtained results, it is noticed that most organizations studied attend to the recommended specifications in prior studies and the current legislation. it is showed that the characteristics: size, independence and expertise are dominant in all companies that have a formalized audit committee. However, there are those that do not attend to the minimal precepts of the recommended practices in what concerns size, independence and expertise.

5 CONCLUSIONS

The study aimed to verify the characteristics of size, independence and expertise of the audit committees of the companies listed at BM&FBovespa in the years 2010 to 2013. Among the 407 companies listed on the Stock Exchange, only 68 of them have duly formed audit committees in any of the periods analyzed.. 2013 presented 59 companies with an audit committee. This was the highest number found, which represents just 14,50% of the population. The majority of these companies belong to the New Market in what concerns the categories of corporate governance and covers mainly the following areas: public utility, cyclical consumption, not-cyclical consumption, construction and transportation and basic materials. The main results showed that, in relation to size, the most part obey to the precepts of the recommended practices, in other words, they have three participant members of the audit committee. However, the companies presented heterogeneous practices in this characteristic. There are

those with one or two members, while other have six members. In relation to the independence, most of the investigated companies have two or three members considered independent, which attends the good practices of corporate governance. However, it is noticed that there are few active members in these committees with formation in accounting and experience in audits. In 2013, there were 192 members from the committees of 59 companies. From those, 25% are engineers and 21,35% are managers. One of the roles of this committee refers to the analysis of accounting reports and procedures of internal control, which demands more specific knowledges. In this sense, the expertise is characterized by the knowledge in accounting, audit and finances. In 2013, the members of an audit committee were 26 accountants and 45 economists, which represents 0,52%, 13,54% and 23,44%, respectively, in relation to the total of participants.

In a general way, it is concluded that the creation of an audit committee it is still not a practice formalized by the Brazilian companies and it manifest itself in a different way between the organizations. The study contributed to strengthen the results of the researches that were already made about the theme, besides to extend the comprehension about the characteristics present on the audit committees from the Brazilian companies and that specially offers some insights for future researches.

In this research, it was investigated the not-financial companies listed at BM&FBOVESPA without making any distinction on the results of a specific sector. Thus, it is suggested a deepen of the study, facing the financial sector and sample comparability. Other suggestion is the realization of studies with the goal to comprehend the reasons which the companies did not institutionalized the audit committees within their organizations. Besides, a specific study would be capable to investigate the reasons that make the companies eliminate the committee previously created, which was the case of nine Brazilian companies. The small portion of the companies with an audit committee causes some worries about its effectiveness. Why the Brazilian companies do not have audit committees in their schedules? Which are the resistances for the formation of this department? Which is the effective role of this department on the Brazilian companies? Thus, the roles and activities exercised by such committees can also be an object of investigation to collate what the literature advocate. Besides, the small number of members with formation i accounting also instigates future studies.

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PERFORMANCE OF POST-MERGERS AND ACQUISITIONS COMPANIES MEASURED BY GRAHAM FILTERS

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ABSTRACT

The objective of this study was to verify the performance of the companies that performed mergers and acquisitions by evaluating performance with the use of Graham Filters. The research, characterized as descriptive, documentary and quantitative, was based on the accounting, financial and market data of 42 Brazilian companies listed on the BM&FBovespa, which conducted mergers and acquisitions with exchange of control between 2006 and 2010. Data on mergers and acquisitions were collected from the CVM (Securities and Exchange Commission) website, and performance information was collected from the Economática® database. The performance of the 42 companies was calculated for the seven Graham Filters, and transformed into a ranking by the application of TOPSIS. From the results, it can be verified that in the five years of analysis the companies had positive variations of performance in the ranking. As a contribution to the company performance calculation, Graham Filters allowed us to identify the increase in net income, reduction of indebtedness and increase in assets. With these results, it can be seen that companies that have gone through mergers and acquisitions have good financial health and low risk. As a conclusion, these results of Graham Filters' performance in mergers and acquisitions, carried out in the Brazilian environment, show reasonable shareholder safety and a good level of Corporate Governance.

Keywords: Mergers and acquisitions. Performance. Graham Filters.

1 INTRODUCTION

Literature suggests several reasons to conduct companies into investment decisions. One of the main growth for the company. The internal growth process (through own profit) can be longer and more cautious than the purchase of the already established business (fusion and acquisition) (Singh & Montgomery,1987). The decision of fusion and acquisitions, according to Gitman (1997), aims to predominantly maximize the richness of the owners, which will be reflected on the stocks of the purchaser company.

In the Brazilian corporate environment, the fusions and acquisitions also started to occur with a higher intensity, mainly through the 80's and 90's, which were marked by the reduction of

the restrictions to the international commerce, by the government privatization program, for the financial release and by the absence of a strict antitrust law in Brazil (Marion & Vieria, 2010).

The investments decisions in fusions and acquisitions can be used by the manager for own benefit and contrary to the shareholders interests, inducting them to apply resources in business that are destined to fail. These operations to acquire assets (fusions and acquisitions) generate dependence of the company in relation to its management (Shleifer & Vishny, 1989). This way, the manager perceives the fertile field for the deliberations, which not always serve to the investors' interests.

To evaluate this conflict of interests, there were researches about the fusions and acquisitions and the abnormal returns that have been focused mainly on the creation of value for the company, evaluated by the assets' abnormal returns. In face of this scenery, it was not observed a specific way that would carefully evaluate such returns superior to the market using the analysis of value (*valuation*). This analysis of value is the theme of interest of the Fundamentalist Analysis, in the extent that the search for the identification of companies with good accounting and financial foundations.

Among the ways to make this analyze, something that stands out is the approach made by the valuation creators, Benjamin Graham and David Dodd in 1934, who developed a mathematical-statistical that evaluate compost by 10 filters, which consider the stock market indicators and economic-financial indicators of the companies (Graham, 2007). The main objective of the 10 filters of Graham is to identify companies with good indexes of the capital market, good financial health and profit stability that present good long-term income (Oppenheimer, 1984; Zargham & Hu, 1996; Damodaran, 2006). Lowe (1997, p. 100) states that "a good company that has 7 out of the 10 criteria can be considered evaluated with a proper safety margin".

In Brazil, there are few applications from the methodology. In a recent research, three studies were found from 1994 to 2016. Passos (2006) discussed Graham's theory and applied it to the market of Brazilian capital, based on the data from 1994 to 2000. It was constructed a portfolio and it evaluated the next five years. The return of the actions from the portfolio that was approved by Graham's filters was of 566% against 219% from Ibovespa. However, it was not mentioned the performance of significant statistic tests.

Artuso and Chaves (2010) intended to advance into the knowledge about the Brazilian stock market and into effective analysis for the small investor. For this, they proposed the application of Graham's filters for the definition of assets at BM&FBovespa in the period from 1998 to 2009. With analysis of quartile results for each filter, they identified investments with returns superior to the average of return from the Ibovespa index for all of the analyzed periods.

For last and more recently, Artuso (2012) performed a study on the period from 1999 to 2009 based on the Hypothesis of Efficient Market (HME). It was found contrary indexes to the domestic market reference. The selected longitudinal portfolio return was of 39,78% against 12,37% of Ibovespa. The differential from Artuso's study (2012) in face of the previously ones was the realization of tests with significant statistics. The results showed a success on the application of Graham's filter on the recognition of standards. it is possible to explain a good part of the data variability through the liquidity factors, pricing of the books values, profitability and indebtedness degree.

In the post-fusion and acquisitions period it was not found any kind of study in Brazil that would be capable to measure the performance of companies through Graham's filters. Such filters represent a mathematical method composed by 10 filters that are from the market, financial or economic from the companies. In face of what is exposed, the research question arises: what is the performance of the companies that passed through fusions and acquisitions measured by Graham's filters? Resulting from the research question, the study aims the verification of performance from the companies that passed through fusions and acquisitions through the measurement of Graham's filters.

One of the factors that justify the study is the board of changes provided by the increase of fusions and acquisitions on the Brazilian capital markets over the last 20 years, which were of 176 operations in 1993 and passed to 796 annual operations in 2013 (KPMG, 2013). Such operations consist in simple acquisition of actions, above 10% of fusions or incorporations with or without the exchange of the equity control. These economic alterations provoked by the

representative volume of fusion and acquisitions operations, allied to the financial scandals in 2001 and to the sub-prime crisis in 2008 had been demanding a more solid corporate and management environment from the emerging capital markets, including the Brazilian. Thus, the transparency from the executive actions and the search for the maximization of richness of the owner with the greatest performance from the company turns into one of the orienting principles of the executive actions in the organizations.

Another factor that justify the current research is its amplitude and depth when compared with the other researches made on the Brazilian capital market. The existing researches did not perform the temporal clipping of five years as it was made by this study, observing the post-fusions and acquisitions period in four years, as the sensibility analysis. Additionally, this study contemplates the improvement of instruments to measure the companies' performance, because, until then, national and international studies performed an evaluation of the performance with the return of actions. As the proposal of this study is to evaluate the performance of companies with the application of Graham's filters, the evaluation is being made with the application of accounting and financial indicators which indicate the market standards, financial health and profit stability of the companies after the fusions and acquisitions. This way, it is possible to provide a detailed analysis about the performance of the companies that passed through fusions and acquisitions, enabling another method of evaluation to the investor, besides the simple abnormal return of stocks.

2 THEORETICAL FRAMEWORK

2.1 Mergers and acquisitions

The research focus was to study the fusions, acquisitions and incorporations with an exchange of the equity control. However, Silva, Gallo, Pereira and Lima (2004) explain that the incorporation meaning used in Brazil differs from the North-American and European concepts, which considers this operation as a special type of fusion. Due the international literature deals about fusion and incorporations as a corporate restructuring, following up will be approached only the concepts about fusions and acquisitions.

The transference of propriety and control of a company might occur in two ways: the company is acquired by a group of people or by another company; or the company merges itself with another, occurring the combination of business. Both situations will be denominated as takeover. it is common to denominate a company that assumes the control as an acquiring company as *acquirer* or *bidder,* while the sold company is called as target company or acquired company (Berk & Demarzo, 2009).

The fusions and acquisitions are often classified about their payment method and the commercial relation between the acquiring company and the target company. In what concerns the payment method, the fusions and acquisitions can occur with a cash payment, stock exchange (stocks from the acquiring and target companies) or as the combination of both ways (Berk & Demarzo, 2009).

The fusions and acquisitions operations aren't completely assimilated and broken down in a general theory that serves them as a support. For Kloechner (1994), what happens is a group of explanations that propose to assure some legitimacy, derivative from some aspects from the company's theories. Referring to the question about efficiency and gains (synergy), Weston (1994) presents five different hypothesis that explain the fusion and acquisitions activity, according to table 1.

Table 1
Hypotheses about the efficiency and gains in mergers and acquisitions

Hypotheses	Theoretical arguments
Efficiency	A fusion and acquisition can improve the as much as the company's performance as to produce a more efficient company, due the obtainment of some kind of synergy.
Information	Short-term effect caused by the quotation of the companies' stocks involved on the market that tries to incorporate the result into the price or to the union's unfolding.
Bank branch	The fusions and acquisitions can be a mechanism to minimize the agency's problems and costs.

Continue

Table 1 (continued)

Hypotheses	Theoretical arguments
Market power.	If the economies expected by the fusions and acquisitions do not occur, the increase of concentration was motivated by gain of monopoly.
Taxes	Fusions and acquisitions are motivated by tax gains.

Note. Source: Weston, J. F. (1994). The payoff in mergers and acquisitions. In M. Rock, R. H. Rock & M. Stroka (editors). *The mergers and acquisitions handbook* (2a ed.). New York: McGraw-Hill.

Besides these hypothesis or explanations for the activity of fusions or acquisitions, Kloechner (1994) and Camargo and Barbosa (2003) present the hypothesis of: maximization of richness, maximization of management utility, operational gains (synergy), new information, market efficiency, gain efficiency, diversification.

The fusions and acquisitions occur when the acquiring company believes into add economic value through the acquisition, something the ordinary investor wouldn't be able to do (Nardi, 2012). Berk and Damarzo (2009) describe that the fusions and acquisitions generate an increase of value, which is a result from the synergy created by the combination of two companies. This is the most used reason to justify the performed business, even if there's the need to pay the additional prize to the market value.

For Berk and Damarzo (2009), the synergy and its consequent creation of value has its origin from two sources: a) the increase of revenue generated by the union of two companies promote the opportunity of acting in new markets, with new products and an extension of the number of clients and consumers; b) the synergy generated through the reduction of costs is usually obtained by the elimination of duplicated areas and by the optimization of the remaining resources.

2.2 Performance of the companies

The focus of this study does not refer to the evaluation of the corporate performance measured just by the return of stocks for the decision making, but to the evaluation of performance considering, besides the return of actions, the financial health and the profit stability from the companies, points contemplated by the 7 filters of Graham,

it is comprehended that several factors have influence over the stock's prices, the internal stocks as with the ones related to the performance of the companies that issue stocks, as the external ones, related to the country's economy. For Mellagi and Ishikawa (2003, p. 274): "... To handle the innumerable factors, it is more then necessary the comprehension about the statistical methods for the evaluation of the investments' risks". In face of the pricing models, which are essentially mathematical and statistical, this understanding is comprehended at the extent that the return evaluation only makes sense if it is estimated with the risk involved on the investment. This way, to put a price on an asset or to put a price in an expected return over a risky investment, statistical knowledges are needed.

The selection of assets based in a series of filters, that might be determined by multiples of market and other economic-financial indicators, is known as the passive filtration, idealized by Graham e Dodd (1951). The authors identified certain characteristics on the companies, such as good management, low risk and good profits as determining to allow the stock of these companies to perform above the market and translated these qualitative characteristics into quantitative characteristics that might be used to identity promising investments.

The idea of what really represents an investment is singular for these authors that concepts it as "an operation that, after a deep analysis, promise the safety of the main thing and a proper return" (Graham & Dodd, 1951, p. 43).

Artuso (2012) address that on the first edition of *Security Analysis* from 1934, Dodd and Graham presented the ten filters to identify the assets with a promising return. On the posterior editions, the filters suffered minor adjustments. In 2003, the Graham's filters returned into discussion with the publication of the novel "*The Intelligent Investor*", from Benjamin Graham.

For Artuso (2012), Graham's filters performed a valuation. The themes are from the interest of the fundamentalist analysis, on the extent that it searches for the identification of

companies with good accounting/financial foundations and undervalued by the market. Thus, Benjamin Graham was considered the creator of valuation. Such foundations compose a new form of evaluation that value the financial health of the company and the lower cost for investments. To clarify better the situation of these ten filters, it fits a discussion a bigger depth about each one of them.

Filter 1 (F1) – A profit/price index equal to the double of the income of a fixed income title classified as AAA (low risk) (Graham & Dodd, 1951). This filter identifies the relation of profit with the stock price and, if such relation overcame the double of the income of a AAA title, it is practically free from risks. Its goal is to identify stocks from the companies that produce an income higher than a title free from risks. The AAA classification is given by agencies such as Moody's and Standard & Poors, which evaluate the risk from the titles. In this study, it was used the annual average Selic rate, which renumber the public titles in Brazil for the five years of analysis, for a year before and four years after the researched event (fusions and acquisitions). The Selic rate in Brazil is high: in 2010, which was the last year of the study analysis, the rate was at 10,03%, while it stays in the range of 0,25% in the United States. This way, it is not common for the companies present a good evaluation in this Graham's filter (Artuso, 2012).

Filter 2 (F2) – Multiple price per Profit, P/L, from a stock lower than 40% of the average P/L of the market over the last five years (Graham & Dodd, 1951). This filter also relates the price of stocks and profit as the same filter number 1, but it compares the result of the same relation of existing titles on the market over the last five years. The filter aims the identification of stocks with the price below 40% of the profit on the average of the last five years, so such stocks can be undervalued (Artuso, 2012).

Filter 3 (F3) – Dividends ratings higher than two thirds of the income of a fixed income title classified as AAA (low risk) (Graham & Dodd, 1951). Besides the return with the liquidity of stocks, the investor receives a dividend yield, which is distributed to the shareholder in established dates. This filter aims the identification of investments that renumber, through dividends, two thirds of the income of a title free of risks and classified at the AAA level. In this study, the Selic rate was used to represent such titles free from risks (Artuso, 2012).

Filter 4 (F4) – Price inferior to two thirds of the Tangible Book Value, comprehended as Net Equity minus the Intangible Asset (Graham & Dodd, 1951). This filter makes a relation with the total price of stocks. it is inferior than two thirds of the company's Tangible Book Value. This filter searches the identification of understated stocks, granting them a good safety margin. Normally, the researchers use the net equity, but Graham is more conservative and removes the intangibles assets from the analysis, because they might present elevated distortions. Within the logic of this filter, it is possible to acquire companies at a value that reaches 33% of the net equity (Artuso, 2012). To exemplify, it is commented a hypothetical case where if a company had reached the market value, it would correspond to 33% of its net equity. This means that, in the event of a purchase, the investor would pay R$0,33 for each R$1,00 from the company's wealth, representing an interesting business to be acquired.

Filter 5 (F5) – Price inferior to two thirds of the net capital, comprehended as a circulating asset minus the total debt (Graham & Dodd, 1951). The total debt corresponds to the short and long terms debts. This filter is related with the stock price along with the net capital. It can be considered as the most restrictive of all. it is the most powerful criteria to identify if the company is being undervalued, because it deals about the comparison of the price market with the net assets of the company and to turn them into currency. When the filter is attended, it would be possible to acquire a company without paying the assets. it is rare to attend this Graham filter when the market is in abundance, but to find a company in these conditions is a relevant opportunity (Artuso, 2012).

Filter 6 – Total debt lower than the Tangible Accounting Value (Graham & Dodd, 1951). With this filter, the financial risk of the company is analyzed, corresponding to an indebtedness index, which indicates the company's capital structure. The filter aims the evaluation of the company's capacity to increase its tangible accounting value and to reduce the total debt, in other words, the filter evaluates the company's financial strength producing more financial resources than its financial need (Artuso, 2012). Graham (2007) describes that a representative business generates more money than it consumes, and that good managers use the money in a

productive way. On the long term, the companies that keep this standard will have extend their market value, regardless the growth of other companies.

Filter 7 (F7) – Circulating asset more than the double of the circulating asset (Graham & Dodd, 1951). This filter corresponds to the current liquidity index. There's always the search for companies that present a current liquidity higher than 1. It represents that the companies own resources to settle their short-term debts. This is a conservative criterion for Graham, who establishes an ideal index higher than 2 (Artuso, 2012). The author reveals that in 2010, the current liquidity of the open companies reached the level of 1,45%.

Filter 8 (F8) – Total debt twice lower than the Net Capital (Graham & Dodd, 1951). This filter identifies the modified liquidity index. A company conservatively financed would have at its disposal at least half of its debts value, which would concede a very low value of noncompliance (Artuso, 2012).

Filter 9 (F9) – Profit growth by an action higher than 7% during the last 10 years (Graham & Dodd, 1951). For Graham (2007), is the stocks' profits have a stably growth of at least 6% or 7% over the last ten years, the company that generates stable money and its growth perspectives are good. The biggest problem of the negotiated company are the market multiples, target of the first five filters and that have a low growth (Artuso, 2012).

Filter 10 (F10) – Not more than two years of cash profit in decline of 5% or more over the last ten years (Graham & Dodd, 1951). This last filter has the goal to identify the profit stability in a way that the objective is only that the companies that present low variation in their profit, indicating a sustainable growth, be able to become a part of the investor's portfolio (Artuso, 2012).

After the seminal work of Graham and Dodd (1951), new researchers arisen, disseminating and using Graham's filters principles. Lander, Orphanides and Douvogiannis (1997) formalized the observation made by Graham and Dodd, where the evaluations about stocks and titles are connected by a balance relationship between the income of the dividends previewed and the real income by the titles. Where the stocks' prices tend to move to restore deviations through this balance. With the econometric model, the researchers obtained provisions with one month in advance.

Bildersee, Chen and Zutshi (1993) reported that the investment strategy made by Benjamin Graham seemed to be working on the Japanese stock market. The authors found results that indicated that the return of the elaborated portfolio based on Graham's filters is positive and tends to overcome the return of other portfolio that does not apply to the filters referred on the Japanese stock market.

Arnott, Hsu and Moore (2005) examined a series of thoughtful indexes from the stock market through fundamental metrics instead of the capitalization of market. They've concluded that these indexes provided consistent and significant benefits in relation to the standard market indexes. They showed annual returns that are, in average, 213 points above of the equivalent thoughtful capitalization indexes over the period of 42 years of the study.

Bogle (2008) mention that the principles of simple investments defended since 1951 by Benjamin Graham remain valid until 2008. Investments strategies became much more active. The financial sector has been performing a dominant role in the global economy. In other article, Bogle (2009) traces the causes of the 2009 financial crisis, indicating changes in the ethical values, quoting a list of violations from the fiduciaries duties by managers of mutual founds. Based on the wisdom of Harlan Fiske Stone, Benjamin Graham and John Maynard Keynes, Bogle defends a federal low of fiduciary duties for institutional managers.

Calandro (2009) studied how the high executives in a variety of economic sectors can find important lessons on the sixth edition of the recently published by Graham and Dodd (2008). This document includes an interview with the main editor of the book, the investor editor Seth Klarman, who explains key strategic lessons that the non-financial executives can learn with the concepts of investments and methodology

Cheung (2010) reported that Benjamin Graham, the father of value investments, argued that the stock market suffers from a humor disorder known as bipolar disorder. Warren Buffet and John Maynard Keynes also endorsed the idea that the market psychology has an influent role to play on the stock market. The author's explanation uses three market bubble as

illustration: Japanese bubble of 1990; Internet bubble of 2000 and the sub-prime mortgage crises of 2007.

Woods (2013) reported in his study that a British economist called John Keynes would've admitted, in 1938, that his approach to the investment portfolio management in ongoing stocks would've dramatically changed. Keynes would've abandoned the speculator profile in favor of an investor profile, a careful selection of some investments considering its low prices and potential of intrinsic value in the prior year of the acquisition; thus, he was applying the filters of Benjamin Graham.

Artuso and Chaves (2010) intended to comprehend the Brazilian stock market and, thus, they analyzed effective strategies for the small investor. They proposed the application of Graham's filters for the selection of companies to purchase stocks in the period from 1998 to 2009. The portfolio indicated by Graham's filters produces abnormal returns superior to Ibovespa; however, the portfolio presented a low diversification.

Kreuzberg, Beck, Gollo, & Rosa (2014) evaluated an investments portfolio from the companies listed at the corporate governance levels at BM&FBovespa, through the application of Graham's filters in accordance to the Brazilian context. Up next, they applied the analysis of the main components, searching the dimension of variables. The results indicated that the stability criteria on the profits presented a reduced quantity of adapted companies, followed by the sixth criterion. On the other hand, criteria 1 and 7 demonstrated a higher adequacy index. They verified that only 22 companies presented themselves in accordance with all seven criteria analyzed by Graham's filters.

Ferreira and Santos (2014) compared the performance efficient of a portfolio generated by the application of Graham's filters (portfolio A) and another one originated from employment to Elton-Gruber model (portfolio B), having as scope the ordinary stocks listed at BM&FBovespa during the period from 2008 to 2012. Portfolio B presented a higher return, but a higher risk than portfolio A. Portfolio B would be an investment more proper to the profile of an aggressive investor, while portfolio A would be better suited for the expectations of a conservative investor.

Zin and Tarso (2016) verified the efficiency of Graham's filters and the efficient frontier modal by Harry Markowitz to define the participation of each asset on the composition of portfolios. The period studied comprehend the years from 2006 to 2010, two years before and two years after the global crisis of 2008. The results showed that it is possible to minimize the risks and to obtain returns superior than Ibovespa's index, composing portfolios with a small number of assets.

Artuso (2012) aimed the comprehension of the Brazilian capital markets, proposing and analyzing strategies about the selection of portfolios. The best results were achieved by the filtration model made from Graham's filters, where the annual return was of 39,78% faced with the return of 12,37% from Ibovespa. Thus, the used techniques allowed a higher comprehension about the stock market and indicated a possibility to systematically identify sub-evaluated assets and to obtain the exceeding returns.

Passos (2006) explains that the fundamentalist analysis has been a strong ally from the capital market and has Benjamin Graham as one of its main exponents. The author explained Graham's concepts, adapting them to the Brazilian reality and considers the research an advance on the learning of variables that correlate with the capitalization marketing, contributing for future investors.

In short, Graham's filters were idealized by Benjamin Graham and David Dodd on the book *Security Analysis* from 1934 (first edition). After that, there was the publication of the book *The Investor Intelligent* in 2003 and, in the sequence, the number of articles' publication is considerable. With these facts, it is noticed that after 2005, the discussions around Graham's filters were intensified. This might be linked to a higher concern from the investors with their investments and the filters might be attending their evaluation needs.

3 METHODOLOGICAL ASPECTS

The research delineation consists on its planning and relates itself to the adopted methodology, considering the environment where the data are collected and to the ways of control from the variables involved (Gil, 2006). For Kerlinger (1980), the delineation of a study

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relates itself to the way where the research problem is conceived and to the structure used for the experimentation, collect and analysis of data.

Hair, Babin, Money, & Samouel (2005, p. 86) described that "the descriptive research plans, in general, are structure and specifically created to measure the characteristics described in a question of a research". In relation to the documental research, Gray (2012) states that the use of documents consists in one of the most used non-evasive ways, because it might be used documents that bring financial, political and legal registrations from organizations or institutions. Inserted in this context, the characteristics from this study allow to classify it as a descriptive research with a quantitative approach, performed through a documental research.

Martins and Theóphilo (2009) recognize as mains feature the typology of the data, information and evidences sources that are exclusive from the documents of primary sources, material compiled by the researchers that haven't been an analysis study object or worked according with the research goals. I this research, the collection of data was from the documental type from the accounting, financial and market data, available a Economática® database and corporate data published in sites of BM&FBovespa S.A. e CVM - Commission of Furnishing Values, disclosed by the investigated companies, which evinced characteristics of secondary sources that did not received an analytical treatment.

The composition of the research population was defined considering the open capital companies listed at BM&FBovespa S.A. The choice of open capital companies occurred due the fact they widely disclose their accounting, financial, market and corporate information. With the definition of the population, it was performed a consulting by date along with the Commission of Furnishing Values (CVM) in "relevant facts" and it is being granted access to all important communicates that the companies disclosed to their shareholders. Searching only notifications about fusions, incorporations and acquisitions, it was reached the final sample of forty-two companies, according to table 2.

Table 2
Composition of the sample

Year	Listed companies	(-) Financial and insurance companies	(=) Population	(=) Number of mergers and acquisitions
2006	394	(90)	304	2
2007	449	(96)	353	13
2008	439	(111)	328	7
2009	434	(115)	319	11
2010	471	(114)	357	9
Total	**2,187**	**(526)**	**1,661**	**42**

Note. Source: Research data.

Based on the notifications disclosed by CVM, it was constructed the international sample, obeying some criteria according with Wang and Xie (2009), such as: a) business established between 2006 and 2010; b) fusions, incorporations and acquisitions with an exchange on the equity control; c) operations with value above U$1 million and 1% of the market value; d) in situations where the purchaser company performed several acquisitions, it was only considered the one with the higher value. As a result, from the application of these criteria, it was constituted the final sample, that aims to represent, with the highest reliability possible, all of the corporate and structural transformations suffered by the companies that perform fusions and acquisitions, attending better the study goals. On table 2, it is observed the number of companies listed at BM&FBovespa between 2006 and 2010. It was extracted the financial institutions and insurance companies due the peculiarity from the SFN – National Financial System.

The target year to perform the analysis of fusions and acquisitions was 2010, due the post-event evaluation of a four years of performance from the companies. Thus, the event that occurred in 2012 had its post-fusions and acquisitions analysis performed in 2011, 2012, 2013 and 2014. This way, it is considered as a recent period of analysis within the availability of the data disclosed by the companies. It was established this recent clipping due the fact it is within the growth cut of the fusions and acquisitions indicated by KPMG (2013).

After the identification of fusions and acquisitions, it was performed the calculation of performance using Graham's filters. For this, it was made the collection of data along with Economática®. It was extracted economic, financial and corporate data from the forty-two companies listed for the construction of the seven Graham's filters. For each company, it was collected information of one year before and four years after the fusions and acquisitions, totalizing five years of information for the calculation of 1.470 operations.

The second preparation stage for the companies' performance data was the elaboration of an aggregated ranking of the information obtained over the seven resulting indexes from the application of Graham's filters; To compute the aggregated measure, it was applied the multi-criteria method, known as Technique *for Order Preference by Similarity to Ideal Solution* (TOPSIS), developed by Hwang and Yoon (1981). The TOPSIS technique is fundamental on the alternatives ranking to obtain the best solution among them, which is near the ideal solution, considering the distance from the ideal and anti-ideal solutions (Bulgurcu, 2012). According to this technique, the best alternative should be the one that's near the ideal solution and far from the negative ideal solution (Benitez, Martin, & Roman, 2007). For the calculation of the TOPSIS method, the coefficient variance concept was additionally applied.

4 PRESENTATION AND ANALYSIS OF RESULTS

In this section, it is explained about the mathematical and statistical procedures adopted to calculate the companies' performance, which used seven Graham's filters a which were turned into a ranking by TOPSIS. For this, it was collected economic, financial and corporate data from Economática® database from the forty-two companies listed on the sample.

Up next, about the collected data, the following mathematical formula was applied for the filters: F1, F3, F4, F5, F6, F7 e F8. Filters F2, F9 and F10 weren't applied in this study, because they need data with the average of 5 to 10 years posterior to 2010, which weren't available until the performed collection. Artuso and Chaves (2010) described that the first five filters refers to the market multiples and the filters from 6 to 8 are related to the financial health. Differently from the research performed by Artuso (2012), which considered just the companies that attended 100% of Graham's filters, this study considered the levels of achievement from the filters and made a ranking of the companies through TOPSIS. The seven Graham's filters were applied on the forty-two companies in five years, a year before the event (t-1) and four years later (t+1), (t+2), (t+3) and (t+4). It was found seven indexes of the filters per year in five years, referring to forty-two companies, totalizing 1.470 results from Graham's filters. TOPSIS was used to group seven indexes of the years and to provide a position in the ranking for the company.

The TOPSIS method is a technique to evaluate the performance of alternatives through the similarity with the ideal solution (Hwang & Yoon, 1981). According to the same author, accordingly with this technique, the best alternative would be the one near the ideal solution, composed by all achievable values of the benefits criteria. However, the ideal negative solution consists in all of the worst achievable values from the criteria of the goal proposed in this study.

Furthermore, as a complementary procedure, it was applied the variation coefficient technique along with TOPSIS, which identified the results from the filters that had a higher variation, giving them a higher weight on the formula, as presented on table 3. The variation coefficient is used to identify the filters with higher relevance for the companies and to consider them on the TOPSIS ranking.

Table 3
Weight of Graham filters

	F1	F3	F4	F5	F6	F7	F8
T − 1	6.03%	4.87%	4.21%	71.71%	3.29%	2.03%	7.87%
T + 1	30.80%	2.15%	1.90%	16.04%	1.45%	0.75%	46.90%
T + 2	3.85%	0.84%	0.93%	2.90%	0.70%	0.39%	90.39%
T + 3	86.06%	1.38%	0.98%	3.36%	1.06%	0.52%	6.64%
T + 4	32.69%	9.37%	10.43%	17.25%	6.71%	2.66%	20.89%

Note. Source: Research data.

Based on table 3, it is verified on the period pre-fusions and acquisitions (t-1) that filter 5 (F5) concentrated the heaviest weight, 71,71% from the TOPSIS ranking index. On the period post-fusions and acquisitions specifically one year later (t-1), we have filter one (F1), with 30,80%, and filter eight (F8) with 46,90%, sharing the heaviest weights of the generated ranking. Two years later (t+2), filter eight (F8) presented to surprising weight of 90,39%. On the third year after the fusion and acquisition, filter one (F1) presented a higher weight, with 86,06%. Lastly, the weight became better distributed on the fourth year. However, it is verified that the filters one (F!) and eight (F*) had higher weights, filter one with 32,69% and filter eight with 20,89%. These differences occur because the filters that produced a higher weight had a higher variation of used data. Thus, higher the difference of results in a certain filter, higher its weight by the variation coefficient.

After the TOPSIS application, with the variation coefficient over the seven Graham's filters, it was obtained the companies' performance, according to table 4. This analysis allows the identification of the companies that better attend the seven Graham's filters simultaneously, generating an innovative way to evaluate the performance post-fusions and acquisitions. It we generated five rankings, one for the period pre-fusions and acquisitions, and four for the post-fusions and acquisitions period.

Table 4
Companies' performance rank

NAMES	t - 1	RT	t + 1	RT	t + 2	RT	t + 3	RT	t + 4	RT
ANDRADE GUTIERREZ CONCESSOES S.A.	0.312	29	0.519	31	0.352	35	0.808	33	0.857	24
ALL AMERICA LATINA LOGISTICA S.A.	0.396	15	0.530	28	0.391	26	0.806	34	0.855	29
ARTERIS S.A.	0.291	36	0.460	39	0.261	42	0.818	29	0.831	39
BRASKEM S.A.	0.211	41	0.466	38	0.364	33	0.822	27	0.855	28
BRF S.A.	0.385	17	0.597	13	0.553	11	0.823	26	0.861	21
BROOKFIELD INCORPORAÇÕES S.A.	0.591	3	0.695	3	0.663	6	0.881	4	0.852	31
CCR S.A.	0.194	42	0.506	35	0.328	40	0.826	23	0.854	30
CIA ENERG. DE MINAS GERAIS - CEMIG	0.473	8	0.484	36	0.339	37	0.915	1	0.880	3
COSAN S.A. INDUSTRIA E COMERCIO	0.324	25	0.537	25	0.392	25	0.907	2	0.859	22
CPFL ENERGIA S.A.	0.270	38	0.516	32	0.370	30	0.840	16	0.856	26
DIAGNOSTICOS DA AMERICA S.A.	0.342	23	0.555	22	0.437	22	0.825	24	0.858	23
DURATEX S.A.	0.250	40	0.581	14	0.474	18	0.845	13	0.865	12
ECORODOVIAS INFRAEST. E LOGÍST. S.A.	0.298	34	0.538	24	0.351	36	0.833	20	0.868	10
FIBRIA CELULOSE S.A.	0.303	32	0.529	29	0.329	39	0.766	38	0.851	32
FLEURY S.A.	0.594	2	0.603	11	0.515	13	0.829	22	0.871	6
GAFISA S.A.	0.595	1	0.841	1	0.619	7	0.864	9	0.843	37
GENERAL SHOPPING BRASIL S.A.	0.305	30	0.562	18	0.475	17	0.800	36	0.848	34
METALURGICA GERDAU S.A.	0.337	24	0.555	21	0.421	24	0.861	11	0.864	13
GOL LINHAS AEREAS INTELIGENTES S.A.	0.483	7	0.422	40	0.606	8	0.823	25	0.840	38
HYPERMARCAS S.A.	0.350	21	0.641	6	0.581	10	0.804	35	0.856	27
INVEST. PART. EM INFRA S.A.-INVEPAR	0.387	16	0.508	34	0.330	38	0.789	37	0.843	36
JBS S.A.	0.416	12	0.528	30	0.445	20	0.832	21	0.857	25
LIGHT S.A.	0.415	13	0.531	27	0.360	34	0.874	7	0.863	14
LUPATECH S.A.	0.298	33	0.484	37	0.380	29	0.203	41	0.027	42
MARFRIG GLOBAL FOODS S.A.	0.342	22	0.556	20	0.368	31	0.753	39	0.817	41
OI S.A.	0.353	20	0.546	23	0.711	3	0.881	5	0.921	1
CIA BRASILEIRA DE DISTRIBUICAO	0.464	9	0.636	7	0.594	9	0.839	17	0.863	16
PDG REALTY S.A. EMPREEND E PARTIC.	0.421	10	0.778	2	0.803	1	0.862	10	0.873	5
PETROLEO BRASILEIRO S.A. PETROBRAS	0.513	5	0.600	12	0.423	23	0.877	6	0.866	11
RENAR MACAS S.A.	0.312	28	0.398	41	0.306	41	0.082	42	0.862	20
SANTOS BRASIL PARTICIPACOES S.A.	0.305	31	0.572	16	0.388	27	0.821	28	0.863	17
SCHULZ S.A.	0.278	37	0.604	10	0.504	16	0.868	8	0.871	7
CIA SIDERURGICA NACIONAL	0.269	39	0.644	5	0.453	19	0.845	14	0.870	8
TRANS. ALIANÇA ENERGIA ELÉTRICA S.A.	0.318	27	0.561	19	0.437	21	0.890	3	0.879	4
TRACTEBEL ENERGIA S.A.	0.320	26	0.531	26	0.380	28	0.837	19	0.862	18
CTEEP - CIA TRANS. ELÉTR. PAULISTA	0.418	11	0.570	17	0.505	15	0.855	12	0.884	2

Continue

Table 4 (continued)

NAMES	t - 1	RT	t + 1	RT	t + 2	RT	t + 3	RT	t + 4	RT
TPI - TRIUNFO PARTICIP. E INVEST. S.A.	0.296	35	0.165	42	0.367	32	0.810	31	0.850	33
ULTRAPAR PARTICIPACOES S.A.	0.358	19	0.579	15	0.513	14	0.810	32	0.863	15
VANGUARDA AGRO S.A.	0.491	6	0.514	33	0.667	4	0.686	40	0.847	35
VIA VAREJO S.A.	0.398	14	0.620	9	0.667	5	0.811	30	0.862	19
VULCABRAS/AZALEIA S.A.	0.372	18	0.631	8	0.553	12	0.844	15	0.826	40
WEG S.A.	0.563	4	0.681	4	0.735	2	0.839	18	0.868	9
Average	**0.372**		**0.556**		**0.469**		**0.800**		**0.839**	

Note. Source: Research data.
Legend: RT – *Ranking TOPSIS*

Graham's filters were a choice to perform the evaluation of performance considering the economic, financial and corporate data. This study did not evaluate if the company was approved or not by the filter, according to Artuso (2012) research, but by the percentage of achievements, in other words, nearest to 100%, the best.

The ranking of the seven Graham's filters by TOPSIS contributed significantly to measure the performance of corporations in the middle of the sub-prime crisis that occurred in 2007, due the fact it related the performance indicators of the company with other companies. This might have contributed for the realization of an exempt performance evaluation in face of the crisis' reflexes.

The application of the TOPSIS contributed to transform the results of the seven Graham's filters in a single indicator, the ranking, exposed on table 4. Through TOPSIS is possible to verify which company is on the top of the ranking or in a lower position. Higher the position on the ranking, better the jointly achievement level of the seven Graham's filters in relation to the other companies in the sample group.

On table 4 it is possible to verify that the performance of the companies by Graham's filters have a growth over the analysis pre-and post-fusions and acquisitions. This was determined based on the average during the period (t-1), which was of (0.372) in comparison with the post-fusions and acquisitions period. They are: period (t + 1) with (0,556); period (t + 2) with (0,469); period (t + 3) with (0,800) and period (t + 4) with (0,839). This average increase is statistically different, confirmed by the test *t of student*. it is believed that the evolution of performance might be linked to the event of fusions and acquisitions, which consists in provide a higher safety to the investor that bet in the acquisition of companies' stocks that wen through fusions and acquisitions. And it is still noticed that, over the fiver years analyzed, several companies had positive and negative modifications in their positions on the ranking, evincing a position pre-fusion and acquisition on the ranking that was not kept static during the four subsequently years to the post-fusion and acquisitions period.

These modifications on the ranking can be explained by the behavior of the data used on the basis of each one of Graham's filters. In this temporal clipping of the periods (t-1) to (t+4), occurred several modifications on the stock prices, market value and on the dividend rates used n filters F1, F3, F4 and F5. It also occurred modifications on the economic-financial indicators of the companies, such as: accounting indicator of the liquid capital, total debt, tangible accounting value, total of circulating assets and from the circulating passive used on filters F6, F7 and F8.

Several works analyzed the applicability of Graham's filters assumptions on the Brazilian and international capital markets (Lander, Orphanides & Douvogiannis, 1997; Bildersee, Chen & Zutshi, 1993; Arnott, Hsu, & Moore, 2005; Passos, 2006; Passos & Pinheiro, 2009; Artuso & Chaves, 2010; Artuso, 2012; Silva, Silveira, Del Corso, & Stadler, 2011; Woods, 2013; Kreuzberg *et al.* 2014; Ferreira & Santos, 2014; Zin & Tarso, 2016)

In face of the results showed on table 4, it is inferred that the companies that improved their ranking in relation to the other companies are worried with the return of investments by the shareholders. Thus, the act on the alignment of interests between managers and shareholders. In relation to the companies that fell down in the raking, it is possible that their managers weren't able to keep their superior performance or weren't able to overcome the performance of

the group of purchaser companies. Thus, the problems with shareholders became livelier due the lower return occurred on the post-fusion and acquisition period.

As a complementary procedure, it was made the replacement of the companies' development by Graham's filters via TOPSIS by the simple return of stocks. This represents the withdrawal of economic and financial indicators of the performance evaluation. However, the return of stocks is a metric frequently used on the studies about corporate performance.

For this, it is initially presented the performance of the forty-two companies, calculated by the return of stocks on the periods $(t - 1)$, $(t + 1)$, $(t + 2)$, $(t + 3)$ and $(t + 4)$, according to table 5. The calculation over the return of actions was obtained with the division of the stock's price from the year of analysis with the price of stock previous year, always using the quotation of actions from the last day of cry in the year.

Table 5
Companies' performance by returning shares

NAMES OF COMPANIES	t − 1	t + 1	t + 2	t + 3	t + 4
ANDRADE GUTIERREZ CONCESSOES S.A.	0.356	0.014	0.463	0.121	0.009
ALL AMERICA LATINA LOGISTICA S.A.	0.374	0.082	-0.534	0.938	-0.516
ARTERIS S.A.	0.356	-0.334	-0.434	1.777	0.791
BRASKEM S.A.	1.537	-0.348	0.045	0.641	-0.135
BRF S.A.	-0.317	0.219	0.364	0.163	0.184
BROOKFIELD INCORPORAÇÕES S.A.	-0.387	2.342	0.125	-0.410	-0.229
CCR S.A.	0.779	0.084	0.646	-0.048	-0.093
CIA ENERGETICA DE MINAS GERAIS - CEMIG	0.049	0.023	0.372	0.031	-0.002
COSAN S.A. INDÚSTRIA E COMERCIO	-0.528	1.278	0.100	-0.001	0.578
CPFL ENERGIA S.A.	0.160	-0.034	0.266	0.257	0.340
DIAGNOSTICOS DA AMERICA S.A.	1.555	-0.307	-0.147	0.110	-0.229
DURATEX S.A.	-0.675	0.120	-0.384	0.712	-0.004
ECORODOVIAS INFRAESTRUTURA E LOGÍSTICA S.A.	0.356	0.134	0.266	-0.101	-0.191
FIBRIA CELULOSE S.A.	0.356	-0.322	-0.464	0.627	0.225
FLEURY S.A.	0.356	-0.189	0.088	-0.179	-0.039
GAFISA S.A.	0.356	-0.682	1.721	-0.139	-0.649
GENERAL SHOPPING BRASIL S.A.	0.356	-0.869	2.767	0.531	-0.133
METALURGICA GERDAU S.A.	0.682	0.767	-0.217	-0.313	0.302
GOL LINHAS AEREAS INTELIGENTES S.A.	-0.026	-0.772	1.632	-0.006	-0.500
HYPERMARCAS S.A.	0.356	2.003	0.127	-0.621	0.955
INVESTIMENTOS E PARTICIP. EM INFRA S.A. - INVEPAR	0.356	0.014	0.463	0.121	0.009
JBS S.A.	-0.177	-0.228	-0.152	-0.013	0.476
LIGHT S.A.	0.336	0.248	-0.150	0.040	-0.153
LUPATECH S.A.	0.881	0.160	-0.290	-0.769	-0.560
MARFRIG GLOBAL FOODS S.A.	-0.508	-0.187	-0.445	-0.007	-0.528
OI S.A.	0.776	0.228	-0.246	-0.075	0.152
CIA BRASILEIRA DE DISTRIBUICAO	-0.085	0.077	-0.022	0.363	0.171
PDG REALTY S.A. EMPREEND E PARTICIPACOES	0.356	-0.547	2.112	0.187	-0.409
PETROLEO BRASILEIRO S.A. PETROBRAS	0.409	-0.461	0.659	-0.230	-0.183
RENAR MACAS S.A.	0.068	-0.353	-0.572	-0.444	0.467
SANTOS BRASIL PARTICIPACOES S.A.	0.356	-0.754	1.734	0.361	0.135
SCHULZ S.A.	-0.447	0.807	0.129	-0.173	0.332
CIA SIDERURGICA NACIONAL	0.447	-0.432	1.079	-0.016	-0.407
TRANSMISSORA ALIANÇA DE ENERGIA ELÉTRICA S.A.	0.868	0.567	0.939	-0.073	0.203
TRACTEBEL ENERGIA S.A.	0.299	-0.050	0.209	0.322	0.162
CTEEP - CIA TRANSMISSÃO ENERGIA ELÉTRICA PAULISTA	0.486	0.350	0.181	0.180	-0.397
TPI - TRIUNFO PARTICIP. E INVEST. S.A.	0.356	-0.855	4.713	0.759	-0.017
ULTRAPAR PARTICIPACOES S.A.	0.356	0.005	0.463	0.121	1.778
VANGUARDA AGRO S.A.	1.504	-0.680	0.357	-0.070	-0.685
VIA VAREJO S.A.	0.356	0.014	0.463	0.121	0.009
VULCABRAS/AZALEIA S.A.	1.077	-0.065	0.519	0.069	-0.723
WEG S.A.	0.828	-0.491	0.519	0.220	-0.113
MEDIUM	**0.356**	**0.014**	**0.463**	**0.121**	**0.009**

Note. Source: Research data.

Through the annual averages, it is verified that on the pre-fusions and acquisitions period, the average return was kept in (0,365). On the period (t+1), it is noted that the return had a significantly drop to (0,014). On the period (t+2), it occurred a return of (0,463), which is expressly and superior than the period (t-1). On the period (t+3), the return of stocks was kept in (0,121) and, finally, it was kept in (0,009) on the period (t+4).

It was applied the test t *Student* of an average difference between the periods (t-1) in relation to periods (t+1), (t+2), (t+3) and (t+4), and it was determined that the averages are statistically different, except for the comparison between the periods (t-1) and (t+2).

Based on the averages, it is verified that on the prior period to the event of the stocks' prices showed a growth, maybe explained by the good reputation of the company on the capital market or by the pre-visualization of a corporate recovery by the investors, that search a higher return with the new formed companies.

On the post-fusions and acquisitions period, it is possible to notice that the return of stocks was positive between the four years of analysis. The highest index was identified on the second period after the event. Due the fact there was not any kind of negative averages, it is stated that the average price of the stocks had a growth or was kept during the four years of analysis. The possible explanation for the return of actions might been the growing economic-financial development after the corporate restructure. The results on table 4 corroborate the data of table 4, also indicating growing results of performance of the post-fusions and acquisitions companies.

5 CONCLUSIONS

This study aimed the verification of performance from the companies that passed through fusions and acquisitions through the measurement of Graham's filters. Forty-two fusion and acquisition events were identified, which Graham's filters were applied over the four posterior years with the support of the TOPSIS method.

As results, it is being made the evaluation of development by Graham's filters that specifically produces the measurement of economic, financial and corporate performance, the last one also being denominated as market. By the application of Graham's filters, the economic and financial development is reasoned by the company's elevated net profit, by the reduction of the indebtedness and increase of availabilities provided by the increase of circulating asset in relation to the passive circulating. With these indicators, which are also accounting, we have the differential of application of this methodology, because its' evaluated the post-fusions and acquisitions companies by their financial health.

The application of Graham's filters also provided the evaluation through the corporate performance. This evaluation considered the price of stocks and rate of paid dividends. Differently from the other observed studies until the present, this technique considered, in its formulas of paid dividends, that it would indicate a relevant cash flow after the fusions and acquisitions.

By the evaluation of performance through Graham's filters, transforming the rankings by STOPSIS, it was determined that there's been a growth statistically distinct over the four years after the fusions and acquisitions. it is justified that the seven Graham's filters via TOPSIS compose a rigid form of evaluation of the company's development. It promises the safety of the main and the proper return for the performed investment. The rigid analysis is needed, because when an investor is acquiring a stock from a company that's been through a fusion and acquisition, he's becoming a partner of that enterprise. it is necessary to know your operations better, your performance, and to adequately evaluate the assets.

Analyzing the results found, it is concluded that the managers of the researched companies appreciated a group of indexes composed by Graham's filters after the fusions and acquisitions so the companies could have good market indicators and a proper financial health, this last one composed by the good structure of capital and low risk of insolvency. This way, they paid good dividends to their shareholders and gave a financial structure for the company, in other words, they took good financial decisions that were identified by Graham's filters. Thus,

it is inferred that the relevant performance of the companies, measured by Graham's filters, indicate that the shareholders and managers interests are aligned and contribute for the best corporate governance of the company.

Consequently, it is recommended, as a suggestion for new researches, analysis of performance applying different methodologies of evaluation for the companies, such as: abnormal return of stocks. Q of Tobin, sustainability indexes, among others. it is also recommended the realization of a performance evaluation by Graham's filters with the companies that perform public offers of stocks.

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THE IMPACT OF SOCIOECONOMIC INDICATORS
ON THE DEGREE OF BUDGET EFFICIENCY

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ABSTRACT

Studies have shown that budget effectiveness is influenced by the socioeconomic indicators of a locality, such as income, health, education and population size. In this context, budget effectiveness is understood with a measure that shows whether an organization has achieved its objectives, goals and results. Thus, the present study aimed to verify the relationship between the budget effectiveness of the 223 municipalities of the State of Paraíba and the socioeconomic conditions portrayed by the social and economic indicators in the period from 2005 to 2013. As an early answer to the research question two hypotheses were formulated: H1: socioeconomic indicators positively influence municipal budget effectiveness; And H2: the larger municipalities present a greater degree of budgetary efficiency when compared to smaller municipalities. The hypothesis test was performed through balanced panel data analysis with fixed effects and correlation analysis between model variables. The results showed that municipal budget effectiveness is positively influenced by socioeconomic indicators, confirming hypothesis 1. However, hypothesis 2 was rejected. In sum, the study found that social indicators of education and health promote the budgetary effectiveness of local governments.

Keywords: *Budget efficiency. Social indicators. Economic indicators.*

1 INTRODUCTION

The control and planning of activities made by the public entities must be integrated to allow the government to reach the efficacy at the budget's execution. For this, the managers need to guide their actions based on the working programs established on the public budget, as well as being actions followed by the society. The public budget can be defined as an instrument for the forecast of revenues and fixation of expenses. The revenues earned and expenses paid have the goal to ensure the continuity, efficiency, effectiveness, efficacy and the economy of the services provided to the State (Carvalho, 2007). The budget is an important mechanism for the planning and control of the activities performed by the public entities.

In this context, it is noticed the importance of the budgetary execution supported on the planning and control instruments so the public administration be allowed to reach a higher budgetary efficiency. Castro (2006) relates the efficacy as something that worries about the purposes, aiming the achievement of goals. Interpreting this concept, it is possible to understand the efficacy as the achievement of goals that were planned on the budget.

The society is inserted in this approach according to the service of its needs on the health, education, leisure, safety and transportation areas, among others. So, the efficient budget promotes improvements on the rights that were assured to the community, positively impacting the socioeconomics indicators of a location.

The economic and social indicators enable the evaluation of the society's situations and improvement. The comprehension about its meanings and limitations is essential (Moldau, 1998). Therefore, study these indicators under the budgetary efficacy might be crucial for the comprehension about the planning and execution structures for the government actions.

The social and economic indexes can have significant reflexes in this planning, considering that the public administration will be supporting the citizens' concerns. Faced with this, the main areas for this research is about the indicators that reflect realizations on the education, health and on the community's income, followed by socioeconomic indicators. For Lima and Diniz (2016), the socioeconomic indicators briefly point out the social and economic needs indicators for a society. These indicators can be pointed as, for instance, the income, health and education, indicating the topics where the government should pay more attention.

The budgetary efficacy benefits two important stakeholders from the governmental environment: the society and the government, each one them with their own peculiarities, but with this interest merging for a common objective, which is the implementation of the governmental law previewed on the budget. According to Freeman (2010), stakeholder might be classified as individuals that might affect the achievement of organizational goals, in other words, a group of people interested in the same business. Thus, the compatible and incompatible interests from the stakeholder's need be reconciled so the organizational goals can be achieved,

In this sense, Boaventura, Cardoso, Silva and Silva (2009) sign that among the contributions of the stakeholder's theory, it is emphasized the administrative attitude of the organization, which becomes more strategic and brings benefits for the entity. In the vision of Donaldson and Preston (1995), the stakeholder's theory is founded in ethical basis. It allows to identify the role and importance of each stakeholder.

In this scenery, the pillars of this theory are fundamental on the governmental area, considering that the managers' interests shouldn't prevail over the population well-being. Therefore, the community should know what is the State's acting, in which the citizens' interests must be considered. So, the citizens need to be stimulated to effectively participate in the elaboration, follow-up and evaluation of public policies (Borges & Pereira, 2014).

In this context, it is important to emphasize that the society is becoming each time more demanding and more participative over the last decades. On the educational area, as stated by Lück (2000), the society is more demanding because they acknowledge that the education constitutes a great value for the social development. Nogueira (2004) states that in a participative democracy, it is essential to have the presence of citizens that are capable to

collaborate for the improvement of the public management. For this, the rulers must expose clear decisions and guidance, besides pointing out paths and possibilities to the social actors.

Thus, to allow an efficient advance on the public management efficacy, according to Litpvsky and MacGillivray (2007), there must be a mutual collaboration between the development actors: rulers and ruled, distributing responsibilities so that there can't be substantial results. In this sense, Brazil has been presenting an improvement on the social participation in what concerns the charge of efficacy and transparency of the public accounts. However, the inclusion of the poor people remains a challenge (Litpvsky and Macgillivray, 2007).

Based in this theoretical approach, the following questioning for the investigation was raised: which is the relation between the budgetary efficacy in the cities of Paraíba and their socioeconomic conditions?

Aiming the anticipation of an answer to the formulated questioning, the following hypothesis were defined: H_1: the socioeconomic indicators have a positive influence over the municipal budgetary efficacy and H_2: the bigger cities presented a higher degree of the budgetary efficacy when compared with the smaller cities.

Thus, the main goal of the current study consisted on the verification of the relation between the budgetary efficacy in the cities of Paraíba and the socioeconomic conditions retracted by the social and economic indicators.

The current research aims to contribute with knowledges about the budgetary efficacy for the accounting science, as well as to support the municipal management. This way, the research justify itself by the importance that a coherent budgetary management can bring to the State, from the social, economic and organizational control perspective. It presents the benefits that might be reflected on the population's socioeconomic conditions.

This article starts with this introduction. The theoretical framework is presented on the second topic. Up next, it is presented the methodological aspects and the results of analysis. Finally, we have the presentation of the final considerations.

2 THEORETICAL FRAMEWORK

In this theoretical framework, the budgetary efficacy is approached, as well as its relation with the socioeconomic indicators and the stakeholder's theory.

2.1 Budgetary efficacy

The conception of budget-program has support on the Federative Republic of Brazil Constitution (1988), under Law n° 101 (2000), on Law n° 4.320 (1964), Decree-Law n° 200 (1967). The foundations of the budget-program are centered on the link between the budget and planning, aiming to check this instrument, besides the control function, the management function. This marks the transition from the traditional budget to the modern budget. Carvalho (2007) verifies the advantages on the usage of the budget-program. He explains the government's working benefits, his projects and activities, objectives, goals, costs and results, which generates a higher public transparency.

According to Giacomoni (2012), the budget-program was based on the performance budget experienced by the USA and that began to be disseminated through the world in the 50's, especially through initiatives of the United Nations Organization (ONU). It suffered modifications during its implementation in Brazil. However, it was only in 1974 that the Brazilian government included the programmatic classification by the need of information over the government's programming and also by the integration of planning and budget (Kashiwakura, 1997).

This way, it is comprehended that a budget planned coherently, in a way that the goals are achieved by the integration of the government and society, the socioeconomic conditions of the cities tend to improve, supporting the budgetary efficacy. The efficacy issue is centered on the products that the governments offers to the community, in the outputs. These, according with Lima and Diniz (2016), can be viewed as physical unities of the assets and services that are result from the productive process, emphasizing the difficulties to identify them.

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Thus, the efficacy is a measure which a company can use to achieve its goals and other results, in other words, is the relation between expected results and assets' outposts and information (Controller General of the Union [CGU] 2009). The relation between the efficacy and the budget-program is found on the satisfaction of the citizens' needs in what concerns the assets and public services, mainly on the focus about results, if the execution of the budget-program attends to the population's needs (Koscianski, 2003).

But the provision of services can't be made in whatever form. The quality of services must be inherent to its provision. With this, when all of the real needs are placed in the city's budgetary planning and the objectives are attended, it is possible to comprehend that the budgetary efficacy was reached. As stated by Bezerra (2013), the efficacy occurs on the moment when the predefined goals are reached.

The Brazilian budgetary planning is made through the instruments known as Multi-Annual Plan (PPA), Budgetary Guidelines Law (LDO) and Annual Budgetary Law (LOA), all of them forecast on the Federative Republic of Brazil Constitution (1988), as well as on the Fiscal Responsibility (LRF) (2000). According to Carvalho (2007), the PPA is the medium-term strategic planning; the LDO is the tactical planning. It represents the guidelines for the LOA elaboration, it makes the connection between the PPA and LOA; and the LOA represents that operational planning of the public management, because it implements the goals that were established on the PPA.

This way, these planning instruments, aligned to the social needs, promote the identification of the society's priorities that matches the government's priorities, which are: ensure a higher transparency, integrate the planning to the budget, balance revenues and expenses, promote a proper budgetary execution, present health, educational, safety and social assistance improvements, and, essentially, to reach the budgetary efficacy.

However, if the allocations initially planned on the budgetary law aren't enough or aren't forecast, the manager might legally open an additional credit to include new expenses or to reinforce the existing ones (Carvalho, 2007). Such procedure might harm the budgetary efficacy if the coverage resources are insufficient. In this sense, Santana, Pessoa, Cabral, Santos and Diniz (2007) believe that the alteration in the cities' budget counter the theoretical housing of the planning and budget, because, if the planning the way to forecast the expenses that'll be performed in a certain period, the additional credits would only be necessary in the event of an extreme urgency. Thus, if the manager does not open additional credits during the exercise, the budgetary efficacy won't be much negatively impacted.

Therefore, it is necessary that the planning and budgetary execution be integrated so the efficacy can be achieved, attending the population's needs and contributing for an improvement of the health and educational actions, and leveraging the city's community income.

2.2 Socioeconomic indicators and budgetary efficacy

The social indicators are important to measure the profile of a city's reality. It allows the tracking of more accurate public policies (Jannuzzi, 2012). Lima and Diniz (2016) denote that these indicators are composed by social and economic variables and that they measure the population's needs. They can be, for instance, the income, unemployment, transportation, natality and mortality indexes, analphabetism indexes, etc.

Jannuzzi (2002) conceptualizes the social indicator as a quantitative measure that theoretically interests to academic researches and, in a programmatic way, supports the formulation of policies. Aristigueta, Cooksy and Nelson (2001) argue that the States sees the social indicators as a fundamental governance tool and as strategies for the management of results. The authors (2001) bring the social indicators as signs of social and economic health.

According to Jannuzzi (2002), for this indicator being present in academic researches, it is strictly important that it is noticed a series of requirements, such as sensibility to the public policies and disaggregation in geographic and historical terms, so that may have possible comparisons over time. Thus, the socioeconomic diagnosis presented by these indicators become relevant, valid and reliable to provide a continuous allocation of resources and implementation of public policies.

Several researches used the socioeconomic indicators, relating them with the budgetary efficacy and, mainly, associating them to the public transparency. Aristigueta *et al.* (2001) analyzed the role performed by the social indicators over a system of guided results in a

Delaware study case. They determined that these indicators are useful to control the performance of institutions, as well as the families', children and community's well-being measurement. This way, they provide information about the society, its needs and satisfaction.

In what concerns the budgetary efficacy performed by Santana *et al.* (2007) verifies that the Paraíba cities weren't impacted by the LRF (2000) in the period immediately prior and posterior to the law's implementation; however, when compared with the previous years, it was verified the statistic significance between the budgetary efficacy and the expenses fixed and executed, in other words, the LRF positively influenced on the improvement of the public planning.

Queiroz, Nobre, Silva and Araújo (2013) studied the information advancement level in cities of Rio Grande do Norte, including the population's quantity. The study determined a weak relation between the city's size and the advancement level. Besides, Queiroz *et al.* (2013) used socioeconomic variables. They determined that the cities with a higher level of the socioeconomic development tends to disclose more information.

Poker, Nunes and Nunes (2013) can sustain the use of two variables highlighted in this article: income and education. In their research, the authors allowed the conclusion that the public policies must develop a higher investment in education and, for this, they used the income factor in their empiric tests. Besides, Poker *et al.* (2013) clarify that there's a relative inefficiency of the cities with a higher rural area, which indicates the need for specific public policies.

Neves, Diniz and Martins (2015) connect the public transparency and the IDHM as a proxy of the socioeconomic condition. They point out that there's the relation between the socioeconomic indicator and the public transparency level, in other words, cities with better socioeconomic indicators tend to present a higher transparency about the management.

Wright and Paulo (2014) sustain the use of the income and educational variables, which are also evident in this research. These authors studied the determinant fiscal transparency elements in the Brazilian cities, proving that the variables of age, education and income presented a correlation with the transparency variable.

Oliveira and Passador (2014) made an analysis about the utilization of health on the evaluation of the allocation of the cities' resources. They found out that the cities that spends more resources in basic attention have a higher level of performance on the system. Besides, they determined that the cities with higher populations have worse results in the health area, because the access to these services is harmed by the high demand.

Most of the researches made using the socioeconomic indicators compare them with the public transparency, but are useful to support this research since this dimension is an assumption of the budgetary efficacy.

Among the main indicators used in this research, the ones that stand out among the others are the ones about the education, income and health. To represent one of the indicators, it'll be used the Municipal Development Index FIRJAN (IFDM) on the consolidated level, such as the notes discriminated by employment and income, education and health. it is about a system that annually follows the economic development of all Brazilian cities in the three aforementioned areas.

The public management is supported by these indicators that determine the demands and diagnosis the economic and social situation of the community (Varela, 2004). Therefore, the information generated from the socioeconomic indicators support the government health analysis and from the society's needs.

2.3 Stakeholders theory and budgetary efficacy

The stakeholder's theory showed up for the first time due the dissatisfaction arisen by the fact that the efficacy's financial criteria being unilateral (Gomes, 2006). The efficacy can't be measured to satisfy only one of the interested parties, but must satisfy all agents that compose an organization.

The stakeholders represent several parties involved in a business relationship, in other words, they are the individuals interested in certain actions. Due the management's difficulties to identify each stakeholder, to allow all interested parties to feel satisfied in any kind of negotiations in which They are inserted, the defenders of the stakeholder's theory, such as Donaldson and Preston (1995), identify the importance of this theory within this context.

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In what concerns the efficacy, the stakeholder's theory can be highlighted as the perspicacity to serve, to ensure the satisfaction not only for the shareholders, but for all the ones that have a bond with the organization. Within the public-sector scope, it is possible to define stakeholders as government and population. However, as much as the government as the people that compose a community present needs, desires and differentiated desires. Besides, other components are encompassed on the government and society context, which increase the complexity of the stakeholder's management, such as suppliers, financial institutions and shareholders.

That's why there's a difficulty to make a proper management about the stakeholders. According to Bandeira-de-Melo, Marcon and Alberton (2005), the empiric verification of this management is still scarce on the literature. Due differentiated demands, the govern must analyze which are the key and common aspects for the society.

The managers are afflicted by several difficulties to manage the public services. A way to observe the society needs is the quantitative verification of the social indicators, extracting the needed information to allow an improvement on the budgetary planning elaboration. This is a way to dialog with the society's stakeholders, evincing a guide of the organizations and institutions where they act, showing general dispositions such as the usage of space, degree of influence of the organizations and the routine difficulties (Santos, 2008).

However, considering the difficulty to identify the population's needs, the managers need the popular participation since it is believed that this participation has a higher capacity to identify the citizens' needs. This becomes even more clear in demographic countries where the government have expectations about the increase and expansion of programs, such as health, education and income distribution (Khan & Hildreth, 2002).

With this analysis it is possible to infer a strengthening of the relationship between the stakeholders, consolidating the public interest on areas such as education, health, safety and infrastructure. Government and society, through mutual interests, must reach a consensus about the real needs of a city to redirect the basic attention to those purposes, making the stakeholders keep a relationship that benefits the society's socioeconomic condition, which tends to the budgetary efficacy.

3 METHODOLOGY

In this section, it'll be presented the methodological procedures: universe and data, research model and hypothesis, and definition of the model's variables.

3.1 Universe and research data

For the achievement of goals of this research, it was collected data referring to 223 cities of Paraíba in the period from 2005 to 2013. Due the access' difficulties and due the fact these are the most recent years with data available, the temporal universe was useful to determine the advances or setbacks on the budgetary execution in relation to the efficacy aspects and its impacts on the socioeconomic indicators.

The data were collected on the sites of the Brazilian Institute of Geography and Research [IBGE] at the SAGRES basis (System of Following-up of the Society's Resources Management) in Paraíba's Court of Auditors and on the FIRJAN index site.

3.2 Research model and hypothesis

To answer the question initially made by the research, it was developed a regression model accordingly with the following equation:

$$GEO_t = \beta_0 + \beta_1 SAUDE_{it} + \beta_2\, EmpRenda_{it} + \beta_3 EDUC_{it} + \beta_4 HABM_{it} + \mu \ (1)$$

Where:
β_0 – is the model constant;
GEO – Budgetary efficacy degree;
SAUDE – FIRJAN index of the municipal health development;
EmpRenda – employment and income;
EDUC – FIRJAN index of the municipal education development;

HABM – number of inhabitants in the city;
µ – is the error term.

In face of the model exposed, the study formulated the following hypothesis, with the goal to verify if the socioeconomic indicators are capable to impact the budgetary efficacy in the cities of Paraíba.

H_1: the socioeconomic indicators have a positive impact on the municipal budgetary efficacy.

This hypothesis was formulated considering that the relationship between the cities and its socioeconomic indicators translates an opportunity to observe the budgetary behavior in face of the social issues, such as the lack of financial resources (Bárbara & Rodrigues, 2005).

H_2: the bigger cities present a higher degree of budgetary efficacy when compared with smaller cities.

This hypothesis was formulated considering that the cities with a higher population, the collection of taxes tends to be higher, according to Mendes, Miranda and Cossio (2008), when they explain that a higher economic development tends to express the higher capability of collection. Besides, the needs of expenditure are influenced by the population's size and growth.

3.3 Definition of the model's variables

According to the model developed on the equation1 above, the following table describes the dependent variable – budgetary efficacy degree – and the respective independent variables, represented by social and economic variables.

Table 1
Description of the variables used on the research model

VARIABLES	ABBREVIATION	OPERATIONAL DEFINITION	JUSTIFICATION
Degree of budget efficiency	GEO	This variable will be measured with the following equation 2, using data extracted from the SAGRES site of the Court of Auditors in Paraíba.	The use of this variable is supported in the studies performed by Santana *et al.* (2007) and it is useful to reduce possible inconsistencies on the monetary variations over time; that's why it is important to measure in indexes. The ideal efficacy degree is 1. It'll be assigned a good budgetary efficacy degree for the cities that presents a GEO between 0,9 to 1,10.
Number of inhabitants in the city;	HABM	The number of inhabitants was collected at the IBGE site bases on the 2010 census and on the estimative of the other years studied in this research (2005, 2006, 2007, 2008, 2009, 2011, 2012 and 2013).	it is believed that the bigger cities presented a higher budgetary efficacy, as sustained on the works made by Queiroz *et al.* (2013) and Oliveira & Passador (2014).
Employment and income	EmpRenda	For this variable, the FIRJAN index was used as proxy, since it contains the years proposed by this study. The note for this index is assigned in the following way: using the formal generation of employment and the capacity to absorb local labor, the income generation and its distribution on the city's job market. It was assigned the weight of 25% in each concept. The formula is presented according to the equation 3 below.	it is assumed that higher the budgetary efficacy, higher will be the citizens' income, as sustained by the studies performed by Queiroz *et al.* (2013), Poker *et al.* (2013), Neves *et al.* (2015) and Wright e Paulo (2014).

Continue

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Table 1 (continued)

VARIABLES	ABBREVIATION	OPERATIONAL DEFINITION	JUSTIFICATION
Education	EDUC	For this variable, the FIRJAN index was used as proxy, since it contains the years proposed by this study. The note for this index is assigned by the following way, with the weights indicated after each item: using the registrations on the child education – 20%: the abandonment on the elementary school – 15%: distortion in the age-grade on the elementary school – 15%: the average of daily hours of classes on the elementary school – 15%: and the IDEB result on the elementary school – 25%. The formula is presented according to the equation 4 below.	it is comprehended that higher the budgetary efficacy, higher will be the cities' education level, as sustained by the studies performed by Queiroz *et al.* (2013), Neves *et al.* (2015), Costa (2012) and Wright e Paulo (2014).
Health	HEALTH	For this variable, the FIRJAN index was used as proxy, since it contains the years proposed by this study. The note for this index is assigned by the following way: using the number of prenatal consultations, the deceases obtained due non-resolved issues, the children deceases due avoidable causes and the sensible hospitalization to basic attention. It was assigned the weight of 25% in each concept. The formula is presented according to the equation 5 below.	it is expected that higher the budgetary efficacy, higher will be the education level, as sustained by the studies performed by Queiroz *et al.* (2013), Neves *et al.* (2015) and Oliveira e Passador (2014).

Note. Source: Own elaboration (2016).

Budgetary Efficiency Degree (GEO) – is the variable that depend on the research, represented by a measured proxy according to the following equation, according with Santana *et al.* (2007). For the utilization of the GEO value, it was considered the result's module.

$$GEO\ i = 1 - \frac{DOR\ i - DOF\ i}{DOF\ i} \tag{2}$$

Where:
GEO = Degree of budget efficiency;
DOR = Performed budgetary expenses;
DOF = Fixed budgetary expenses.

Employment and income (EmpRenda) – this variable has the Labor Department as source. Two dimensions are used: the employment, which analyzes the generation of employments and the capacity to absorb labor; and the income, which evaluate the income generation and its distribution on the city's job market. Each dimension represents 50% of the Employment&Income index, whose goal is to capture the economic situation as a characteristic of the cities' job market Thus, this variable is measured by the following equation:

$$EmpRenda_{it} = \gamma\ Geração\ de\ Emprego + \\ + \gamma\ Capacidade\ de\ absorção\ da\ Mão-de-Obra \\ + \gamma\ Geração\ de\ Renda \\ + \gamma\ Distribuição\ no\ mercado\ de\ trabalho \tag{3}$$

FIRJAN index about the municipal education development (IFD – Education) – this variable considers six indicators, as described on board 1. This index has the purpose to capture the child education offer, as well as the quality on the education provided in public and private schools. It was assigned the weight of 80% for the elementary school among five

indicators: 55% for middle-indicators and 25% for ending-indicators. The child education Thus, this variable is measured by the following equation:

$$
\begin{aligned}
EDUC_{it} = \gamma \; & Matrículas \; na \; educação \; infantil + \\
& + \gamma \; Abandono \; no \; ensino \; fundamental \\
& + \gamma \; Distorção \; idade - série \; no \; ensino \; fundamental \\
& + \gamma \; Docentes \; com \; ensino \; superior \; no \; ensino \; fundamental \\
& + \gamma \; Média \; de \; horas \; aula \; diárias \; no \; ensino \; fundamental \\
& + \gamma \; Resultado \; do \; IDEB \; no \; ensino \; fundamental
\end{aligned}
\tag{4}
$$

FIRJAN index on municipal health development (IFDM – Health) – this variable is focused on the basic health. It contemplates four indicators, which have a weight of 25%, according to what is described on table 1. Thus, this variable is measured by the following equation:

$$
\begin{aligned}
SAUDE_{it} = \gamma \; & Número \; de \; consultas \; pré - natal + \\
& + \gamma \; Óbitos \; obtidos \; por \; causas \; mal - definidas \\
& + \gamma \; Óbitos \; infantis \; por \; causas \; evitáveis \\
& + \gamma \; Internação \; sensível \; à \; atenção \; básica
\end{aligned}
\tag{5}
$$

it is important to emphasize that the FIRJAN index about employment and income, health and education allows to precisely find out if the improvements in a city are resulting from the good practices of public policies of if they occurred due a drop in other cities.

This index varies from 0 (minimal) to 1 point (maximum). Closer to 1, higher the location's development, as presented on table 2:

Table 2
Parameters for the IFDM interpretation

INDEX VARIATION	CLASSIFICATION
From 0 to 0.4	Low development
From 0.4 to 0.6	Regular development
From 0.6 to 0.8	Moderate development
From 0.8 to 1	High development

Note. Source: Index portal FIRJAN (2015).

4 RESULTS

As defined on the methodology, the research universe consists from the 223 cities of Paraíba state. From those, 14 did not presented all information in different years. Due this, these cities, which did not present complete data for all years and for all variables, were removed from the sample and, thus, remained 209 cities on the study.

It was used the data analysis in a balanced panel with fixed effects, since to the contrary of pooled, it considers the heterogeneity of the cities that might influence the variable dependent on the study, in other words, it considers the cities' specifications over time, the impact caused by the variables on the period analyzed. This way, the variables omission problems are avoided, which leads to more consistent and efficient estimators.

The HABM variable presents outliers, since there are cities with a big population and other with few inhabitants. It shows the discrepancy between the cities of Paraíba. By presenting a big disparity on the HABM variable, showing an abnormal distribution, the natural logarithm was applied for this variable, now denominated as lnHABM. It was also decided to apply a natural logarithm o the SAUDE variable, because it was noticed the importance of a better way to adjust the variables to the model.

Despite the high number of observations, 1.881 observations, assuming the normality of data, it was applied the normality tests of Shapiro-Wilk and Shapiro-Francia. It was noticed that only the EDUC variable present a normality on the data, according to the table 3 below.

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Table 3
Shapiro-Wilk and Shapiro-Francia normality tests on the periods from 2005 to 2013.

Variable	Shapiro-Wilk	Shapiro-Francia
GEO	0.00014	0.00022
lnHABM	0.00000	0.00001
EDUC	0.17773	0.25202
EmpRenda	0.00000	0.00001
lnSAUDE	0.00000	0.00001

Note. Source: Own elaboration (2016) with the data extracted from SAGRES, IBGE and FIRJAN.

Up next, it was performed the variables' descriptive statistics, described on table 4. The GEO variable, according to the presented model, is the dependent variable, explained by the other independent variables. EDUC, EmpRenda, lnSAUDE and lnHABM as a control variable.

Table 4
Descriptive statistics of the model on the period from 2005 to 2013.

Statistics	GEO	lnHABM	EDUC	EmpRenda	lnSAUDE
Average	1.127092	9.051869	0.5415434	0.4027247	-0.5692249
Standard deviation	0.1935049	0.9167358	0.1005181	0.0873441	0.277974
Notes	1,881	1,881	1,881	1,881	1,881
Minimum	0.3941116	7.24065	0.246868	0.1439972	-2.59083
Maximum	1.713902	13.55367	0.8817995	0.8827442	-0.1046459
Asymmetry	-0.0687741	1.210343	0.0371865	1.123141	-1.111657
Kurtosis	3.138443	6.068068	2.911983	7.023269	5.381835

Note. Source: Own elaboration (2016) with the data extracted from SAGRES, IBGE and FIRJAN.

The GEO variable presents and average of 1,12, surpassing the value of 1. it is noticed that, in general, the Paraíba cities use less resources than what is scheduled at LOA. Analyzing the GEO minimal (0,39) and the maximum (1,71), it is noticed that the cities of Paraíba that presented values lower than 1 uses more resources than what was previously established, in other words, they use more additional credits. They compromise the budgetary efficacy. In the counterpart, the cities with values above 1 tends to be less effective, because they do not use the minimal resources that were previously established.

The GEO variable, due the fact it presents a kurtosis of 3,13, a value next to 3, identifies that the cities of Paraíba, in average, presents a normality in the data. The EDUC variable, in the kurtosis analysis, shows almost the same behavior adopted by the GEO. The EmpRenda and lnSAUDE variables present an abnormal distribution. They identify the differences between the income and health in the cities of Paraíba, as well as the lnHABM variable, which shows the difference on the number of inhabitants in the cities of Paraíba, which might compromise the budgetary efficacy.

Soon after the descriptive analysis, it was performed the correlation tests described on table 5, which shows the Pearson and Spearman correlations between the model's variable and their respective significances. The values above the 1.0000 diagonal refers to Pearson's correlation and the values below this diagonal are from Spearman's correlation for the research's variables.

Table 5
Pearson and Spearman correlation for the study variables in the period from 2005 to 2013.

	GEO	**InHABM**	**EDUC**	**EmpRenda**	**InSAUDE**
GEO	1.0000	-0.1472***	0.3216***	-0.0087	0.1992***
		0.0000	0.0000	0.7066	0.0000
InHABM	-0.1444***	1.0000	-0.0582***	0.3559***	0.0139
	0.0000		0.0116	0.0000	0.5480
EDUC	0.3195***	-0.0794***	1.0000	0.0450**	0.4422***
	0.0000	0.0000		0.0511	0.0000
EmpRenda	-0.0085	0.1657***	0.0421**	1.0000	0.1798***
	0.7136	0.0000	0.0680		0.0000
InSAUDE	0.2057***	-0.0372*	0.4554***	0.1471***	1.0000
	0.0000	0.1069	0.0000	0.0000	

Note. Source: Own elaboration (2016) with the data extracted from SAGRES, IBGE and FIRJAN.
Legend: Significance * = 10%; ** = 5%; *** = 1%.

By Pearson's correlation, it is noticed that almost all variables from the model, InHABM, EDUCA and SAUDE presented a strong significance, at the level of 1% with the GEO dependent. Only the EmpRenda variable did not had any significance with GEO. Equally, when observed on table 5, the values obtained by Spearman's correlation, it is noticed that the only variable that did not presented a significance with GEO was EmpRenda.

On table 5, it is observed that the InHABM variable, despite its significance, present a negative correlation value with the GEO variable. It indicates that cities with a big population presents a lower degree of budgetary efficacy. This makes hypothesis 2, which states that the higher cities present a higher budgetary efficacy degree compared to smaller cities, does not be accepted, since GEO and InHABM are inversely proportional. This differ from the studies performed by Poker *et al.* (2013) and Neves *et al.* (2015) and corroborate with the studied performed by Oliveira e Passador (2014) and Queiroz *et al.* (2013).

Furthermore, it is important to emphasize that smaller cities seem to not dispose from the same efficacy in what concerns the planning and incorporation of new practices that higher cities present difficulties to make a proper budget elaboration (Santana *et al.*, 2007).

Table 5 also shows a significant and negative relation between the EDUC and InHABM variables. It shows that the cities that present a higher population have lower educational indicators. This does not repeat when we observe the EmpRend variable, because it present better results in cities with a higher population.

Analyzing the EDUC and InSAUDE variable, which presented a significance at the 1% level with GEO, besides the positive correlation, it is deduced that the educational and health social indicators positively influence the budgetary efficacy, not rejecting, thus, hypothesis number 1. However, the EmpRenda variable, besides the fact it does not have any kind of significance with GEO, the correlation is negative and evince that the cities of Paraíba presents different types of income and that higher the employment and income index, lower the budgetary degree will be.

Still, with the relation of correlations between the variables, it is necessary to emphasize that the EDU and EmpRenda expresses significant and positive correlations with the InSAUDE

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variable. They reveal that the cities which present good educational and employment indicators present better results in the health area.

For the choice of data in panels with fixed effects, it was performed the Hausman test, presented on table 6, which considers that all invariable characteristics over time are unique for each individual, in other words, they do not relate with the characteristics from other individuals. In the current study, this shows that each city has own characteristics and that it does not depends from other cities. So, the estimate to capture the heterogeneity of the cities in what is constant, in other words, the difference of city from city that do not vary over time, such as some environmental factors that tend to be unchanged. As observed on table 6, the result prob>chi2 was lower than 5%. it is noticed that working with a panel with fixed effects is more proper for this study.

Table 6
Hausman's test for the period from 2005 to 2013.

Statistics	Fixed effects	Random effects	Difference	Standard error of the difference
EDUC	0.7683925	0.6965754	0.0718172	0.0244958
EmpRenda	0.090302	0.0461549	0.0441471	0.0310782
lnSAUDE	0.0537956	0.0560105	-0.0022149	0.0096662
lnHABM	-0.0099448	-0.0185237	0.0085789	0.0038336
chi2(4)=34.89			Prob>chi2 =0.0000	

Note. Source: Own elaboration (2016) with the data extracted from SAGRES, IBGE and FIRJAN.

To give a bigger strength for the choice of data in panel with fixed effects, it was performed Chow's test. It was noticed that the fixed effects are the most appropriate for the studied model as it is presented on table 7, where Prob>F = 0,0000, in other words, is lower than 5%.

After the verification by Hausman's test from the best model to be worked, and to give a bigger strength for the choice of data in panel with fixed effects, it was performed Chow's test. It was noticed that the fixed effects are the most appropriate for the studied model as it is presented on table 7, where Prob>F = 0,0000, in other words, is lower than 5%.

It was followed with the analysis of the empiric model application, presented on equation 1 of the methodological procedures. Table 7 shows the regression results from the module.

Table 7
Coefficients and statistics obtained from the regression model

GEO	Coefficient	Standard deviation	t	p-value	95% Confidence	Range
EDUC	0.7683925	0.0560911	13.70	0.000	0.6583763	0.8784088
EmpRenda	0.090302	0.064895	1.39	0.164	-0.0369823	0.2175863
lnSAUDE	0.0537956	0.0211523	2.54	0.011	0.0123078	0.0952833
lnHABM	-0.0099448	0.0069263	-1.44	0.151	-0.02353	0.0036404
__cons	0.7952478	0.0777055	10.23	0.000	0.6428373	0.9476583
F (208, 1668)	5.13				Prob>F 0.0000	
sigma_u	0.11724016	sigma_e	0.1500173		rho 0.37906673	

Note. Source: Own elaboration (2016) with the data extracted from SAGRES, IBGE and FIRJAN.

Analyzing the regression presented on table 7, it is verified that the EmpRenda and lnHABM variables weren't significant. However, the other variables were significant, so they explain the behavior of the dependent variable and confirm hypothesis 1, that the socioeconomic indicators positively influence the municipal budgetary efficacy, equally conforming the findings in the study performed by Neves *et al.* (2015) and Wright e Paulo (2014).

The control variable lnHABM, which represents the number of inhabitants, present an inverse relation with the GEO dependent variable, noticing the negative sign of the coefficient,

indicating that the number of inhabitants of a certain city has a negative influence on the budgetary efficacy degree, in other words, the cities with a bigger population present a lower GEO.

Besides, it is noticed that the EDUC and InSAUDE variables are significant at the 1% and 5% levels, respectively, with the GEO and present positive correlations. This conducts the interference that good educational and health indicators provide high degrees of the budgetary efficacy. Therefore, the budgetary efficacy is reflected in these social indicators.

5 CONCLUSIONS

This study tried to verify if the budgetary efficacy degree is influenced by the socioeconomic indicators, adopting them as unities of analysis in the cities of Paraíba. For this, the proxies used for education, income and health were the grades assigned by the FIRJAN index during the period from 2005 to 2013. Besides, the population size was also considered important to measure the budgetary degree efficacy.

The results obtained revealed that most of cities present a good efficacy degree, with the GEO between 0,9 and 1,1. With the GEO presenting an average of 1,12, it is deduced that the cities use less resources than what would be ideal.

Referring to the correlation between the variables, it is noticed that the health and education variables present a strong relation with the GEO. They indicate that the expenditures in these two segments demand more public expenses. Besides, the inhabitants number also presented a correlation with the GEO, but it was negative. it is noticed that the population number inversely influences the budgetary efficacy degree. The EmpRenda variable does not present a significance and, besides, it shows a negative correlation. So, it is concluded that the cities with more jobs and a higher income has a low degree of budgetary efficacy.

The regression results show the non-significance of the EmpRenda and InHABM variables with the GEO, while the other variables were significant. Therefore, it was confirmed the hypothesis that the budgetary efficacy is positively influenced by the socioeconomic indicators, corroborating the works performed by Neves *et al.* (2015) and Wright e Paulo (2014).

However, hypothesis 2 states that the bigger cities present a higher degree of budgetary efficacy compared to smaller cities, was rejected, because the InHABM variable, besides not being significant with the GEO, has a negative coefficient, confirming the study performed by Queiroz *et al.* (2013), when finding few relations between the population size and the evincing degree, more precisely, public transparency.

For future researches, it is suggested the use of other proxy for the proposed variables, as well as the other unities of analysis. Besides, other way to measure the budgetary degree might reflect the results obtained.

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IMPLICATIONS OF CAPITAL CONTRIBUTION RECEPTION TO INDEPENDENT STATE-OWNED COMPANIES: THE CASE OF SERPRO

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ABSTRACT

This paper addresses the self-sufficiency of the operational activities carried out for cash generation purposes at the Federal Data Processing Service (Serpro) aiming at its continuity as an independent state-owned company vis-à-vis the controlling shareholder. A qualitative, descriptive and documentary study is conducted to analyze the cash flow behaviors in operating, investment and financing activities, alongside the financial statements from 2005 to 2016. The analysis pointed to: a decrease in the cash balance from 2005 onwards, with a recurring shortage of operating activities compared to cash consumption; cash reconciliation based on financing activity involving constant capital injections from the controlling entity; evidence of payment of current expenses and dividends with capital contribution; receipt of financial contribution in 2012 and 2014, without prejudice to the status of independence and therefore in prejudice to legal regulations. The analysis also reveals that Serpro was uncompliant to the characteristics and the requirements of an independent state-owned company during the period. The results of this study have practical implications as it discusses and proposes aspects regarding the planning and development of the public audits oriented to the analysis of the conditions of dependence in independent state-owned companies building on the accounting information.

Keywords: Independent state-owned company. Cash flow statement. Fiscal Responsability Law.

1 INTRODUCTION

In the companies, as a general rule, managers have investment, financing and operational cash sources to finance the acquisition of resources. When choosing one of them, the best cost - benefit ratio must be considered. Therefore, it is well reasoned to expect that the better the performance of operational activities is, the greater is the self-sufficiency and the lower the dependence on third-party resources – loans / financing – or on capital contributions from partners as financing source of ordinary activities.

In the public sector, the dependent companies are basically characterized by the lack of self-sufficiency and by its continuity require action by its controller, that is, these are loss-making companies relying on treasury capital to finance their ordinary activities.

The need for conceptual differentiation between a dependent and independent state-owned company arises from the different legal regimes to be applied. As proposed by Art. 165, § 5 and sections of the Constitution of the Federative Republic of Brazil (1988), independent state-owned companies are included in the Investment Budget, as these ordinarily generate sufficient resources for their maintenance and, therefore, have greater budgetary, financial and equity autonomy. While the dependent companies are included in the Social Security and Fiscal Budget because they need public resources to finance their continuity (Constitution of the Federative Republic of Brazil, 1988) and, therefore, comply with all laws applicable to other entities of the direct administration, such as those issued by the Treasury Department [STN] and by the Federal Budget Department [SOF], being further subject to Law n. 4.320 (1964), Complementary Law n. 101(2000) and Law n. 6.404 (1976).

Among the fiscal restrictions set out in the abovementioned regulations, the following can be highlighted: remuneration ceiling of the administration, generation of expenses, including those with personnel and social security, and indebtedness, including regarding the execution of credit operations. Although the legislation presents such restrictions, it is not clear, however, to which type of deficit it refers – if economic or financial – when states that resources transferred in the form of economic subsidies are exclusively intended to cover deficits of companies and shall, therefore, be allocated directly to the budget of the beneficiary company.

Regarding this matter, it is possible to observe from the General Budget of the Union of the last years an increasing amount of budget allocation in independent state companies for capital increase. Among these companies is the *Federal Data Processing Service* (Serpro), which has received four contributions for capital increase from 2005 to 2014. On the other hand, the company has presented sharp reduction in cash flows – from R$ 388 million at the end of 2005 to R$ 31 million at the end of 2014 and net cash deficits on 2006, 2008, 2009, 2010, 2011, 2013 and 2014, although contributions occurred in the period have leveraged the balances, which demonstrates a possible dependence of the state company.

Given this scenario, the following question is raised: Has Serpro met the legal requirements and maintained the characteristics necessary to an independent state company from 2005 to 2016? To answer this question a research was developed aimed at evaluating the self-sufficiency of Serpro operational activities regarding cash generation, so as to allow its continuity as independent state-owned company *vis-à-vis the controlling shareholder in the period from* 2005 to 2016.

This research proves to be relevant as it aims to encourage the debate on an issue still controversial in the Brazilian public sector: the characterization of the loss of independence by state-owned companies. This debate is particularly opportune if analyzed considering that maintaining a loss-making entity as independent overloads the National Treasury, that is, the general society. Moreover, there practical consequences of contributing to the planning and execution of public audits whose purpose is to analyze the c conditions of dependence of independent state-owned companies, based on accounting information.

Moreover, the paper aims to contribute to the literature on Fiscal Responsibility. The issue develops as the approaches of previous studies (Gerigk, Clemente, & Ribeiro, 2014; Linhares, Penna, & Borges, 2013; Azevedo, 2013; Mello & Dalchiavon, 2012; Santos & Alves, 2011) are analyzed.

Finally, the study explores the discussion on whether the accounting analysis provides the knowledge of the economic, financial and operational profile of an entity in the public sector

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with the purpose of reducing the asymmetry of information between the company and the management of state-owned companies.

2 THEORETICAL BACKGROUND

2.1 Dependent and Independent state-owned companies in the Public Administration

The state-owned companies can only be created by legislative authorization, issued according to the case, and as regards the autonomy for executing its budget; it will depend on the characterization as to its level of dependency from the relevant controlling entity.

Complementary Law n. 101 (2000), of section II, Art. 2º, defines as controlled company those whose majority of the share capital with voting rights belongs to the Federation, while, in section III, dependent state-owned company is defined as "controlled companies that receive financial resources for the payment of personnel or general expenses, or the payment of capital expenses, excluded, in the latter case, those arising from capital increase". Based on the foregoing, it can be inferred that dependent state-owned companies are those whose income generation is insufficient to meet recurrent expenditures, thus requiring budgetary / financial resources from the National Treasury, a situation that subjects them to the provisions of Complementary Law n. 101, unlike independent state-owned companies.

In greater detail, the section II, of Art. 2, of the Federal Senate Resolution n. 43 (2001), further describes the fact that the company, having received financial resource in the immediately preceding year, has "budgetary authorization under the Annual Budget Law [LOA] for receiving financial resources for the same purpose". In the light of said resolution, it is evidenced the need for a payment of personnel or general expenses, or the payment of capital expenses in the previous year, with the receipt of financial resources for the same purpose budgeted in the current year. Therefore, according to this resolution, a single transfer, or sporadic transfers is not enough to characterize the company's dependence. For that, it is necessary both the receipt of financial resources in the previous year and the budgetary forecast in the current year.

This rule can make it very difficult to characterize the condition of dependence of a state-owned or mixed company, given that the financial transfer may take place a single time, but in a volume large enough to cover more than one financial year, thus avoiding a new budgetary authorization. In this way, the relevant company, from the formal point of view, remains independent, but, essentially, the resources previously received finance its continuity.

Moreover, STN Ordinance n. 589 (2001), in Art. 3 sole paragraph, alongside with Art. 7 of Interministerial STN/SOF Ordinance n. 163 (2001), establishes that resources transferred as financial allowance are exclusively intended to cover corporate deficits and should, therefore, be allocated directly to the beneficiary company's budget. Based on these legal standards, state-owned companies that are in deficit and, in such conditions, still receives public resources, shall have these amount classified as financial allowance, and the beneficiary company is included in the Fiscal Budget, as a unit of that budget, that is, the deficit characterizes the loss of independence, and thus the company is removed from the Investment Budget and covered under the Fiscal Budget.

As regards transfers of public resources to loss-making companies, Art. 167, VIII, of the Constitution of the Federative Republic of Brazil (1988), further requires specific legislative authorization when using fiscal and social security resources to cover corporate losses. Although the deficit is referred to in the two standards (STN Ordinance no. 589, 2001 and Interministerial Ordinance STN/SOF no. 163, 2001), it should be noted that the legislation does not provide the means for its characterization. This study develops a methodological choice to fill this gap (see section 2.2).

This methodological choice seeks to gather the conditions necessary to allow the characterization of a state-owned company as a dependent, namely: (1) to identify whether the expenses is budgeted in the Fiscal and Social Security Budgets; (2) even if integrating the Investment Budget, identify whether the company is in deficit when receiving resources from the controlling entity - situation which results in its inclusion in the Fiscal and Social Security

Budgets, and, therefore, in the loss of independence; (3) check in the Investment Budget whether the company receives financial contributions from the controlling entity for the payment of personnel or general expenses, or the payment of capital expenses, even if it is not in deficit (except for an increase in equity interest) in the previous year, with the receipt of financial resources for the same purpose budgeted for the next year.

2.2 Evaluation of the Financial Situation through Cash Flow Analysis

Recent studies on the economic and financial situation of companies in Brazil and abroad, such as Sun, Ding, Guo & Li (2016) and Mamede, Nakamura, Nakamura, Jones, & Jardim (2017), has focused on corporate finance, whose main objective is to analyze the capital structure of companies. The practical contribution of these works is that they present an adequate capital structure for the financial managers of institutions, whether private or state-owned, leading to a lower level of cost of capital (Aslan & Kumar, 2012; Nisiyama & Nakamura, 2015).

Furthermore, there are papers addressing public finances, discussing the control of the indebtedness of federative entities, and the logic and / or budgetary process at different levels (e.g., Hatadani, 2015, Azevedo, 2016). This paper, however, addresses the cash management of a state-owned company, discussing in particular the financial deficit as an evidence of dependence on the controlling entity.

According to Fernandes & Meireles (2013), the financial autonomy of a company can be understood as the capacity of providing itself the financial resources necessary to deal with operational setbacks. Therefore, the financial situation (deficit or surplus) is a result of such capacity / autonomy.

As referred to in section 2.1, the law is deficient in specifying which type of *deficit* – economic or financial – the company must present so that the contribution is considered an allowance and requires specific legislative authorization for the transfer of the resource, further failing in choosing the methodology for calculating such deficit. Using the concept of financial *deficit*, assessed based on the information contained in the Cash Flows Statement (DFC) disclosed in accordance with Technical Approval 03 of the Accounting Practice Committee [CPC] – PT CPC 03 (CPC, 2010) for analyzing whether there are indications of loss of independence, stands as a conservative choice when compared to economic deficit.

According to Braga & Marques (2001), many financial performance indicators can be obtained from the DFC, especially those related to the cash flow generated (or consumed) by the regular operating activities of the company. According to Quintana, Porto & Lemos (2008), the DFC is relevant as it evidences, for internal and external users, how the cash management is conducted, in other words, how the company manages the available resources in a given period, evidencing its origin and application, as well as the company's ability to honor its obligations in the short term. Thus, indexes obtained from this statement, such as those proposed by Braga &Marques (2001), can help analysts, creditors and other stakeholders in forecasting future cash flows and in the performance evaluation of the current flows, thus posing as a tool to monitor financial performance (Bachmann, Tonin, Colauto, & Scherer, 2014).

In this sense, it would be possible to check from the DFC: (a) the company's capacity to generate future positive net cash flows; (b) the company's capacity to honor its obligations, to pay dividends and loans assumed; (c) the company's liquidity, solvency and financial condition; (d) the rate of the conversion of earnings to cash; (e) to compare the operational performance of different companies, by eliminating the effects of different accounting treatments for the same transactions and events, among others (Braga & Marques, 2001). In other words, the use of indicators obtained from the DFC facilitates the interpretation of the company's financial situation (in particular, in the present study, the financial deficit), which, therefore, highlights the relevance of these indicators compared to the conventional structure, profitability and return indicators obtained from the Balance Sheet, for instance.

Braga & Marques (2001) present the following groups of financial indexes that can be obtained from the information disclosed in the DFC: (i) Cash Coverage Ratio; (ii) Capital Expenditure Ratio; (iii) Cash Flow Return Indicators and (iv) Performance Quality Ratio. The study of these authors focused on illustrating these indicators with data from Companhia Vale

do Rio Doce and Centrais Elétricas de Minas Gerais (CEMIG). While this study amplifies the application of these indicators, alongside with the proposal of Almeida (2000) (see section 4).

3 METODOLOGY

This study consists of a descriptive and documentary research of a qualitative nature focused on the Serpro case. Analyzes have been carried out horizontally and by indicators, based on the information obtained from the financial statements of the company studied hereunder, from 2005 to 2013, as Serpro began to publish such statements only as of 2005.

Initially, aimed at analyzing the financial situation of Serpro, a horizontal analysis of cash balances and cash flows from operational (FCO), investment (FCI) and financing activities (FCF). The assessment of the he horizontal variation has used as basis the previous year. In this sense, 2005 is the benchmark only for 2006, and so on.

Almeida (2000) presents a comparative table (Table 1), through which it is possible to classify in which stage a company is by means of a cash flow analysis. Worth noting, however, that such analysis shall be carried out alongside other indicators in order to confirm the observed trends. For this purpose, two indicators listed in Table 2 are later calculated, with reference to Braga and Marques (2001) & Almeida (2000).

Table 1
Stages of the Organization

Cash Flow / Stage	Creation	Expansion	Maturity	Decline
Operational – FCO	-	+	++	+
Investment – FCI	- -	-	-	+
Financing – FCF	++	+	-	-

Note. Source: Almeida (2000)

In summary, information contained in Table 1 can be interpreted from the organization's development cycle. Upon the Creation, a greater contribution is required to dealing with the permanent investments and, therefore, the operational cash flow (FCO) tends to be negative. In the *expansion phase*, the FCO is expected to be positive, however, still requiring the fund raising to address necessary investments. In the *maturity* phase, the organization presents a greater inflow of resources via FCO and, to the same extend, the payment of funds raised and dividends occurs, via negative financing cash flow (FCF). Finally, in the *decline* phase, a positive FCO is expected, given the reduction of receivables and inventories. However, due to the demobilization, the investments cash flow (FCI) becomes positive. Table 2 summarizes the indicators used in the present study.

Table 2
Indicators for performance analysis from the DFC

Indicator/formula	Indicators against the research objective
Payment of debts with cash = (FCO – dividends) ÷ liabilities	Aims to evaluate the ability of Serpro to honor its obligations, only with the free cash generated by the company's business. The indicator assists institutions in assessing the entity's ability to honor its obligations, with the cash generated from its operations, to cover existing debts.
Payment of dividends with cash = FCO ÷ total dividends and interest on equity	Provides evidence of Serpro's ability to pay dividends and interests on current equity based on the FCO flow.
Performance Quality = FCO ÷ earnings before interest and taxes	This indicator aims to provide the study with the following evidences: (i) indicate the operational cash generated by the operational performance; (ii) indicate the dispersion between operational cash flows and operational profits disclosed by Serpro.
Investment/financing = FCI ÷ FCF	Compare Serpro net flows necessary for the purposes of investment with those generated from financing.
Coverage of Investments = FCO ÷ FCI	Evaluates Serpro's ability to finance its investments with resources generated from its operation.

Continue

Table 2 (continued)

Indicator/formula	Indicators against the research objective
Total Return = FCO ÷ (FCI+FCF)	Assesses the level of Serpro's internal resource generation for its investment and financing activities.
Return on Profit = FCO ÷ Net Income for the year	Indicates how much of Serpro's net income is realized financially. The return of net income as regards cash.
Return on assets = FCO before interest and taxes ÷ total assets	The cash value generated by Serpro operations for each monetary unit of the applied asset.
Return on Equity = FCO ÷ net equity	Evidences if Serpro has been able to generate cash. In this sense, it presents the of cash recovery rate of investments made by its shareholder - the Union.

Note. Source: Braga, R., & Marques, J. A. V. D. C. (2001). Evaluation of the liquidity of companies through analysis of cash flow statement. *Revista Contabilidade & Finanças, 12*(25), 06-23.

Regarding the indicators, it is worth noting that, an adaption to the cash return on assets is made so that the study comprises only fixed and intangible assets, considering that these are the most expressive items in the consumption of financial resources. The investment-financing indicator has not been used, as the investment coverage index itself is sufficient for the purpose hereunder. Moreover, for calculating the indicators: (a) the "financial performance" is the concept of interest used in the formulas, which is the sum of the financial income less the interest for the year, reported in the Income Statement for the year; (b) dividends plus interest on shareholders' equity is the concept of dividends used; (c) the FCI is converted to positive so as to enable the analysis of the financing and investment ratios and (d) the FCF and FCI are converted to positive so as to enable the analysis of the total return index.

Therefore, the horizontal analysis has enabled to compare homogeneous elements of successive periods - cash by cash -, that is, a perspective evaluation of the cash flow. In addition, the analysis of indicators has further enabled the comparison of cash flow items with elements of other statements, such as: Explanatory Notes, Budget Laws and Decrees authorizing the capital increase on recurring receipts of contributions for capital increase in Serpro.

Considering the object hereunder, data have been subject to nominal analysis, without deflation, which, therefore, poses as a limitation to the results. Additionally, the study has been conducted with a single dependent state-owned company. Another limitation lies in the fact that this paper has been developed from the perspective of the external user, thus unconnected to the process of preparation of the financial statements as a primary source. And, within such perspective, it has not been possible to identify any references to expansion plans or projects budgeting that demand specific contributions.

4 ANALYSIS OF RESULTS

As stated in the Management Report, Serpro was established by Law no. 4,516 (1964) and falls under Law n. 5,615 (1970) as a state-owned company, with full capital from the Union. Since 2004, Serpro has migrated from the Social Security and Fiscal Budget to the Investment Budget of state-owned companies, thus assuming the status of an independent state-owned company. The main implication of this shift is the suspension of financial resources from the National Treasury to finance current expenditures.

After becoming independent, Serpro has been authorized to receive some resource contributions, namely: (1st) June 2008 in the amount of R$ 271 million for capital increase (Law 11,647, 2008); (2nd) December. 2010, in the amount of R$ R$ 250 million (Provisional Measure No. 515, 2010), with financial transfer carried out in two installments: R$ 184 million (2011) and R$ 66 million (2012); and (3rd) 2014, in the amount of R$ 193.6 million (Law No. 12,942, 2013).

4.1 Cash balance analysis

Considering the occurrences during the period hereunder (2005-2016), an analysis was developed observing the behavior of the final cash balance, according to Figure 1.
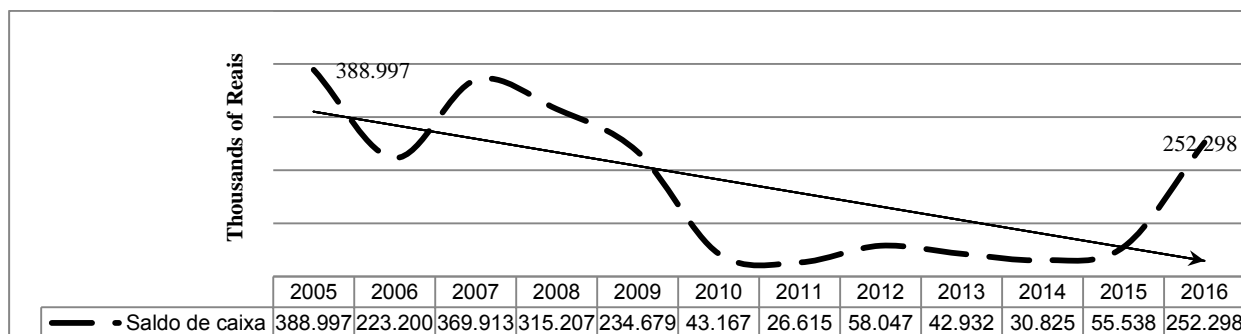
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Saldo de caixa	388.997	223.200	369.913	315.207	234.679	43.167	26.615	58.047	42.932	30.825	55.538	252.298

Figure 1. Evolution of the final cash balance for 2005-2016
Source: Research data (2017).

It is clear that, in 2005, Serpro has presented a significant cash reserve in comparison with the following balances of this item. However, Figure 1 evidences a sharp reduction in the final cash balance over the period analyzed, especially up to 2014. From R$ 389 million at the end of 2005, Serpro jumps to R$ 31 million at the end of 2014 – its first year as an independent company –, representing a reduction of 92%, although the balances have been leveraged by contributions during the period. In the years of 2015 and 2016, a recovery of the cash balance is observed, amounting to R$ 55 and R$ 253 million, respectively, but it is still lower than the beginning of the historical data series. In the period from 2005 to 2014, it can be observed that the injections of resources in Serpro via capital increase were not sufficient to meet the successive reductions of resources available. The increase in the need for resources evidences possible signs of inefficiency of the internal cash generation when recomposing balances used.

The trend graph, shown in Figure 2, where the final cash balance is evidenced with and without the effect of the contributions in order to comparatively verify the financial performance of the company, corroborates this analysis. In spite of the transfers of funds occurred on a timely basis in 2008, 2011, 2012 and 2014, the average has been used in this study in order to find a trend in the effect of the contributions for the period (2008-2016). This procedure is particularly justified considering that the balances were leveraged after the transfers. Adopting this procedure, it is observed that the contributions rectify a situation of total cash exhaustion, and are used to leverage the balance line.

Since 2009, considering the line without capital contribution (Figure 2), the result of the analysis started to indicate the loss scenario, where without the support of the Union, there would not be financial resources to pay regular operational expenses, such as personnel expenses, until the end of 2015.

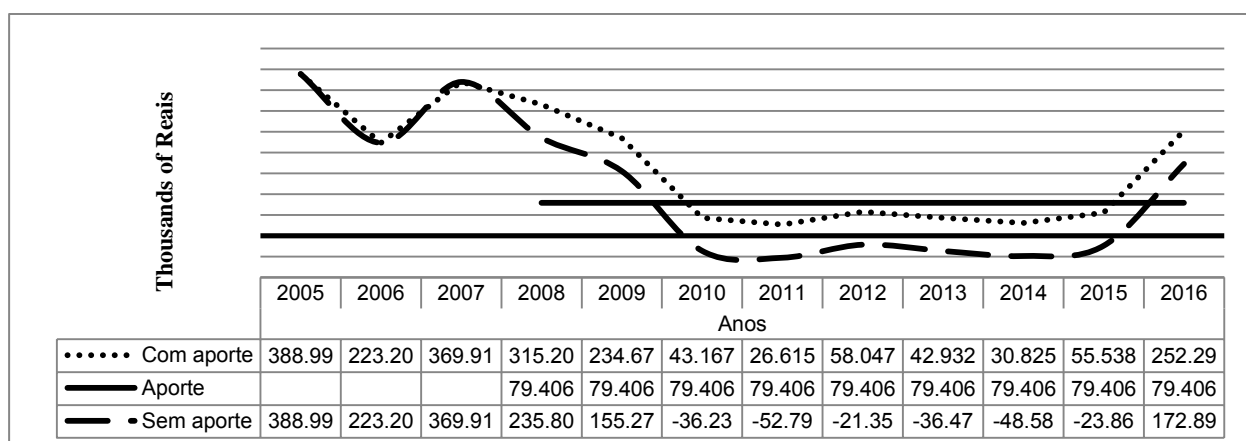|	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
						Anos						
Com aporte	388.99	223.20	369.91	315.20	234.67	43.167	26.615	58.047	42.932	30.825	55.538	252.29
Aporte				79.406	79.406	79.406	79.406	79.406	79.406	79.406	79.406	79.406
Sem aporte	388.99	223.20	369.91	235.80	155.27	-36.23	-52.79	-21.35	-36.47	-48.58	-23.86	172.89

Figure 2. Evolution of the final cash balance for 2005-2016 with linear distribution of the contribution
Source: Research data (2017).

To complement this previous analysis, Table 3 shows a summary of the cash stock, year by year, with their respective flows.

The first contribution occurs in 2008, in the amount of R$ 271 million. In that year, there is still an initial cash balance in the amount of R$ 369 million, ending with R$ 315 million, representing a reduction of 15%. Excluding the contribution, the final cash balance would be R$ 44 million, which would not support the demand for cash in 2009, in the amount of R$ 80 million (variation in the cash flows from activities).

The cash balance of 2010 carried for 2011 is R$ 43 million. In 2011, it is observed that the deficit in the FCO alone is greater than this amount, thus exceeding the entire balance of the inventory and further requiring R$ 2 million, which is then covered by the FCF surplus, through capital contribution. In 2011, therefore, it is reasonable to determine the dependence of Serpro on the contribution to pay operational obligations.

Worth mentioning that, according to income statement of 2010 and 2011, Serpro has recorded two consecutive losses of R$ 176 million and R$ 175 million, which reinforce the deficit situation of the company and, therefore, the contribution to the capital increase received in this period is in the form of a current economic subsidy, as it is intended to meet the cash needs and the amortization of operational financial deficits.

In the legal scope, besides the requirement that the transfer is authorized by specific law, there are also the implications provided for in the Budget Guidelines Law (LDO). As the transfer of funds to Serpro is not intended to (a) increase ownership, (b) supply of goods or services, (c) payment of loans and financing granted and (d) financing, which are the exceptions provided for in the LDO's, Serpro would be removed from the Investment Budget and transferred to the Fiscal Budget, thereby losing its independence and being subject to the state-owned companies legal regime. Worth pointing that, in 2011, there has been a payment of dividend in the amount of R$ 40 million and, given the aforementioned reasons, it raises indications that these may have been paid with funds provided by the Union.

As regards 2014, the following should be highlighted: as the cash balance at the end of 2013 transported to 2014 is R$ 42 million, this would be the limit for a possible deficit in the operational activity to be demonstrated in the FCO, which has been exceeded by R$ 65 million (FCO performance of -108 million). Corroborating this observation, in the 2013 budget, a special loan of R$ 193.6 million (Law No. 12,942, 2013) has been approved in favor of the Ministry of Finance to make a capital contribution to Serpro in 2014. So, at this moment the need for capital contributions to finance its operational activities is fully confirmed.

From the data listed herein Serpro's loss of independence is verified, given that in 2012 the company has received the amount of R$ 66 million and, in 2014, the same financial resources to finance recurrent deficits. According to art. 2, item II, of Federal Senate Resolution n. 43 (2001), it would become a state-owned company.

Table 3
Statement of compound cash flows with opening and closing balances

Item	2005	2006	2007	2008	2009	2010
Opening cash balance	335.955	388.997	223.200	369.913	315,207	234.679
FCO	409.612	66.689	313.372	-171.858	57.819	-134.219
FCI	-42.014	-106.130	-127.232	-90.735	-128.347	-57.293
FCF	-314.556	-126.356	-39.426	207.739	-10.000	0
Variation	53.042	-165.797	146.713	-54.854	-80.528	-191.512
Balance other banks				147		
Closing cash balance	**388.997**	**223.200**	**369.913**	**315.207**	**234.679**	**43.167**
Item	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Opening cash balance	43.167	26.615	58.047	42.932	30.825	55.538
FCO	-45.192	163.564	103.469	-108.303	147.832	323.812
FCI	-115.252	-198.132	-118.584	-97.454	-123.119	-127.052
FCF	143.892	66.000	0	193.650	-	-
Variation	-16.552	31.432	-15.115	-12.107	24.713	196.760
Balance other banks				-	-	-
Closing cash balance	**26.615**	**58.047**	**42.932**	**30.825**	**55.538**	**252.298**

Note. Value in thousands of reais; Variation = Opening cash balance + FCO + FCI + FCF.
FCO – Operational Cash Flow
FCI –Investment Cash Flow

FCF – Financing Cash Flow
Source: Research Data (2017).

In summary, for the analysis of cash balances, it cannot be assumed that in all years presenting a deficit in the FCO there are indications of a possible fragility of Serpro's independence condition, as these deficits could be financed with stock from previous years. However, for the years 2011, 2013 and 2014, the indications are clear. In 2011, considering that the inventory of cash transported was insufficient to cover the operational deficit, the administration has resorted to the contribution to cover the difference, that is, Serpro has paid the current operational expenses with funds from the capital contribution of 2011. In 2013 and 2014, considering that it incurs in the hypothesis of direct dependence established by Federal Senate Resolution n. 43 (2001). This means that the receipt of resources from the Union as a contribution to the capital increase, at the deficit situation in which the Serpro was, has not adhered to the provisions of the relevant regulations.

4.2 Horizontal analysis of operational, investment and financing activity flows

Table 4, below, show the ability of the resources generated by FCO to, at least, maintain the potential level of production of the equipment and facilities of the company's current installed capacity.

Table 4
FCO deducted from financial resources intended for depreciation (in thousands of reais)

Item	2006	2007	2008	2009	2010	2011
(a) FCO	66.689	313,372	-171.858	57.819	-134.219	-45.192
(b) Depreciation/Amortization	-53.166	-73.863	-93.692	-102.124	-110.563	-133.610
(c) = (a) – (b) free FCO	13.523	239.509	-265.550	-44.304	-244.782	-178.803
Item	2012	2013	2014	2015	2016	
(a) FCO	163.564	103.469	-108.303	147.832	323.812	
(b) Depreciation/Amortization	-108.829	-120.835	-133.495	-39.995	-44.719	
(c) = (a) – (b) free FCO	54.735	-17.366	-241.797	107.837	279.093	

Nota. FCO – Operational cash flow
Source: Research Data (2017).

As can be seen, in the period from 2008 to 2011, and also in the years of 2013 and 2014, the operational activities have not been able to generate sufficient cash to maintain Serpro's current installed capacity. In these years, the replacement of fixed and intangible assets was borne with the resources from the contribution made by the controlling entity.

Another important information to be observed from Table 4 is the instability of FCO, which can indicate either that the resources have not been invested efficiently and, therefore, are not generating sufficient operational cash, or the default by major customers. When compared the behavior of FCO with the criteria presented by Almeida (2000), Serpro falls under the first scenario (see Table 1), at the initial stages of its existence, where the recurrence of a negative or modest FCO is common for investments. This scenario occurred in 6 of the last 11 years under analysis, with a persistence in the period from 2008 to 2011.

Table 5 shows Serpro's investment activities flow against depreciation / amortization for the period, and aims to enable the evaluation of the company's investment policy. If FCI is closer to the depreciation/amortization it means that the company is investing to maintain its installed capacity. How the investment is paid is not analyzed, if using the resources from the operations or with resources of the controlled entity, but rather the amplitude of the investment and if it, at least, covers the current conditions so that there is no discontinuity.

Table 5
Expansion / retraction of investments (in thousands of reais)

Item	2006	2007	2008	2009	2010	2011
(a) FCI – Investments cash flow	106.130	127.232	90,735	128,347	57,293	115,252
(b) Depreciation/Amortization	53.166	73.863	93.692	102.124	110,563	133,610
(c=a-b) Expansion/retraction	52.965	53.369	-2.957	26.223	-53.270	-18.359

Item	2012	2013	2014	2015	2016	
(a) FCI – Investments cash flow	198.132	118.584	97.454	123.119	127.052	
(b) Depreciation/Amortization	108.829	120.835	133.495	39.995	44.719	
(c=a-b) Expansion/retraction	89.303	-2.251	-36.041	83.124	82.333	

Note. Source: Research data (2017).

As observed from Table 5, during the entire period under analysis the FCI has consumed resources and, based on information contained in DFC and the Explanatory Notes, the investments are basically directed to fixed and intangible assets. The years of 2006, 2007, 2009, 2012, 2015 and 2016 present sings of expansion of the installed capacity. In these years, the consumption of resources in the investment activity was higher than the sum of depreciation and amortization. Which indicates the investments have exceeded the amount necessary to maintain the installed capacity. In the other years, sings of retraction of the installed capacity are observed, as a result of the decrease in the investments below the necessary for the replacement.

In other words, despite the negative FCI, which indicates the resources have been directed to fixed and intangible assets, the returns (of this investment) do not contribute to the sufficient generation of FCO, that is, the assets resulted from the investments have not yet demonstrated efficiency gains in production capacity. Given this scenario, it is reasonable to assume that the cause for retraction in investments relates to Serpro's inability to generate operational surpluses, considering that in the years of retraction (except for 2013) a deficit in the FCO is also evidenced. Worth noting that the FCO has "competed" with the FCI for the remainder of the FCF or the company's cash stocks.

The insufficient generation of operational cash observed in many years within the period under analysis combined with the recurrent resource demands on investment activities provides grounds for the surplus in the cash flows from the surplus financing activities, which have posed as an important source of funds for the company's cash balance, and also for covering operational expenses.

As regards the partners, considering the period when Serpro has paid dividends and Interest on shareholders' equity (2005 a 2011), the total of R$ 275 million have been paid (see Table 6), while three contributions totaling R$ 521 million have been received in the period.

Table 6
History of partners' remuneration from 2005 to 2011 in thousands of reais)

Item	2005	2006	2007	2008	2009	2011	Total
Distribution of Ordinary Dividends	20,494	41,321	29,414	56,966	10,000	40,108	198,303
Distribution of Complementary Dividends	19,460	21,020	-	-	-	-	40,480
Interest on shareholders' equity	-	-	25,000	-	10,905	-	35,905
Dividends + Interest on shareholders' equity	39,954	62,342	54,414	56,966	20,905	40,108	274,688

Note. Source: Research Data (2017).

As already mentioned, in the years of 2008, 2010 and 2011, operational activities have generated a negative FCO and, even in this case, Serpro has distributed dividends and / or Interest on shareholders' equity in the relevant years. In the light of that, it is reasonable to infer that the resources from the capital contributions have also been used to remunerate partners.

Considering the three cash flows – FCO, FCI and FCF – accumulated throughout the historical data series, the following profile of cash generation, in nominal terms: (1) FCO has generated cash in the amount of R$ 1,126 million, presenting deficit in four years (2008, 2010,

2011 and 2014); (2) the FCI has consumed R$ 1,331 from the cash, with the occurrence of disinvestment in some years; (3) the FCF represents a contribution of R$ 120 million, which, added to the FCO generated in the period and subtracted from the FCI, represents a net deficit of R$ 85 million in 11 years.

In summary, as the generation of operational cash was insufficient compared to cash consumption in other activities, the company has used funds from the Federal Government and the cash balance from previous years. Such failure could have led to insolvency if the Union had not provided resources. More specifically, in order to meet its obligations, Serpro has relied not only on the financial resources of third parties, but also on recurring contributions from the controlling shareholder (R$ 714.6 million).

An horizontal analysis of FCO, FCI and FCF has made it possible to verify that the company has not reached self-financing capacities and, in order to continue its operations, it has resorted to the aid of the controlling entity, which has made contributions for the capital increase. But, as mentioned above, whenever the company was in a deficit scenario the resources should, essentially, be received and recognized as an allowance. Therefore, Serpro has not meet the legal requirements in order to maintain the necessary characteristics of an independent state-owned company in the period from 2005 to 2016.

Worth highlighting that such assertion is made within the limitations of the adopted methodological procedures, both as regards the choice of indicators herein and given the fact the information are obtained in the condition of external user, implying that internal that could reveal a different scenario are not considered. It is also important to note the limitations of the type of analysis and research carried out , namely: qualitative and documentary research..

4.3 Analysis of Indicators

The analysis of the indicators, shown in Table 7 according to their categories – liquidity, investment and return for the period 2005-2016, corroborates the results presented in the horizontal analysis

Table 7
Summary of indicators for the period from 2005 to 2016

Indicators	2005	2006	2007	2008	2009	2010
Payment of debits with cash	1,23	0,01	0,82	-0,64	0,08	-0,27
Payment of dividends with cash	10,25	1,07	5,76	-3,02	2,77	-
Investment / financing	0,13	0,84	3,23	-0,44	12,83	-
Coverage of Investments	9,75	0,63	2,46	-1,89	0,45	-2,34
Total Return	1,15	0,29	1,88	-1,47	0,42	-2,34
Return on Profit	3,73	0,42	3,26	-237,73	1,34	0,77
Quality of the result	2,32	0,23	2,00	-3,66	0,79	0,47
Return on equity	0,69	0,10	0,42	-0,17	0,06	-0,16
Return on fixed / intangible assets	1,15	0,15	0,60	-0,32	0,10	-0,22
Indicators	**2011**	**2,12**	**2013**	**2014**	**2015**	**2016**
Payment of debits with cash	-0,18	0,30	0,16	-0,16	0,19	0,40
Payment of dividends with cash	-1,13	-	-	-	-	-
Investment / financing	-0,80	-3,00	-	-0,50	-	-
Coverage of Investments	-0,39	0,83	0,87	-1,11	1,20	2,55
Total Return	-1,58	1,24	0,87	-0,37	1,20	2,55
Return on Profit	0,26	2,48	2,21	-6,68	-0,42	-2,00
Quality of the result	0,32	1,21	0,55	-1,40	-0,34	-1,78
Return on equity	-0,05	0,16	0,10	-0,08	0,18	0,79
Return on fixed / intangible assets	-0,09	0,27	0,16	-0,16	0,23	0,66

Note. Source: Research Data (2017).

Based the liquidity indexes, it is found that Serpro has faced difficulties to pay its short-term debt, considering that, except for 2005, where for each R$ 1.00 of debt the free operating activity has generated R$ 1.23, the indicator of coverage of debt with cash has showed a low-liquidity result. It can be observed that the reason for the negative results of this indicator in the years of 2008, 2010, 2011 and 2014 is the operational deficits occurred in those years. It is shown that, besides not generating funds to pay installments of short-term debt, the demand for capital injections of the controller has also increased. Another fact to be highlighted is that, only

in 2005 (1,25), 2007 (0,82) and 2016 (0,40) this indicator has reached the level considered adequate (equal to or greater than 0.4) for healthy companies, according to Casezy and Bartzcak (1984, as quoted in Almeida, 2000). These results indicate that the company faces difficulties in generating cash through the operations to honor its financial debts.

As regards the dividends, in the years of 2010 and 2012 to 2016, there has not been any distribution thereof – null cash dividends coverage index. In the other years, despite the *deficit*s in FCO, distributions have occurred in 2008 and 2011. In 2008, dividends may have been paid with resources from the capital contribution. While in 2011 the possibility that the dividends were paid with the contribution is more evident, as the previous cash balance of 2010 (R$ 43 million) transferred to 2011 was lower than the operational *deficit* (R$ 45 millions). However, both the uncovered part of the *deficit* (R$ 43 – R$ 45) and the dividends made use of the *surplus* arising from the financing activity resulting from the contribution of the controlling entity.

As regards the investment indicators, a sharp variation is observed. The investment / financing indicators have presented negative results in 2008 (-0.44), 2011 (-0.80), 2012 (-3.00) and 2014 (-0.50). It shows that the financing activity has contributed to the payments of the investments, via capital increase. It supports the idea that, during the first two years, financing has completely covered the investments and there has been still resources left over, which have been used for regular / current operational activities. In the years of 2005 (0.13), 2006 (0.84), 2007 (3.23) and 2009 (12.83), the FCI has recorded deficit. In the years of 2010, 2013, 2015 and 2016 no movements in the flow have been recorded

As regards the return indicators, a distancing between the return on profit and the quality of the result indicators is observed. That occurs because the indicator of quality of the result disregards the effect of items that do not affect cash, such as interest, taxes and depreciation, which results in a better approximation of the cash to the results (Braga & Marques , 2001). As regards the return on profit indicator, besides some high results, its oscillations also stand out. The years of 2005 (3.73), 2007 (3.26), 2009 (1.34), 2012 (2.48) and 2013 (2.21) present positive results, while the opposite occurs in 2006 (0.42), 2008 (-237.73), 2010 (0.77), 2011 (0.26), 2014 (-6.68), 2015 (-0.42) and 2016 (-2.00). It may occur due to debts from previous periods or be a reflex of the impact caused by steep records of provisions, deferred tax credits, among others.

In most of the years under study, the quality indicator of the result, unlike the return on profit, presents low conversion of profit into cash. Although the quality indicator of the result has showed that the operational result has generated cash in 2006 (0.23), 2009 (0.79) and 2013 (0.55), it is observed that these values are relevant only in 2005 (2.32) and 2007 (2.00), which demonstrates the poor quality of the result generated. In the year of 2008 FCO was negative, and, in 2010 and 2011, both earnings before interest and tax were negative, which justifies the poor quality of the result generated.

The total return indicator, which measures the level of internal resource generation in Serpro for application in its investment and financing activities, has presented the best performance in the years of 2005 (1.15), 2007 (1.88) and 2012 (1.24). In other years, the indicator reveals an inversion of the flow, with the financing activity covering the insufficiency of the operational activity.

The return on fixed and intangible assets, due to the fact that the company has presented negative FCO in 2008, 2010, 2011, 2015 and 2016, was also negative in these years, which indicates that the company does not contribute as regards the investments. In 2005, the highest return was recorded, generating R$ 1.15 per FCO for each R$ 1.00 invested in the expansion of production capacity. In the other years, the return on fixed assets and intangible assets is below 1, which indicates that the investment decisions, evidenced from the FCI, have not been adequate.

In summary, the results of the analysis of the indicators have indicated a scenario of low liquidity and low quality of results, as well as inefficient returns on Serpro's investments in the period under study. The majority of indicators, as shown, have evidenced the need to use the capital contribution for the payment of debts. It was found, from the period analyzed, that in 2006 – second year of Independence – Serpro has actually presented dependency evolution, marked by the negative net cash variation (R$ 165 million) and decrease in the FCO value. This trend has remained in the following years, with: (1) sharp fall in the cash stock from R$ 388

(2005) to R$ 43 (2013), regardless of the contributions; (2) insufficiency of operating activities - without the contribution, from 2010 onwards, the liquidity would face difficulties; (3) evidence of inadequacy in investments – recurring negative FCO; (4) Recurring positive FCF, financing also the operational activities; (5) cash balance carried for 2011 lower than the operational deficit and (6) sharp fall in the liquidity indicators and investment ratios, confirming that the financing covers investment and operational activities, as already evidenced by horizontal analysis.

Addressing the compliance with formalities required in transactions with capital contributions, a non-compliance with Federal Senate Resolution n. 43 (2001) in found, given that, while considered independent, Serpro has received financial resources from the Union, in fiscal year 2012 and obtained a budgetary forecast in 2013, with contribution in 2014, which characterizes dependence.

Finally, two aspects can be highlighted from the analysis. The first refers to the need to review the recognition of the capital contributions in the controlling entity in the periods in which the transfers have occurred to, as a matter of fact, cover Serpro's financial deficit. As the resource has been formally intended to capital increase, the cash counterpart, in the controlling entity, was accounted as investment, when, essentially, the counterpart should account for as effective expense, thus changing the net equity. The second addresses the need to reflect the situation against the requirement of specific law to authorize the allowance, as defined in the Constitution of the Federative Republic of Brazil (1988) and Complementary Law n. 101 (2000).

5 CONCLUSION

This study has aimed at analyzing whether Serpro should have remained as an independent state-owned company from 2005 to 2016, considering the characteristics and requirements to fall under this condition. Based on the legal standards, as well as the horizontal analysis and the analysis of indicators, this study concludes the existence of indications of possible conditions of dependence by Serpro on the Union resources in the financing of current expenses, what indicates the non-compliance with the regulations on the characteristics and requirements necessary to an independent state-owned company.

More specifically, the study has analyzed the behavior of cash stocks as regards the operational, investment and financing activities flow. The analysis of cash balances has evidenced the inability of the operational assets in maintaining or producing new cash stocks. The cash of a R$ 388 million stock at the end of the year of 2005 – first year of Serpro as an independent company -, has jumped to R$ 31 millions at the end of the year of 2014, which represents a reduction of 92%, even having the balances leveraged by the contributions occurred in the year. In the following year (2015 and 2016) some recovery is observed in the balance, however, still below the initial balance of the historical data series (252 millions), which condition is aggravated if considering the contributions made in the amount of R$ 715 million (accumulated net cash deficit for the period in the amount of R$ 798 million).

The reason for such performance is explained in the analysis of the flows and confirmed by the results of liquidity, investment and return indicators. The combination of these analysis have demonstrated the insufficiency of the operational activities, given the absence of conditions to generate enough surpluses to cover the investments, leading the independent state-owned company to the recurrently resort to the assistance of the Union.

Based on the evidence that the cash balance of 2010, carried for 2011, has not been sufficient to cover not even the operational *deficit* of 2011, it is therefore characterized the indications necessary to prove that Serpro was in a deficit situation and that any such assistance by the union would, essentially, represent an economical allowance for financing current expenses. Such indication is corroborated by the fact that the company has received financial resources in 2012 and 2014. Therefore, it indicates that Serpro, in 2011, 2013 and 2014, no longer met the characteristics and requirements necessary to fall under independent state controlled company, pursuant to Complementary Law n. 101 (2000) and Federal Senate Resolution n. 43 (2001). As regards the years of 2015 and 2016, although it has generated a positive FCO, it has recorded losses (2015 = R$ 356 million, 2016 = R$ 162 million) and a reduction in its shareholders' equity (2015 = R$ 804 million, 2016 = R$ 410 million).

Worth emphasizing that the results described hereunder are limited to the analysis object and shall not be considered to other independent state-owned companies. Additionally, regarding the research limitations, the indicators hereunder have not been adjusted to the inflation of the period. In future research, the methodology herein proposed should be used, but using inflation-adjusted accounting data, in order to identify the extent to which the conclusions herein evidenced could be changed or ratified, as well as the use of this methodology for other companies, in order to validate or not the use of such indicators for the analysis of independence. As an alternative, the applicability of the indicator proposed by Fernandes and Meireles (2013) can be assessed, in order to verify the occurrence of a possible economic deficit by Serpro.

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LEVEL OF DISCLOSURE IN SUSTAINABILITY REPORTS IN COMPLIANCE WITH GLOBAL REPORTING INITIATIVE (GRI)

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ABSTRACT

The objective of the study is to analyze the level of disclosure in the sustainability reports in compliance with the Global Reporting Initiative (GRI) in the companies listed on the BM&FBovespa. In this sense, a descriptive research was carried out with procedures of documentary collection and quantitative approach. The sample analyzed was composed of 93 companies listed on the BM&FBovespa, which published the sustainability report in 2014 in compliance with the GRI model. The results show that to the extent that there is more complexity in the information that comprises the groups of indicators presented in the sustainability reports, it reduces the level of disclosure by companies. Regarding the level of disclosure, it is noticed that the largest group of companies is concentrated with low disclosure, representing around 30% of the analyzed companies, attending up to 50 items out of the 150 that the report proposes. As for the economic sector, public utility presented a higher level of disclosure in sustainability reports in compliance with the GRI model. It is concluded that, although there has been an increase in the dissemination of sustainability reports, companies still need adaptation to meet the GRI indicators, improving the quality of the reports disseminated and increasing the transparency of the various stakeholders.

Keywords: Social and environmental responsibility. Sustainability reports. GRI.

1 INTRODUCTION

The environmental responsibility of productive organizations is being discussed intensely recently and a part of society has become more demanding with the origin and sustainability of the products. In addition, companies have been asked about their responsibility for the use of natural resources and the environmental impacts of their activities.

Environmental problems such as climate change, resource depletion, water scarcity and air pollution, among others, have a major impact on the Earth and its inhabitants. All these factors have led the population to become aware of the importance of natural resources to reverse the process of environmental degradation (Sartori, Ensslin, Campo & Ensslin, 2014).

Social and environmental responsibility is understood as a set of actions focused on the management strategy of companies, aiming at their commitment to natural resources and at the same time contributing to economic development. The technological advance allowed the emergence of mechanisms capable of inserting social and environmental information into the management process of companies. They comprise an artifact of competitiveness in the segment of performance (Lima, Cunha, Morreira, & Porte, 2012).

The movements in favor of sustainability have made social and environmental responsibilities more prominent in recent times, generating greater concern in the various areas of knowledge. These areas started to work on the subject observing the involvement of the whole society, seeking solutions that do not harm the environment (Martins, Quintana, Jacques, & Machado, 2013).

The development of environmental management is an important step, as it leads companies to sustainable practices and to guarantee a better quality of life for society. Disclosure of environmental management through reports provides a competitive advantage, since it demonstrates the activities that the company undertakes and is fundamental so that its image before society is not neglected (Bauer & Naime, 2012).

Due to the needs of companies to demonstrate concern about natural resources and the effects that their activities have on the environment, the commitment to transparency and social and environmental responsibility has become essential to avoid waste and degradation. Disclosure reports become important tools for informing society and other stakeholders about the responsibility and awareness of natural resource management and its rational use. Thus, proper accounting for these records has become necessary (Freitas & Oleiro, 2011).

Reports that record social and environmental responsibilities generate transparency in the execution of their activities demonstrate greater involvement of the company with society; provide benefits for the community in general and for the natural resources that will be preserved (Mazzioni, Di Domenico, & Zanin, 2010).

For the users, the reports function as a mechanism for evaluating the practices developed in society. The social and environmental information disclosed enables to construct instruments capable of measuring and controlling the consequences, such as the costs and benefits derived from the social and environmental actions carried out by the company (Holanda, Cardoso, Oliveira, & Luca, 2012).

From the context presented, it is intended to respond to the following research problem: What is the level of disclosure in sustainability reports in compliance with the Global Reporting Initiative (GRI)? The objective of the study is to analyze the level of disclosure in sustainability reports in compliance with the Global Reporting Initiative (GRI). They were considered as specific objectives: (i) To identify the level of disclosure in each group of indicators suggested by the GRI; (ii) To analyze the disclosure of companies, segregating them into groups according to the level of disclosure and by economic sector of performance; (iii) To evaluate the capacity of different levels of corporate governance to influence social and environmental disclosure; (iv) To verify the existence of explanatory factors for the level of disclosure observed in the sample investigated.

The study demonstrates how companies are disclosing environmental, social and economic practices in their management and how this information is presented to stakeholders. The most complete artifact for the disclosure is the report proposed by the GRI, which serves as an aid tool for decision making, standardization of information and comparability.

The importance of the study is justified, due to the growing concern of society with the preservation of the environment. This is one of the reasons why companies need to innovate and invest in sustainable practices to ensure the credibility of consumers, investors and, above

all, society itself. Therefore, it is necessary for companies to disseminate environmental and social practices, as well as management of the environmental impacts caused (Di Domenico, Mazzioni, Gubiani, Kronbauer, & Vilani, 2015). Environmental management is important as a tool for market differentiation, as it demonstrates the concern with natural resources, the negative effects on society, and the concern with the perenniality of the entity.

Proper disclosure of social and environmental practices can add value to organizations, as it not only promotes information transparency, but also improves communication and reduces discrepancy with its counterparts. Disclosure is an important tool for internal management and control. It establishes standards of environmental documents, in addition to include an organizational strategy (Rosa, Ensslin, Ensslin & Lunkes, 2011). The GRI is the most widely used model, helping companies to understand and communicate the impacts caused to the environment in a transparent way to their users (*Global Reporting Initiative* [GRI], 2015).

In addition to the introduction, the study presents four more sections. Section two addresses the literature review, which is divided into three subsections: environmental sustainability, environmental disclosure, and related studies. Section three presents the methodological procedures; section four demonstrates the analysis of results and section five outlines the conclusions and future researches.

2 REVIEW OF THE LITERATURE

The social and environmental sustainability grant demonstrates the commitment of companies to the environment and society. The subsection of environmental sustainability demonstrates the concepts around environmental management and its impacts on the environment. The subsection of environmental disclosure addresses the importance of dissemination of practices developed by companies and the impact of their image before society. And finally, the subsection of related studies presents results obtained in similar researches.

2.1 Social and environmental sustainability

Environmental sustainability refers to innovative ways of reducing impacts to the environment through activities that do not harm natural resources and benefit their conservation. The word sustainability is usually related to the environment, but also encompasses social and economic aspects, which, interlinked, seek balance over time (Nogueira & Faria, 2012).

Medeiros, Souza, Franzin, Almeida e Souza (2013) understand environmental sustainability as the process of company development, without affecting the natural resources existing in the place and that in no way can generate scarcity and extinction, aggravating imbalance or promoting aggressions of the essentiality of preservation of life.

Sustainability is measured by the company's ability to move natural resources in an innovative way, without harming existing resources, seeking alternative materials that do not impact on their costs and preserve the environment (Tomé & Bresciani, 2015).

Sustainability is characterized by efficient, responsible and sustainable management that generates benefits for all stakeholders, who use their resources or invests financially to avoid negative environmental damage and preserve it properly, which works with a good operation of the preservation of the environment (Holanda *et al.*, 2012).

In this way, sustainability makes it possible to guarantee, preserve, conserve and secure natural resources over a long period of time. It satisfies the present needs of living beings and provides a continuation of the future needs of the next generations (Pereira, Pereira, Monteiro, & Paixão, 2015).

On the other hand, social responsibility makes the company rethink its institutional mission and how to conduct its corporate business, seeking to remain in the globalized market, in which we work with ethical, transparent and responsible position in the activities carried out. Company with social responsibility is the one that offers its products and services thinking about the preservation of the environment and sustainable development, not only complying with the laws, but acting in the best way, prioritizing information for quality management (Holanda *et al.*, 2012).

Seeking to eliminate the negative effects of economic growth on nature, sustainability is linked to the preservation of natural resources and self-regulation of the consumption of these resources. Its main objective is to improve the quality of life and to use renewable resources properly (Siche, Agostinho, Ortega, & Romeiro, 2007).

The term sustainability has undergone constant evolution. It gained interpretation in the economic environment, that is, it is not only to guarantee environmental resources for future generations to survive, but to act in a way to control the damages that occur with its degradation, to make companies to promote environmental preservation, applying its wealth in a fair way to achieve its economic efficiency (Bauer & Naime, 2012).

Sustainability reflects a policy of economic and social development, without causing damage to the environment and its natural resources. The quality of conservation and continuity depends on human activities. Such development requires the preservation of global equilibrium. It reflects on socioeconomic effects. Society needs to avoid waste and depletion of natural reserves (Rodrigues & Duarte, 2011). Sustainability is the way to meet human needs without harming the future of the next generations (Santos, 2014).

The vision of society and customers has been changing. It begins to evaluate and criticize the degradation that occurs in the environment, caused by the companies. If well employed, sustainability can become strategic for the company. It can lower its costs by reusing materials, increasing its sales, and winning customers who opt for sustainable companies. This concern of the society and customers with the sustainability tends to generate changes in better quality of life of the future generations (Scarpin, Walter, Mondini, & Roncon, 2013).

Companies began to focus on sustainability. They work on social, environmental and economic issues, play an important role as agents involved in sustainable development, create strategies for contribution and satisfaction of sustainability (Nobre & Ribeiro, 2013).

Seek improvements in the productive sector aimed at the preservation of natural resources is also constant, observing actions to recover the environment that has been degraded with its activities and developing environmental education for employees, third parties and the community in general (Freitas & Oleiro, 2011).

The adoption of social and environmental management influences employees and consumers regarding the preservation of environmental resources and how to maintain these resources for future generations with sustainable quality of life, guaranteeing the well-being of society as a whole (Freitas & Oleiro, 2011).

Companies have the need to implement environmental policies to reduce or eliminate environmental aggression, which is caused by the activities carried out. But this is not just about environmental policy practices. It is necessary to disseminate this information to society, reporting the impacts, objectives and goals they intend to achieve. The relationship between the company and society must be transparent. It should show the actual situation that the activities exert in the environment. It must ascertain when any problem occurs, avoiding to generate risks, pressures or judgments on the part of the society (Carneiro, De Luca, & Oliveira, 2008).

Companies that worked exclusively with financial reports came to realize the importance of drawing up sustainability reports, to make public their vision, challenges and social, environmental and economic results, and thus enable interaction with society (Mazzioni, Di Domenico, & Zanin, 2010). The most common way to report sustainability information is through the specific reports. Although these types of reports assume different titles, they relate to the same theme (Carreira & Palma, 2012).

Sustainability practices are being used not only by companies, but by society, which is constantly seeking the best quality of life. These practices avoid harmful effects caused to the environment, bring innovations of reuse, as they reduce the aggressions and preserve the natural resources. Therefore, sustainable practices and the preparation of environmental conservation reports are necessary.

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2.2 Social and environmental disclosure

Companies have been reporting social and environmental disclosure reports, not only for their interest in complying with the standards, but also to preserve their image and demonstrate transparency, providing effective information for different users.

Social and environmental disclosure is a means used by companies to meet the demands of the international community, necessary to generate information to governments, shareholders, administrators, employees, among other users. This information is available on websites and in annual company reports (Silva, Vicente, Pfitscher, & Rosa, 2013).

In Brazil, although companies report sustainability reports, their process is still embryonic, as there is a lack of adequacy in the accounting aspect. This creates a deficiency in disclosure and prevents the company from better managing its environmental issues. In addition, it deprives users of information that can help them get to know the company in greater depth (Carneiro, De Luca, & Oliveira, 2008).

Thus, there is no legislation in Brazil that obliges companies to disseminate statements of environmental and social practices. The companies that voluntarily disclosure their sustainability reports are visible (Di Domenico & Lavarda, 2013).

The company has the option to disseminate certain information, which is not required by law. In this way, each company acts according to the view of its managers. They can provide users with enough information to understand the activities and their risks (Beuren, Nascimento, & Rocha, 2013). The information disclosed voluntarily shows that companies are concerned with improvements and maintenance of results (Borges, Rosa, & Ensslin, 2010).

Voluntary dissemination means that there is no legal obligation to disseminate environmental information in the company's reports during the years, but it is not an easy task for managers to choose what information to make available. The lack of any of the information may lead to questions regarding the way to control environmental and social issues, directly and indirectly affect the entity's business. The society will only be aware of environmental information if the company is committed to the transparency and veracity of the facts that occur (Boff & Beuren, 2012).

Concern about social and environmental issues and the dissemination of this information interfere with organizations as an ethical attitude. Companies need to detail their performance to users and disseminate information with transparency. If they do not do so, they may harm the continuity of the company, causing losses in the market for the others, which demonstrate environmental aspects in their reports (Pereira, Carvalho, & Parente, 2011).

For the disclosure to be efficient information, it is necessary that the company's management and performance be revealed. These aspects include information on balance sheets, result, emissions, social and environmental, consumption of natural resources, among others, that must be demonstrated in its reports. The lack of such information could lead to market loss and credibility (Rosa *et al.*, 2011).

The lack of standardization in sustainability reports opens up a space for companies to freely choose the type of report for the use of social and environmental disclosure resulting from productive activities (Cavalcanti, Almeida, Almeida, & Limeira, 2009). In order to respond to society, companies need instruments to disseminate their information, activities developed and how it affects the environment. This information will be demonstrated, through reports, to determine if the company has financial conditions to ensure longevity without destroying the environment (Guimarães, Rech, Cunha, & Pereira, 2014).

The most widely used report today is the Global Reporting Initiative (GRI), which has an international standard and helps organizations understand and communicate the company's impacts on sustainable issues. GRI model reports use standardized information norms, describe economic, environmental and social impacts. In addition, they increase both the comparability and the quality of the information available to the stakeholders, allowing a better decision between the relationship between the company's activities and its impact on sustainable development (GRI, 2015).

The GRI is an international organization with the mission of developing and disseminating sustainability reports. This organization helps to understand and communicate environmental impacts. It contributes to the standardization of information and verifies compliance with the reports presented by the companies (GRI 2016).

With the growing concern of society with the environment, sustainability reports serve as

tools to support decision-making, as well as showing concern about the negative effects of its activities on natural resources. Therefore, it is necessary to disclosure in the reports the environmental performance, show concern and guarantee a better quality of life for future generations.

2.3 Related studies

This topic presents related studies, with similar approaches, which demonstrate how companies have disclosed environmental issues and their concern about resource degradation in their reports.

Beuren *et al.* (2013) verified the relationship between the level of environmental disclosure and the economic performance of open corporations classified in Guia Você S/A - Best Companies for You to Work For. The results of the research show that: a) in the categorization of the environmental disclosure, 680 information was disclosed, distributed in 99 complete information, 126 incomplete information and 455 missing information; b) at the level of environmental disclosure score, 55% of the companies received insufficient concept, 35% regular and 9% good, and c) the relationship between the level of environmental disclosure and the economic performance of the companies showed a weak correlation. It was concluded that, using the Data Envelopment Analysis (DEA) methodology, it was concluded that not all companies that presented a higher level of disclosure of environmental information obtained efficient economic performance.

Beuren, Di Domenico e Cordeiro (2013) investigated the behavior of Environmental Management Accounting (EMA) indicators, as evidenced by the Global Reporting Initiative (GRI) of pulp and paper companies listed on BM&FBovespa. The results show that Suzano Papel e Celulose S.A. presented efficiency throughout the period, comparing the volume of material resources, water and energy consumed and the volume of production generated. Klabin S.A. gained efficiency in the period, particularly as of 2008. Celulose Irani S.A. decreased its efficiency in 2008 and 2009 and recovered in 2010. They concluded that the physical indicators of the EMA, disclosed in the GRI from 2006 to 2010, indicate that these companies have been seeking greater efficiency in the use of natural resources, which is important to ensure the future of the next generations.

Miranda and Malaquias (2013) analyzed the level of environmental disclosure provided by Brazilian open corporations in their financial statements. The results showed that the level of environmental disclosure increased over time. By means of the correlation analysis, it was verified that the variable size presented a positive and moderate correlation with the levels of disclosure of 2005 and 2010. Through the Student Test, it was possible to verify if the entities of regulated sectors disclose more environmental information of the than those in non-regulated sectors. The results showed that companies in the regulated sectors expose more environmental information than those belonging to the non-regulated sectors. Then, the analysis of variance was carried out. It can be verified that the level of corporate governance is not directly related to the levels of disclosure.

Santos, Silva, Lorandi (2014) examined the level of environmental disclosure of the companies listed on the BM&FBovespa, belonging to the electric energy segment. It was identified that among the 65 companies listed in this segment, 75% (49 companies) disseminated the social and environmental report corresponding to 2011. The National Electric Energy Agency (ANEEL) directs companies to publish the social report (IBASE model) within the social and environmental reports. However, it was verified that only 49 companies of the sample disseminated it. The results of the research indicated that 34 companies disclosed 90% or more of the analyzed items, 28 of them described all in the reports. It was concluded that the intervention of the regulatory body boosts companies in the Brazilian electricity sector to be accountable to society, considering that natural resources are essential for the operationalization of the activities carried out.

Di Domenico et al. (2016) identify the determinants of the level of disclosure in sustainability reports, in compliance with the Global Reporting Initiative (GRI), in the companies listed on the BM&FBovespa. The results show that, as there is more complexity in the items that comprise the groups of indicators of sustainability reports in compliance with the GRI model, the level of disclosure of companies is reduced. The public utility sector presented a higher level of disclosure in sustainability reports in compliance with the GRI model. The determinants for the

level of disclosure were: wealth generated, net margin, return on shareholders' equity and return on assets.

The results of the researches showed that the companies have assumed a concern with the environment. They introduced the environmental disclosure in their reports, even though they still lacked adaptations. Companies seek to improve transparency and results year after year to meet stakeholder expectations. They should therefore provide information that will benefit their image before the market and ensure a better quality of life for the next generations.

3 METHODOLOGICAL PROCEDURES

In this section, the methods and procedures used to conduct the research are presented. As for the objectives, the study is characterized as descriptive, because its deepening is based on the analysis of the informational characteristics of the sustainability reports of the companies listed on BM&FBovespa. Regarding the procedures, the research was based on the documentary analysis, for examining the sustainability reports of the companies composing the sample. And as for the approach to the problem, it is quantitative, by the use of statistical techniques for analysis and interpretation of the data.

The research population was composed of 757 companies listed on the BM&FBovespa and the sample includes 93 companies that disseminated the sustainability report in 2014, based on the GRI model. Financial companies were excluded because accounting and financial policies, corporate strategies and the way of operating have different characteristics from other organizations.

The data collection instrument was constructed by means of a check list in accordance with the requirements of the international model GRI version G4, composed of 150 indicators, divided into 13 groups. The analysis considered some characteristics of the companies analyzed, in order to verify the existence of differences in the level of disclosure, as shown in Figure 1.

VARIABLE	METRIC	SOURCE
Social and environmental disclosure	Total points obtained in relation to GRI 4's total social and environmental indicators. 1 is assigned to the information fully disclosed; 0.5 to partially disclosed information; and 0 to the information not disclosed.	Annual and/or sustainability reports, GRI model.
Corporate governance	Group 1 = companies of the traditional group; Group 2 = companies listed in the IGCX	BM&FBovespa
Indebtedness	Group 1 = companies with indebtedness below the median; Group 2 = companies with indebtedness above the median;	Economatica
Concentration of ownership	Group 1 = companies with concentration below the median; Group 2 = companies with concentration above the median;	Economatica
Audit committee	Group 1 = companies that do not have an audit committee; Group 2 = companies that have an audit committee;	BM&FBovespa
Presence of institutional investor	Group 1 = companies in which institutional investors hold up to 5% shareholding; Group 2 = companies with institutional investors whose shareholding is more than 5%;	BM&FBovespa
Internationalization of companies	Group 1 = companies that do not have ADR's issuance; Group 2 = companies that have ADR's issuance;	BM&FBovespa
Size	Group 1 = companies with size below the median; Group 2 = companies with size above median;	Economatica

Figure 1. Study variables
Source: Prepared by the authors.

Figure 1 presents the main characteristics studied in relation to the disseminate of sustainability reports, in which the dependent variable used is composed of the indicators proposed by the GRI and the independent variables refer to the organizational characteristics.

For the data analysis, were used: (i) descriptive statistics measures, to identify the performance of the companies investigated regarding social and environmental disclosure levels; (ii) Kolmogorov-Smirnov (KS) test to verify the normality of the data; (iii) Levene test to verify equality of variances; (iv) t test for equality of means and ANOVA test to identify the existence of differences in the disclosure of information from the different business

characteristics. The analyzes were developed using the Statistical Package for the Social Sciences (SPSS®).

4 ANALYSIS AND INTERPRETATION OF RESULTS

This section presents the level of disclosure of the indicators proposed by the Global Reporting Initiative (GRI) in the sustainability reports of the companies listed on the BM&FBovespa. The GRI allows the extraction of data from environmental disclosure of companies, generating relevant information for users, improving environmental performance management and assisting decision making in identifying practices that can be improved.

In order to meet the specific objective of identifying the level of disclosure in each group of indicators suggested by the GRI, the consolidated results are presented in Graph 1. The subdivision is given in thirteen groups: strategy and analysis; organizational profile; material aspects and limits; stakeholder engagement; report profile, governance; ethics and integrity; economic performance; environmental performance; social performance; human rights; society and responsibility for the product.
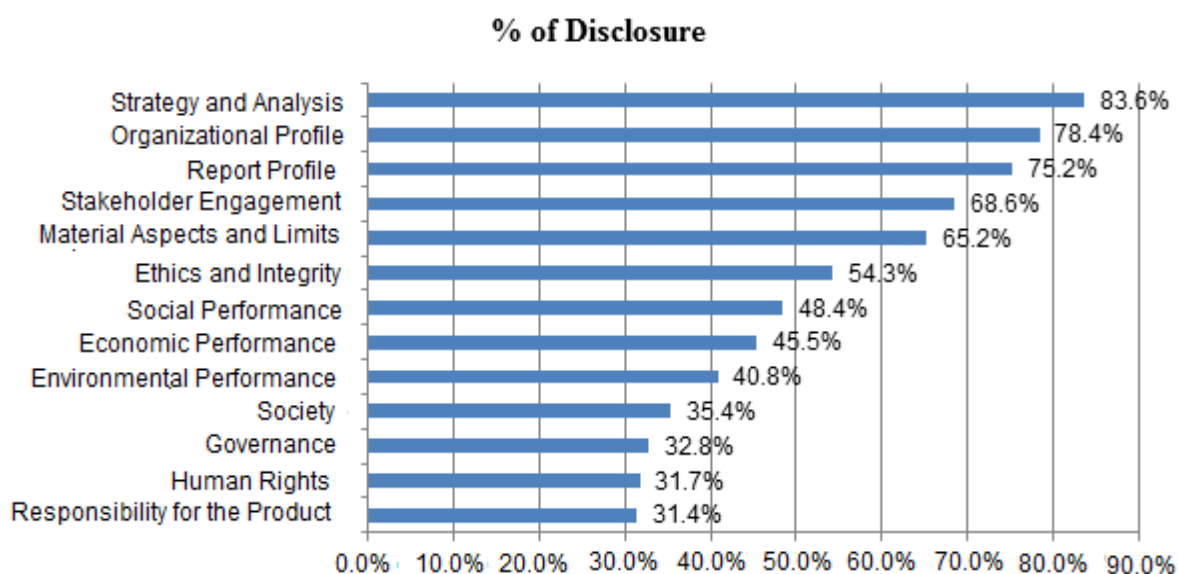

% of Disclosure

Group	%
Strategy and Analysis	83.6%
Organizational Profile	78.4%
Report Profile	75.2%
Stakeholder Engagement	68.6%
Material Aspects and Limits	65.2%
Ethics and Integrity	54.3%
Social Performance	48.4%
Economic Performance	45.5%
Environmental Performance	40.8%
Society	35.4%
Governance	32.8%
Human Rights	31.7%
Responsibility for the Product	31.4%

Figure 2. Social and environmental level of evidence by group of indicators
Source: Research data.

Figure 2 shows that the groups of indicators that presented a higher level of disclosure are: strategy and analysis (83.6%), organizational profile (78.4%) and report profile (75.2%). A possible explanation for the high level of disclosure is related to the character of cadastral information, such as the name of the organization, main products/services, location of the headquarters, countries in which it operates, markets of performance, size of the organization, relevance of sustainability, main impacts, risks and opportunities, period covered by the report, date of previous report, issue cycle and contact data.

Subsequently, the stakeholder engagement indicator groups (68.6%), material aspects and limits (65.2%) and ethics and integrity (54.3%) emphasize. The level of disclosure may be related to the low complexity of the information, including the disseminate of the process adopted to define the content of the report, the limit inside and outside the organization, aspects of identified materials, stakeholder groups engaged in the organization, basis for identification, selection and approach of the organization to engage stakeholders, principles, values, behavioral norms and how organizations communicate concerns about unethical or incompatible behaviors with legislation.

The other indicators, such as social performance, economic performance, environmental performance, society, governance, human rights and responsibility for the product presented a low level of disclosure, with a mean below 50%. In this way, it can be seen that companies partially disclose social and environmental information, which indicates the need to expand these practices that indicate the social commitment of companies.

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The groups of indicators of social performance, human rights, society and responsibility for the product detail the impacts of the organization on the social systems in which they operate. They cover information on employment, labor practices, health and safety at work, training and education, diversity and equal opportunities, freedom of association and collective bargaining, supplier assessment, impact on corruption, public policies, unfair competition, customer safety and health, customer privacy and compliance with laws and regulations.

The group of economic performance indicators addresses the impacts of the organization on the economic conditions of the stakeholders and the local, national and global economic system. The group of environmental performance indicators demonstrates the organization's impacts on the ecosystem, including soil, air and water. On the other hand, governance presents its structure and composition, the role played by the highest governance body in defining the organization's purpose, values and strategy, risk management and in the preparation of sustainability reports. The result indicates that companies are not going into environmental, social, governance, human rights and responsibility for the product issues, which harms the results of reports and signals to users of information fragilities in social commitment

Compared with the study by Di Domenico, Dal Magro, Mazzioni, Preis and Klann (2016), issues related to human rights, environmental performance and responsibility for the product present low disclosure. They show how companies are not going into these issues and partially report to the extent that information is more complex. In the study by Beuren et al. (2013), the environmental disclosure presented information in its incomplete predominance. They corroborate the low level of disclosure by companies.

In general, it can be inferred from Graph 1 that the greater the complexity in the items that comprise the groups of indicators presented in the sustainability reports in compliance with the GRI model, the lower the level of disclosure by the companies, the more complex the information, the greater the likelihood of full dissemination not occurring.

However, the number of companies that use sustainability reports is increasing, although the information is presented in a partial way with regard to GRI model indicators.

In order to meet the objective of analyzing the disclosure of companies, segregating them into groups according to the level of disclosure and by economic sector of performance, Tables 1 and 2 were elaborated.

Table 1 shows the mean level of disclosure of the companies, according to the distribution to the groups and the number of items disclosed, from the checklist elaborated in compliance with the GRI model. The checklist included 150 items. For each company studied, a score of 0 to 150 was assigned.

Then, the companies were grouped according to the score obtained, obeying the following scales of disclosure: Group 1 - from 0 to 50 items met (low), Group 2 - from 51 to 75 items met (mean), Group 3 - from 76 to 100 items met (high) and Group 4 - above 100 items met (higher).

Table 1
Disclosure of indicators by groups of companies

Disclosure Level	N° of Companies	% mean of companies	Mean n° of items disclosed
Group 1	28	30.11%	33
Group 2	27	29.03%	64
Group 3	24	25.81%	89
Group 4	14	15.05%	123

Note. Source: Research data.

Table 1 shows the disclosure of the indicators by groups of companies. The largest concentration is in Group 1. It represents 30% of the companies analyzed. The number of items met ranges from 0 to 50 of the 150 observed. It represents low disclosure. The results show that companies report lower than compound items in reports. They do not meet the complexity of other indicators.

Group 4 contains the companies that adequately meet the items in the reports, that is, around 15% of the companies analyzed showed an mean of 123 of the 150 observed items. In this way, these companies are working ethically, transparently and responsibly. They are concerned about environmental resources.

These results corroborate those presented by Beuren et al. (2013) that indicate that the information disclosed in the sustainability reports, in their predominance, are absent. They represent an insufficient concept of disclosure and do not meet the criteria required by the GRI model.

Table 2 shows the mean level of general disclosure, segregating companies according to economic sectors.

Table 2
Mean level of disclosure of the 150 indicators of the GRI model in relation to the sectors

Performance Sectors		General Disclosure Level			
		Group 1	**Group 2**	**Group 3**	**Group 4**
Oil, Gas and Biofuel	Percentage	3.57%	3.70%	4.17%	7.14%
	Number	1	1	1	1
Basic Materials	Percentage	7.14%	14.82%	12.50%	14.29%
	Number	2	4	3	2
Industrial Goods	Percentage	7.14%	7.41%	29.17%	14.29%
	Number	2	2	7	2
Non Cyclic Consumption	Percentage	14.30%	18.52%	4.17%	14.29%
	Number	4	5	1	2
Cyclic Consumption	Percentage	35.71%	22.22%	0.00%	7.14%
	Number	10	6	0	1
Health	Percentage	7.14%	3.70%	4.17%	0.00%
	Number	2	1	1	0
Information Technology	Percentage	3.57%	0.00%	0.00%	0.00%
	Number	1	0	0	0
Telecommunications	Percentage	0.00%	7.41%	8.32%	0.00%
	Number	0	2	2	0
Public Utility	Percentage	21.43%	22.22%	37.50%	42.85%
	Number	6	6	9	6
TOTAL	Percentage	**100%**	**100%**	**100%**	**100%**
	Nº of Companies	**28**	**27**	**24**	**14**

Note. Source: Research data.

Table 2 shows the level of disclosure for the economic sectors, divided into four groups: 1 (low disclosure), 2 (moderate disclosure), 3 (high disclosure) and 4 (extensive disclosure). It demonstrates the sectors of action that present greater disclosure and those that need to conform to the requirements of the GRI, providing greater transparency to its stakeholders.

The results presented in Table 2 show that of the 14 companies that disseminated their sustainability reports with superior disclosure, 42.85% are concentrated in the public utility sector; 14.29% in the basic materials sector, non-cyclical consumption and cyclical consumption, respectively. From the 24 companies with a high level of disclosure in sustainability reports, the largest concentration is in the public utility sector (37.50%), consumer sector (29.17%) and basic materials (12.50%). From the 27 companies that presented mean disclosure in sustainability reports, the largest concentration of companies is in the sectors of cyclical consumption and public utility, with (22.22%), respectively. Then, it is the non-cyclical consumption sector (18.52%) and basic materials (14.82%). Finally, from the 28 companies that demonstrated low disclosure in the sustainability reports in compliance with the GRI model, 35.71% are concentrated in the cyclical consumption sector; 21.43% in the public utility; 14.30% in the non-cyclical consumption; 7.14% in basic materials, industrial goods and health and 3.57% in the oil, gas and biofuel and information technology sectors.

The results indicate that the intervention of a regulatory agency boosts public sector companies to disseminate information to society, given that resources are essential for the

operationalization of the activities carried out. With this, the public utility sector presents a higher level of disclosure.

The application of the statistical tests observed the results obtained in the Kolmogorov - Smirnov (KS) test for the quantitative variables, namely: concentration of property, indebtedness, size and the index of disclosure, as shown in Table 3.

Table 3
Kolmogorov-Smirnov test for normality of the data

		CONC	END	Ln_TAM	IE
N		93	93	93	93
Normal Parameters	Mean	52.55	0.62	6.85550645	69.9839
	Standard deviation	24.906	0.208	0.634037747	32.49435
Maximum Extreme Differences	Absolutes	0.097	0.086	0.053	0.051
	Positives	0.097	0.086	0.053	0.051
	Negatives	-0.082	-0.046	-0.026	-0.045
Kolmogorov-Smirnov Z		0.940	0.831	0.507	0.488
Asymptotic Significance (2 tails)		0.340	0.495	0.960	0.971

Note. Source: Research data.

From the results of Table 3, the normality of the data is confirmed, it is possible to work with parametric tests to analyze them.

Another objective of the study is to assess whether the capacity of different levels of corporate governance influences social and environmental disclosure. In order to verify the existence of differences in the social and environmental disclosure level in relation to the different levels of corporate governance, the analysis of variance (ANOVA) technique was used with the Tukey test, as shown in Table 4.

Table 4
ANOVA results from the multiple comparisons of the Tukey's test according to the NGC

(I) NDGC	(J) NDGC	Mean Difference (I-J)	Standard Model	Significance	Confidence Interval 95%	
					Lower limit	Upper limit
1	2	-9.86979	11.02661	0.807	-38.7401	19.0005
	3	-7.07813	12.87631	0.946	-40.7914	26.6352
	4	-12.03239	7.68380	0.403	-32.1504	8.0856
2	1	9.86979	11.02661	0.807	-19.0005	38.7401
	3	2.79167	14.86828	0.998	-36.1371	41.7204
	4	-2.16260	10.69145	0.997	-30.1554	25.8302
3	1	7.07813	12.87631	0.946	-26.6352	40.7914
	2	-2.79167	14.86828	0.998	-41.7204	36.1371
	4	-4.95427	12.59048	0.979	-37.9192	28.0107
4	1	12.03239	7.68380	0.403	-8.0856	32.1504
	2	2.16260	10.69145	0.997	-25.8302	30.1554
	3	4.95427	12.59048	0.979	-28.0107	37.9192

Note. Source: Research data.

In the analysis of Table 4, the companies were segregated into four groups: 1 - companies with level 1 of governance; 2 - companies with level 2 of governance; 3 - companies in the new market; 4 - traditional market companies.

The result obtained with ANOVA, based on the multiple comparisons of the Tukey test, shows that there are no significant differences in the disclosure index and levels of corporate governance. The BM&FBovespa listed companies that voluntarily adhere to corporate governance levels tend to disseminate more information that goes beyond rules and disclosure requirements.

The study by Gallon, Beuren and Hein (2007) presented a relationship between the degree of disclosure and the level of corporate governance. In contrast, Gonçalves, Weffort, Peleias e Gonçalves (2008) and Cong and Freedman (2011) show that the level of corporate governance does not seem to influence the relationship.

To verify the existence of explanatory factors for the level of disclosure, observed in the investigated sample, parametric tests were used. From the normality in the distribution of the quantitative variables data, verified through the K-S test (Table 3), the Levene test for equality

of variances and the t-test for equality of means were used. The results are shown in Table 5 and Table 6.

Initially, Table 5 presents the disclosure statistics for each segregation of group of business characteristics, described in Table 1.

Table 5
Group Statistics

Characteristics	Group	N	Mean	Standard deviation	Standard error of the mean
COM_AUDIT	1	26	62.3654	31.86363	6.24897
	2	67	72.9403	32.48875	3.96913
INV_INST	1	41	75.5122	31.06254	4.85115
	2	52	65.6250	33.22677	4.60772
INTER	1	63	72.3333	33.00440	4.15816
	2	30	65.0500	31.36392	5.72624
NGC	1	32	62.7969	30.90356	5.46303
	2	61	73.7541	32.91791	4.21471
CONC	1	46	71.3478	33.43748	4.93009
	2	47	68.6489	31.84847	4.64558
END	1	46	68.1630	33.79334	4.98256
	2	47	71.7660	31.43313	4.58499
TAM	1	46	65.7391	34.74090	5.12227
	2	47	74.1383	29.92358	4.36480

Note. Source: Research data.

The results presented in Table 5 indicate that companies with an audit committee, which do not have an institutional investor, which do not have ADRs, with a differentiated level of corporate governance, with a higher concentration of capital, with a higher level of indebtedness and with higher values of assets presented higher levels of disclosure.

The verification of the existence of statistical significance in the mean differences found in Table 5 was carried out from the Levene test (to verify the equality of variances), followed by the t test for independent samples, as presented in Table 6, using the emphasized business characteristics in Table 1. When the Levene test is shown to be statistically significant (<0.05), equal variances should be considered as non-assumed. Otherwise, consider the equal variances assumed.

The results obtained did not allow identifying any significant differences between the groups of companies constituted according to the defined criteria. One possible explanation for the results is that the concern with environmental disclosure is at a similar level of consideration, regardless of the operational characteristics of the companies.

Table 6
Levene test and t-test of means

Characteristics		Levene test for equality of variances		t-test for equality of means		
		F	Significance	T	df	Sig.
COM_AUDIT	Equal variances assumed	0.049	0.826	-1.416	91	0.160
	Equal variances not assumed			-1.428	46.381	0.160
INV_INST	Equal variances assumed	0.171	0.680	1.466	91	0.146
	Equal variances not assumed			1.478	88.338	0.143
INTER	Equal variances assumed	0.373	0.543	1.011	91	0.315
	Equal variances not assumed			1.029	59.862	0.308

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Table 6 (continuation)

	Characteristics	Levene test for equality of variances		t-test for equality of means		
		F	Significance	T	df	Sig.
NGC	Equal variances assumed	0.180	0.672	-1.557	91	0.123
	Equal variances not assumed			-1.588	66.680	0.117
CONC	Equal variances assumed	0.072	0.789	0.399	91	0.691
	Equal variances not assumed			0.398	90.552	0.691
END	Equal variances assumed	0.592	0.444	-0.533	91	0.596
	Equal variances not assumed			-0.532	90.204	0.596
TAM	Equal variances assumed	1.561	0.215	-1.250	91	0.214
	Equal variances not assumed			-1.248	88.454	0.215

Note. Source: Research data.

Based on the analyzes carried out, it is noted that although the number of companies that disseminate sustainability reports has increased over the years, companies are partially disseminating the information in their sustainability reports. They disclose cadastral information and fail to present more complex information. They harm the result of the report and its relevance before the users.

The social and environmental reports have an important condition to improve the image of the companies before the society, based on the information proposed by the models. However, it is relevant to disseminate not only cadastral information, but also to cover more complex information. Companies need to be aware of and adopt sustainable practices, act in a way to control damages to the environment and guarantee environmental resources for future generations.

5 CONCLUSION

The study aimed to analyze the level of disclosure in sustainability reports in compliance with the Global Reporting Initiative (GRI). In this way, the research is characterized as descriptive, with documental and quantitative analysis. It was developed in a sample of 93 companies listed on BM&FBovespa that disseminated the sustainability report in 2014, based on the GRI model.

The results pointed out by the study allow us to conclude that to the extent that there is more complexity in the information that comprises the groups of indicators presented in the sustainability reports in compliance with the GRI, the level of disclosure by the companies is reduced. Thus, the complexity of the information of an item is related to the possibility of not disseminating such data, while more conventional indicators (such as cadastral data) are disclosed with success due to the ease of dissemination of the data.

Regarding the level of disclosure of indicators by groups of companies, it is noticed that a large part of it discloses of inferior mode items composed in the sustainability reports. They do not meet all the indicators. On the other hand, there are companies that disclose voluntarily and with quality indicators in the reports. They demonstrate their concern for the environment and work ethically, transparently and responsibly.

Contrary to expectations, higher levels of corporate governance did not conduct companies to higher levels of social and environmental disclosure. Regarding the sector of activity, it was observed that the regulated companies, predominantly of the public utility sector, boosted the level of disclosure in compliance with the GRI model, constituting a factor of distinction. It is observed that the analysis of the disclosure by sector was carried out only in descriptive terms, since the number of companies by group and by sector did not allow an inferential analysis.

The disclosure of sustainability reports is important for organizations, since it allows building credibility, trust and transparency to stakeholders, as well as demonstrating their concern for natural resources. Although the number of companies with the available report has grown compared to previous studies, the information is still presented in a partial way; it does not cover all the composite indicators in the GRI model.

The results presented signs that the larger companies, with an audit committee, which do not have an institutional investor, do not have ADR's issuance, with a differentiated level of corporate governance, with a higher concentration of capital and with a higher level of indebtedness, presented higher levels of disclosure. However, the differences for their counterparts were not significant.

Based on the research carried out, it is proposed that new studies be carried out to analyze the performance of environmental indicators in sectors with heavy dependence on the production of natural resources. In addition, other business characteristics can be used to justify the level of disclosure.

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TRANSFER PRICE AND ITS ACCOUNTING AND TAX IMPACTS WITHIN A AUTOMOTIVE FILTERS COMPANY IN IMPORTS AND EXPORTS OF GOODS

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ABSTRACT

Brazilian law require specific accounting entries, when the subject is Transfer Price. These existing rules were created to prevent Brazilian companies with foreign subsidiaries from using the foreign currency drain strategy, since without appropriate system of laws; prices could be undervalued so that there would be no due payment of taxes in the transfer of products abroad. The objective of this study is to verify the accounting and tax impacts on the use of the transfer price in the import and export of goods, for an automotive company. For this, the applied research was used, through the collection of documentary data and unstructured interview. Considering the legal penalties when the law is not applied properly, the following research problem was presented: What are the accounting and tax impacts, when the calculation methods appropriate to the transfer price are applied? The results obtained for the calculation of the import for the product P603 showed that the PRL Resale method, to obtain the lowest adjustment compared to the PIC method in the year 2014, was the most appropriate to be used in the calculation of the transfer price. At the time of export, the CAP method was the most appropriate accounting and tax for the products F175F13 and R161F042, since it was the only possible method to calculate the transfer price for the company studied. As a conclusion of the research, it was verified that the use of the methods recommended by the current Brazilian tax law could contribute to the quality of the accounting information and, at the same time, would result in an increase in the calculation basis of the taxes on income.

Keywords: Transfer price. Management accounting. Tax adjustments. Subsidiary companies. Import. Export.

1 INTRODUCTION

International trade has the characteristic to enable countries to exchange goods and services in an ever more agile flow. With the strong growth of multinational companies in Brazil, the transfer price, also internationally known as transfer price, has been used to control commercial and financial transactions carried out with related companies and domiciled abroad.

Many companies have operations around the world and often administer the subsidiaries

on a geographical basis. In general, these subsidiaries carry out transactions of purchase and sale of goods or services. Fiscal authorities play a role of regulators of the amounts transferred in this transaction, in a coercive and also regulation way, to avoid foreign currency drain (Newton & Steevens, 2013).

Brazilian law requires specific accounting entries when the subject is transfer price. There are legal penalties when the law is not applied or when it is applied incorrectly, which may make operational results unfeasible.

In view of the need to avoid losses of tax revenues, the transfer price is an important instrument whose primary function is to avoid undue increase in costs of companies with operations between related parties or when one of the parties resides in a tax haven. With the introduction of Law no. 9430 (1996), there is a tendency to establish criteria for tax control and adjustment of transfer prices delivered.

Empirical studies, such as that presented by Chen & Chen (2014), discuss transfer price in line with agency theory and suggest a standardization for the use of appropriate tax rates and values to be used in the transfer price as a form of influencing the performance mediation system and also of transferring price autonomy.

Thus, the objective of this study is to analyze the transfer pricing calculation methods applicable to the export and import of goods in a multinational automotive filter industry. For the delimitation of the research the following problem was established: What are the accounting and tax impacts, when the calculation methods appropriate to the transfer price are applied?

In order to achieve the central objective, the specific objectives were classified, such as analyzing the Brazilian transfer pricing rules applicable to imports and exports of goods, calculating the most appropriate methods for the products proposed in the study, verifying the accounting impacts and, finally, analyzing the tax effects of using transfer pricing methods.

The applied research configured the design of this study, which used data and unstructured interview to carry out the analysis and verify the impacts of the transfer price on the products studied.

Thus, this study presents the theoretical concepts about the use of transfer pricing, the methodology adopted, the results found and the conclusion of the application of the study in practice, as a way of corroborating the central objective of this research.

2 TRANSFER PRICE

Transfer price is the value of the purchase or sale of goods, services or rights, traded between organizational units of the same company that are located in different countries. These values may increase or decrease market values.

For Higuchi (2015), with the regulation of Law no. 9430 (1996), a great step was taken in Brazilian law to reduce over-invoicing in imports and under-invoicing in exports. Most of the time, it is not a question of lawful tax avoidances, but of even gross tax evasions. With the advent of the law that defines transfer prices, the risk of dishonest companies being assessed has become higher.

All individuals or legal entities resident in Brazil that engage in transactions with individuals or legal entities residing abroad, considered to be related or, even if not related, residing in a country that does not tax the income or that taxes at a rate of less than twenty per cent are subject to the transfer pricing rules (Andrade, 2011).

In order to control the related transfer price, only the individual or legal entity resident or domiciled abroad, who owns a company located in Brazil and who carries out transactions between them, will be considered. In this sense, the definition of art. 23 of Law no. 9430/96, which considers that a legal entity domiciled in Brazil is one whose headquarters or subsidiary is formally incorporated in national territory, is appropriate.

For Schoueri (1999, p. 111), transfer price is "the amount charged by a company in the sale or transfer of goods, services or intangible property, the related company." With the methods of import and export, it is determined that the price parameter must be consistent for each good, service or right, for the whole calendar year. Since the company can choose one of the methods for each different good or raw material, that is, use different methods for different

goods, as long as it does not change method in the calendar year. With this, it may have excess cost in one good and not have in another.

In the import and export operations of goods with related companies, the transfer price is calculated according to the methods contained in Table 1.

Table 1
Import and export methods

Import	Export
PIC	PVEx
PRL Production	PVV
PRL Resale	PVA
CPL	CAP
PCI	PECEX

Note. Source: Adapted from Law no. 9430, December 27, 1996 (1996). It provides for federal law, social security contributions, administrative process of consultation and other measures. Retrieved from http://www.planalto.gov.br/ccivil_03/leis/L9430.htm

Delivery price is the average price actually realized in the imports or exports of the period in question, involving the related or originated person. The price parameter is the price obtained by means of one of the methods stipulated in the transfer pricing law. The excess cost paid on import or the lower sales revenue received on export, involving the related person or tax haven, is considered profit and carrying basis for taxation of CSLL and IR, becoming the adjustment or fiscal exposure.

According to Normative Instruction n. 1312, art. 3, of December 28, 2012, the costs, expenses and charges related to the goods, services and rights are those contained in the import or acquisition documents, in the transactions carried out with related person. They are deductible in the determination of the actual profit and the basis of calculation of the social contribution only up to the value that does not exceed the price determined by one of the methods provided by law (Kimi Shiraishi, Gonzales, & Fernandes dos Santos, 2015).

Schäfer, Petri, Gasparetto & Mattos, in 2015, published a bibliometric research on international literature focused on transfer pricing and showed that most of the authors researched seek to work out the management aspects of the transfer price and that there is still a vast path to be explored in this theme, since the accounting and tax aspects are less explored.

On the other hand, Morch, Castro, Castro and Cogan (2008) and Checoli (2013) studied the transfer price in financial securities for banks, emphasizing the need for detailed studies on the theme. Cripe, Harmon and West (2015) applied an accounting/tax study to a company with headquarters in Italy and a subsidiary in the United States, in order to demonstrate the influence of the correct use of the transfer price in the financial statements. They concluded that there is a significant influence of the application of the transfer price correctly in the accounting information.

When it comes to intangible assets, the transfer price has its significance because it is an item also supported for this asset category. Franklin and Mayers' (2016) research presents a history of the international courts on the transfer price in relation to the American market. There is a need for regulation and creation of legal weapons that consider the use of this tool.

Kumar and Sosnoski (2011) proposed in their study the prediction of transfer pricing problems for small and medium-sized companies. They assessed the need for clarity regarding tax issues and reduced the exposure of these companies to double taxation.

The transfer price may change the accounting, tax and management information. The study carried out by Araujo (2013) verified the management effect, considering the calculation methods of the transfer price and its impact on the contribution margin of a Brazilian company, related to a Chinese company.

2.1 Transfer price on the import of goods

When importing goods, the prices to be used as a parameter price will be compared with the constant acquisition documents, observing if the delivery price in the acquisition of the related company is higher than the price used as a parameter price. The amounts resulting from the excess of cost, computed in the company results, due to the difference between the comparative prices are added to the actual profit. In this way, it can be said that if the price is lower, no adjustment with tax effect can be made.

According to art. 45, I, II of Law no. 10.637 (2002), in cases of determination of excess cost of acquisition of goods, services and rights imported from related companies and which are considered nondeductible in determining the actual profit and the calculation basis of the social contribution on the net profit, the legal entity shall adjust the excess cost, determined by one of the methods provided for in the law, at the end of the accounting period, by means of account debit entry of accumulated results and of account credit of the asset in which the acquisition of goods, rights or services was accounted for. These entries must remain there recorded at the end of the calculation period, or own account of cost or expense of the calculation period, that records the value of the goods, services or rights in case these assets have already been written off from the asset account registered their acquisition.

The PIC method, or independent comparative price method, is set forth in Article 18, I, of Law no. 9430 (1996). It was defined as the weighted arithmetic average of the prices of goods, services or rights, identical or similar, calculated in the Brazilian market or in other countries, in purchase and sale operations undertaken by the interested party or by third parties, under similar payment conditions.

That means the method compares the price charged for property or services in a controlled transaction with that charged for property or service in an independent comparable transaction. If there are differences, precise adjustments should be made to eliminate the impact.

The method of resale price less profit or PRL has its standardization according to art. 18, II, of Law no. 9430 (1996) and is defined as the weighted arithmetic average of the country's sales prices of imported goods, rights or services under similar and calculated payment conditions.

This method shall be used in the case of imported goods, services or rights applied to production and resale. In that case, the parameter price of the imported goods, services or rights will be calculated excluding the value added in the country and the profit margin of sixty percent by 2012 and from 2013 with the profit margin of forty percent, thirty percent or twenty percent, according to the economic activity sector.

If the company imports the same good to be resold and applied in the production of one or more products, or in the event that the imported good is submitted to different production processes in Brazil, the final parameter price will be the weighted average of the values found by the application of the PRL Method.

In 2013, there was a change in Brazilian law, passing the percentage from sixty percent to forty percent, thirty percent and twenty percent, depending on each industrial sector (Higuchi, 2015).

The method of production cost plus profit, known as CPL, is defined as the weighted average cost of producing goods, services or rights, identical or similar to the taxes and fees charged on the export in the country where they were originally produced and the margin of profit of twenty percent, calculated on the calculated cost.

In determining the cost of the good, service or right, acquired by the company in Brazil, the referred costs, incurred by the producing unit abroad, will be considered in proportion to the quantities destined to the company in Brazil.

In the case of the use of a similar product, for cost measurement, the cost of production should be adjusted according to the differences between the good, service or acquired right and what is being used as a parameter. The profit margin of twenty percent will be applied to the costs calculated before the incidence of taxes and fees charged in the country of origin on the value of goods, services and rights acquired by the company in Brazil.

For Andrade (2012), in calculating the price by this method will be considered exclusively the costs incurred in the production of the good, service or right, excluding any others, even if they refer to the profit margin of wholesale distributor.

Also, according to the same author, in the same way, it can be said that production costs must be demonstrated in a discriminatory way, by component, values and respective suppliers. Data may be used from the supplying unit itself or from producing units of other companies located in the country of origin of the good, service or right. For the purposes of determining the price by this method, they may be computed as part of the cost: (a) the cost of acquisition of the raw materials, intermediate products and packaging materials used in the production of the good, service or right; (b) the cost of any other goods, services or rights applied or consumed in production; (c) the cost of personnel employed in production, including direct supervision, maintenance and guarding production premises and the related social charges incurred, required or permitted under the law of the country of origin; (d) the costs of renting, maintenance and repair and the costs of depreciation, amortization or exhaustion of goods, services or rights applied in production; (e) the amounts of reasonable tears and losses occurring in the production process, which are permitted under the tax laws of the country of origin of the goods, service or right.

The PCI (method of price under quotation on import), according to art. 18-A of Law no. 9430 (1996), is defined as the daily average values of the quotation of goods or rights subject to public prices in the internationally recognized commodities exchange and futures. The law requires the use of this method when the product cumulatively meets the commodity product requirement.

Considering the relevance of the theme, previously published studies, such as those of Pedó, Muller and Cortimiglia (2011); Padhi and Bal (2015) elaborated a study to identify the impacts of the legal limitations on the transfer price in Brazil and in the world, on good imports, whose proposal also compared the already revoked norms and that perpetuate with legal proceedings, due to the large number of situations concerning the subject.

2.2 Transfer price on the export of goods

According to art. 19 of Law no. 9430 (1996), income earned on transactions with related person is subject to arbitration when the average sales price of the goods, services or rights related to the export, made during the calculation period of the income tax, is less than ninety percent of the average sales price of the same goods, services or rights in the Brazilian market during the same period and under similar payment conditions.

According to art. 6 of the Normative Instruction n. 1312/12, the determination of the average export price and the average comparison price will be obtained by multiplying the prices by the quantities for each operation and the results calculated will be summed and divided by the total quantity, thus determining the price weighted average.

It is important to emphasize that the taxpayer must verify if the export will be made with related persons, with individual or legal entity, who is resident or domiciled in a country that does not tax the income or that taxes the income less than twenty percent.

This means that if the taxpayer falls under the aforementioned hypotheses, it is obliged to make the comparison to determine the average sales price of the goods, services and rights in the exports made in the calculation period of the tax calculation basis. If export sales prices are less than ninety per cent, sales revenues shall be disregarded and the amounts shall be arbitrated using one of the five methods provided for in §3 of art. 19 of Law no. 9430 (1996).

On export, the methods used, presented in Table 1, are defined as:

a) Export Sales Price Method - PVEx: According to art. 19, §3, I of Law no. 9430 (1996), is defined as the arithmetic average of the sales prices of similar goods in the exports made by the company itself, to other customers or by another national exporter of goods, services or rights, during the calculation period of the Income Tax calculation basis and under similar payment conditions.

b) Wholesale Price in the Country of Destination Method Less Profit Method - PVA: In art. 19, §3, II, of Law no. 9430 (1996), is defined as the arithmetic average of the sales prices of identical or similar goods in the wholesale market

of the country of destination, under similar payment conditions, less taxes included in the price, charged in that country, and a profit margin of fifteen percent on the wholesale price.

c) Retail Price in Country of Destination Less Profit Method - PVV: According to art. 19, § 3, III, of Law no. 9430 (1996), is defined as the arithmetic average of the sales prices of identical or similar goods in the retail market of the country of destination, under similar payment conditions, less taxes included in the price, charged in that country, and a profit margin of thirty percent on the retail price.

d) Acquisition or Production Cost Plus Taxes and Profit Method - CAP: According to art. 19, § 3, IV, of Law no. 9430 (1996), is defined as the arithmetic average of the acquisition or production costs of goods, services or rights exported, plus taxes and contributions charged in Brazil and a profit margin of fifteen percent on the sum of costs plus taxes and contributions.

e) Price under Quotation Method for Exports - PECEX: According to art. 19-A of Law no. 9430 (1996), is defined as the daily average values of the quotation of goods or rights subject to public prices in internationally recognized markets and futures exchanges.

Thus, whenever a company transfers or receives products from a foreign subsidiary, it must obey the provisions of the law for the transfer price. It can not, in any case, practice what suits its best.

3 METHODOLOGY

This study is an analysis of the transfer price in the import and export of goods in an automotive filters company headquartered in Brazil. Its headquarters in Switzerland. The main objective was to demonstrate the impacts of accounting for the adjustment on results.

Company with a Brazilian subsidiary inaugurated in 1997 opened the way to new factories in other countries. In times of change and expansion in the automotive industry, the company has always been aware of the development of the automotive sector that has been growing rapidly. With the concern of healthy growth, focused on prospects for the future, the company tends to reduce the consumption of raw material to facilitate the process of disposal and recycling in the future. As the main product in the automotive sector, the company in Brazil manufactures complete parts for vehicles of large automakers. The Brazilian subsidiary provides customer service, among automakers and the entire Brazilian market for spare parts. It can thus develop solutions and meet the needs of customers. For reasons of professional secrecy the name of the company was hidden, preserving only the results obtained in the case study.

This study is classified as applied research. It seeks to produce knowledge for practical application in relation to a given problem. Its approach is qualitative, since it appropriates data for elaboration and analysis based on law and data collection, without the use of statistical procedures.

The data collection involved the accounting documents regarding the products studied and unstructured interview with the company accountant. The interview took place in October 2015 and data collection took place from August to October 2015. For the large number of products with the possibility of transfer pricing analysis, the F175F13 and R161F042 were used for the export and the P603L for the import, being products with a large volume of export and import of goods. The data for these products came through the entry/exit invoices, internal reports and financial statements for the calendar year of 2014. The calculations were conducted to verify the most appropriate procedures in the tax treatment, according to the current law in Brazil, and subsequently the accounting effects of this tax change, in the accounting of the company.

4 RESULTS ACHIEVED

By analyzing the data collected in this research, it was observed the absence of practices, according to the current law, transfer prices for the products studied. Therefore, the results obtained are based on the calculations made, considering the need and legal obligation of this practice.

The calculation methods were divided into two steps: imported product, first and then exported products.

4.1 Calculation of import methods

The data found for the import of the product, here called P603L Filter, were calculated considering the four methods in importing goods, allowed in law, in order to identify the most appropriate procedure for this product.

It was then verified that this product comes from the related company in Switzerland and has

as its purpose its resale in the Brazilian domestic market. The calculations made for each method are presented below, considering Table 2, with the simulation of the first calculation, by the PIC method.

Table 2
Calculation of PIC method

P603L	Condition	Average	Observations
Related Acquisitions	370 pieces for R$ 29,514.90	R$ 79.77	Delivery Price
Other Acquisitions	18,741 pieces for R$ 927,828.75	R$ 49.51	Parameter Price
	With margin 5%	R$ 51.98	(R$ 49.51 + 5%)
	Difference	R$ 30.26	(R$ 79.77 – R$ 49.51)
	Total Imported Quantity	370	
	Total Adjustment	R$ 11,196.20	(370 x R$ 30.26)

Note. Source: The authors.

It was verified that the parameter price is lower than the delivery price. In this method, 5% (five percent) is added to the parameter price to verify the possibility of its price being within the divergence margin. Determined, even with the increase of the divergence margin, the parameter price is still lower than the delivery price. Then, the difference between the delivery price with the price parameter should be determined, to multiply by the quantity imported, and thus reach the value of the adjustment.

If the company uses this method, it would be paying for a product imported from its related a higher cost, that is, it will be leaving currencies in the country of origin.

For the PRL Resale method the same filter P603L was analyzed, as in Table 3.

Table 3
Calculation of PRL Resale Method

P603L	Conditions	Average	Observations
Related Acquisitions	370 pieces for R$ 29,514.90	R$ 79.77	Delivery Price
Sales	364 pieces for R$ 43,686.83	R$ 120.02	
	– 20% Profit	R$ 96.02	Parameter Price (R$ 120.02 – 20%)
	With margin 5%	R$ 100.82	(R$ 96.02 + 5%)

Note. Source: The authors.

For the calculation of the Resale Price Less Profit Method - PRL, it was analyzed the delivery price, which is the average of the prices of acquisitions in the import of related to the parameter price, calculated by the average of the prices of goods of the sales of that product imported, deducting twenty percent of profit and calculating the divergence margin of five percent.

In this way, the price parameter is higher than the delivery price. This means that the company earns a profit of twenty percent or more above the value that was acquired by the related that is, the company can sell its product with the profit stipulated by law and has no need to make any adjustment to its results.

Table 4
Demonstration of calculation options

Methods	Calculation options
PIC	Calculated - Adjustment of R$ 11,196.20
PRL Production	There is no way to calculate, product P603L Elem Filter is resale product
PRL Resale	Calculated - No adjustment
CPL	There is no way to calculate, related does not make the cost reported.
PCI	There is no way to calculate, method for products listed on the stock exchange (commodity)

Note. Source: The authors.

The company headquartered in Brazil imports the P603L filter only for resale, that is, it does not use any process of industrialization in this filter. Therefore, the PRL Production method calculation does not apply to this product.

The related does not provide a breakdown of the costs incurred in the production of the good, such as records in the accounting books, commercial invoices for the acquisition of raw materials and other goods used in production, labor cost apportionment worksheets, copies of the payrolls, expenses with maintenance and repairs of equipment applied to production, statement of the percentages and depreciation, amortization or depletion charges used. Furthermore, it does not present a copy of the income tax return filed by the tax authorities of its country. In this way, it is not possible to calculate the CPL method.

The product is an automotive filter. It does not fall within the list of commodities provided in IN RFB No. 1395, of September 13, 2013. Then, in this case, the calculation of the PCI method does not apply.

The main objective of the transfer price on import is to make the companies make domestic purchases to generate wealth for Brazil.

4.2 Calculation of export methods

According to the guidelines of Law no. 9430 (1996), the analyzes of the five export methods for the F175F13 and R161F042 filters were elaborated to identify the best method to be used for the calculation of adjustment in their results.

Based on the data collected, the CAP method for the F175F13 filter was calculated, as in Table 5.

Table 5
Calculation method CAP filter F175F13 Filter

F175F13	Conditions	Average	Observations
Related Exports	20.616 pieces for R$ 8,359,765.11	R$ 405.50	Delivery Price
CPV/CMV	R$ 7,398,670.08	R$ 358.88	
	+ 15% Profit	R$ 412.71	Parameter Price (R$ 358.88 +15%)
	Without margin – 5%	R$ 392.07	(R$ 412.71 – 5%)

Note. Source: The authors.

By analyzing the calculations, the company has a high cost regarding the sale price. According to art. 19, § 3, IV, of Law no. 9430 (1996), fifteen per cent was added to the cost of the good sold to the related to verify if there was the profit required by law. In this case, with the addition of fifteen percent, the delivery price is lower than the parameter price. This means that the company is not charging the minimum profit required by law. The divergence margin of five percent was then reduced, so that the product could remain within the margin and there was no adjustment.

According to the data collected in the company, the CAP method was calculated for the filter R161F042, as in Table 6.

Table 6
Calculation method CAP filter R161F042

R161F042	Conditions	Average	Observations
Related Exports	1.200 pieces for R$ 98.664,00	R$ 82.22	Delivery Price
CPV/CMV	R$ 61,848.00	R$ 81.54	
	+ 15% Profit	R$ 93.77	Parameter Price (R$ 81.54 + 15%)
	Without margin – 5%	R$ 89.08	(R$ 93.77 – 5%)
	Difference	R$ 11.55	(R$ 93.77 – R$ 82,22)
	Quant. Total Export.	1,200	
	Total Ajustment	R$ 13,860.00	(1,200 x R$ 11.55)

Note. Source: The authors.

In relation to the cost with the sale price, it was verified that the company sold to its related with a profit of less than one percent. According to the CAP method law, the company should have exported to its related with a minimum profit of fifteen percent.

Even calculating the divergence margin for this product, there will be a need to adjust the result, since the value exported did not reach the minimum established by law. In this way, the difference between the delivery price with the parameter price was calculated to multiply by the total exported quantity of the year and to reach the total adjustment of the product.

The studied company has no way to calculate PVEx for both the F175F13 and R161F042 filters, since it exports only to its related, which makes it impossible to compare the delivery price with the parameter price of other exports of independent companies.

According to Law no. 9430 (1996), to perform the calculation of the PVV and PVA method, there is an obligation to export to its related and resale to the retail or the wholesale. Thus, these two methods do not apply in this study, since the related purchase of Brazil for use in the manufacturing process.

According to art. 19-A of Law no. 9430 (1996), the PECEX method is only calculated for

products listed on the stock exchange (commodity). This method does not apply to the automotive filter industry.

4.3 Ajustment

The Tax-Accounting Bookkeeping (ECF) of the Income Tax (IRPF) and the Social Contribution on Net Income (CSLL) came to replace the bookkeeping in the Taxable Income Calculation Book (Lalur), in relation to events occurring from the January 1, 2014.

Transfer pricing adjustments if they were treated according to the tax standard and adjusted in the company's accounting would bring about a change in their results, since the values for the exported products would be higher, generating a higher export revenue than the revenues currently practiced. On the other hand, the imported product would generate an additional cost by the PIC method and a lower cost in the use of the PLR Resale method.

Tax adjustments, if not adopted in the accounts, would only be reported in the ECF annual statement, registration M300 - entries of part A of e-lalur, according to Figure 1.

Figure 1. ECF Sped Statement
Source: ECF Sped System.

It can be seen in Figure 1 that there is a field called Adjustments Due to Methods of Transfer Price in the ECF, precisely to consider situations related to the transfer price, due to its obligatoriness.

4.4 Infraction notice

The company, according to the interview conducted with the accounting coordinator of the institution, uses the transfer price. From the calculations and analyzes presented in this study, there is no evidence of this practice, as demonstrated previously. In this way, it incurs the risk of supervision, since it does not exercise what is determined in law. The transfer price is not only a method to check sale or purchase prices. Through it are classified the taxes that will be paid by the company, such as IRPJ and CSLL. The Internal Revenue Service has the obligation to launch the letter that can have heavy consequences for the company, such as the exclusion or suspension of the CNPJ or application of fines.

According to Law no. 11488 (2007), the amounts to be paid by the company, due to the fine of the transfer price, bring high losses and must first be paid seventy-five percent on the

totality or difference between the taxes paid and those due, which is defined by the agent of the tax authorities, and also fifty percent on the monthly payment amount of the income tax when the corporation.

The tax authorities may also request to inspect the last five years as permitted by law. You can also file fines if there is any kind of irregularity in the transfer pricing calculations.

5 CONCLUSION

Law no. 9430 (1996) dictates transfer pricing rules that are increasingly required for taxpayers who carry out import and export operations with related companies.

This study was elaborated with the objective of studying the transfer price within a automobile filters company, and its accounting and tax impacts, such as Income Tax (IRPJ) and Social Contribution on Net Income (CSLL), the Brazilian law allows the taxpayer the option of choosing the method to be used that can bring the lowest adjustment. With the complexity associated with transfer pricing, it is important to carry out a tax planning with the strategic planning, which will indicate the method considered the best for the company's business. If there is such a planning, when identifying that the product is adjusting, the company has the possibility to negotiate with its related the transfer of the profit of said product to another that adjustment is not necessary.

From all the information collected and analyzed from the import, it was verified that only two methods, the PIC and the PRL Resale, can be applied in the product studied, in the imports. In the PIC method there was an adjustment in the amount of R$ 11,196.20 (eleven thousand, one hundred and ninety-six reais and twenty cents) and in the PRL Resale method there was no adjustment, since the delivery price is lower than the parameter price. It is concluded, therefore, that the best method to be used for the import related to the P603L filter is the PRL Resale method because there is no adjustment in the year 2014.

With the data collected and analyzed for export, it was concluded that only the CAP method can be used to calculate the transfer price in the two products studied F175F13 and R161F042. For the F175F13 filter there was no adjustment, since the value is within the divergence margin. For the R161F072 filter, there was an adjustment in the amount of R$ 13,860.00 (thirteen thousand, eight hundred and sixty reais), which will be released at LALUR for the year 2014.

Through the simulation carried out, the importance of transfer pricing within a company was exemplified. It has also been shown that, in view of the assumptions presented in the examples, there would be an adjustment to be made.

It is concluded that the transfer price is nothing more than a way to prevent companies from circumventing the customs system, doing the correct process and adjustments as required by law. The company will not have future damages, such as fines or exclusion from the national legal entity registry, as shown in the studies presented by Newton and Steeves (2013); Pedó, Muller and Cortimiglia (2011); Schäfer (2016).

Also, through this case study, it was evident, in a clearer way, how the transfer price can be applied within an automotive filter industry, directed to a planning of its managers regarding the purchase and sale prices for its related. Considering the presented situations, it is stated that the objectives proposed in this research were fully met.

The limitations of this study are lack of data and access to documents that could calculate other exercises and products. It is suggested for future studies an analysis on products and its impact on the profits of the company to be studied, mainly considering the effect of this profit in the distribution to partners and shareholders.

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