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Income smoothing and comparability of financial reports: evidence from public companies in the Brazilian market

Suavização de resultados e comparabilidade dos relatórios financeiros: evidências em empresas abertas do mercado brasileiro

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Keywords
Comparability.
Quality of accounting information.
Intentional income smoothing.

Abstract

The aim of this study is to analyze the influence of the intentional income smoothing on the comparability of financial reports. Our sample is composed of 87 companies, considering quarterly periods from 2013 to 2017. For the measure of comparability, we opted the method of similarity of the accounting function presented by DeFranco, Kothari and Verdi (2011) and for the intentional income smoothing, we used two measures that capture different dimensions of income smoothing presented by Lang, Lins and Maffett, (2012). The data were analyzed using quantile regression. Our results indicate that intentional smoothing in fact impairs comparability. However, when we analyzed the intentional smoothing of results by accruals, we found evidence of a reflex on comparability only in the quantile that comprises the observations with the lowest comparability levels. For most companies analyzed, accrual smoothing is less detrimental to comparability than more general smoothing, which also includes operational smoothing. This aspect was observed by Sohn (2016) and may be related to the problem of operational management being more profound and persistent than management by accruals. .

Palavras-chave
Comparabilidade.
Qualidade da informação contábil.
Suavização intencional de resultados.

Resumo

Este estudo objetiva analisar a influência da suavização intencional de resultados na comparabilidade dos relatórios financeiros. A amostra corresponde a 87 companhias, considerando períodos trimestrais de 2013 a 2017. Para o cálculo da medida de comparabilidade, optou-se pelo método da similaridade da função contábil de DeFranco, Kothari e Verdi (2011) e para mensurar a suavização intencional de resultados, utilizou-se duas medidas que capturam diferentes dimensões da suavização, apresentadas no trabalho de Lang, Lins e Maffett, (2012). Os dados foram analisados por meio da regressão quantílica. Os resultados obtidos indicam que a suavização intencional de fato prejudica a comparabilidade. Contudo, quando analisada a suavização intencional de resultados por accruals*, houve indícios de reflexo sobre a comparabilidade apenas no quantil que compreende às observações com os menores níveis comparabilidade. Para a maioria das empresas analisadas, a suavização por* accruals *é menos nociva para a comparabilidade do que a suavização mais geral, que incluí também a suavização operacional. Este aspecto foi observado no trabalho de Sohn (2016) e pode estar relacionado ao problema de o gerenciamento operacional ser mais profundo e persistente do que o gerenciamento por* accruals*.*

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Practical implications

Comparability is at the heart of the decision-making process for allocating capital to most financial report users. This study addresses a relevant aspect of this dynamic, the reflection of the income manipulation on the level of comparability of financial reports. By smoothing income, managers seek to show a position linked to lower levels of risk to investors and creditors. However, this type of manipulation impairs the ability to compare reports and, as a consequence, decreases information efficiency for the entire market.

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1 INTRODUCTION

Financial reports serve as an important means of communicating a company with its stakeholders. In these reports, managers are able to show the market a little of their strategies in the business environment, the risks of their companies and the return they can provide (Healy & Wahlen, 1999).

Profit stands out among the most popular information in the financial reports. Although profit is criticized in the financial market for having greater discretion compared to cash flow, it provides a picture of the company's economic-financial performance and serves as a decision parameter for a relevant range of investors and creditors (Ge, 2009). This same measure, which guides the investment decisions of external users, also serves as an internal performance metric, in addition to being used as a parameter to remunerate managers and other employees in an organization.

Due to the profit relevance, the managers (responsible for providing the information) may have a particular interest in managing this performance measure with the purpose of meeting their own desires. According to Scott (2015), income management has a wide range of justifications and effects on the quality of financial information. According to pioneers on the subject, such as Healy (1985) and Jones (1991), the conscious manipulation of financial information impairs its quality, contributing to increase informational asymmetry and transaction costs for the market.

One of the most popular and studied forms of income manipulation is profit smoothing (Ronen & Sadan, 1981). According to Eckel (1981), there are two types of income smoothing. The first corresponds to natural smoothing , which depends on the flows of input and output of resources in an entity. The second consists of intentional smoothing , which derives from the manager's action in a deliberate attempt to alter these flows to fulfill a private objective. Gordon (1966) mentions that a way to smooth the results is to build up reserves to reverse them in periods of falling profitability, failing to report the company's reliable performance. Doupuch and Drake (1966), on the other hand, describe that accounting methods with greater discretion have a natural tendency to be manipulated, that is, manipulation to smooth income is more feasible by accruals.

Dechow, Ge and Schrand (2010) argue that when there are considerable impacts on results, the intentional income smoothing affects the quality of financial reports. Schipper and Vincent (2003), when considering the persistence of profits as one of the quality aspects of financial reports, argue that components of transience (such as intentional smoothing) decrease persistence of profits and impair the quality of financial reporting. Additional empirical evidence indicates that smoothing also undermines other measures of quality in financial reporting, such as conservatism (see Gassen, Fülbier & Sellhorn, 2006). Still, Lang, Lins and Maffett (2012) state that the intentional income smoothing is detrimental to transparency. Thus, the income smoothing can decrease the quality of financial reports and, thus, affect the costs of transactions in the financial markets, impacting the efficiency in the allocation of resources by the users of such information.

The decision-making process of external users is based on two main decisions: allocating capital, among the possible investment alternatives, and whether or not to continue with existing investments (Healy & Palepu, 2001). Based on these premises, we understand the investor's need to have access to the appropriate information level, with timely and quality information. Based on the financial information, users can assess the risks and returns of an investment and of others and, thus, compare which is the best alternative given their risk function.

The comparability of financial reports stands out In this decision-making environment. According to the Financial Accouting Standards Board (FASB) (2010), comparability is the ability of financial information to demonstrate what is equal or different between two individuals or, even, the same subject over time. Although it is not considered a main quality characteristic in the scope of accounting regulation (FASB, 2010), comparability is the foundation of any decision-making process that involves different investment alternatives and can directly affect transaction costs in a market economy (Kang & Stluz, 1997).

Research related to comparability indicate a series of advantages related to its presence, such as: ease of capital allocation between countries (Yip & Young, 2012; DeFond, Hu, Hung & Li, 2011; Fang, Maffett & Zhang, 2015), a decrease in the cost of debt (Kim, Li, Lu & Yu, 2016) and an increase in the quality of analysts' forecast (DeFranco et al., 2011; Reina, Carvalho, Reina & Lemes, 2019).

Nevertheless, some theoretical and empirical studies have attempted to discuss the effect of income smoothing on the quality of financial reports (Schipper & Vincent, 2003; Gassen et al. 2006; Tucker & Zarowin, 2006; Talebnia & Javanmard, 2011; Kolozsvari & Macedo, 2016; Al-Taie et al., 2017). Even so, few studies have specifically focused on the impact of profit management on comparability.

Although research demonstrates a negative effect of earnings management on comparability (Sohn, 2016; Yang, Su, Zhou & Li, 2016; Chen & Gong, 2019; Ahmed, Neel & Safdar (2019), none of them tested smoothing as a management measure and, for the most part, were carried out only in developed markets.

In Brazil, the study by Ribeiro, Carmo, Fávero and Carvalho (2016a) stands out, which analyzed the comparability and discretionary power of the manager. The authors conclude that greater discretionary power favors comparability in the sense of incorporating the different nuances of business models to accounting numbers. However, the authors did not analyze the negative discretion of accounting manipulation. In this research, the aim is to advance in this direction, analyzing the influence of the intentional income smoothing in the comparability of financial reports.

The income smoothing can be a controversial issue when related to the comparability of financial information. Companies that smooth income can increase the uniformity of their financial reports and, with that, increase their comparability (although they are different constructs, there is a part that uniformity and comparability permeate, according to Ribeiro, Carmo, Fávero and Carvalho et al., 2016b). Studies such as those by Tucker and Zarowin (2006) and Gassen et al. (2006) demonstrate that the income smoothing can have positive effects for the persistence of profits and, in turn, for the measures of conditional conservatism among companies from different countries, which in some way could bring a positive effect for comparability.

On the other hand, the idea of "genuine" comparability (Ribeiro, 2014), would tend to suffer a loss with intentional smoothing, as companies would have limitations in showing their real performance.

In this scenario, to achieve the proposed objective, the smoothing measures chosen were those presented in the work by Lang et al. (2012). For the measure of comparability we used the measure of the similarity of the accounting function developed by DeFranco et al. (2011). The data of the sample composed of 87 publicly-held companies were analyzed using a quantile regression.

The results obtained indicate that intentional smoothing in fact impairs comparability. This result shows that the intentional income smoothing is harmful to the market, as it can increase transaction cost and affect operation efficiently.

However, when analyzing the intentional income smoothing of results by accruals, there was evidence of a reflex on comparability only in the quantile that comprises the observations with the lowest comparability levels. The positive effect, for the lowest levels of comparability, reflects the facet of informational dynamics in the market.

For most of the companies analyzed, smoothing by accrual is less harmful to comparability than more general smoothing, which also includes operational smoothing. This aspect was observed in the work of Sohn (2016) and may be related to the problem of operational management being more profound and persistent than management by accruals.

It is more difficult for a manager whose intention, for example, is to reduce his profit, to decrease his sales revenue (since this is a generally low transitory element) than to temporarily increase his estimate of losses with bad loans. The point is that with the increase in vigilance over the actions of managers by the external auditors and corporate governance committees, they feel inhibited to smooth income by accruals. This reduction in the space to use accruals causes managers to resort to operational strategies to smooth their income, further damaging comparability, due to the greater persistence of the harmful effects of operational management (Zang, 2012).

2 THEORETICAL FOUNDATION

In the regulatory view of accounting, comparability is a qualitative characteristic that makes enables to identify the similarities and differences between at least two items (FASB, 2010). These two items are related to the comparison reference, and can be different companies or the same company over time. More comparable financial reports are needed, as they reduce the cost of obtaining information and streamline the way it is processed by its users (Kang & Stluz, 1997). In a market economy, this characteristic can be considered a positive implication and generates benefits for users of information, for example, the decrease in transaction costs.

In the academic view, comparability is linked to the idea that the accounting system is a mechanism that maps economic events (Simmons, 1967; DeFranco et al., 2011). This mapping system involves the stages of recognition and measurement, culminating in the disclosure of financial reports. The product of the mapping is profit, which incorporates managers' view of how economic events have affected an organization's assets within the assessed period.

This view of comparability was defined in the work by DeFranco et al. (2011), in which it is known as similarity of the accounting function. The view of comparability as an output measure (distinct from the view by inputs in the harmonization index models) was well accepted by the academy and is already a metric widely used to measure the phenomenon, in view of the large number of recent studies that used it (see Ribeiro, 2014).

The empirical studies that used the measure of comparability of DeFranco et al. (2011), different facets have already been analyzed. Among them are: the quality of the market analysts' forecast (DeFranco et al. 2011), the ease of circulation of capital flow between markets in different countries (DeFond, et al. 2011; Barth, Landsman, Lang & Williams, 2012; Yip & Young, 2012; Brochet, Jagolinzer & Riedl, 2013), the reflection of different regulatory strategies (Ribeiro et al., 2016a) and how the measure is affected by earnings management practices (Sohn, 2016; Yang et al., 2016).

Within the scope of this research, the works that come closest to the rationale employed here were developed by Sohn (2016) and by Yang et al. (2016). In the article by Sohn (2016), the objective was to test how comparability influences management practices by accruals and operations. The author found that the most comparable companies have less use of earnings management practices using discretionary accruals, but have greater use of earnings management through operations. Sohn (2016) states that there is a "leak" from accrual management practices to operational management when comparability is greater.

The work by Yang et al. (2016), in turn, tested how the practices of managing operational results and by accruals affected the republishing of reports from Chinese companies and how this contributes to the comparability of the reports analyzed. The authors found results similar to those of the study by Sohn (2016), as they showed the antagonism in management practices by accruals and by operations.

Yang et al. (2016) highlighted in their results, that companies, whose level of management by accruals is higher, tend to republish their reports more, which does not happen when management is done by operations. The authors also emphasize that the measure of comparability was positively impacted by the act of republication, that is, the greater transparency of the analyzed companies allowed greater comparability. This aspect was observed in Brazil in Ribeiro's thesis (2014), in which the adoption of IFRS and the effect on comparability were tested.

With regard to earnings management by intentional income smoothing, it is highlighted that this form of manipulation can be performed in two ways: by operations and by accruals. Both forms can be applied concurrently, although they are antagonistic (Zang, 2012). This antagonism between the management methods identified in the research by Zang (2012) makes perfect sense, because if the goal of smoothing is to achieve a specific objective (greater or lesser profit) when the manager uses more than one method, he/she must use less than another, since profit consists of cash flow plus accruals.

Thus, according to previous studies, the existence of a negative relationship between profit quality and income smoothing practices is considered (Kolosvari & Macedo, 2016; Schipper & Vincent, 2003). Although researches demonstrate a negative effect of earnings management on comparability (Sohn, 2016; Yang, Su, Zhou & Li, 2016; Chen & Gong, 2019; Ahmed, Neel & Safdar (2019), none of them tested smoothing as a management measure and, for the most part, were carried out only in developed markets. Therefore, in this study we propose the following hypothesis, to be investigated:

H_1: there is a negative relationship between the intentional income smoothing and the comparability of financial reports.

Smoothing has been extensively explored in the literature of the 1980s and 1990s (Eckel, 1981; Ronen & Sadan, 1981; Skinner & Myers, 1999; Bao & Bao, 2004), however not exhaustively, an example is the study by Ahmed et al. (2019). Measures of intentional income smoothing gained popularity in the early 21st century. The working paper by Myers and Skinner (1999) - later published by Myers, Myers & Skinner (2007) - was one of the first to create a smoothing measure based on the logic of accruals, as defined in the work by Healy (1985).

The measure by Myers and Skinner (1999), used in this study, is calculated through the correlation between total accruals and the operational cash flow. The logic of this measure is that cash flow represents the economic events that companies are subject to, and accruals are how managers interpret these events. Naturally, a negative correlation coefficient is expected between these measures, since profit is composed of both. If in a given period a company has a profit X, the higher the operational cash, the lower the items subject to accruals.

This measure is characterized by very strong negative correlations, where the managers' attempt to compensate the movement of cash flow is clear. In a practical way, this compensation can be made by discretionary items (such as estimates with losses on customers that can be constituted in one year and reverted in another), where the manager has room for manipulation.

Another income smoothing measure, used in this research, represents a more comprehensive smoothing that is described in the work by Leuz, Nanda and Wysocki (2003). This measure is based on the premise that only fluctuations in the result could identify smoothing. According to the authors, the smallest variation in profit would already be reason to suspect intentional income smoothing. The smaller the variation, the greater the propensity for smoothing practices. Although it is an interesting logic, this reasoning does not take into account different sectors, or different life cycles of a company, which could influence the variation in its profit.

As a result of this limitation, Leuz et al. (2003) adapted the measure and also added the operational cash flow standard deviation, which in this design plays the role of the volatility of the economic events to which a company is subject. The measure uses the ratio of the net income standard deviation by the operational cash flow standard deviation. The lower the result, the greater the smoothing practices . The advantage of this measure, in relation to the measure that captures only the variation by accruals, is that it is able to capture the broadest smoothing, where operational practices can be employed - such as, 'burning' stock to increase revenue, and thus manage the results. It is worth noting that the two forms of earnings management used in this work are complementary since according to Zang (2012) there is a trade-off between operational management and accrual management.

3 METHODOLOGICAL PATHWAY

The population of this research corresponds to all publicly traded Brazilian companies from Brasil Bolsa Balcão (B3). The initial sample consisted of companies that had information available on the return on their shares (necessary to calculate comparability) between 2010 and 2017. As a result, the initial sample consisted of 157 companies. Subsequently, these companies were broken down according to the respective sector of economic activity, based on the North American Classification System (NAICS) sector classification. This classification was used because it is the most popular in works on comparability (Lang, Maffett & Owens, 2010, DeFranco et al., 2011, Yip & Young, 2012, Ribeiro et al., 2016a, Ribeiro et al., 2016b). From this selection, 31 sectors were identified.

Of these sectors, we chose those that were composed of at least four companies. This was necessary because according to Ribeiro (2014), the sector must be a control in the multivariate models of comparability. The author mentions that a minimum number of companies per sector is necessary, given that an analysis by sectors with few companies carries the degrees of freedom and, in turn, does not bring adequate variability to measure the measure of comparability. Given this restriction, it was found that of the 31 sectors, only 13 could be analyzed in the present study. As a result, the sample was composed of only companies from these 13 sectors, totaling a final non-random sample composed of 87 companies.

Data were collected when considering the quarterly periods from 2010 to 2017, as it comprises the period after the adoption of the IFRS standard in Brazil. It should be noted that the initial period of analysis corresponds to the first quarter of 2013, because to measure the measure of comparability and the measures of intentional income smoothing, it was necessary to use data that refer to the current quarter and the previous 11 quarters of each company. In addition, it is noteworthy that all this information was obtained through the Economatica® database. To maintain the characteristics that refer to the operations of the companies analyzed, especially when considering the comparability of financial reports in the same way as adopted in the work of Ribeiro et al. (2016a), Ribeiro et al. (2016b), Ribeiro, Sousa and Vicente (2019), the economic and financial data of this research come from the unconsolidated financial statements.

As for the basic models of the study, it is highlighted that for the calculation of the comparability of financial reports, the similarity of the accounting function, developed by DeFranco et al. (2011), the procedures used to calculate the comparability measure are shown in Appendix B, at the end of this study. To measure the measures that comprise the intentional income smoothing we used a technique similar to the work by Lang et al. (2012), the procedures used to calculate income smoothing measures are shown in Appendix A.

The dependent variable consists of comparability of financial reports (COMPM) and the variables of interest, which correspond to the intentional income smoothing measures, are SUAV1 and SUAV2. These two variables are complementary, when considering the logic presented in the work by Lang et al. (2012) and in the research by Zang (2012). Table 1 shows the dependent and independent variables of the multivariate model.

Tabela 1. Variáveis dependente e independentes utilizadas no modelo)

Variable	Description	Operationalization	References
		Dependent variable	
Comparability (COMPM)	Comparability of individual sector peers	$ROA_{it} = \alpha_i + \beta_i Retorno_{it} + \varepsilon it$	DeFranco *et al.* (2011)
		Independent variables	
		Variables of interest	
SUAV1	General Intentional Income Smoothing	$SMTH1_{it} = \alpha_{ti} + \beta_1 TAM_{it} + \beta_2 DÍVIDA_{it} + \beta_3 MB_{it} + \beta_4 DPRECEITA_{it} + \beta_5 \%PREJUÍZO_{it} + \beta_6 CICLO_{it} + \beta_7 CRESCREC_{it} + \beta_8 IMOB_{it} + \beta_9 FLUXO_{it} + \beta_{10} ANO_{it} + \beta_{11} SETOR_{it} + \varepsilon_{it}$	Lang *et al.* (2012)
SUAV2	Intentional Income Smoothing by Accruals	$SMTH2_{it} = \alpha_{it} + \beta_1 TAM_{it} + \beta_2 DÍVIDA_{it} + \beta_3 MB_{it} + \beta_4 DPRECEITA_{it} + \beta_5 \%PREJUÍZO_{it} + \beta_6 CICLO_{it} + \beta_7 CRESCREC_{it} + \beta_8 IMOB_{it} + \beta_9 FLUXO_{it} + \beta_{10} ANO_{it} + \beta_{11} SETOR_{it} + \varepsilon_{it}$	Lang *et al.* (2012)
		Control variables	
Degree of Operating Leverage (DOL)	Measure that represents a measure of operational performance of the company's cost structure	Gross Profit / (Gross Profit - Selling Expenses and Administrative Expenses)	Sohn (2016); Francis, Hanna e Vincent (1996); Ribeiro *et al.* (2016a) e Ribeiro *et al.* (2016b)
Market to book (MB)	Variable that measures the business growth expectation for the market	Market Value / Book Equity	Lee, Li e Yue (2006); Mcvay, Nagar e Tang (2006); Ribeiro *et al.* (2016a); Ribeiro *et al.* (2016b)
Size (TAM)	Total assets of each company transformed to its logarithmic base	Napierian Logarithm of the total asset	Watts e Zimmerman (1986); Doyle, Ge e McVay. (2007); Ribeiro *et al.* (2016a); Ribeiro *et al.* (2016b)
SECTOR	Sector variable for each company based on NAICS level 2 classification	Dummy variable representing the sectors of economic activity of each company: (0) Auxiliary activities to transportation, (1) Construction of buildings, (2) Electricity, gas and water company, (3) Real estate, (4) Food industry, (5) Transportation equipment industry, (6) Yarn and fabric industry, (7) Paper industry, (8) Metal products industry, (9) Clothing industry, (10) Chemical industry, (11) Other industries, (12) Steel and basic metals industry.	Verrecchia e Weber (2006); Bagnoli e Watts (2010); Ribeiro (2014); Ribeiro *et al.* (2016a) Ribeiro *et al.* (2016b)
YEAR	Variable that gives annual periods	Dummy variable representing the annual periods from 2013 to 2017	Verrecchia e Weber (2006); Bagnoli e Watts (2010); Ribeiro *et al.* (2019a)

Source: prepared by the authors.

The measure of comparability developed by DeFranco et al. (2011) of the similarity of the accounting function, considers that the price of a share reacts in a more timely manner to new information than accounting profit. This theory is known as price leads earnings and has been proven empirically by the works by Beaver, Lambert and Ryan (1987), Beaver, Lambert and Morse (1980) and Brugni, Fávero, Flores and Beiruth (2015). As the price incorporates the information in a more timely manner, it can serve as a proxy for the set of economic events of a certain company in a certain period. The profit, in turn, also incorporates the information reflected in the price, but only on a specific date (report publication) and after the information has been interpreted, processed and made available by the preparers to users. The model by DeFranco et al. (2011) manages to capture this dynamic and uses the economic event of one company in the accounting model of the other company to calculate comparability.

The first measure (SUAV1) for smoothing , presented by Lang et al. (2012), is the relationship between the variation in profit and the variation in operational cash flow. The variation in cash flow is a proxy for the variation in the company's economic flow, the lower this ratio, the greater the income smoothing, as the company seeks to adjust profit to reduce volatility. The second variable used (SUAV2) is the accrual smoothing measure, when calculating the correlation of total accruals in relation to operational cash flow. The lower the correlation, the greater the income smoothing, with -1 being maximum smoothing. It should be noted that the final smoothing measures were extracted from the residues of a model with the intention of controlling natural smoothing , that is, they are measures that capture intentional smoothing . The two smoothing measures represent different dimensions of management.

The first measure is broader and measures the smoothing by accruals, as well as by operational aspects, as it considers the total variation in profit. The second measure, in turn, is more specific for manipulation by accruals. In the study by Zang (2012), the author indicates that there is a trade-off between management by accruals and management by operations. As a result, it was decided to use two measures for smoothing. The results found of the weak correlation between the measures in this research corroborate with Zang's (2012) thesis of complementarity of measures.

In addition to the dependent variable and the variables of interest, the multivariate analysis was composed of control variables (degree of operational leverage, market to book and size) that appear in the investigations by Ribeiro et al. (2016a) and Ribeiro et al. (2019). Control was also carried out by sectors and by year, since each sector has its specificities regarding the operational activities carried out, as well as the internal and external characteristics of the companies are not similar in all periods, given the changes to over time.

For the data analysis, quantile regression was used, with 20 replications, since the influence of the two measures of intentional income smoothing can be distinct throughout the comparability distribution. In addition, the impact of these two results manipulation strategies may be more significant depending on the company's level of comparability. Quantile regression was calculated using five quantiles, that is, 0.10; 0.25; 0.50; 0.75 and 0.90. It is worth remembering that, according to Greene (2000), quantile regression is based on the Minimizing Absolute Deviations (MAD) method and does not present the same assumptions as multiple linear regression. Thus, the tests of normality of residues, multicollinearity, serial autocorrelation and heteroscedasticity are not necessary when performing multivariate analysis using quantile regression (Greene, 2000).

This technique can assist in investigations that deal with the quality of accounting information, since it can enrich these scientific investigations due to the fact that the behavior of observations in extreme quantiles can be analyzed (Duarte, Girão & Paulo, 2017). In addition, Duarte et al. (2017) highlight that the quantile regression, as it is not based on the average, does not have the need to exclude outliers, as in models based on the average. In this sense, the total number of observations was 1,740, of which 193 comprise observations with insufficient information, which resulted in a final sample with 1,547 observations.

4 PRESENTATION AND ANALYSIS OF RESULTS

Table 2 presents the information regarding the descriptive analysis of all quantitative variables in the multivariate model when considering each annual period.

Table 2. Descriptive statistics

Panel A: descriptive statistics									
Variables	**P10**	**P25**	**P50**	**P75**	**P90**	**SD**	**Min.**	**Max.**	**Obs**
COMP	-6.457	-4.411	-2.542	-1.641	-1.135	2.642	-20.705	-0.387	1547
SUAV1	0.156	0.381	0.779	1.443	2.411	2.160	0.001	22.886	1547
SUAV2	0.041	0.108	0.226	0.385	0.558	0.194	0.001	0.967	1547
DOL	-1.823	-0.034	1.485	2.499	4.315	18.641	-341.929	346.410	1547
MB	0.233	0.535	0.944	1.596	2.370	1.341	-14.960	23.657	1547
TAM	12.840	13.767	15.013	15.866	17.102	1.567	9.693	17.995	1547
Panel B: descriptive statistics for each annual period									
2013									
Variables	**P10**	**P25**	**P50**	**P75**	**P90**	**SD**	**Min.**	**Max.**	**Obs**
COMP	-5.118	-3.311	-2.016	-1.405	-1.089	1.751	-8.983	-0.668	324
SUAV1	0.126	0.316	0.674	1.064	2.059	1.609	0.004	20.584	324
SUAV2	0.054	0.139	0.247	0.427	0.644	0.223	0.001	0.967	324
DOL	-1.458	0.172	1.699	2.698	4.328	14.400	-99.107	178.368	324
MB	0.443	0.823	1.317	2.242	3.926	2.340	-14.968	23.657	324
TAM	12.706	13.745	14.892	15.749	16.671	1.551	10.801	17.701	324
2014									
COMP	-5.648	-3.580	-2.103	-1.467	-1.036	2.017	-14.737	-0.387	320
SUAV1	0.132	0.329	0.682	1.325	2.160	1.289	0.003	8.711	320
SUAV2	0.042	0.105	0.243	0.423	0.557	1.998	0.001	0.863	320
GAO	-2.019	-0.173	1.481	2.462	4.304	27.459	-341.929	31.768	320
MB	0.233	0.542	0.968	1.552	2.072	0.697	0.037	3.718	320
TAM	12.840	13.728	14.966	15.734	16.952	1.534	10.973	17.769	320
2015									
COMP	-6.528	-4.172	-2.513	-1.823	-0.966	2.596	-19.379	-0.501	306
SUAV1	0.148	0.309	0.621	1.356	2.357	1.507	0.003	14.230	306
SUAV2	0.034	0.089	0.197	0.378	0.506	0.187	0.001	0.842	306
GAO	-1.751	-0.087	1.363	2.468	4.289	5.487	-25.038	46.245	306
MB	0.174	0.402	0.723	1.332	2.111	0.968	0.013	6.114	306
TAM	12.957	13.858	15.132	15.848	17.135	1.558	10.342	17.999	306
2016									
COMP	-7.074	-5.230	-3.029	-2.230	-1.450	2.862	-18.573	-0.741	294
SUAV1	0.117	0.483	0.938	1.554	2.943	2.604	0.001	20.872	294
SUAV2	0.039	0.102	0.196	0.306	0.450	0.159	0.004	0.776	294
GAO	-1.898	-0.156	1.323	2.078	4.355	6.159	-49.015	26.630	294
MB	0.196	0.449	0.742	1.289	2.191	0.843	0.017	5.145	294
TAM	12.981	13.896	15.071	15.895	17.142	1.542	10.185	17.917	294
2017									
COMP	-7.391	-5.826	-3.824	-2.020	-1.446	3.301	-20.705	-0.658	303
SUAV1	0.259	0.593	1.047	1.895	2.830	3.179	0.002	22.885	303
SUAV2	0.040	0.116	0.237	0.407	0.544	0.186	0.001	0.764	303
GAO	-1.424	0.145	1.530	2.591	4.315	25.038	-135.650	346.418	303
MB	0.285	0.586	0.989	1.461	2.001	0.810	0.026	6.649	303
TAM	12.906	13.754	15.044	16.139	17.175	1.639	9.693	17.823	303

Source: research data.

Legend: P10 = 10th percentile; P25 = 25th percentile; P50 = 50th percentile; P75 = 75th percentile; P90 = 90th percentile; SD = Standard-Deviation; Min. = Minimum; Max. = Maximum, and; Obs. = Observations.

The results of descriptive statistics reveal that the comparability median in Panel A was -2.542. This finding can be considered convergent with the studies by De Franco et al. (2011), Sohn (2016), Fang et al. (2015) Ribeiro et al. (2016a) and Ribeiro et al. (2019), as they presented an average level of comparability between -1.90 and -2.70. However, the measures that represent the general intentional smoothing and the intentional income smoothing by accruals (SUAV1 and SUAV2) had a median of 0.779 and 0.226, respectively. Evidence that cannot be compared with the original measures by Lang et al. (2012), since the authors joined these measures. The bases for calculating SUAV1 and SUAV2 were SMTH1 and SMTH2 (not shown), which had a median of -0.659 and -0.275, respectively. The result of SMTH1 is similar to that of Lang et al. (2012), but the median value of SMTH2 is at odds with the one presented.

From this, it can be understood that Brazilian companies have a similar level of general income smoothing of companies in the main stock markets in the world, as analyzed by Lang et al. (2012). However, the level of smoothing by accruals is lower than that carried out in other countries and, therefore, in Brazilian publicly traded companies, this manipulation strategy may be less harmful to the quality of financial reports. It is worth mentioning that these inferences correspond to the level of general income smoothing and income smoothing by accruals that do not distinguish between the natural and intentional portion.

In a complementary perspective, when analyzing the descriptive results of the annual periods presented in Panel B, there is a drop in the level of comparability in all percentiles when considering the years 2017 and 2013. The decrease in the level of comparability in percentage terms in P10, P25, P50, P75 and P90 was 44.4%; 75.9%; 89.7%; 43.7%, and; 32.8%, respectively. Evidence that is in agreement with that described by Ribeiro et al. (2019), given that there was a decrease in comparability when considering the post-IFRS implementation period. This evidence can complement the findings by Ribeiro et al. (2019), as the level of comparability has sharply decreased from the companies with the smallest to the companies with the highest levels of comparability.

As for the variation in the overall intentional income smoothing, it is noted that over the periods of analysis there was an increase in the use of this strategy of manipulating results. This is because in almost all periods - except for P25 and P50 in 2015, P10 in 2016 and P90 in 2017 - there was an increase in the overall intentional income smoothing in percentage terms. However, when analyzing SUAV2, there is a reduction in the use of accruals to smooth income by managers in all percentiles throughout the analyzed range.

This aspect in the descriptive results corroborates the thesis raised by Zang (2012) that the management measures by accruals and by operations are antagonistic. Such behavior can demonstrate that governance mechanisms, such as statutory audit committees (implemented in a more recent period) and independent auditors, are inhibiting accrual management practices (Gaganis, Hasan & Pasiouras, 2016), forcing managers who want to manipulate results by smoothing resorting to practices related to operational issues.

After the descriptive data analysis, Pearson's correlation test was performed, even if it is not a necessary assumption for quantile regression, as mentioned by Greene (2000). A central point for carrying out this analysis is the fact that SUAV1 and SUAV2 can present multicollinearity, given that they capture manipulation strategies that are complementary to each other. The correlation coefficient between SUAV1 and SUAV2 was -0.0236, which demonstrates the complementarity of the measures. Furthermore, the results of the correlation analysis suggest that there is no multicollinearity between the independent variables, as they presented correlation coefficients much lower than 0.70, as suggested by Fávero and Belfiore (2017).

In this context, the next step was to perform multivariate analysis in quantiles for the comparability measure. Table 3 shows the results of factors related to the measure of comparability.

Table 3: Multivariate analysis of comparability

Comparability										
V	Quantile									
	0.10		**0.25**		**0.50**		**0.75**		**0.90**	
	Coeff	Est T	Coeff	Est T	Coeff	Est T	Coeff	Est T	Coeff	Est T
SUAV1	-0.676	-13.44***	-0.609	-26.06***	-0.332	-7.23***	-0.162	-4.74***	-0.137	-4.95***
SUAV2	1.016	3.73***	0.113	0.70	-0.139	-0.93	-0.052	-0.52	-0.006	-0.06
DOL	-0.001	-0.40	-0.002	-0.66	0.001	0.27	-0.001	-0.05	-0.001	-1.36
MB	-0.054	-1.20	-0.04	-0.07	0.001	0.03	-0.040	-0.13	-0.017	-0.68
TAM	0.546	5.93***	0.314	6.57***	0.136	4.07***	0.069	3.50***	0.044	3.58***
Const.	-13.157	-8.82***	-8.468	-9.03***	-5.297	-12.42***	-3.794	-13.61***	-3.089	-13.96***
SC	Yes		Yes		Yes		Yes		Yes	
CPA	Yes		Yes		Yes		Yes		Yes	
R^2	0.4799		0.4577		0.4181		0.3806		0.3731	
Obs.	1.547									

Source: research data.

Note: V. Variables; Const. = Constant; SC = Sector Control; CP = Control of Annual Periods; Obs = Observations; * significance at the level of 10%; ** significance at the 5% level; *** significance at the 1% level. The abovementioned regressions were estimated using the non-parametric method in quantiles (0.10; 0.25; 0.50; 0.75 and 0.90). The constants of these econometric models absorbed the following variables: SECTOR = transport auxiliary activities and YEAR = 2013. The models were obtained based on the following equations:

$$COMPM_{it} = \beta_0 + \beta_1 SUAV1it + \beta_2 SUAV2_{it} + \beta_3 GAO_{it} + \beta_4 MB_{it} + \beta_5 TAM_{it} + \beta_6 CONSTRUÇÃO_{it} + \beta_7 ELETRICIDADE_{it} + \beta_8 IMOBILIÁRIA_{it} + \beta_9 INDALIMENTOS_{it} + \beta_{10} INDTRANSPORTE_{it} + \beta_{11} INDTECIDOS_{it} \beta_{12} INDPAPEL_{it} + \beta_{13} INDMETAL_{it} + \beta_{14} INDROUPAS_{it} + \beta_{15} INDQUIMICA_{it} + \beta_{16} OUTRASIND_{it} + \beta_{17} SIDERURGIA_{it} + \beta_{18} 2014 + \beta_{19} 2015 + \beta_{20} 2016 + \beta_{21} 2017 + \varepsilon_{it}$$

The findings in Table 3 demonstrate that SUAV1 is negatively related to comparability for all analyzed quantiles. SUAV2 (intentional income smoothing by accruals), however, presented a non-significant result for most of the analyzed quantiles and a positive and significant result for the quantile of companies with lower levels of comparability, that is, 0.10 quantile.

This result indicates that, in general, the intentional income smoothing impairs the comparability of financial reports, corroborating the H1 hypothesis tested in this research, and with the works that point to a drop in the quality of information with the increase in intentional income smoothing practices. (Schipper & Vincent, 2003; Lang et al., 2012; Kolozsvari & Macedo, 2016).

The fact that SUAV2 did not show a significant relationship in all quantiles with comparability, except in the 0.10 quantile that corresponds to the observations of companies with the lowest levels of comparability, can be explained from two logics. The first involves the trade-off of operational and accrual management measures as found in Zang (2012). As companies used more aspects related to operational issues to smooth results (as seen in the behavior of SUAV1), naturally they used less accruals and, as argued by Zang (2012), operations management practices are more harmful to the quality of information than the manipulation practices based on accruals that are more easily reversed.

The second justification involves the fact that the gain in uniformity is linked to the practices of income smoothing by accruals. According to Tucker and Zarowin (2006), income smoothing practices can increase profit persistence because they mitigate profit deviations and create a more constant flow of information. DeFranco et al. (2011) point out that there is a positive relationship between comparability and persistence. Uniformity and comparability are different measures, although they have an initial convergence, and in order to arrive at comparability it is necessary to have a minimum of uniformity in accounting practices (Ribeiro et al., 2016b).

The less comparable companies, by using practices of intentional smoothing of results by accruals, end up standardizing their results, which, for less comparable companies, may have brought a gain to the measure. This was clear, as in the other quantiles there was no such effect. As genuine comparability is different from uniformity (Ribeiro et al., 2016b), the gain was restricted to the minimum contribution of uniformity that occurred only for companies that presented the worst measures.

It is worth mentioning that there are differences in the results corresponding to the T and R2 statistics between the analyzed quantiles. These differences show the impact on different levels of intentional smoothing on comparability. Understanding that can be justified when analyzing the T statistic of the five percentiles evaluated. The higher level of significance of the observations allocated in Model 1 and Model 2, than in the observations allocated in Model 4 and Model 5, indicates that the smoothing practices are more harmful to the comparability levels of the companies presenting the lower levels of this characteristic. This result is in line with the study by Sohn (2016).

5 FINAL CONSIDERATIONS

This study aimed to analyze the influence of the intentional income smoothing on the comparability of financial reports. The results revealed that the general intentional income smoothing has a negative influence on comparability, from the companies with the smallest to the companies with the highest comparability levels. This result generates contributions to the discussions on the theme and corroborates the findings of the works by Schipper and Vincent (2003), Lang et al. (2012) and Kolozsvari and Macedo (2016) who found a negative effect of income smoothing on the quality of financial reports. From a practical point of view, intentionally smoothing income through operations can impair the comparability of financial reports, compromising the analytical power of investors, together with creditors, and negatively contributing to the efficient functioning of the market.

Another piece of evidence that deserves to be highlighted is the sharpest decrease in comparability when managers perform general income smoothing in companies that already have the lowest levels of comparability. This more harmful reflection of the income smoothing in companies whose comparability is lower serves as a warning to the market of the opportunistic practices of managers in financial reports. In the theoretical perspective, this evidence is in line with the results obtained by Sohn (2016).

Finally, the results demonstrate the more perverse side of the income smoothing through operations and corroborates Zang's (2012) thesis. There is a trade-off between accruals and operations management. As a possible explanation for this phenomenon, we highlight the improvement of control practices (such as the creation of statutory audit committees) and greater monitoring of external auditors under the way managers make their accounting choices (Gaganis et al., 2016). This meant that accrual smoothing practices were reduced over time and in turn there was an increase in operations smoothing practices.

The result of the intentional income smoothing by accruals was not negative for comparability, on the contrary, for companies with the lowest levels of comparability, it presented a positive result, possibly due to the uniformity gain generated by the most homogeneous profit. This aspect was also observed by Tucker and Zarowin (2006), who reported an increase in profit persistence that were more smoothed out. However, this result needs to be analyzed with restrictions, since uniformity does not represent genuine comparability, as advocated by Ribeiro et al. (2016b). According to the authors, if uniformity is exacerbated, it can contribute negatively to comparability, since the idea of comparability is to identify what is equal, but also what is different. Uniformity only identifies what is equal. This aspect can bring a gain to measure when comparability is very low, even if it brings a loss when it already has an acceptable level.

This study was not without limitations, as like Ribeiro et al. (2016a) and Ribeiro et al. (2019), possible accounting policies that affect the comprehensive result were not considered, in addition to the research interval corresponding to a period of economic slowdown. In this sense, space is opened to analyze the reflection of other practices of manipulation of results in the comparability of financial reports. Additionally, it is suggested in future research to investigate the external reflexes, regulatory or macroeconomic environment, in this qualitative improvement feature .

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Appendix A

The intentional smoothing measures used in this research are included in the work by Lang et al. (2012). The authors present two ways to measure aspects of this form of result manipulation, called Smoothing 1 (SMTH1) and Smoothing 2 (SMTH2).

Lang et al. (2012) highlight that SMTH1 captures the volatility of profits in relation to operational cash flow in the period. Leuz et al. (2003) and Francis, LaFond, Olsson and Schipper (2004), argue, that the more companies use accruals for earnings management purposes, the profit will be more smoothed compared to the final cash flows for the year. In this way, SMTH1 captures the income smoothing linked to accruals, as well as the company's operational issues. With this, it can be understood that this measure captures an aspect of the more general income smoothing.

Regarding the form of this measure, Lang et al (2012) describe that SMTH1 consists of the standard deviations of net profit before the extraordinary items at the end of the period with the standard deviations of operational cash flows at the end of each period, when using the range of the last three to five annual periods. However, with regard to SMTH1, an adjustment was made by using net income at the end of the period instead of net income before extraordinary items.

In this context, the interval of three annual periods was used, that is, twelve quarters, which comprises the current quarter plus the previous eleven quarters. After the SMTH1 calculation and, following the procedures performed by Lang et al. (2012), SMTH1 was multiplied by -1. This multiplication was necessary so that the highest values of the SMTH1 variable correspond to the highest levels of smoothing and, likewise, the lowest results comprise the lowest levels of smoothing. Thus, it makes the measure more intuitive by demonstrating that the higher the value of the measure (SMTH1) the greater the level of income smoothing. Given the information about the metric design, SMTH1 was calculated using Equation 1:

$$SMTH1 = (\sigma LL / \sigma FCO) * -1 \qquad (1)$$

Where: SMTH1 = general income smoothing; σLL = standard deviation of net income at the end of the 12-quarter period, and; σFCO = standard deviation of operational cash flow at the end of the 12-quarter period.

SMTH2 is calculated based on the correlation between the operational cash flow at the end of the period divided by the total assets with the total accruals at the end of the period divided by the total assets at the end of the period. Lang et al. (2012) comment that when the correlation test of these two variables results in a negative coefficient, it indicates that there is a higher level of income smoothing by accruals. In which this central idea of this measure, is based on capturing the increased use of discretionary accruals in periods with reduced profits. If this movement persists over time, the correlation coefficient of the test will be negative. Thus, according to the logic of the equation described by Lang et al. (2012), Leuz et al. (2003) and Francis et al. (2004), it is an indication that the company presents a smoothed profit through accruals.

SMTH2 was calculated from the correlation between the operational cash flow at the end of the period divided by the total assets in relation to the total accruals at the end of the period divided by the total assets at the end of the period in the current quarter and the last eleven previous quarters. It should be noted that the SMTH2 variable was also multiplied by -1, according to the procedure performed by Lang et al. (2012). Multiplication necessary so that the second measure (SMTH2) also becomes more intuitive as to its interpretation, because with this multiplication, the greater the result of this measure, the greater the income smoothing by accruals.

$$SMTH2 = \rho[(FCO / AT),(Accruals / AT)] * -1 \qquad (2)$$

Where: SMTH2 = intentional smoothing of results by accruals; FCO = operating cash flow at the end of the 12-quarter period; AT = total assets at the end of the 12-quarter period, and; Accruals = total accruals at the end of the 12-quarter period.

With the measures that capture the general income smoothing and the income smoothing by accruals (SMTH1 and SMTH2, respectively) calculated. The next step was to submit these measures to Equation 3. From this equation, it was possible to separate the general intentional income smoothing (SUAV1) from the general natural income smoothing, in which these two added together comprise the overall total income smoothing (SMTH1). Likewise, with Equation 3, it was possible to distinguish the intentional income smoothing by accruals (SUAV2) from the natural income smoothing by accruals, that is, due to the company's operational activities. These two types of accrual smoothing (natural and intentional) make up the total income smoothing by accruals (SMTH2). Thus, we proceeded to calculate SUAV1 and SUAV2, which correspond to the error term of the following multivariate models with SMTH1 and SMTH2, respectively, as the dependent variables, as shown in the study by Lang et al. (2012):

$$SMTH_{it}=\alpha_{it} + \beta_1 TAM_{it} + \beta_2 DÍVIDA_{it} + \beta_3 MB_{it} + \beta_4 DPRECEITA_{it} + \beta_5 \%PREJUÍZO_{it} + \beta_6 CICLO_{it} + \beta_7 CRESCREC_{it} + \beta_8 IMOB_{it} + \beta_9 FLUXO_{it} + \beta_{10} ANO_{it} + \beta_{11} SETOR_{it} + \varepsilon_{it} \quad (3)$$

Where: SMTH1 = general income smoothing ; SMTH2 = intentional smoothing of results by accruals; TAMit = logarithm of total assets at the end of year of the company i in period t;DÍVIDAit = total debt (short and long term loans and financing) at the end of the year divided by the total year-end assets of company i in period t;MBit = market to book at year-end of company i in period t; DPRECEITAit = standard deviation of net revenue for the year for the last twelve quarters (3 years) of company i in period t; % PREJUÍZO = proportion of the periods in which there was a negative net result in the last twelve quarters (3 years) of company i in period t; CICLOit = Operational Cycle logarithm (operational cycle = average storage time + average receipt time) end of year for company i in period t; CRESCRECit = revenue growth for company i in period t; IMOBit = fixed assets at the end of the year divided by the total assets at the end of the year for company i in period t;FLUXOit = average operational cash flow divided by the total assets at the end of year of company i in period t; ANOit = annual periods, from 2012 to 2017, and; SETORit = represents the economic activity sector of company i in period t;

After the determination of SUAV1 and SUAV2, Lang et al. (2012) performed the multiplication of these variables, which is called DIS_SMTHC, which corresponds to the manipulation of results from intentional practices of income smoothing. However, in this study we decided not to perform this procedure of multiplication of SUAV1 and SUAV2. Because, when considering the result of Pearson's correlation test, it appears that this test had a correlation coefficient of -0.0236.

In this sense, these two variables, despite being similar, do not show the same behavior in the same period. A justification for this is linked to the form of smoothing used by managers according to the period. Because depending on the result of the year, the manager may choose to smooth the results based on general aspects, which even touch the company's operations, or use only accruals to smooth the results in the period. These two ways of manipulating results are different and, according to Zhang (2012), they complement each other, but are used by managers at different times according to the managers' purpose. From this, we chose, unlike Lang et al. (2012), to analyze the impact of the two income smoothing measures separately and not in a single variable.

After determining SUAV1 and SUAV2, the values corresponding to these variables – which comprise the residue from the estimation of SMTH1 and SMTH2 in Equation 3 – were transformed from their respective values in module. This transformation was necessary because the greater the distance of the error term in relation to the regression line, the greater the level of general intentional income smoothing and intentional income smoothing by accruals. Thus, in order to properly measure SUAV1 and SUAV2, it was necessary that the observations related to these variables be transformed into a module. In this way, all observations of these variables with negative values became positive and the observations of these variables that presented positive values continued with the same value. Therefore, the higher the value of SUAV1 or SUAV2, the greater the general intentional income smoothing and intentional income smoothing by accruals, respectively.

Appendix B

The measure of comparability consists of that developed by DeFranco et al. (2011), that is, the similarity of the accounting function. To this end, the accounting function of each company was initially estimated when considering the last 12 quarterly periods, according to the adaptations in Yip and Young's (2012) work when replacing the market value with the total asset. According to the authors, this adaptation also maintains the properties of the original work by capturing the reflections of economic events in the financial reports. In addition, this adaptation has also been used in other studies, such as that by Ribeiro et al. (2016a) and Ribeiro et al. (2016b). Thus, the role of each company was estimated according to the following equation:

$$ROA_{it} = \alpha_i + \beta_i Retorno_{it} + \varepsilon_{it} \quad (4)$$

Where: ROAit = quarterly net profit for the year on total assets at the end of the year company i in period t unconsolidated, and; Retorno it = final share return for the quarterly financial year of company i in period t, calculated from the closing price of common shares, adjusted for earnings and splits. Later, the parameters of the individual accounting functions were estimated when projecting the expected ROA [E (ROA)] of the companies, individually, based on the results of Equation 4. Thus, we have the equation for calculating [E (ROA)].

$$E(ROA)_{iit} = \widehat{\alpha_i} + \widehat{\beta_i} Retorno_{it} \quad (5)$$

Where: E (ROA)iit = expected ROA of company i with the parameters of company i in period t, and; Retornoit = final share return for the quarterly financial year of company i in period t, calculated from the closing price of common shares, adjusted for earnings and splits. The next step was to calculate the expected ROA of the same company with the estimators of the other companies that are in the same sector, using the following equation.

$$E(ROA)_{ijt} = \widehat{\alpha_i} + \widehat{\beta_i}\ Retorno_{it} \quad (6)$$

Where: E (ROA)iit = expected ROA of company i with the parameters of company j in period t, and; Retorno it = final share return for the quarterly financial year of company i in period t, calculated from the closing price of common shares, adjusted for earnings and splits.

When considering the economic event of a company with the estimators of the other companies in the same sector, the idea is that the constant economic event will continue. The measure of comparability of the companies consists of the average of the distance of the results obtained from the results of Equation 5 and 6, when considering the quarterly period interval, that is, [E (ROAiit) – E (ROAijt)]. DeFranco et al. (2011), argue that the closer the values resulting from these two functions, the greater the comparability between companies. In order to measure the comparability of the companies, when considering their peers, the average of the distance of each accounting function was calculated, in what gives the interval of the quarterly period from the following equation:

$$Comp_{ijt} = -\frac{1}{12}\sum_{t-11}^{t} \left| E(ROA_{iit}) - E\left(ROA_{ijt}\right) \right| \quad (7)$$

Where: Compbijt = measure of relative individual comparability of company i based on company j in period t; E (ROA)iit = expected ROA of company i with the parameters of company i in period t, and; E (ROA)iji = expected ROA of company i with the parameters of company j in period t.

The results of Equation 7 correspond to the average distances of the accounting functions of two companies belonging to the same sector. Thus, when calculating the average of the values resulting from Equation 7 regarding the comparability of companies' peers, we have the average of average comparability of each company, in which it is calculated from the following equation:

$$COMPM_{it} = \frac{Compb_{ijt}}{n} \quad (8)$$

Where: COMPMitit = measure of comparability of each company in relation to its peers that belong to the same sector; Compbijt = measure of relative individual comparability of company i based on company j in period t, and; n = Number of companies in the sector.

As expressed above, adaptations were made to the original model by DeFranco, et al. (2011). These adaptations refer to the period interval, in which 12 quarterly periods were used instead of 16 quarterly periods as in the original work. Similar studies carried out adaptations of the original model, such as Yip; Young (2012), Cascino and Gassen (2012), Brochet, et al. (2013), and finally, Ribeiro et al. (2016a) and Ribeiro et al. (2016b).