QUALIDADE NOS LUCROS:
EFEITO COMBINADO DE SEUS ATRIBUTOS

EARNINGS QUALITY:
COMBINED EFFECT OF THEIR ATTRIBUTES

Elizeu Maria Junior
Universidade Federal do Espírito Santo – Brasil
elizeujunior@yahoo.com.br
ORCID: http://orcid.org/0000-0002-8228-5980

Teresa Cristina Janes Carneiro
Universidade Federal do Espírito Santo – Brasil
carneiro.teresa@gmail.com
ORCID: http://orcid.org/0000-0001-9987-1460

Luiz Cláudio Louzada
Universidade Federal do Espírito Santo – Brasil
louzadalvi@yahoo.com.br
ORCID: http://orcid.org/0000-0002-2626-8203

Helio Zanquetto Filho
Universidade Federal do Espírito Santo – Brasil
zanquetto@gmail.com
ORCID: http://orcid.org/0000-0002-5693-0704

Patricia Maria Bortolon
Universidade Federal do Espírito Santo – Brasil
patricia.bortolon@ufes.br
ORCID: http://orcid.org/0000-0001-8087-3837

RESUMO

Este artigo dedica-se à análise da Persistência nos Lucros e do Gerenciamento de Resultados enquanto atributos da qualidade das informações financeiras. O objetivo desta pesquisa é investigar a Qualidade nos Lucros a partir da Persistência nos lucros e do Gerenciamento de Resultados e seus efeitos combinados. A abordagem metodológica caracteriza-se como quantitativa, desenvolvida por meio de modelos estatísticos e econométricos. Os modelos propostos foram estruturados na forma de dados em painel e analisados por meio de regressões lineares multivariadas e regressões logísticas binárias. Os resultados da pesquisa evidenciam que a análise combinada da Persistência nos lucros e do Gerenciamento de Resultados apresenta maior eficiência na discriminação das empresas em função da Qualidade nos Lucros percebida pelo mercado. Adicionalmente, verificou-se que a percepção do mercado acerca do Gerenciamento de Resultados é significativamente inferior à percepção do mercado acerca da Persistência nos Lucros. Estes resultados sustentaram as hipóteses conceituais apresentadas nesta pesquisa.

PALAVRAS-CHAVE

Informações financeiras. Percepção do mercado. Atributos combinados.

ABSTRACT

Financial reports are a relevant source of information for investors and other capital market actors. This article aims to analyze Earnings Persistence and Earnings Management as attributes of the quality of financial information. It aims to investigate Earnings Quality from Earnings Persistence and Earnings Management and their combined effects. The methodological approach is quantitative, developed by statistical and econometric models. The proposed models were structured in the form of panel data and analyzed by simple and multivariate linear regressions and binary logistic regressions. The research results show that the combined analysis of Earnings Persistence and Earnings Management is more efficient to differentiate companies based on the Earnings Quality perceived by the market. Additionally, it was found that the market perception about Earnings Management is significantly lower than the market perception about Earnings Persistence. These results supported the conceptual hypotheses presented in this research.

KEYWORDS

Financial information. Market perception. Combined attributes.

INTRODUCTION

The main objective of the accounting information in financial markets is to serve as a basis for capital allocation. Thus, if the attributes that make up the quality of financial information are inaccurate or used wrongly, they may cause: i) the inefficient allocation of resources or bad investment decisions; II) the reduction of the capital provided by investors to the market, causing an increase in the cost for obtaining this capital; and iii) the reduced predictability of future earnings based on past financial information, reflecting earnings without quality to the market (BHATTACHARYA; DESAI; VENKATARAMAN, 2013). Earnings Quality matters primarily to investors, since it is directly related to the efficiency of resource allocation.

However, according to Licerán-Gutiérrez and Cano-Rodriguez (2017), the lack of conceptual basis of Earnings Quality for use of its attributes may generate research with irrelevant results. The authors present Earnings Quality as a multidimensional construct and highlight that research using its attributes indiscriminately, without a theoretical proposal that bases the studied relationships, may generate results that cannot be theoretically analyzed, establishing relationships that lack inferential utility.

Dechow and Schrand (2004), Kothari (2001), and Dechow, Ge and Schrand (2010) highlight five key attributes of Earnings Quality: i) earnings persistence; II) value relevance; iii) earnings management; iv) conservatism; and v) republication. However, the use of these attributes theoretically comes from the proposed relationships between variables and from data availability. This study aims to investigate Earnings Quality by the combined analysis of Earnings Persistence and Earnings Management,

given the significance of these attributes attested by Kolozsvari and Macedo (2016).

The studies of Dechow and Schrand (2004), Dechow, Ge and Schrand (2010), and Mazzioni, Diel and De Oliveira (2016) show that Earnings Persistence has a direct relationship with Earnings Quality, while Earnings Management has an inverse relationship. Based on these relationships, one can observe that the effect of the increase of Earnings Management in earnings can be the loss of their quality because of the reduced relevance of possible positive variations of Earnings Persistence. The researches by Kolozsvari and Macedo (2016) and Martinez (2013) indicate that practices of Earnings Management can affect the market perception about Earnings Persistence. From this theoretical contextualization, one can infer that the financial reports with greater Earnings Persistence have Earnings Quality, and that Earnings Management is not a significant factor for determining this quality. Thus, we highlight the following research problem: Are the attributes Earnings Persistence and Earnings Management more efficient to differentiate businesses with Earnings Quality when combined?

Thus, the overall objective of this research is to investigate Earnings Quality from Earnings Persistence and Earnings Management and their combined effects. The development of this objective will enable to specifically verify: i) the efficiency of Earnings Persistence as attribute of Earnings Quality; ii) the efficiency of Earnings Management as attribute of Earnings Quality; and iii) if the combined analysis of Earnings Persistence with Earnings Management is more efficient to analyze Earnings Quality than these attributes taken separately.

LITERATURE REVIEW
EARNINGS QUALITY

Although there is not a conceptual definition agreed between researchers (GIVOLY; HAYN; KATZ, 2010), Earnings Quality is usually defined as the ability of the disclosed results to generate trends allowing to predict future earnings of a company. Studies have found that the disclosed earnings have quality when there is a significant correlation between profit and operating cash flows, ratified by the persistence of this relationship in the long run (WILSON, 2015). However, according to Lopes and Martins (2012), the quality of financial information is primarily based on the usefulness and relevance of its content to the information user.

According to Dechow, Ge, and Schrand (2010), Earnings Quality is inextricably linked to the relevance of information. One can only consider the quality of the information regarding earnings when there is influence of the information on its user. Even if a particular information has only a confirmatory character, it will be relevant if it has informational content enough to ratify or not user expectations, which can generate actions for the maintenance or not of a particular investment. Thus, the term "Earnings Quality" acquires meaning insofar as one can observe the informational content consistency revealed by a particular financial reporting to the information user. Earnings with quality must be able to highlight relevant information on the economic and financial performance of the company, since several of the informational aspects of earnings are not observable by external users.

The following section presents the market indicators that express Earnings Quality in companies.

MARKET VALUE

According to Francis et al. (2002) and McConnell and Servaes (1990), the market value of a company represents how much investors are willing to pay for the property of the company or how much they are willing to pay for each unit of profit obtained by it.

According to Collins and Kothari (1989), Sloan (1996), Penman and Zhang (2002), and Huang et al. (2009), market value is directly linked to the Earnings Quality of a company. This relationship is based on the fact that the value assigned by the market to the company is associated with the sustainability of the profits disclosed in financial reports, enabling the cash flow analysis for the long-term investor. Another relevant factor for determining the market value of the company is the recognition of financial reports that express its patrimonial and financial reality, with accounting practices free from management manipulations.

Thus, the attributes of Earnings Quality are directly linked to the market value and performance of companies. According to Dechow and Schrand (2004), the Earnings Quality must reflect the company's current operating performance, which can be used as an indicator of future operating performance and as useful measure to assess its value. Earnings Persistence and Earnings Management.

INDEBTEDNESS

According to Oliveira and Oliveira (2009), tax benefits of debt and bankruptcy costs from debt delinquency are relevant aspects related to indebtedness. From this perspective, the research of Nardi and Nakao (2009), Demonier (2013), Li (2015), Watts (2003), Kothari, Shu, and Wysocki (2009), and Gao (2011) present debt cost and financial constraints as factors relevant to the study of indebtedness.

According to Demonier (2013), a company is in a situation of financial constraint when facing difficulties in raising financial resources in the market. Kaplan and Zingales (1995) define a company is in a situation of financial constraint when the costs of external resources hinder the realization of investments. The cost of debt is defined as the cost of capital raising of third parties, or the ratio between interest paid and capital taken from third parties, equivalent to the cost of financing. According to Dechow, Ge, and Schrand (2010), as a company approaches the financial constraint, it will be more prone to manipulate financial information, which would reduce Earnings Quality.

Prevost, Rao, and Skousen (2008) state that companies of the capital market are encouraged to manage their results under two specific conditions: if the market understands that the disclosed earnings information serves as a basis for prediction of future earnings, so that the manipulation of the results can affect the market value of the company; and if companies (managers and controllers) can benefit from the increase in the stock price or market value of the company, which would lead to a lower cost of capital. When it comes to debt, creditors see a determining factor for the risk of default in the variability of the disclosed earnings, which might promote the increase in the cost of this debt.

CORPORATE GOVERNANCE

The accounting earnings and their components play an important role in the decision-making of investors, also serving as

essential information for market analysts. It is known that the determination of earnings can be affected by different accounting practices, in addition to the possibility of manipulating to adjust them to what is expected, which reduces the quality of these earnings. In this context, Corporate Governance mechanisms aim to monitor and control the administrative process of companies, making it harder for managers to disseminate opportunistic information (JENSEN; MECKLING, 1976).

According to Basilico and Grove (2013) and Marques et al. (2015), the Earnings Quality of companies is linked to the Corporate Governance mechanisms applied. Farber (2005) shows that the greater participation of independent directors and the activism of the audit committee are relevant in reducing financial manipulations. According to Almeida (2010), the competitive environment of companies favor the disclosure of the most reliable financial information and the adoption of better practices of Corporate Governance enhances Earnings Quality.

EARNINGS PERSISTENCE COMBINED WITH EARNINGS MANAGEMENT

Huang and Kale (2018), Dechow and Ge (2006), and Dechow, Ge, and Schrand (2010) highlight the ability of investors to notice and price earnings variability. The increase in earnings variability generates greater divergence between the result obtained and the one expected by market analysts, which may generate greater uncertainty about the future performance of the company. However, Black, Pierce, and Thomas (2017) and Martinez (2013) point out that Earnings Management practices

can be used to reduce earnings variability, generating financial reports with artificially persistent earnings. According to Kolozsvari and Macedo (2016), Earnings Management practices can influence the investors' perception about Earnings Persistence, but all these manipulations are not maintained in the long run, showing earnings without quality.

The relationship between Earnings Management and Earnings Persistence is based on the assumption that the market positively prices companies that present earnings with less variability. Before profits with high variability, different from market forecasts, managers intend to manipulate their financial results to change the investors' perception regarding the real accounting and financial situation of the company. However, financial information that do not show significant Earnings Management, but that have high variability earnings, increase investors' uncertainty and reduce their capacity to analyze the future performance of the company (DECHOW; GE, 2006; DECHOW; GE; SCHRAND, 2010). Both relationships highlighted between Earnings Persistence and Earnings Management show the lack of Earnings Quality of a company.

RESEARCH METHODOLOGY

This research relied on secondary data disclosed by active and publicly traded companies, with common stocks traded on B3, limited to those that had data available from the first quarter of 2010 to the fourth quarter of 2016, totaling 28 quarters (observation) by company/variable. This limitation is mainly due to the significant changes in Brazilian accounting standards during this period. We highlight that the variable Operating Cash Flow, presented in the Cash

Flow Statement, would be significantly affected because it is information that had to be mandatorily disclosed by companies from 2010.

The main filter for defining the companies comprising the sample of this research was the largest number of available information required to execute the econometric models established from the attributes of Earnings Persistence and Earnings Management. The data were collected from the Thomson Reuters Eikon®, Económatica®, and Comdinheiro® databases. The final sample of the research consisted of 205 companies, and enterprises of all economic sectors remained in it, as separated by B3.

From the specific research objectives, it was possible to investigate whether the combined analysis of Earnings Persistence and Earnings Management is more efficient to verify the Earnings Quality of companies compared to the isolated analysis of these attributes. The analyses were done by simple and multivariate linear regressions and binary logistic regressions, and the models are presented below, in the steps of the methodological path.

First step: This step aimed to obtain and parameterize the metrics of Earnings Persistence and Earnings Management, using the following models: Metric of Earnings Persistence (PIMENTEL; AGUIAR, 2012; KOLOZSVARI; MACEDO, 2016):

$$ROA_{i,t} = \alpha_i + \beta_1.ROA_{i,t-1} + \varepsilon_{i,t} \qquad (1)$$

Note: Where α_i => model constant; => is the measure of return on total assets of a company i in period t; β => is the coefficient of the ratio between the explanatory variable and the explained variable; and ε is the error term.

Metrics of Earnings Management (OHLSON, 2014; DICHEV, 2015):

$$\Delta WC_{i,t} = \beta_i + \beta_1.OCF_{i,t+1} + \beta_2.OCF_{i,t} + \beta_3.OCF_{i,t-1} + \varphi_{i,t}$$

$$(2)$$

Note: Where ΔWC => variation of net working capital of cash at time t; OCF_{t+1}, = 1, OCF_t, OCF_{t-1} => operating cash flows at times t+1, t, and t-1; β_0, β_1, β_2, and $\beta 3$ => intercept and parameters of operating cash flows, respectively; and $\varphi_{i,t}$ => error term (residuals) of company i at time t.

$$\varphi_{i,t} = \beta_i + \beta_1.\Delta NI_{i,t} + \omega_{i,t} \qquad (3)$$

Note: Where $\varphi_{i,t}$ => error term of company i at time t obtained by expression xc; $\Delta NI_{i,t}$ => net income variation of company i at time t; and $\omega_{i,t}$ => error term (residuals).

According to Basu (1997), the confirmation of market forecasts would determine Earnings Persistence. However, by the lack of availability of earnings forecast for all the companies, expression 1 allows obtaining a proxy of persistence, with unexpected profit as the error term. Thus, the higher the error term (ε) of expression 1, the lower the Earnings Persistence of this company. Regarding the metric of Earnings Management, Ohlson (2014) and Dichev (2015) state that the working capital variation of a company must be explained by its operating cash flow in different periods according to the accrual basis. According to the authors, the part not explained by this relationship, presented in expression 2 by the error term (φ), must be related to the net income variation of the company, because if not, there will be significant evidence that the discretionary accruals of this company are being used to manipulate financial

ELIZEU MARIA JUNIOR, TERESA CRISTINA JANES CARNEIRO, LUIZ CLÁUDIO LOUZADA, HELIO ZANQUETTO FILHO, PATRICIA MARIA BORTOLON

information. Thus, the proxy of earnings management is given by the error term of expression 3 (ω).

The parameterization performed in the metrics of Earnings Persistence and Earnings Management took place based on the difference between the frequency of data for obtaining these metrics (quarterly data) and the frequency of data used for obtaining the explanatory variables (annual data) of the proposed logistic regression models. Parameterization was used as a resource to enable the analysis of data with temporal uniformity. Below, we present the models used for the parameterization of errors:

$$MeanError_{EP\,i,a} = \frac{\sum_{t=1}^{t=4}(\varepsilon_{i,t})^2}{\sqrt{n}} \qquad (4)$$

$$MeanError_{EM\,i,a} = \frac{\sum_{t=1}^{t=4}(\omega_{i,t})^2}{\sqrt{n}} \qquad (5)$$

Note: Where Mean Error_EP $_{i,a}$ => mean error of Earnings Persistence calculated for company i at year a; $\varepsilon_{i,t}$ => error obtained by the model of Earnings Persistence of company i at quarter t; Mean Error_EM $_{i,a}$ =. mean error of discretionary accruals calculated for company i at year a; $_{i,t}$ => error obtained by the model of Earnings Management (expression 3) of company i

at quarter t; n => number of quarters with valid observations.

Second step: Dedicated to verifying the efficiency of Earnings Persistence and Earnings Management as Earnings Quality attributes. The verification of efficiency was carried out by logistic regression models, enabling the comparison of the probabilities of occurrence of Earnings Quality by the various attributes in function of the market indicators that express this same quality. The explanatory variables used to highlight Earnings Quality were based on market indicators and information from the companies. Chart 1 presents the variables used and their respective calculation:

By the models described in the expressions 6 and 7, we verified the probability of occurrence of Earnings Quality using Earnings Persistence and Earnings Management as dependent variables:

$$\frac{prob}{EQ_{EP}\binom{0}{1}_{it}} = \frac{1}{1+e^{(\propto|\Box|i\,+\,\beta_1.VM_{i,t}\,+\,\beta_2.PER_{i,t}\,+\,\beta_3.CD_{i,t}\,+\,\beta_4.CG_{i,t}\,+\,\beta_5.FC_{i,t})}} \qquad (6)$$

$$\frac{prob}{EQ_{GR}\binom{0}{1}_{it}} = \frac{1}{1+e^{(\propto|\Box|i\,+\,\beta_1.VM_{i,t}\,+\,\beta_2.PER_{i,t}\,+\,\beta_3.CD_{i,t}\,+\,\beta_4.CG_{i,t}\,+\,\beta_5.FC_{i,t})}} \qquad (7)$$

Note: Where $Prob/EQ_{EP}\binom{0}{1}\,e\,Prob/EQ_{EM}\binom{0}{1}$

CHART 1 – Independent variables of the logistic models

Abbreviation	Nomenclature	Definition (Metric)
MV	Market Value	$\dfrac{Number of shares * Price}{Total Assets}$
PER	Price Earnings Ratio	$\dfrac{Common share price}{Earning per share}$
CD	Cost of Debt	$\dfrac{Financial Expenses - Interest on own capital}{Total Debt}$
CG	Corporate Governance	Dummy variable – 1 companies in the New Market; 0 other companies
FC	Financial Constraint	Dummy for companies with financial constraints

Source: Based on previous research, as described in the theoretical framework.

represent the probability of occurrence of Earnings Quality (1) compared to non occurrence (0) based on the metrics of Earnings Persistence (EP) and Earnings Management (EM) in both methods (median and quartiles). (i) company observed; (t) quarterly period observed; (EQ) Earnings Quality {0 to companies without quality; 1 to companies with quality}; (MV) market value of the company weighted by its total assets; (PER) price earnings ratio per share; (CD) cost of debt of the company; (CG) *dummy* variable for corporate governance {1 to companies in the New Market; 0 to other companies}; (FC) financial constraint {1 to companies on condition of risk; 0 to other companies}.

The differentiation of companies with and without Earnings Quality in light of the metrics of Earnings Persistence and Earnings Management took place by the cut of the data calculated by median. The parameterized values of Earnings Persistence and Earnings Management were arranged in ascending order. Values lower than the median were assigned values of 1, indicating companies with Earnings Quality. The other companies, without Earnings Quality, were assigned values equal to zero.

Third step: Dedicated to verifying the efficiency of the combined analysis of Earnings Persistence and Earnings Management as Earnings Quality attributes. The verification of this efficiency took place by the analysis of probability of occurrence of Earnings Quality by combining the metrics of Persistence and Management in function of market indicators that express this same quality, described in Chart 1. To test the effects of this combined analysis compared to the attributes examined in isolation, we compared the results of the logistic regression models using the attributes separately with the model that combined the attributes. Below, we present the model used for the combined analysis of Earnings Persistence and Earnings Management:

$$\frac{prob}{EQ_{PL_{GR}}\left(\begin{smallmatrix}0\\1\end{smallmatrix}\right)_{it}} = \frac{1}{1+e^{\left(\propto|\square|i + \beta_1.MV_{i,t} + \beta_2.PER_{i,t} + \beta_3.CD_{i,t} + \beta_4.GC_{i,t} + \beta_5.FC_{i,t}\right)}}$$

(8)

Note: Where $Prob/EQ_{combination}\left(\begin{smallmatrix}0\\1\end{smallmatrix}\right)$ (1) (1) represents companies with higher levels of Earnings Persistence and lower levels of Earnings Management, thus with Earnings Quality; and (0), companies with lower levels of Earnings Persistence and higher levels of Earnings Management, thus without Earnings Quality.

Similarly, the differentiation of the companies with and without Earnings Quality based on the combined metrics of Persistence and Management took place by median. Separated, the companies with Earnings Persistence were arranged by ascending order of Earnings Management. The cut-off point was the measure of the same metric of Management, assigning values of 1 to companies with Management values lower than the median (companies with Earnings Persistence and non significant levels of Earnings Management), highlighting them as having Earnings Quality. Among the companies without Earnings Persistence, we emphasized those that had higher levels of Earnings Management, assigning them values of zero, highlighting them as without Earnings Quality. Statistical tests were conducted to verify the assumptions required for the use of ordinary least square models. The following section presents the results of the tests and the analysis of the models proposed by this research.

ANALYSIS OF THE RESULTS

Table 1 shows the results of the tests conducted for choosing the panel data approach that best matches the data of this research. To verify the most appropriate approach to panel data among POLS, fixed effects, or random effects, Breusch-Pagan, Hausman, and Chow tests were carried out (FÁVERO; BELFIORE, 2017). As Table 1 shows, the Fixed Effects approach was more appropriate to the three models used to calculate the metrics of Earnings Persistence and Earnings Management.

Table 2 shows the results of the models described in expressions 1, 2, and 3, used for the calculation of the Earnings Quality metrics. The model of Earnings Persistence showed statistical significance, since the coefficient of the explanatory variable ROA_{t-1} is significantly different from zero, according to the f-statistic presented (Prob > F = 0.000). $EM\_Model_{\_step1}$ was also statistically significant, and only the variable OCF_{t-1} (operating cash flow at time t-1) was not significant. However, $EM\_Model_{\_step2}$ showed no statistical significance from the Fixed Effects approach. This result is not understood as relevant to interfere with the research continuity, since the model is

only being used for the calculation of the variable Earnings Management, without any use of its parameters to perform statistical inferences.

The array of simple correlation between the quantitative variables Market Value, Price Earnings Ratio, and Cost of Debt, described by Fávero and Belfiore (2017) as a tool for verifying multicollinearity among explanatory variables, presented VIF < 0.5 and P-value > 0.1 for all the correlations, denoting the absence of significant correlation between the variables analyzed.

Table 3 presents the results of the models concerning Earnings Quality by the metrics separately and in combination. It is observed, by the significance of the Chi-square test (0.000) for the models, that the null hypothesis that there is no association between the metrics of Earnings Quality and the explanatory variables must be rejected. Similarly to the Chi-square test, by the significance of Omnibus test, we can reject the null hypothesis that all model parameters are equal to zero. Hosmer and Lemeshow test shows that the null hypothesis that the expected and observed frequencies are equal cannot be rejected, allowing one to infer there are no prob-

TABLE 1 – Distribution of the companies by economic sector.

Description	Breusch-Pagan LM Test (X^2)	Hausman Test (X^2)	Chow Test (X^2)	Selected Model
EP_Model	0.001	813.86***	4.7*	Fixed Effects
EM_Model$_{\_step1}$	-	-	1.21**	Fixed Effects
EM_Model$_{\_step2}$	13.01*	0.001	1.37*	Fixed Effects

Source: Research data.

Note: EP_Model => $(ROA_{i,t} = \propto_i + \beta_1.ROA_{i,t-1} + \varepsilon_{i,t})$.

EM_Model$_{\_step1}$ => $(\Delta WC_{i,t} = \beta_i + \beta_1.OCF_{i,t+1} + \beta_2.OCF_{i,t} + \beta_3.OCF_{i,t-1} + \varphi_{i,t})$;

EM_Model$_{\_step2}$ => $(\varphi_{i,t} = \beta_i + \beta_1.\Delta NI_{i,t} + \omega_{i,t})$;

Breusch-Pagan LM Test (X^2) => H_0: POLS Model; H_1: Random effects;

Hausman Test (X^2) => H_0: Random effects; H_1: Fixed effects;

Chow Test (X^2) => H_0: POLS Model; H_1: Fixed effects.

(EP) Earnings Persistence; (GR$_{\_step1}$) Earnings Management step 1, according to expression 9; (GR$_{\_step2}$) Earnings Management step 2, according to expression 10; *P-value<0.01;**P-value<0.05; ***P-value<0.10.

TABLE 2 – Results of the models used for obtaining the variables Earnings Persistence and Earnings Management.

Variables		Fixed Effects[+] Approach		Prob > F
Dependent	Independent	Coeffic.	Stand. Dev.	
(ROA) EP_Model	Constant	0.3766*	-0.0537	0.000
(Expression 1)	ROA_{t-1}	0.1755*	-0.0145	
ΔWC	Constant	0.0401	-0.0589	0.017
EM_Model_step1	OCF_{t-1}	-1.32E-14	-3.01E-11	
(Expression 2)	OCF_t	5.70e-11**	-2.89E-11	
	OCF_{t+1}	-6.59E-11**	-3.19E-11	
DA EM_Model_step2	Constant	0.000	-0.0513	0.7966
(Expression 3)	ΔNI	-0.0083	-0.0324	

Source: Research data.

Note: (Prob > F) F-statistic for significance of the model presented by P-value; (EP) Earnings Persistence; (ROA) EP_Model, according to expression 1 => $(ROA_{i,t} = \alpha_i + \beta_1 . ROA_{i,t-1} + \varepsilon_{i,t})$; ; (EM_step1) Earnings Management step 1, according to expression 2 => $(\Delta WC_{i,t} = \beta_i + \beta_1 . OCF_{i,t+1} + \beta_2 . OCF_{i,t} + \beta_3 . OCF_{i,t-1} + \varphi_{i,t})$; (GR_step2) Earnings Management step 2, according to expression 3 => $(\varphi_{i,t} = \beta_i + \beta_1 . \Delta NI_{i,t} + \omega_i$ (ROA) Return on Total Assets; (OCF) Operating Cash Flow; (ΔWC) Working Capital Variation; (ΔNI) Net Income Variation; Discretionary accruals (DA) presented as dependent variable of EM_Model_step2 are equivalent to the error term of expression 2; *P-value<0.01; **P-value<0.05; ***P-value<0.10.

lems regarding the goodness of fit of the models. However, despite the similarities of the models regarding their significance and goodness of fit, the significant explanatory variables were not the same. When using Earnings Persistence as metric of Earnings Quality metric or the combined metrics of Persistence and Management, only the variable Price Earnings Ratio was not significant. In turn, the model of Earnings Quality based on Earnings Management presented only Corporate Governance and Financial Constraint as significant.

Concerning the quality of the model, the Nagelkerke R^2, presented in Table 3, shows that 21.6% of the explanatory variable changes are able to clarify the probability of occurrence of companies with Earnings Quality compared to companies without quality by the metric of Earnings Persistence; However, the combined metrics analysis model presented greater Nagelkerke R^2, in which 27.1% of the explanatory variable changes are able to clarify the probability of occurrence of companies

with Earnings Quality compared to the companies without quality by the perspective of the combined metrics.

In model 1, only the variable Price Earnings Ratio was not significant for the model. This result allows us to infer that the variables Market Value, Cost of Debt, Corporate Governance, and Financial Constraint affect the probability of occurrence of Earnings Quality both from Earnings Persistence and from the combined metrics.

Table 3 shows the relationship between the expected signal and the signal obtained in the explanatory variables, of which stands out the signal of the variable Market Value. The Market Value of a company is associated with the ability of its assets to generate economic benefits in the long run (ASSAF NETO, 2014). According to Jiang, Lee, and Anandarajan (2008), the Market Value of the company tends to incorporate the expectation of growth of its profitability. Research such as those by Vesco and Beuren (2015) and Silva and Margem (2015) show that the size of the total as-

TABLE 3 – Results of models 6, 7, and 8.

Coeffic.	Variables	Sign Expected	EP Model[1]		EM Model[2]		Combined Analysis	
			Coeff.	P-Value	Coeff.	P-Value	Coeff.	P-Value
β_1	Market Value	+	-1.629	0.000	0.091	0.271	-1.377	0.000
β_2	Price Earnings Ratio	+	0.003	0.453	-0.002	0.565	-0.001	0.842
β_3	Cost of Debt	-	-0.009	0.004	-0.002	0.238	-0.012	0.014
β_4	Corporate Gov.	+	0.584	0.043	0.506	0.001	1.333	0.000
β_5	Financial Constraint	-	-0.840	0.000	-0.632	0.000	-1.750	0.000
Number of Observations			944,000		944,000		501,000	
X^2 Test			76.620	0.000	43.090	0.000	110.850	0.000
Hosmer and Lemeshow Test			0.297		0.623		0.244	
Omnibus Test			0.000		0.000		0.000	
Nagelkerke R^2			0.216		0.072		0.271	

Source: Prepared by the authors with the research results.

Note: Binary logistic regression models as proposed in expressions 6, 7, and 8.

EP Model[1]- Dependent variable: Earnings Persistence {0- companies without Earnings Quality/1- companies with Earnings Quality (data separated by median)}, according to expression 6.

EM Model[2]- Dependent variable: Earnings Management {0 - companies without Earnings Quality/1 - companies with Earnings Quality (data separated by median)}, according to expression 7; Combined Analysis - Dependent variable: combined metric of the Earnings Persistence and Earnings Management attributes {0 - companies without Earnings Quality/1 - companies with Earnings Quality}, according to expression 8.

sets of a company is positively associated to its accounting performance. Therefore, if the Market Value reflects the expectation of growth of profitability, which is related to the size of the asset, one can infer that the growth of total assets can significantly impact the Market Value of the company.

According to Groppelli, Nikbakht, and Castro (2002), the decision to increase the investment of capital in a company must go through a careful analysis about the marginal costs that such investments may cause. If the expected return is not greater than the marginal cost of the investment, taking as a reference the current investment structure, the market may negatively price such attempt to increase the company's assets. Thus, if there is a mismatch between the growth of earnings and total assets, the growth of the company's value can be understood as a market movement induced by manipulations of the financial results. The disproportionate increase of this Market Value will be related to companies with lower levels of Earnings Persistence and higher levels of Earnings Management, which would cause the possibility of a negative association between Market Value and Earnings Quality.

Table 4 presents the classification predicted to the observations based on the parameters obtained in the logistic regression models established in expressions 6, 7, and 8. This table aims to present the efficiency of the models tested compared to the correct classification of observations. The EP model[1] tests the probability of occurrence of Earnings Quality based on the attribute of Earnings Persistence. The EM model[2] tests the probability of occurrence of Earnings Quality based on the attribute Earnings Management, while the combined analysis model tests the probability of occurrence of Earnings Quality based on the combination of the metrics of Persistence and Management.

Table 4 shows that the overall efficiency of the EP model[1] is 68.43%, which allows us to classify a company as with or without Earnings Quality from the explanatory variables with a 68.43% probability of success. The model of Earnings Quality based on Earnings Management showed an overall efficiency of 60.38%. Table 4 also shows that the result of the classification of companies according to the Earnings Quality by the parameters obtained with the combined analysis model of Earnings Persistence and Earnings Management presented overall efficiency of 74.05% of probability of success compared to the models of Earnings Quality based on the attributes of Persistence and Management used separately.

The Combined Analysis model was more effective to differentiate companies with Earnings Quality, similarly to the results obtained by the EP[1] and EM[2] models. However, the differentiation of companies without Earnings Quality also showed better performance in the Combined Analysis model, with 53.26% probability of success, against 42.23% and 33.41% obtained in EP[1] and EM[2], respectively.

Table 5 presents the results of the performance tests of the models verified in this study. The model of Earnings Quality based on Earnings Persistence showed a better performance than the model based on Earnings Management.

It is observed that the best overall performance is presented by the Combined Analysis model of Earnings Quality metrics. The lowest AIC and BIC (559.95 and 585.25, respectively), the largest area under the ROC curve (0.7691), and the highest value of Nagelkerke R^2 show the best performance of the Combined Analysis model to differentiate companies with Earnings Quality by the explanatory variables used.

CONCLUSIONS

The evidence found in the results have

TABLE 4 – Classification and overall efficiency of the models EP, EM, and Combined Analysis

Description		Total Obs. Without EQ	Prediction of the Models		(%) of Success
			With EQ		
EP[1] Model	Without EQ	386	163	223	42.23%
	With EQ	558	75	483	86.56%
	Total	**944**	**238**	**706**	**68.43%**
EM[2] Model	Without EQ	425	142	283	33.41%
	With EQ	519	91	428	82.46%
	Total	**944**	**233**	**711**	**60.38%**
Combined Analysis	Without EQ	184	98	86	53.26%
	With EQ	317	44	273	86.11%
	Total	**501**	**142**	**359**	**74.05%**

Source: Prepared by the authors with the research results.

Note: Binary logistic regression models as proposed in expressions 6, 7, and 8.

EP[1] Model - Dependent variable: (EP) Earnings Persistence {0 - companies without Earnings Quality/1 - companies with Earnings Quality}, according to expression 6; EM[2] Model - Dependent variable: (EM) Earnings Management {0 - companies without Earnings Quality/1 - companies with Earnings Quality}, according to expression 7; Combined Analysis Model - Dependent variable: combined metrics of Earnings Persistence and Earnings Management {0 - companies without Earnings Quality/1 - companies with Earnings Quality}, according to expression 8.

TABLE 5 – Efficiency test results of the verified models.

Tested Model	AIC	BIC	ROC Curve	% Success[(0)]	% Success[(1)]	(Δ) Success	Nagelkerke R[2]
EP[(1)] Model	1128.2	1157.3	0.7140	59.11	68.43	9.32	0.216
EM[(2)] Model	1271.4	1300.49	0.6248	54.98	60.38	5.40	0.072
Combined Analysis	559.95	585.25	0.7691	63.27	74.05	10.78	0.271

Source: Prepared by the authors with the research results.

Note: (EP[(1)]) Earnings Persistence; (EM[(2)]) Earnings Management; (AIC and BIC) tests of adequacy of the verified models. This test displays the adequate model by the smallest values assigned to AIC and BIC; (% Success 0) represents the percentage of success without the proposed model; (% Success 1) represents the percentage of success with the proposed model; ((Δ) Success) gain in the probability of success using the proposed model compared to its non use.

shown that the combined effect of Earnings Persistence and Earnings Management can be perceived by the market as a more efficient tool to differentiate the Earnings Quality of companies than analysis of these attributes separately. The relevance of the analysis of components of past and current earnings in the evaluation and prediction of future performance, often emphasized in research involving the analysis of financial data, does not allow us to dismiss the significance of financial manipulations on the disclosure of artificially persistent earnings (SLOAN, 1996; DECHOW; GE; SCHRAND, 2010; KOLOZSVARI; MACEDO, 2016).

The analysis of the isolated efficiency of Earnings Quality attributes has shown that market indicators have a lower discriminatory power of companies with quality when using the metric of Earnings Management to verify this quality. The study of Bushman et al. (2016), which analyzes the relationship between accruals and operating cash flows in American companies from 1964 to 2013, reveals that such a relationship has become weaker over the years, with a tendency of reduction.

From the results of Bushman et al. (2016), one can infer that the loss of significance in the relationship between accruals and operating cash flows has affected

the relevance of the discretionary deposits obtained by expressions 2 and 3, used as metric of Earnings Management. It is still possible to consider, from the study of Sloan (1996), that the weak relationship of Earnings Management with the market perception about Earnings Quality may have occurred due to the reduced capacity of the market to see, understand, and/or use the information about these accruals. Therefore, the results of this research corroborate the studies of Sloan (1996) and Bushman et al. (2016), by showing evidence of the low efficiency of Earnings Management as attribute of Earnings Quality according to the market perception.

Regarding the efficiency of Earnings Persistence as Earnings Quality attribute, the evidence of this research corroborate the study of Beaver, Mcnichols, and Wang (2016), which verifies that companies with Earnings Quality have greater volunteer disclosure of financial information, directly affecting the informational content of earnings and, consequently, the market indicators that highlight the quality of this information.

Therefore, in the light of the results obtained, it is possible to infer that the perception of Earnings Quality by the market Profits by Earnings Management is statistically weaker than by Earnings Per-

sistence, from the explanatory variables used in this research. However, since the combined analysis of Earnings Persistence and Earnings Management was significant, there is evidence that the metric of Earnings Persistence can be perceived by the market with higher or lower levels of Earnings Management, which allows one to consider the possibility that the market uses variables or mechanisms different from those used in this study (BEAVER; MCNICHOLS; WANG, 2016).

REFERÊNCIAS

ALMEIDA, José Elias Feres de. **Qualidade da informação contábil em ambientes competitivos**. 2010. Tese (Doutorado em Ciências Contábeis) – Departamento de Contabilidade e Atuária da Faculdade de Economia, Administração e Contabilidade, Universidade de São Paulo, São Paulo, 2010.

ASSAF, NETO. **Valuation**: métricas de valor e avaliação de empresas. São Paulo: Atlas, 2014.

BASILICO, Elisabetta; GROVE, Hugh. The Relationship between Earnings Quality, Control Mechanisms of Corporate Governance, and Future Stock Price Returns: The Case of the Netherlands. **Corporate Ownership and Control Journal**, v. 10, 2013.

BASU, Sudpita. The conservatism principle and the assymetric timeless os earnings. **Journal of Accounting and Economics**, p. 78-90, 1997.

BHATTACHARYA, Nilabhra; DESAI, Hemang; VENKATARAMAN, Kumar. Does earnings quality affect information asymmetry? Evidence from trading costs. **Contemporary Accounting Research**, v. 30, n. 2, p. 482-516, 2013.

BEAVER, William H.; MCNICHOLS, Maureen F. The characteristics and valuation of loss reserves of property casualty insurers. **Review of Accounting Studies**, v. 3, n. 1, p. 73-95, 1998.

BEAVER, William H.; MCNICHOLS, Maureen F.; WANG, Zach Zhiguang. **The Information Content of Earnings Announcements**: New Insights on Intertemporal and Cross-Sectional Behavior. 2016. Available from: <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2814387>. Access on: June 23, 2016.

BLACK; Dirk E; PIERCE, Spencer;

THOMAS, Wayne B. A New Measure of Managers' Intentional Income Smoothing. **Tuck School of Business Working Paper**, 2017. Available from: <https://ssrn.com/abstract=3026235>. Access on Apr. 5, 2018.

BUSHMAN, Robert M.; LERMAN, Alina; ZHANG, X. Frank. The changing landscape of accrual accounting. **Journal of Accounting Research**, v. 54, n. 1, p. 41-78, 2016.

COLLINS, Daniel W.; KOTHARI, SP. An analysis of intertemporal and cross-sectional determinants of earnings response coefficients. **Journal of Accounting and Economics**, v. 11, n. 2-3, p. 143-181, 1989.

DECHOW, Patricia M.; SCHRAND, Catherine M. **Earnings quality**, 2004. Available from: <https://www.cfapubs.org/doi/pdf/10.2470/rf.v2004.n3.3927>. Access on July 19, 2016.

DECHOW, Patricia M.; GE, Weili. The persistence of earnings and cash flows and the role of special items: Implications for the accrual anomaly. **Review of Accounting studies**, v. 11, n. 2-3, p. 253-296, 2006.

DECHOW, Patricia; GE, Weili; SCHRAND, Catherine. Understanding earnings quality: A review of the proxies, their determinants and their consequences. **Journal of Accounting and Economics**, v. 50, n. 2, p. 344-401, 2010.

DEMONIER, Gladyson Brommonschenkel. **O impacto a restrição financeira na prática do conservadorismo contábil**. 2013. Dissertação (Mestrado em Ciências Contábeis) – Programa de Pós-Graduação em Ciências Contábeis, do Centro de Ciências Jurídicas e Econômicas, Universidade Federal do Espírito Santo, Vitória, 2013.

DICHEV, Ilia D. **Accrual duration**. 2015. Available from: <https://sites.insead.edu/ facultyresearch/research/file.cfm?fid=56684>. Access on: Apr. 20, 2017.

FARBER, David B. Restoring trust after fraud: Does corporate governance matter? **Accounting Review**, v. 80, n. 2, p. 539-561, 2005.

FÁVERO, Luiz Paulo; BELFIORE, Patricia. **Análise de dados:** modelos de regressão com Excel®, Stata® e SPSS®. Rio de Janeiro: Elsevier Brasil, 2017.

FELTHAM, Gerald A.; OHLSON, James A. Valuation and clean surplus accounting for operating and financial activities. **Contemporary accounting research**, 1995, 11.2: 689-731.

FRANCIS, Jennifer; LAFOND, Ryan; OLSSON, Per M.; SCHIPPER, Katherine. **The market pricing of earnings quality**, 2002. Available from: <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=414140>. Access on Feb. 14, 2017.

GAO, Pingyang. **A contracting approach to conservatism and earnings management.** The University of Chicago Booth School of Business Working Paper, 2011. Available from: <faculty.chicagobooth.edu/workshops/accounting/pdf/GaoConservatismV3.pdf>. Access on: Oct. 15, 2017.

GIVOLY, Dan; HAYN, Carla K.; KATZ, Sharon P. Does public ownership of equity improve earnings quality? **Accounting Review**, v. 85, n. 1, p. 195-225, 2010.

GROPPELLI, Angelico A.; NIKBAKHT, Ehsan; CASTRO, André Olimpio Mosselman Du Chenoy. **Administração financeira**. 2. ed., São Paulo: Saraiva, 2002.

HUANG, Lixin; KALE, Jayant R.

Large Customers, Earnings Persistence, and Earnings Management, 2018. Available from: <https://ssrn.com/abstract=2937346>. Access on: Apr. 22, 2018.

HUANG, Pinghsun; ZHANG, Yan; DEIS, Donald R.; MOFFITT, Jacquelyn S. Do artificial income smoothing and real income smoothing contribute to firm value equivalently? **Journal of Banking & Finance**, v. 33, n. 2, p. 224-233, 2009.

IUDÍCIBUS, Sérgio de; LOPES, Alexsandro Broedel. **Teoria Avançada da Contabilidade**. 2. ed., São Paulo: Atlas, 2012.

JIANG, Wei; LEE, Picheng; ANANDARAJAN, Asokan. The association between corporate governance and earnings quality: Further evidence using the GOV-Score. **Advances in Accounting**, v. 24, n. 2, p. 191-201, 2008.

JENSEN, Michael C.; MECKLING, William H. Theory of the firm: Managerial behavior, agency costs and ownership structure. **Journal of Financial Economics**, v. 3, n. 4, p. 305-360, 1976.

KAPLAN, Steven N.; ZINGALES, Luigi. **Do financing constraints explain why investment is correlated with cash flow?** Massachusetts: National Bureau of Economic Research, 1995.

KOLOZSVARI, Ana Carolina; MACEDO, Marcelo Álvaro da Silva. Análise da Influência da Presença da Suavização de Resultados sobre a Persistência dos Lucros no Mercado Brasileiro. **Revista Contabilidade & Finanças**, v. 27, n. 72, p. 306-319, 2016.

KOTHARI, SP. Capital markets research in accounting. **Journal of Accounting and Economics**, v. 31, n. 1, p. 105-231, 2001.

KOTHARI, SP.; SHU, Susan; WYSOCKI, Peter D. Do managers withhold bad news? **Journal of Accounting Research**, v. 47, n. 1, p. 241-276, 2009.

LI, Xi. Accounting conservatism and the cost of capital: An international analysis. **Journal of Business Finance & Accounting**, v. 42, n. 5-6, p. 555-582, 2015.

LICERÁN-GUTIÉRREZ, Ana; CANO-RODRÍGUEZ, Manuel. **Measuring Earnings Quality**: A Proposal of a Theoretical Framework and an Empirical Method. 2017. Available from: <https://ssrn.com/abstract=3079680>. Access on May 22, 2017.

LOPES, Alexsandro Broedel; MARTINS, Eliseu. **Teoria da Contabilidade**: Uma nova abordagem. São Paulo: Atlas, 2012.

MARQUES, Wagner Antônio; ALVES, Rosilaine Francisca Campos; AMARAL, Hudson Fernandes; SOUZA, Antônio Artur de. Relação entre Níveis de Governança, Política de Dividendos, Endividamento e Valor das Empresas Brasileiras. **Revista Evidenciação Contábil & Finanças**, v. 3, n. 2, p. 4-26, 2015.

MARTINEZ, A. L. Gerenciamento de resultados no Brasil: um *survey* da literatura. **Brazilian Business Review**, v. 10, n. 4, p. 1-31, 2013.

MAZZIONI, Sady; DIEL, Fábio José; DE OLIVEIRA, Juliete Maria Senczkowski. Attributes of the Quality of Accounting Information in Firms that Participate in the Brazilian Stock Market. **Revista Contabilidade, Gestão e Governança**, v. 19, n. 2, p. 230-253, 2016.

MCCONNELL, John J.; SERVAES, Henri. Additional evidence on equity ownership and corporate value. **Journal of Financial economics**, v. 27, n. 2, p. 595-612, 1990.

NARDI, Paula Carolina Ciampaglia; NAKAO, Silvio Hiroshi. Gerenciamento de resultados e a relação com o custo da dívida das empresas brasileiras abertas. **Revista Contabilidade & Finanças-USP**, v. 20, n. 51, 2009.

OHLSON, James A. Accruals: an overview. **China Journal of Accounting Research**, v. 7, n. 2, p. 65-80, 2014.

OLIVEIRA, Fernando Nascimento; OLIVEIRA, Pedro Góes Monteiro de. Uma análise empírica das políticas de financiamento adotadas pelas empresas de capital aberto brasileiras. **Revista Brasileira de Finanças**, v. 7, n. 4, art. 171, p. 459-484, 2009.

PENMAN, Stephen H.; ZHANG, Xiao-Jun. Accounting conservatism, the quality of earnings, and stock returns. **Accounting Review**, v. 77, n. 2, p. 237-264, 2002.

PIMENTEL, Renê Coppe; AGUIAR, Andson Braga de. Persistence of quarterly earnings: an empirical investigation in Brazil. **Brazilian Business Review**, v. 9, p. 38-54, 2012.

PREVOST, Andrew K.; RAO, Ramesh P.; SKOUSEN, Christopher J. **Earnings management and the cost of debt**, 2008. Available from: <https://ssrn.com/abstract=1083808>. Access on Nov. 7, 2017.

SCOTT, William Robert. **Financial accounting theory**. 6. ed, Upper Saddle River, NJ: Prentice hall, 2012.

SILVA, André Luiz Carvalhal da; MARGEM, Helena. Mulheres em Cargos de Alta Administração Afetam o Valor e Desempenho das Empresas Brasileiras? **Revista Brasileira de Finanças**, v. 13, n. 1, 2015.

SLOAN, Allan. Search in. **Accounting review**, v. 71, n. 3, p. 289-315, 1996.

ELIZEU MARIA JUNIOR, TERESA CRISTINA JANES CARNEIRO, LUIZ CLÁUDIO LOUZADA, HELIO ZANQUETTO FILHO, PATRICIA MARIA BORTOLON

VESCO, Delci Grapégia dal; BEUREN, Ilse Maria. Influência da estrutura de propriedade e dos interlocks entre proprietários no desempenho das empresas. **Contabilidade Vista & Revista**, v. 26, n. 3, 2015.

WATTS, Ross L. Conservatism in accounting part I: Explanations and implications. **Accounting Horizons**, v. 17, n. 3, p. 207-221, 2003.

WILSON, Reginald. Nonprofessional Investors' Framework for Understanding Earnings Quality (October 21, 2015). **Journal of Accounting and Finance**, Vol. 16 (1), p. 113-123, 2016. Available from: <https://ssrn.com/abstract=2677056>. Access on Jan. 20, 2017.