THE IMPACT OF THE LEVEL OF DISCLOSURE ON THE RETURN ON ASSET AND RETURN ON EQUITY INDICATORS OF BRAZILIAN PUBLICLY TRADED COMPANIES IN THE EDUCATION SECTOR

O IMPACTO DO NÍVEL DE DISCLOSURE NOS INDICADORES DE RETORNO SOBRE O ATIVO E RETORNO SOBRE O PATRIMÔNIO LÍQUIDO DAS EMPRESAS BRASILEIRAS DE CAPITAL ABERTO DO SETOR EDUCACIONAL

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ABSTRACT

The objective of this study was to evaluate the impact of the level of disclosure on the accounting indicators Profitability on Assets and Profitability on Shareholders' Equity. A quantitative and explanatory approach was used in the study, with the application of multiple linear regression with panel data with fixed effect. The study analyzed the financial statements of publicly traded companies in Brazil, which had to adapt to changes arising from the standardization and convergence process for a global accounting model. The results obtained in the study showed that the greater the disclosure of strategic and operational information, the lower the profitability of the companies. This finding underscores the importance of balancing the need for transparency and disclosure with the need to maintain financial performance. Additionally, the study found that the Student Financing Fund for Higher Education had a positive impact on the economic-financial

results of the companies, as it contributed to a considerable increase in the enrollment of new students. In conclusion, the study highlights the importance of disclosure in financial reporting and the need for companies to balance transparency with financial performance. The study also suggests that state support for higher education can have positive economic benefits for companies, and future research should explore this relationship further. By understanding the relationship between disclosure, state incentives, and financial performance, companies can make informed decisions that support their long-term success.

Keywords: Disclosure. Profitability Indicators. Multiple Linear Regression with Panel Data.

RESUMO

O objetivo deste estudo foi avaliar o impacto do nível de disclosure nos indicadores contábeis Rentabilidade do Ativo e Rentabilidade do Patrimônio Líquido. Utilizou-se no estudo uma abordagem quantitativa e explicativa, com aplicação de regressão linear múltipla com dados em painel com efeito fixo. O estudo analisou as demonstrações financeiras das empresas de capital aberto no Brasil, que tiveram que se adaptar às mudanças decorrentes do processo de padronização e convergência para um modelo contábil global. Os resultados obtidos no estudo mostraram que quanto maior a divulgação de informações estratégicas e operacionais, menor a lucratividade das empresas. Essa descoberta ressalta a importância de equilibrar a necessidade de transparência e divulgação com a necessidade de manter o desempenho financeiro. Adicionalmente, o estudo constatou que o Fundo de Financiamento Estudantil do Ensino Superior teve impacto positivo nos resultados econômico-financeiros das empresas, pois contribuiu para um aumento considerável na captação de novos alunos. Em conclusão, o estudo destaca a importância da divulgação nos relatórios financeiros e a necessidade de as empresas equilibrarem a transparência com o desempenho financeiro. O estudo também sugere que o apoio estatal ao ensino superior pode trazer benefícios econômicos positivos para as empresas, e pesquisas futuras devem explorar mais essa relação. Ao compreender a relação entre divulgação, incentivos estatais e desempenho financeiro, as empresas podem tomar decisões informadas que apoiem seu sucesso a longo prazo.

Palavras-chave: *Disclosure. Indicadores de Rentabilidade. Regressão Linear Múltipla. Dados em Painel.*

1 INTRODUÇÃO

Due to the economic globalization and, consequently, the narrowing of trade relations on a global scale, the adaptation of accounting language at the international level became necessary so that communication in the business world could be carried out in several countries without so many differences (SILVA et al., 2018).

One of the significant changes arising from the process of standardization and convergence for an international accounting model is disclosure because of the need to qualify the information disclosed by the companies to their stakeholders. According to Murcia and Machado (2014), the word disclosure means revealing, divulging, exposing, that is, making something public, showing something or business information. Thus, disclosure is linked to the objectives of Accounting by guaranteeing differentiated information to various types of users (IUDÍCIBUS, 2015).

In Brazil, Higher Education Institutions (HEIs) also had to adapt to the changes resulting from this process of standardization. The education sector in Brazil is highly relevant to the country's economy, due mainly to the size of its population. In addition, these organizations play an important social role in the development and empowerment of thousands of people. According to data from the Census of Higher Education 2017, Brazil represents the fifth largest market of higher education in the world and the largest market of higher education in Latin America, with 8.3 million students enrolled. The average annual growth in enrollments in HEIs is 4.6%.

According to Locateli et al. (2017), in the past decades, there has been a great increase in the number of students attending HEIs, and one of the factors that led to this growth was the Higher Education Student Fund (Fundo de Financiamento ao Estudante do Ensino Superior - FIES). Funds coming from FIES may represent a considerable percentage of the Accounts Receivable of these institutions. This program may affect the profitability of private higher education institutions and its effects may therefore be demonstrated in the financial statements. Thus, it is possible, from the analysis of these statements, to verify the variations of the indices of profitability of the companies.

It is impossible to deny the importance of the information obtained through the analysis of the economic-financial indicators as an element for analysis of the performance of companies in a given period. This information is of paramount importance for investors interested in changes in equity of companies and other users of accounting information interested in obtaining information concerning the evolution of companies and the possible risks they may present. In addition, it is also important for government agencies and policymakers, who are aware of the impact of policy changes on the profitability of educational institutions (LOCATELI et al., 2017).

In addition to this set of legal and voluntary information, the application of the accounting technique, which uses statistical tools to examine, compare and interpret the content of financial statements, contributes in a relevant way to the analysis of the economic situation of companies and therefore represents an important tool to support decision making (PADOVEZE; BENEDICTO, 2010).

Thus, the economic-financial indicators are a representation of several indices or quotients, whose purpose is to facilitate and deepen the analysis of the financial statements. Index is the connection between accounts or group of accounts of the Financial Statements, aiming to highlight a certain aspect of the economic or financial situation of a company (KITZBERGER; PADOVEZE, 2015).

Under the Return on Assets (ROA) index, profitability is measured based on investments, which are accounted for as Assets. Following the same path, investors want to know how much this return represents in relation to the invested equity, which is classified as Shareholders' Equity (SE). In order to obtain this measure, the Return on Shareholders' Equity (ROE) is calculated.

In this perspective, this research proposes the application of models of quantitative methods to determine the impact of the level of disclosure on the ROA and ROE indicators of Brazilian publicly traded companies in the education sector. Therefore, this question arises: what is the impact of the level of disclosure on the accounting indicators of ROA and ROE profitability of Brazilian publicly traded companies in the education sector? The aim of the study is to evaluate the impact of the level of disclosure on ROA and ROE accounting indicators of the Brazilian publicly traded companies in the education sector and, accordingly, to demonstrate to users of accounting information the importance of considering such influence on their analysis and economic decisions.

The choice of this topic is justified because, from the organizational point of view, based on the analysis of the results of the research, users of accounting information can make economic decisions about buying, maintaining or selling financial instruments and also provide financial resources for the entities. In addition, from the perspective of company managers, the result of the research may contribute to decisions such as increasing or decreasing the level of disclosure. It is also hoped to contribute with future academic research on the subject, since the approach to the existence of the impact of the level of disclosure on the ROA and ROE indicators of Brazilian publicly traded companies in the education sector is recent, mainly due to the convergence of Brazilian accounting standards with international ones as of 2008.

2 THEORETICAL FRAMEWORK

2.1 Disclosure Theory

Studies from the 80's already dealt with the Theory of Disclosure, with an emphasis on the researches by Verrecchia (1983) and Dye (1985), who presented a theoretical review and demonstrated arguments for the existence of a unified or comprehensive theory on disclosure.

Salotti and Yamamoto (2005) carried out an essay on the Theory of Disclosure based on Verrechia's study of 2001, and emphasize that, in order to initiate the development of a disclosure model, some assets are assumed to exist (in general, the company), whose value is uncertain, and some information about it is disclosed.

Yamamoto and Salotti (2006) emphasize that disclosure, which can be classified as complete, fair or adequate, is related to the use of formal or informal channels by companies to provide accounting information of a quantitative and qualitative nature to those who need it.

However, the information is imperfect, its acquisition has cost, there is information asymmetry and the level of this asymmetry is affected by the action of companies and individuals. As a consequence of this lack of symmetry of information about companies, economic decisions made by users of accounting information may not be effective. In this scenario, better informed users tend to make the best decisions (STIGLITZ, 2000).

Accordingly, Lima and Pereira (2011) say that disclosure plays an essential role in reducing the informational asymmetry between the company and the stakeholders and is considered as one of the main forms of communication between the company and the various users interested in evaluating the performance of its administration.

Without disclosure of information, users do not have a secure basis for distinguishing an equity, financial and economic position of a company. Voluntary disclosure of information can contribute in a relevant way to users' decisions in favor of those companies which disclose less favorable information (CONSONI; COLAUTO, 2016).

2.2 Analysis of Financial Statements

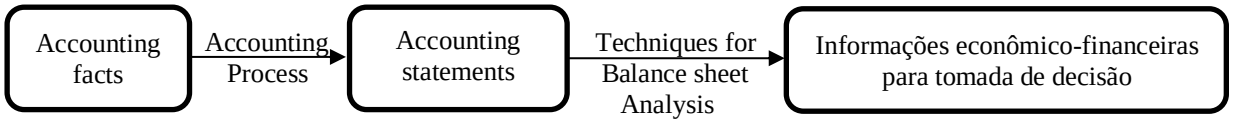
One of the main tools used in the analysis of the economic and financial situation of the companies is the analysis of the financial statements or, simply, analysis of balance sheets, as they are known. Among the attributes of Accounting, the comprehensibility of information is one of the characteristics that confers its usefulness to the decision making by its users. One of the essential tools in this process is the analysis of the financial statements (ALMEIDA et al., 2018).

The main purpose of using the quotients or indicators is to allow the analyst to extract trends and compare the quotients with preestablished patterns. The periodicity of the analysis, another point of great importance, will depend on the objectives to be reached and attained (ALMEIDA et al., 2018).

In this respect, it is important to highlight the distinction between data and information. Data are numbers or description of objects or events that, in isolation, do not provoke any reaction in the reader, that is, they are irrelevant from the informational point of view. On the other hand, information represents, for those who receive it, a communication that can produce reaction or decision, and is therefore relevant (MATARAZZO, 2010).

In this sense, Figure 1 illustrates this idea:

Figure 1 – Accounting process sequence



Source: Adapted from Matarazzo (2010).

Several reasons or specific objectives also lead the various users of the financial statements to look at them to obtain an assessment of the company's situation (PADOVEZE; BENEDICTO, 2010).

Chart 1 – Reasons for the analysis of the financial statements

- Credit release;
- Capital investments;
- Merger, Spin-off or Incorporation of companies
- Profitability/Return;
- Liquidity;
- Perspectives of the company;
- Supervision or control;
- Administrative reports;

Source: Adapted from Padoveze and Benedicto (2010).

2.3 Analysis of Financial Statements

Basically, some of the indices that emerged many years ago remain in use today. However, with the evolution of companies over time, the techniques have been enhanced by scientific studies within universities that have employed advanced knowledge of statistics and mathematics. Their acceptance gained strength as a way of knowing the situation of the companies very practically; something between 10 and 20 indicators tends to be the most used. Some of those are imposed by their natural importance and are universally accepted as good ones and must necessarily be included on the list of the indicators (ALMEIDA et al., 2018).

According to Padoveze and Benedicto (2010), the analysis of profitability can be considered as one of the most important for the analysis of the financial statements, since its objective is to present the return on invested capital and to identify the reasons that led to this rate of profitability.

ROA represents the rate of return generated by the investments made by a company in its assets. It indicates the return generated by each $1.00 invested by the company (NET, 2012). It is calculated as follows:

$$ROA = \frac{Net\ Profit}{Total\ Assets}$$

It indicates how much net profit the company gets for every $1.00 of total investment. The higher the quotient, the better the return on investment.

According to Wernke (2008), ROE points the return on the shareholders' equity (SE) applied in the company. Thus, shareholders are the ones who are most interested in monitoring the performance of this indicator, since this is the return on investment that was made, analyzing whether it was superior to other alternatives or it exceeded the financial market's income rates (WERNKE, 2008).

For Neto (2012), ROE is a measurement of the company's return on resources invested by its owners (shareholders), that is, for each $ 1.00 of equity invested in the company, how much the shareholders receive in return.

To calculate it, the following expression is uded:

$$ROE = \frac{Net\ Profit}{Average\ Equity}.$$

3 METHODOLOGY

3.1 Methodological Approach

To reach the proposed objective, the approach used in this research will be quantitative, aiming to answer the problem of this paper through applied research. This approach is characterized by the organization, summarization, characterization and interpretation of numerical data collected and treated through the application of statistical methods and techniques (THEOPHILO; MARTINS, 2016).

For this reason, in terms of its objectives, the study is an explanatory one, since its main concern is to identify the most important variables that determine or participate in the occurrence of the studied phenomenon, according to Gil (2009).

3.2 Hypotheses

In order to verify the impact of the level of disclosure on the profitability indicators of the education sector companies which are listed on the stock exchange, the following hypotheses were formulated:

H0: There is a positive impact of the level of disclosure on the ROA accounting indicator of Brazilian publicly traded companies in the education sector.

H1: There is a negative impact of the level of disclosure on the ROA accounting indicator of Brazilian publicly traded companies in the education sector.

H2: There is no impact of the level of disclosure on the ROA accounting indicator of Brazilian publicly traded companies in the education sector.

H3: There is a positive impact of the level of disclosure on the ROE accounting indicator of Brazilian publicly traded companies in the education sector.

H3: There is a negative impact of the level of disclosure on the ROE accounting indicator of Brazilian publicly traded companies in the education sector.

H5: There is no impact of the level of disclosure on the ROE accounting indicator of Brazilian publicly traded companies in the education sector.

3.3 Hypotheses

To determine the level of *disclosure*, the model proposed by Consoni and Colauto (2016) will be used. The authors formulated the metrics based on Brazilian studies and also define its content from elements that remain voluntary during a given study period.

Thus, the information content of the metrics is structured in four categories: 1. Market vision; 2. Corporate strategy; 3. Economic and financial performance; and 4. Operational aspects, as shown in Figure 2.

Figure 2 – Categories of the voluntary disclosure index

<table>
<tr><td colspan="4">Market vision</td></tr>
<tr><td rowspan="3">Information related to the management's perception of the dynamics of the economic, competitive and regulatory environment of the market(s) in which the company operates.</td><td colspan="3">Corporate Strategy</td></tr>
<tr><td rowspan="2">Information related to the explanation of the corporate strategy for the creation of values to the shareholders based on the objectives, plans or goals. It includes risk management strategy and organizational structure as well as information about the structures of alignment of interests.</td><td colspan="2">Economic and Financial Performance</td></tr>
<tr><td>Analysis of economic and financial indicators used to monitor the company's financial performance. It includes parameters such as cost of equity, economic value added and results by segments or business units.</td><td>Operationals
Information about actions taken by management to execute its strategy. Description of operational activities as well as information on innovation, brand development, intellectual capital formation, consumer relations and supply chain.</td></tr>
</table>

Source: Consoni and Colauto (2016).

Consoni and Colauto (2016) conceived the metrics based on Brazilian studies and define its content from elements that remain voluntary during the period under study.

The procedures for collecting data in this research are the same as those adopted by Consoni and Colauto (2016), aligning the scope of each metrics item with the content of the financial statements and quarterly financial reports of the companies.

Considering the fact that some companies diclose more detailed information than others, the authors defined the coding criteria that consider the level of information details, both qualitatively and quantitatively.

Thus, the metricss evaluation followed the criteria shown in Chart 2.

Chart 2 – Metricss evaluation criterion

Disclosure Level	Descrição	Nota
Missing information	When no information is presented on the item being analyzed.	0
declarative Information	When the information is presented in purely descriptive terms.	1
Declarative and quantitative information	When the information is presented in a declarative way and expressed in numbers of a financial and non-financial nature.	2

Source: Adapted from Consoni and Colauto (2016).

Based on this criterion, each company can receive an absolute individual score ranging from 0 to 50 points, since there are 25 items measured, each one being worth 2 points at the most. To obtain the index for each company, on a scale from 0 to 2, the absolute score for each quarter will be the sum of the scores assigned to each metricss. Thus, the closer to 50 the result ascertained by the sum of the notes is, the better the voluntary disclosure of the company will be considered.

Chart 3 – Disclosure Index

Market Vision	
1	Competitive analysis
2	Market Share
3	Assessment of the main economic trends of the market
4	Government Influence on company activities
Corporate Strategy	
5	Corporate goals and plans
6	Alignment of the comapny's activities with the established objectives
7	Prospection of new investments
8	Sale forecasts
9	Results forecasts
10	Cash-flow forecasts
Economic and Financial Performance	
11	Change in receivables level
12	Change in sales volume
13	Change in the level of administrative and commercial expenses
14	Change in the level of operating result
15	Change in the cost of goods sold, manufactured products or services rendered
16	Financial effect arising from the acquisition of short and long term third party resources
17	Financial effect deriving from the application of own resources
18	Behavior of the value of common and preferred shares
19	Global indicators (EVA, EBITDA, MVA)
20	Cost of equity
Operational Aspects	
21	Operational efficiency measures
22	Dependence on technology, suppliers, customers or labor
23	Investments and divestments
24	Investment of resources in human capital management
25	Investment of resources in education, culture and social development projects

Source: Adapted from Consoni and Colauto (2016).

It is worth noting that an adjustment was made in the metricss, excluding those referring to the manufacturing industry, in order to make them more adherent to the companies that provide educational services.

The variables to be explained are the profitability indicators ROA and ROE, measured according to the formulas presented in the theoretical framework. As explained variables, the indicators will be tested for positive, null or negative variation upon the explanatory variables market view (MV) of company *i* at the end of period *t*, corporate strategy (CS) of company *i* at the end of period *t*, economic and financial performance (EFP) of firm *i* at the end of the period *t* and operational aspects (OA) of company *i* at the end of period *t*, in addition to the binary control variables Financing Fund for Higher Education Students (Fundo de Financiamento ao Estudante do Ensino Superior - FIES), University for All Program (Programa Universidade para Todos - PROUNI), Economic Crisis (EC) and Mergers or Incorporations (MI).

Thus, the equations to be applied are:

Equation 1:

$$ROA_{it} = \alpha + \beta MV_{it} + \beta CS_{it} + \beta EFP_{it} + \beta OA_{it} + \beta VARCONTROL1_{it} + \beta VARCONTROL2_{it} + \beta VARCONTROL3_{it} + \beta VARCONTROL4_{it} - \varepsilon \quad (1)$$

Equation 2:

$$ROE_{it} = \alpha + \beta MV_{it} + \beta CS_{it} + \beta EFP_{it} + \beta OA_{it} + \beta VARCONTROL1_{it} + \beta VARCONTROL2_{it} + \beta VARCONTROL3_{it} + \beta VARCONTROL4_{it} - \varepsilon \quad (2)$$

Where:
ROA = Retorn on Assets
ROE = Return on Shareholders' Equity
MV = Market Vision
CE = Corporate Strategy
EFP = Economic and Financial Development
OA = Operational Aspects
VARCONTROL1 = FIES
VARCONTROL2 = PROUNI
VARCONTROL3 = Economic Crisis
VARCONTROL4 = Mergers and Incorporations
i – Selected companies
t – Time
Ɛ – Error

The FIES and PROUNI control variables were included in the formula because they exerted a significant influence on the profitability of institutions in the educational sector (MATTOS, FILHO and MOREIRA, 2016; LOCATELI et al., 2017).

And the Economic Crisis control variable was included as a result of the impact of the HEI results, which since 2012 has seen a significant reduction in enrollment, evasion growth and defaults (SILVA, 2017).

The control variable Mergers and Incorporations is considered in the formula because it can influence the calculation of the ROA indicator when these business combinations and their respective impacts on the Companies' assets occur (CPC 15 (R1), 2011).

All control variables identified and included in the presented formulas will have binary behavior when occurring in *i* and in the given period *t* .

3.4 Population and Sample

The population of the present study is made up of companies that have shares traded on B3. The sample is made up of companies in the education sector that have their shares traded in B3, namely:

i. Ânima Holding S.A. (ANIM3);
ii. Estácio Participações S.A. (ESTC3);
iii. Kroton Educacional S.A. (KROT3); e
iv. Ser Educacional S.A. (SEER3).

3.5. Data Collection

Regarding the method adopted for the data collection, the research can be classified as ex-post facto. According to Gil (2009), this type of research is by definition a systematic and empirical investigation in which the researcher does not have direct control over the independent variables, since they represent a fact or can not be manipulated intrinsically. Thus, the data will be collected directly from the financial statements and quarterly financial reports of the sample companies.

To perform the analysis of the research results, the data were first collected and calculated in Excel. To perform the descriptive statistical analysis and structuring of the data in panel, Gretl software version 1.7.1 was used, to where the data corresponding to the variables (dependent, independent and control) were imported.

4 PRESENTATION AND ANALYSIS OF RESULTS

In this section, the statistical results found in the search will be displayed. The analysis, in both descriptive and inferential terms, aims to give meaning and to obtain information that allows to answer the hypotheses in this study, based on the presented objectives.

4.1 Descriptive Analysis of Results

The descriptive statistics of the sample shows the average, standard deviation and minimum and maximum values, according to Table 1, composed by the four companies for each quarter of the period from 2012 to 2018.

Table 1 – Descriptive statistics of variables for each quarter between 2012 and 2018

variables	average	standard deviation	minimum	maximum
ROA	2,9912%	2,6730%	-3,6742%	16,941%
ROE	6,8856%	15,361%	-31,311%	128,03%
MV	2,7188	1,3195	0,00000	6,0000
CS	2,8958	0,49160	1,0000	4,0000
EFP	18,000	0,00000	18,000	18,000
OA	5,5417	1,2559	2,0000	8,0000
FIES (*dummy*)	0,38542	0,48925	0,00000	1,0000
PROUNI (*dummy*)	0,56250	0,49868	0,00000	1,0000
EC (*dummy*)	0,25000	0,43529	0,00000	1,0000
MI (*dummy*)	0,31250	0,46595	0,00000	1,0000

Source: survey data (2019).

The measures presented were calculated on nominal values disclosed in each quarter by each company. For the purposes of calculating actual values, it would be necessary to take inflation into account in the period under review.

From this information, it can be seen that the average of the ROA presented in the period was 2.99% in the quarter, that is, the return on investments in Assets of the companies remunerates, on average, approximately R$0.0299 for each R$1.00 investment in quarterly terms. According to Neto (2012), the higher the quotient, the better the return on investment.

Still on this variable, a negative net result of R$17.9 Million[1], presented by Ânima S.A. in the third quarter of 2013, is revealed by the negative minimum index of -3.67% when applying the calculation formula of the indicator.

The ROE average of 6.89% for the quarter shows that for each R$1.00 of Average Shareholders' Equity, R$0.06 of invested equity is paid. Like the ROA, the higher the quotient, the better the return on equity. The minimum rate of -31.31% for this variable occurred for the same reason already reported, with regard to the loss of Ânima S.A. in the third quarter of 2013.

The explanatory variables MV, CS, EFP and OA could, according to the adapted model of Consoni and Colauto (2016), reach the score shown in Table 2.

Chart 4 – Minimum and maximum possible score of the explanatory variables

variables	minimum	maximum
MV	0	8
CS	0	12
EFP	0	20
OA	0	10
Total	**0**	**50**

Source: author (2019).

When analyzing the descriptive statistics of these variables, it is verified that none of them reached their maximum possible score. On the other hand, a minimum disclosure was made by all companies when it comes to operational aspects, corporate strategy and economic-financial performance. The only exception was the market vision variable to which, at a given period, there was no information related to any company.

The result of Table 1 also showed that all companies reported the same qualitative and quantitative information for the variable economic-financial performance, since the average reached the maximum score and, with that, there was no standard deviation. Due to this behavior, the independent variable EFP was taken from the regression calculation with panel data because it presents multicollinearity, that is, when the independent variables have exact or approximate linear relations.

4.2 Inferential Analysis of Results with Panel Data

The correlation matrix, presented in Table 2, expresses, in general, the correlation at the level of significance between the model variables.

Table 2 – Correlation matrix between the variables used in the research

	ROA	**ROE**	**MV**	**CE**	**OA**	**FIES (*dummy*)**	**PROUNI (*dummy*)**	**EC (*dummy*)**	**MI (*dummy*)**
ROA	1								
ROE	0,604039	1							
MV	-0,06447*	-0,20442	1						
CE	-0,25246	-0,3074	0,343822	1					
OA	-0,26272	-0,38701	0,524845	0,314005	1				
FIES (*dummy*)	0,297942	0,084111*	0,071846*	-0,35651	0,084945*	1			
PROUNI (*dummy*)	-0,0788*	-0,1609	0,194963	0,155651	0,13026	-0,25078	1		
EC (*dummy*)	-0,25398	-0,14765	-0,02291**	0,073788*	-0,01926**	-0,35835	-0,02425**	1	
MI (*dummy*)	-0,07414*	-0,088*	0,195821	0,097654*	0,355276	0,112553	-0,03964**	-0,18165	1

* Significant correlation at 10%.
** Significant correlation at 5%.
Source: survey data (2019).

According to Dantas (2012), correlations above 0.7 may be detrimental to the model since they mathematically cause numerical instability when adjusting the regression curve; the so-called multicollinearity effect. Table 2 shows a negative correlation of 5% between the variables MV, OA and PROUNI (dummy) with the variable EC (dummy), and also between MI (dummy) and PROUNI (dummy) variables. At the level of significance at 10%, there is a positive correlation between the ROE, MV and OA variables with the variable FIES (dummy), between the variable CS with the variables EC (dummy) and MI (dummy) and also correlation negative relationship between the variable ROA with the variables MV,

PROUNI (dummy) and MI (dummy) and between ROE variables with MI (dummy). For the purposes of the research, this result may be an indication that there is no problem of multicollinearity. This occurs when there are very high correlations between explanatory variables (FÁVERO, 2015).

The regression with panel data, with respect to the fixed effects model, can be used to identify the sequential interrelationship between the variables over time (CONSONI, COLAUTO and LIMA, 2017). Thus, given the requirements and statistical assumptions for the use of multiple linear regression with panel data, the results are demonstrated in the sequence.

Table 3 – Regression results with panel data with fixed effect - Return on Asset (ROA)

$$ROA_{it} = \alpha + \beta MV_{it} + \beta CS_{it} + \beta OA_{it} + \beta FIES_{it} + \beta PROUNI_{it} + \beta CRI_{it} + \beta FI_{it} - \varepsilon$$

variable	coefficient	standard error	t-reason	p-value	
Const	0,0749102	0,0182613	4,102	9,34e-05	***
MV	0,00223196	0,00229259	0,9736	0,3330	
CS	-0,00726621	0,00596009	-1,219	0,2262	
OA	-0,00586212	0,00246663	-2,377	0,0197	**
FIES (*dummy*)	0,0123376	0,00619164	1,993	0,0495	**
PROUNI (*dummy*)	0,00165335	0,00529079	0,3125	0,7554	
EC (*dummy*)	-0,00951090	0,00621125	-1,531	0,1294	
MI (*dummy*)	-0,00270637	0,00574587	-0,4710	0,6388	
Average dep. variable	0,029912	S.D. dep. variable		0,026730	
Residual sum - squares	0,047958	P.E.of regression		0,023753	
R-squared LSDV	0,293460	R-squared inside		0,224229	
F (10, 85) LSDV	3,530452	P-value (F)		0,000619	
Log of da likelihood	228,6677	Durbin-Watson		1,755431	

** Significant correlation at 5%.
Source: survey data (2019).

Table 3 shows the results of the regression, using the variables MV, CS and OA, according to the model adapted from Consoni and Colauto (2016), plus the control variables FIES, PROUNI, EC and MI as explanatory ones and ROA as dependent variable, according to Equation 1.

The regression model tested for the dependent variable R|OA obtained a R-squared of 0.293460, that is, the regression model with panel data with fixed effects is only reliable at 29.35%. This indicates a low degree of adjustment, because through this coefficient of determination, only 29.35% of the variations of ROA are explained by the independent variables. However, this level is common in cross-section data, making the use of the model possible. The Durbin-Watson test presented a result of 1.755431, revealing that there is no evidence of autocorrelation of the errors.

The results also indicate that only the explanatory variables Operational Aspects (OA) and FIES (dummy) were relevant at the 5% level of significance with the dependent variable ROA of the companies.

From this inference, it is verified that the disclosure of operational aspects contributes negatively to the profitability over the assets of the companies, that is, the more operational aspects are disclosed, the less profitability on the assets the company will have. Therefore, the H1 hypothesis is accepted, since the OA variable negatively impacts the ROA accounting indicator of Brazilian publicly traded companies in the education sector.

Considering that the operational aspects variable consists basically of items of corporate and voluntary disclosure, this result differs from the conclusion of the study by Murcia and Machado (2014), which confirmed that companies can increase the liquidity of the shares through the disclosure of corporate information.

Nevertheless, it can be seen from this result that the FIES contributes to the profitability over assets of the companies surveyed, corroborating with the findings of the study by Locateli et al. (2017), concluding that onlendings of the FIES may represent a considerable percentage of receivables from private higher

education institutions, affecting the profitability of these institutions and, therefore, their effects may be evidenced in the financial statements. Likewise, the study by Mattos, Filho and Moreira (2016) evaluated the economic and financial performance of companies in the education services segment at BM & FBovespa and the participation of FIES and PROUNI in their results. The research identified that there was a significant increase in the economic-financial result of these institutions, as well as in the number of enrolled students who joined these programs to encourage higher education. In this case, the H0 hypothesis is accepted, since the FIES (dummy) variable positively impacts the ROA accounting indicator of Brazilian public sector companies in the education sector.

Table 4 – Result of regression with panel data with fixed effect - Return on Equity (ROE)

$$ROE_{it} = \alpha + \beta MV_{it} + \beta CS_{it} + \beta OA_{it} + \beta FIES_{it} + \beta PROUNI_{it} + \beta EC_{it} + \beta MI_{it} - \varepsilon$$

variable	coefficient	standard error	t-reason	p-value	
Const	0,512749	0,107980	4,749	8,22e-06	***
MV	0,0100174	0,0135561	0,7390	0,4620	
CS	-0,0674939	0,0352422	-1,915	0,0588	*
OA	-0,0422367	0,0145852	-2,896	0,0048	***
FIES (*dummy*)	-0,0214727	0,0366113	-0,5865	0,5591	
PROUNI (*dummy*)	-0,0345441	0,0312846	-1,104	0,2726	
EC (*dummy*)	-0,0573203	0,0367273	-1,561	0,1223	
MI (*dummy*)	0,00135032	0,0339755	0,03974	0,9684	
Average dep. variable	0,068856	S.D. dep. variable		0,153607	
Residual sum - squares	1,676783	P.E.of regression		0,140452	
R-squared LSDV	0,251953	R-squared inside		0,223572	
F (10, 85) LSDV	2,862927	P-value (F)		0,004026	
Log of da likelihood	58,06052	Durbin-Watson		1,309923	

* Significant correlation at 10%. *** Significant correlation at 1%.
Source: survey data (2019).

Table 4 shows the results of the regression, using the same explanatory variables and RPL as the dependent variable, according to Equation 2.

The regression model tested for the dependent variable ROE obtained a R-squared of 0.251953, that is, the regression model with panel data with fixed effects is only reliable at 25.20%. Similarly, this indicates a low degree of adjustment, because through this coefficient of determination, only 25.20% of the ROE variations are explained by the independent variables, but also, it is emphasized that this result is common in cross- section. The Durbin-Watson test, with a result of 1.309923, is located in the inconclusive area and of indecision about the existence of evidence of autocorrelation of the errors.

The result on the degree of significance reveals that the Corporate Strategy (CS) variable has a correlation at the 10% level and that the Operational Aspects (OA) at the 1% level, both with a negative coefficient.

It can be assumed from this result that although the disclosure of information related to the corporate strategy - such as corporate plans and objectives, alignment of the company's activities with established objectives, prospection of new investments and forecasts of sales, results and cash flows - contribute to the reduction of informational asymmetry between the entity and society, according to a study by Slomski (2013), it contributes negatively to the profitability of the companies 'Shareholders' Equity, that is, the more the corporate strategy is disclosed, the less profitability Shareholders' equity the Company will own.

In relation boath to the OA variable and the result of the regression obtained for the ROA, it is proven that the disclosure of operational aspects contributes negatively to the profitability of the companies 'Shareholders' Equity, that is, the more operational aspects are disclosed, the less profitability on the Stockholders' Equity the company will have, also confirming the findings of the Lima and Pereira study (2011).

Therefore, the H4 hypothesis is accepted, since the CS and OA variables negatively impact the ROE accounting indicator of Brazilian publicly traded companies in the education sector.

5 CONCLUSIONS

In this chapter, conclusions are drawn from the results of the research conducted and recommendations are given for future research and studies on the impact of the level of disclosure on the profitability indicators of listed companies.

The theoretical assumptions of this study were based above all on the fact that disclosure plays an essential role in reducing the informational asymmetry between the company and the stakeholders and is considered as one of the main forms of communication between the company and the various users interested in evaluating the performance of management, according to results of the studies of Slomski (2013), Stiglitz (2000), Lima and Pereira (2011), Murcia and Machado (2014) and Consoni, Colauto and Lima (2017), and also that the analysis of profitability can be considered as one of the most important for the analysis of financial statements, since its objective is to present the return on invested capital and to identify the reasons that led to this rate of profitability, as discussed in the surveys of Padoveze and Benedicto (2010), Vieira et al. (2011) Wernke (2008), Locateli et al. (2017) and Dal Magro et al. (2015).

The descriptive analysis of the results showed that the companies surveyed have a different level of disclosure, especially of voluntary information related to the strategic, operational and market vision aspects.

From the analysis of the regression, it was found that the disclosure of only two categories of the Consoni and Colauto model (2016) negatively impacted the return on Assets and Shareholders' Equity, namely: Operational Aspects (OA) with negative influence at a significance level of 5% for the Return on Asset indicator and at a significance level of 1% for Return on Equity and Corporate Strategy (CS) with a negative influence on a 10% level of significance for the Return on Equity.

These results for the variable OA indicate the acceptance of the H1 hypotheses, at a significance level of 5%, and H4, at a significance level of 1%. In a similar outcome, the CS variable also indicates the acceptance of the H4 hypothesis, but at a significance level of 10%. Therefore, it can be concluded that the disclosure of information related to the actions taken by the administration to execute its strategy - as well as information on innovation, brand development, intellectual capital formation, consumer relations and the supply chain, in addition to those associated with explanation of the corporate strategy for the creation of values to the shareholders based on the objectives, plans or goals - contribute to the reduction of the ROA and ROE profitability indicators of the companies surveyed and for the period under study.

Different from the results found in the studies carried out by Souza and Almeida (2017), who verified that there is a positive and significant relationship between the internationalization and the level of disclosure of companies, and by Murcia and Machado (2014), when they indicate that companies can increase the liquidity of the shares through the disclosure of corporate and voluntary information, it was verified in this study that the disclosure, mainly related to the disclosure of information related to the operational aspects and corporate strategy, contribute, in a negative way, to the profitability of investments in Assets and to the profitability of the shareholders 'investments in Shareholders' Equity.

On the other hand, the result presented for the FIES (dummy) variable indicates the acceptance of the hypothesis H0, at the level of significance at 5%, but it can not be said that this effect is related to the level of disclosure, since this is a control variable of the proposed model for this research and does not integrate the standard of determination of the disclosure level proposed by Consoni and Colauto (2016),

used in this study to measure the variables MV, CS, EFP and OA, but by the relevant fund transfers to private institutions by financing the graduation in higher education of students who can not afford the costs of their training. This program contributed to a considerable increase in the enrollment of new students in the institutions surveyed, which resulted in a significant increase in the economic-financial results of these institutions.

The area of finance is a critical field that plays a significant role in economic growth and development. One area that has received significant attention in recent years is the impact of state incentives on higher education. While there is some evidence to suggest that state incentives can have a positive effect on enrollment and economic growth, more research is needed to understand the full extent of the impact of these incentives on the financial health of institutions and the broader economy.

To advance our understanding of the impact of state incentives on higher education, future research should focus on examining the relationship between the receipt of state incentives and key financial indicators such as revenue, expenditures, and debt. Additionally, research should investigate the impact of state incentives on the quality of education provided by institutions and the long-term economic outcomes of students who attend institutions that receive these incentives. Finally, research should also explore the effectiveness of different types of incentives, such as tax breaks or grants, and their impact on different types of institutions, such as public versus private universities. By addressing these important questions, future research can provide valuable insights into the role of state incentives in shaping the financial health and outcomes of higher education institutions and the broader economy.

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