

Impact of the Adoption of IFRS 15 on the Financial Analysts' Forecasts

PATRÍCIA PAIN

Universidade Federal do Rio Grande do Sul

FERNANDA GOMES VICTOR

Universidade Federal do Rio Grande do Sul

MÁRCIA BIANCHI

Universidade Federal do Rio Grande do Sul

Abstract

The quality of data provided by companies, in their reports, influences the results forecasts made by financial analysts. The implementation of IFRS 15 has had impacts in several market sectors. Among the advantages of adopting the International Financial Reporting Standards (IFRSs), it can be highlighted that the countries that adopt them tend to have clearer accounting information, and consequently, credibility and integration with countries and institutions that apply the same method, such as a common language. This study aimed to analyze the impact of the adoption of IFRS 15 on the forecast of financial analysts for the companies participating in the Brasil 100 Index in the period from 2016 to 2019. The sample comprised 71 companies of the Brasil 100 Index (IBrX100) and data collection it took place from the availability of forecast information from financial analysts. The data were treated using descriptive analysis, correlation analysis and multiple linear regression to verify the existence of a relationship between the adopted variables. Among the results found, the size, the number of estimates and the results of the companies analyzed showed a significant relationship with the accuracy of the forecast. The variables of mandatory adoption of the standard and the disclosure of the effects expected with the adoption of such were not shown to be related to the quality of profit forecasts. When adopting a progressive variable, assuming a learning curve for the application of the standard, the results obtained reveal that in relation to the application of IFRS 15, the more time that has passed since the publication of the standard, the less accurate is the forecast made by financial analysts. Therefore, the objectives intended with IFRS 15 formulated by the International Accounting Standards Board (IASB) are, at least, questionable from a practical point of view.

Keywords: IFRS 15, Accuracy of forecast, Financial analysts.

1 INTRODUCTION

The purpose of corporate disclosures is to provide investors with enough information to better understand the nature, value, timing and uncertainty of revenue and cash flows arising from the company's contracts with customers. Although the disclosure requirements are comprehensive and require the breakdown of revenue into appropriate categories, the objective is not to obscure the usefulness of the information with a large amount of trivial details (Tomi, 2018). The company needs to consider the amount of details to present in order to fulfill the purpose of the disclosures (Tomi, 2018).

For Zortea et al. (2017) International Financial Reporting Standards (IFRS) aim to regulate accounting information, standardizing already existing standards to mitigate information asymmetry between different markets. IFRS 15 - Revenue from Contracts with Customers - issued by the International Accounting Standards Board (IASB), addresses how the revenue from contracts with clients should be recognized. Corresponding to the accounting pronouncement CPC 47 – *Receita de Contrato com Cliente* - in Brazil, this standard establishes principles that entities must apply to make accounting information useful and able to demonstrate the amount, nature, opportunity and essential uncertainties for the recognition of revenue and cash flows from customer contracts (Oliveira, Crabbi & Rodrigues, 2020). Price Waterhouse Coopers ([PWC], 2017) pointed out that the implementation of the standard brought several impacts in various sectors of the market, highlighting challenges imposed on managers to comply with the standards and financial market analysts for the correct interpretation of the equity situation and financial performance of companies.

Martinez (2004) highlights that capital market analysts, independent or parts of intermediary institutions, are attentive to the voluntary and mandatory disclosures disclosed by companies, in addition to indicators of the macroeconomic and sectorial conjuncture. When justifying the recommendations, financial analysts consolidate the information collected, assessing the company's current performance and making forecasts for the future, so as to arrive at a fair share price.

The objective of financial analysts is to recommend stock purchase, sale and maintenance operations to investors through the forecasting of results (Domingues & Nakao, 2017). Therefore, the quality of data provided by companies, in their reports, influences the results forecasts made by analysts (Domingues & Nakao, 2017).

This study aims to answer the following question: *what is the relationship between the adoption of IFRS 15 and the forecast of financial analysts for companies participating in the Brasil 100 Index?* The objective of the research was to verify the relationship between the adoption of IFRS 15 and the forecast of financial analysts for the companies participating in the Brasil 100 Index (IBrX100) in the period from 2016 to 2019.

The adoption of CPC 47, following the standard of IFRS 15, aims to standardize and unify the existing standards, in addition to elucidating how the revenues from contracts with clients in Brazil should be recognized, in order to standardize the statements between the different sectors of the economy. The impact of the adoption was perceived in the need to adapt the company to conform to the new standard and the financial analysts to interpret the data (Gonçalves & Gomes, 2018). This study verifies, by reflecting on the quality of market analysts' forecasts, whether the understanding and application of IFRS 15 brought the effects it intended. The determination of the existence of a relationship between the requirement of the standard and the quality of the forecasts was verified as a determinant of the fulfillment of the objective of adopting IFRS 15 for external users. Following what was predicted by Price Waterhouse

Coopers ([PWC], 2017), it was necessary to analyze the perception of how the sectors reacted and were impacted by the differences imposed for the composition of their financial reports.

2 THEORETICAL FRAMEWORK

2.1 Adoption of IFRS 15 in Brazil

In the context of internationalization, Jião et al. (2012) make it clear that, according to regulators, investors benefit from the publication of information with greater uniformity between countries and companies and from information for individual companies with higher quality. Positive capital market reactions were noted for each statement that revealed the likelihood of adopting IFRSs.

Among the advantages of adopting IFRSs, it can be highlighted that the countries that adopt them tend to have clearer accounting information, and consequently credibility and integration with countries and institutions that apply this method, as a common language. The information must represent what is true, without manipulation or effects, and in order to give reliability to what is exposed by companies. Thus, the objective of the information is to provide support, assisting in the analysis of the risk inherent in the investment and the return it produces (Zortea et al., 2017).

IASB issued IFRS 15, which deals with the recognition of revenue from contracts with customers and corresponds to accounting pronouncement CPC 47 – *Receita de Contrato com Cliente* - in Brazil. These standards establish principles that entities must apply in order to make accounting information useful and capable of demonstrating the amount, nature, timing and uncertainties inherent in the recognition of revenue and cash flows from contracts with clients (Oliveira, Crabbi & Rodrigues, 2020).

Haggenmuller (2019) critically evidenced that IFRS 15 is mainly addressing specific sectors, which had difficulties in applying previous IFRS revenue recognition requirements due to the absence or non-specific guidance that forced them to use standards outside of IFRS. Due to its complexity, however, IFRS 15 also affects companies with simple business models and its implementation can be unexpectedly time-consuming, laborious and difficult, without leading to material changes. Although no indication is found that earnings management or manipulation could be related to the adoption of IFRS 15, the standard still requires professional interpretation and judgment that may be subject to incorrect or diverging accounting of transactions. Although IFRS 15 appears necessary, it is anticipated that it represents a complex combination of several existing standards and, consequently, fails to assist the profession. Therefore, the predefined objectives of IFRS 15 formulated by the IASB are easily called into question with regard to the practical point of view.

Publicly traded companies that trade in B3 SA - Brasil, Bolsa, Balcão AS - should apply CPC 47 as of January 1, 2018, except for publicly traded companies that are regulated concurrently by another regulatory agency to enter into an agreement with the *Comissão de Valores Mobiliários* (CVM) for the disclosure of financial statements through regulatory practices. For the accounting years ended in December 31, 2017, Brazilian publicly-held companies should assess the effects that the new accounting pronouncement, CPC 47, could have on their financial statements and disclose in their explanatory notes their conclusions about their effects (Gonçalves & Gomes, 2018).

Khamis (2016) tested the perception of Egyptian preparers and auditors about IFRS 15. Focusing on the level of familiarity, standard clarity and ease of application in different business sectors in Egypt, the final sample of the study consisted of 31 auditors and 34 preparers. It

turned out that, for the most part, the Egyptian accountants and auditors surveyed were not yet ready to adopt and did not have sufficient knowledge about IFRS 15, as well as, they feared the new revenue recognition requirement (which increased discretion and judgment recognition of revenue) and its potential impact in different sectors. Given perceived results, hypothesis 1 of this study is:

***Hypothesis 1 (H1):** The disclosure of the effects of adopting the standard in an explanatory note is positively related to the quality of financial analysts' forecast.*

Price Waterhouse Coopers ([PWC], 2017) points out that the implementation of the standard has several impacts in various sectors of the market. These impacts are greatest in the asset management, automotive, engineering and construction, entertainment and media, industrialized products and manufacturing, pharmaceutical and biotechnology, real estate, retail and consumer, technology and telecommunications industries.

For Oliveira, Crabbi and Rodrigues (2020) the publication of this standard occurred as a result of divergences in the revenue recognition process between IASB and Financial Accounting Standards Board (FASB). Therefore, this standard was created to harmonize and achieve greater convergence between the regulations of the two bodies. Dalmácio et al. (2013) highlight that as a consequence, greater harmonization and quality of the data provided will affect the quality of the forecasts made by analysts, according to hypothesis 2 of this study.

***Hypothesis 2 (H2):** The mandatory adoption of IFRS 15 relates positively to the accuracy of the financial analysts' forecast.*

2.2 Analyst Forecast

Many investors are not as good as they should be in choosing and managing their investments. Thus, it is necessary to enlist the help of professionals, market analysts, who have specific knowledge that makes them qualified to perform their jobs efficiently (Martinez, 2004). Oliveira and Girão (2018) highlight the relevance of analysts' projections, which deserves attention and debate, as they reduce informational asymmetry and influence the decision-making of investors and other users.

Capital market analysts, whether independent or part of intermediary institutions, are attentive to the voluntary and mandatory reports and statements released by companies, in addition to the macroeconomic and sectoral indicators. To justify their recommendations, they consolidate the information collected, assessing the company's current performance and making forecasts about the future, and then calculate the fair share price. (Martinez, 2004)

For Zortea et al. (2017), it is increasingly important to identify the degree of market efficiency, given the economic importance of the relationship between investor and company. Thus, the more efficient the capital market is, the more accessible it will be for investors who do not have the tools and time to analyze information. Analysts now provide more timely forecasts that are revised more frequently than in the past. These follow fewer companies and specialize in certain sectors, tending to issue forecasts for the same companies for longer periods, becoming more experienced in these (Myring & Wrege, 2009).

Oliveira and Girão (2018) perceived as characteristics of accuracy the characteristics related to the experience and coverage of analysts, the size of the broker, the size of the company and corporate governance. However, in a current scenario of resulting crises and constant evolution of firms, the need to identify the influence of internal and external environmental factors on the accuracy of the forecast of profit analysts is evident.

Regarding the quality of the analysts' forecast, Dechow, Hutton and Sloan (2000) realized that the long-term growth forecasts of the sell-side analysts are systematically overly

optimistic about the stock offers and that the analysts employed by the main managers of the companies offers make growth forecasts more optimistic. In addition, they found a positive relationship between the fees paid to the employers of the affiliated analysts and the level of the growth forecasts of the affiliated analysts. The lower post-offer performance is more pronounced for companies with the highest growth forecasts made by affiliate analysts.

Domingues and Nakao (2017) investigated whether the adoption of the IFRS standard by global oil companies led to an improvement in the quality of analysts' forecasts. Two samples were considered, one for the profit forecast error model, in which 49 companies were analyzed from 2003 to 2014, totaling 588 observations, and one for the forecast dispersion model, in which 29 companies were analyzed from 2003 to 2014, totaling 348 observations. The results indicated that it is not possible to accept the hypothesis that the adoption of IFRS increased the quality of analysts' forecasts and also pointed out that the accuracy of market analysts decreased during the period of partial adoption of IFRS in Brazil.

The quality of the analysts' forecasts and recommendations will only be perceived by the investor some time after the investment has been made, as well as the company's capacity in relation to the expected returns. It is the previous experiences that give analysts the conditions to evaluate the information capacity of the company, considering the possible combinations of signals and indices issued to the market (Dalmácio et al., 2013). Domingues and Nakao (2017) realized that with the adoption of IFRS, market analysts make projections in which one can perceive greater accuracy and less dispersion.

Tomi (2018) examined the impact of IFRS 15 on the accuracy of analysts' forecasts. With a focus on sectors that normally engage in grouped contracts and long-term projects, the sample consisted of European companies listed with company and forecast data for the years 2017 and 2018. The survey results showed that IFRS 15 did not had an impact on the accuracy of analysts' earnings per share forecasts. However, for sales forecasts, the survey results showed that IFRS 15 increases forecast errors for the group of companies in the sample. The results suggest that the implementation of a new accounting standard causes at least a temporary decrease in the accuracy of analysts' forecasts.

Based on the assumption of a learning curve to work with the new standards, both from the company and from analysts in understanding the standard, Martinez and Dumer (2014) used an independent variable of progressive interest that assigns a value of 0 for the period prior to the mandatory rule and increasing from 1 to a later period. Based on the understanding that the market as a whole is gradually adapting to content altered by the application of a new standard, hypothesis 3 of the study is:

Hypothesis 3 (H3): *The use of a learning curve by companies and financial analysts is positively related to the quality of financial analysts' forecast.*

3 METHODOLOGICAL PROCEDURES

The study is classified as quantitative (Richardson, 1999), for using statistical analysis, correlation techniques and multiple linear regression in the treatment of data. As for the objective, the study is framed as a descriptive research when analyzing the existing relationship between variables that deal with the adoption of IFRS 15 and the quality of the precision of the forecasts of financial analysts (Martins & Theóphilo, 2009). The documentary research was applied in conducting the study in the definition of the technical procedure used when using data available on an electronic portal to determine the accuracy of the forecasts and characteristics inherent to the companies analyzed and which must be controlled (Martins & Theóphilo, 2009).



São Paulo 28 a 30 de julho 2021.

The population adopted in the study is composed of the companies participating in the portfolio of B3's IBrX100 (Brasil 100 Index) (Brasil, Bolsa, Balcão), comprising the 100 most tradable and representative assets of the Brazilian stock market. The sample includes companies with analyst forecast data for the period from 2016 to 2019, excluding financial institutions, given that BACEN (Central Bank) did not approve the adoption of CPC 47 until December 31, 2019. Thus, the sample consists of 71 publicly traded companies.

The collection of economic and financial data was carried out by consulting the Economatica® database. The data referring to the sector to which the company belongs were obtained through the B3 website. Data related to the forecast of analysts was collected from consultation with the Yahoo Finance database for companies with available data.

Table 1 shows the dependent and independent variables of the research used for descriptive statistics, the correlation analysis and in the multiple regression model with panel data in order to relate the adoption of IFRS 15 with precision of the projections of financial analysts.

Table 1
Variables used in the research

Variable	Acronym	Metric	Theoretical Support	S.E.
<i>Dependent Variable</i>				
Accuracy of projections	PPA	Module of the difference between the real result and the result predicted by the analysts, divided by the absolute value of the real result for the period $ \frac{LPAr - LPApr}{LPAr} $.	Martinez & Dumer (2014)	N.A.
<i>Independent Variables of Interest</i>				
Learning IFRS 15	IFRS15	Progressive variable, assigning a value of 0 for 2016 and increasing by 1 for each subsequent year.	Martinez & Dumer (2014), Gonçalves & Gomes (2018)	-
Mandatory adoption of CPC 47	AdCPC47	<i>Dummy</i> variable that assumes a value of 1 when the company is required to apply CPC 47 and 0 in other cases.	Gonçalves & Gomes (2018), Tomi (2018)	+
Disclosure of the effects of CPC 47	EfCPC47	<i>Dummy</i> variable that has a value of 1 when the company must assess the effects of the new pronouncement on its financial statements and disclose it in an explanatory note and 0 in other cases.	Domingues & Nakao (2017), Gonçalves & Gomes (2018), Tomi (2018)	+
<i>Independent Control Variables</i>				
Company size	SIZ	Natural logarithm of total assets.	Jião et al. (2012), Martinez & Dumer (2014), Domingues & Nakao (2017)	+
Company sector	SET (...)	Set of <i>dummy</i> variables that have a value of 1 when the sector occurs and 0 of the others.	Jião et al. (2012), Khamis (2016)	+/-
Estimates	ESTIM	Number of analysts who made the predictions.	Domingues & Nakao (2017), Jião et al. (2012)	-
Company result	RESULT	<i>Dummy</i> variable that presents a value of 1 when the company's result is negative and 0 when positive.	Domingues & Nakao (2017)	+

Note: S.E. :: Expected signal; N.A. :: Not applicable.

Source: based on research data (2021).

Following Martinez and Dumer (2014), the dependent variable adopted in the study measures the accuracy of the projections, obtaining the absolute value of the expression in terms of the real earnings per share. Thus, all errors are considered, in contrast to the measurement of the error, in which positive errors cancel negative errors of the same magnitude. If the independent variable has a negative relationship, it indicates more accurate and better quality forecasts.

The independent variable of interest adopted IFRS15, follows the proposal of Martinez and Dumer (2014), where a progressive variable was assigned, indicating the years. The choice is due to the assumption of a learning curve to work with the new standards, both of the company and of the published content, and of the analysts in understanding the standard. Therefore, we assign a value of zero to 2016, the year in which the standard was published in Brazil, value one to 2017, a period for which companies should assess the effects of the new pronouncement on their financial statements and disclose in an explanatory note, value two for 2018, first year of publication of the statements in accordance with CPC 47, and value three for the following year. The variable of adoption of CPC 47 by companies (AdCPC47), in agreement with the one proposed by Tomi (2018), is *dummy* and assumes a value of 1 in a period in which the standard is effectively applied in business reports, since it is mandatory from 2018, and a value of 0 must be assigned in the period prior to the application of the standard. The standard also obliged companies to disclose in the year ended December 31, 2017 in an explanatory note the expected effects of applying this on the company's results, as a way of "preparing" stakeholders for reading the reports for 2018. Thus it was necessary to adopt a variable to observe the relationship between the disclosure of expected effects and the accuracy of financial analysts' forecasts, the independent variable of interest EfCPC47 is *dummy* and for this it was assigned a value of 1 in the period of 2017 and 0 in the too much.

In the studies by Jião et al. (2012), the number of analysts' estimates proved to be significant in all tested models, showing a negative relationship with error and a positive relationship with dispersion. In this case too, the variable adopted for size control proved to be significant in the models for dispersion of the forecast. Domingues and Nakao (2017), in the study of the dispersion of the forecast made by analysts, realized that the larger the size of the company, the smaller the dispersion. Martinez and Dumer (2014) concluded that with the growth of the size of the company, there was a trend towards less accurate forecasts.

Following the trend that analysts make projections with less error when companies report positive results, given the greater interest in covering profitable companies, Domingues and Nakao (2017) also highlight the occurrence of worsening estimates in periods of negative results, with evidence that if the result is a loss, the error is greater.

Descriptive analysis is the main phase in the process of studying the collected data. The use of descriptive statistics methods occurred in this research to organize, summarize and describe important aspects of the set of characteristics observed, and then compare those characteristics between the sets of variables (Reis & Reis, 2002).

Outliers were treated with Winsorization of 1% non-binary variables, and then proceeded with their descriptive statistics. The Shapiro-Wilk test was performed to determine normality, in which $p\text{-value} > 0.01$ reveals the presence of normal distribution for the variables, after the presence of normal and non-normal distribution for the study variables was evident, the data were observed by Spearman (non-parametric) and Pearson (parametric) correlation at 1%, 5% and 10% significance. The Variance Inflation Factor Test (VIF) was performed, in which $VIF < 10$ indicated absence of multicollinearity, the Breusch-Pagan Test for heteroscedasticity, and the RESET Test to verify the omission of significant variables at 1%, 5% and 10% (Fávoro & Belfiore, 2017).

Regarding the data regression, it was evaluated how the independent variables affect the accuracy of the forecast of financial analysts, using the model for the dependent variable, according to Equation 1. In which the variables started in SET refer to the sectors to which belong to the company in B3, for which there are companies present in the analyzed sample.

$$PPA_{it} = \beta_0 + \beta_1 IFRS15_{it} + \beta_2 AdCPC47_{it} + \beta_3 EfCPC47_{it} + \beta_4 SIZ_{it} + \beta_5 ESTIM_{it} + \beta_6 RESULT_{it} + \beta_7 SET_BI_{it} + \beta_8 SET_CNC_{it} + \beta_9 SET_CC_{it} + \beta_{10} SET_Out_{it} + \beta_{11} SET_Comit + \beta_{12} SET_Finit + \beta_{13} SET_MBit + \beta_{14} SET_PGBit + \beta_{15} SET_Sauit + \beta_{16} SET_Tlit + \beta_{17} SET_UPit + \epsilon_{it} \quad (1)$$

Given the large number of variables, three regression tests were adopted, at first all variables proposed in the model by the research participated, then those with $t < 0$ statistics and then variables with $t < 1$ statistics were excluded, leading to a lean model with greater statistical significance. The Pooled model was estimated, the model with data in the Fixed Effects panel and then the Chow Test to determine which was the most significant, after that, the model was estimated with data in the Random Effects panel, and then the Breusch and Pagan Lagrangian (LM) to determine which is more significant in relation to the Pooled model. If both fixed and random effects are better than Pooled, the Hausman Test is performed to decide which panel data model to use (Fávoro & Belfiore, 2017).

4 DATA ANALYSIS

This section presents the descriptive analysis of the variables that were the object of study (4.1), the correlation matrix (4.2) and the regression of the panel data (4.3).

4.1 Descriptive Statistics

The purpose of this section is to highlight descriptive statistics, by subsector of companies' operations. In this analysis, the mean, the standard deviation, and the minimum and maximum values of the variables were verified. In order to analyze the behavior of the research variables as a whole, Table 2 was constructed, in which the results for the dependent and independent variables cover the entire sample during the analyzed period.

Table 2

Descriptive statistics of variables

Variable	Obs.	Mean	St. Deviation	Minimum	Maximum
PPA	198	2.276	9.001	0	91.333
IFRS15	198	1.955	0.851	0	3
AdCPC47	198	0.657	0.476	0	1
EfCPC47	198	0.323	0.469	0	1
SIZ	198	16.673	1.179	14.055	19.342
ESTIM	198	8.364	3.576	1	15
RESULT	198	0.136	0.344	0	1

Note: PPA: Accuracy of projections; IFRS15: Learning IFRS 15; AdCPC47: Mandatory adoption of CPC 47; EfCPC47: Disclosure of the effects of applying CPC 47; SIZ: Company size; ESTIM: Estimates; RESULT: Company result.

Source: elaborated using data obtained in the research (2021).

The average for RESULT, close to 0, given that this is a dummy variable and that assumes a value of 0 when the company's result is positive reveals that most companies

presented a positive result in the analyzed period. The average of estimates approximates the average between the minimum and maximum values, while PPA has a standard deviation greater than the average found and minimum value equal to 0, indicating that there is a 100% accurate forecast for the adopted sample.

Table 3 addresses the results of the descriptive analysis of the PPA variable (forecast accuracy) by sub-sector within its respective sector. The sectoral classification adopted in this analysis comprises the divisions of B3, all of which are not included due to the absence of companies in the adopted sample and data from participating companies.

Table 3
Descriptive statistics of the PPA variable by B3 subsector

Sector	Subsector	Obs.	Mean	St-deviation	Minimum	Maximum
Industrial Goods	Machines and equipment	3	0.023	0.021	0	0.039
	Transport material	5	3.351	3.005	0	6.000
	Transport	15	1.135	1.505	0.060	4.500
Non-Cyclical Consumption	Processed foods	15	7.686	19.529	0.017	70.000
	Drinks	3	0.104	0.063	0.037	0.162
	Trade and distribution	3	0.350	0.480	0.024	0.902
Cyclical Consumption	Bisuness	12	5.153	11.345	0.023	31.500
	Fabric, clothing and footwear	3	0.096	0.048	0.061	0.150
	Cars and motorcycles	3	1.011	1.626	0.059	2.889
	Construction	12	0.469	0.509	0.013	1.606
	Travel and leisure	2	45.775	64.429	0.216	91.333
Several	Several	11	0.537	1.009	0	2.791
Basic Materials	Wood and paper	7	1.362	1.896	0.017	5.172
	Mining	6	1.631	2.392	0	5.939
	Chemicals	2	0.137	0.165	0.021	0.254
	Steel and metallurgy	13	1.920	2.953	0.051	10.634
Oil, Gas and Biofuels	Oil, gas and biofuels	16	1.987	2.038	0.067	6.882
Health	Trade and distribution	6	1.335	1.931	0	4.387
	Hospital medical services	10	0.178	0.115	0.048	0.354
Information Technology	Programs and services	6	2.690	2.463	0.432	7.333
Public Utility	Water and sanitation	7	0.764	1.699	0.044	4.617
	Electricity	38	0.637	0.650	0	3.272
Total		198	2.276	9.001	0	91.333

Source: elaborated using data obtained in the research (2021).

The machinery and equipment and fabric, clothing and footwear sectors presented more accurate profit forecasts for the applied sample. At the other end are the processed food, trade and travel and leisure sectors with less accurate forecasts. The findings, since they are not related to the information content changed by IFRS 15, suggest that, according to Myring and Wrege (2009), analysts specialize in certain sectors, tending to issue forecasts for the same companies for longer periods, becoming more experienced in these.

4.2 Correlation Matrix

Given the result of the Shapiro-Wilk test for normality, it was possible to notice that part of the variables had a normal distribution, while the others showed a non-normal distribution. Table 4 addresses the results of Spearman's correlation analysis for non-normal distribution and the results of Pearson's correlation analysis for data with normal distribution.

Both analyzes were considered, given the presence of variables of normal and non-normal distribution in the research.

Table 4
Correlation analysis

Spearman's Correlation Matrix (Non-Parametric)							
	PPA	IFRS15	AdCPC47	EfCPC47	SIZ	ESTIM	RESULT
PPA	1.0000						
IFRS15	0.0455	1.0000					
AdCPC47	0.0082	0.8693***	1.0000				
EfCPC47	-0.0372	-0.8051***	-0.9556***	1.0000			
SIZ	0.1662**	0.0584	0.0374	-0.0714	1.0000		
ESTIM	-0.1715**	0.0489	0.0201	0.0459	0.1058	1.0000	
RESULT	0.2279***	-0.0101	-0.0535	0.0400	0.0112	-0.1004	1.0000

Pearson's Correlation Matrix (Parametric)							
	PPA	IFRS15	AdCPC47	EfCPC47	SIZ	ESTIM	RESULT
PPA	1.0000						
IFRS15	0.1247*	1.0000					
AdCPC47	0.1166	0.8636***	1.0000				
EfCPC47	-0.1134	-0.7774***	-0.9556***	1.0000			
SIZ	0.0220	0.0396	0.0346	-0.0698	1.0000		
ESTIM	0.0142	0.0855	0.0320	0.0476	0.0666	1.0000	
RESULT	0.1144	-0.0134	-0.0535	0.0400	-0.0040	-0.1106	1.0000

Note: ***, **, * is significant at the level of 1%, 5% and 10%, respectively. PPA: Accuracy of projections; IFRS15: Learning IFRS 15; AdCPC47: Mandatory adoption of CPC 47; EfCPC47: Disclosure of the effects of applying CPC 47; SIZ: Company size; ESTIM: Estimates; RESULT: Company result.

Source: elaborated using data obtained in the research (2021).

The high and significant correlation at 1% between the independent variables of interest in the two models is within the expected range, since they occur with the attribution of fixed values (independent of the application of the standard by the company) in a determined period according to the theoretical basis. Among the explanatory variables IFRS15, AdCPC47 and EfCPC47, only the progressive variable for adopting the standard (IFRS15) showed a correlation with the PPA response variable, evidenced by the Pearson Correlation Matrix. This significant at 10% and positive contradicts what is proposed by the standard when it demonstrates that the forecasts, in 12% of the cases, have become less accurate concurrently with the application of the standard.

The Spearman Correlation Matrix showed a correlation between the independent control variables SIZ, ESTIM and RESULT with the dependent variable PPA. The company's natural asset logarithm (SIZ) correlated with the 5% precision variable (PPA) in the analysis. When presenting a positive sign, it is evident that, according to Jião et al. (2012) and Martinez and Dumer (2014), the larger the company, the less accurate the profit forecasts.

Regarding the ESTIM variable, the correlation perceived at 5% and with a positive sign follows what was found by Domingues and Nakao (2017) and Jião et al. (2012), leading to the understanding that in 17% of the sample, the more analysts make profit estimates, the more accurate the average profit forecast will be.

The result variable showed a positive correlation with significant PPA at the level of 1%. The results of Domingues and Nakao (2017) followed, which also highlight the occurrence of worsening in the quality of the estimates in periods of negative result, with evidence that if the result is a loss, the error is greater, on average, in 22% of cases.

4.3 Regression Analysis

From the survey data, panel data regression was performed in order to analyze the relationship between the adoption of IFRS 15 and the accuracy of the forecast of financial analysts of the companies participating in the Brasil 100 Index. Table 5 presents the results of the regression for data with treatment for outliers (Winsorized at 1%) of non-binary variables.

Three regression tests were performed based on the model adopted for this study, the first comprising all the variables proposed by the research. For the second test, variables with $t < 0$ statistics were removed from the model in order to improve the general significance of the model and reduce the VIF (Variance Inflation Factor). For the same purpose, for Test 3, variables with $t < 1$ statistics were subtracted, leading to a model that, among the independent variables of interest, addresses only the progressive learning variable of IFRS 15 (IFRS15).

Table 5
Result of regression analyzes

Variable	Test 1		Test 2		Test 3	
	Coefficient	t	Coefficient	t	Coefficient	t
IFRS15	0.867	0.54	1.221	1.63	1.245*	1.68
AdCPC47	-0.972	-0.15				
EfCPC47	-1.881	-0.36				
SIZ	0.535	0.66	0.437	0.70		
ESTIM	-0.008	-0.04				
RESULT	1.881	0.92	2.129	1.13	2.135	1.15
SET_BI	-0.368	-0.11				
SET_CNC	4.001	1.22	3.931*	1.82	3.983**	1.92
SET_CC	3.745	1.15	4.035**	2.13	3.437**	1.97
SET_Out	-0.405	-0.10				
SET_Com						
SET_Fin						
SET_MB	0.521	0.16	0.366	0.19		
SET_PGB						
SET_Sau	-0.384	-0.11				
SET_TI	2.433	0.49	2.741	0.70		
SET_UP	-0.675	-0.24				
Const.	-7.599	-0.48	-8.882	-0.85	-1.427	-0.88
Obs.	198		198		198	
F	0.83		1.87		3.11	
Prob > F	0.6614		0.0761		0.0166	
R-squared	0.0724		0.0645		0.0605	

Note: ***, **, * is significant at the level of 1%, 5% and 10%, respectively. PPA: Accuracy of projections; IFRS15: Learning IFRS 15; AdCPC47: Mandatory adoption of CPC47; EfCPC47: Disclosure of the effects of applying CPC 47; SIZ: Company size; ESTIM: Estimates; RESULT: Company result; SET (...): B3 sectors. Source: elaborated using data obtained in the research (2021).

Pooled was adopted for all models, with F statistics that suggest general significance of the models. The *dummy* control variables were not treated for outliers because they were binary. The variance inflation factor (VIF) test revealed a tendency towards the absence of multicollinearity for the variables treated in the analysis. The adjusted multiple determination coefficient (R2: R-squared) indicates that the models for the PPA variable explain around 6% of the variability of the response data around its mean.

From the regression analysis by the Pooled model, it was not possible to perceive the relationship between the independent control variables SIZ, ESTIM and RESULT with the dependent variable PPA. Among the B3 sectors included in the analysis, only the Cyclical

Consumer Goods and Non-Cyclical Consumer sectors were perceived to be related to the accuracy of the financial analysts' forecast in the analyzed period for the adopted sample.

Unlike the perceived results, PWC (2017) suggests that the impacts are greater in the asset management, automotive, engineering and construction, entertainment and media, industrialized products and manufacturing, pharmaceutical and biotechnology, real estate, retail and consumer, technology and telecommunications industries. At the same time that PWC (2017) determines the sectors with the greatest impact of adopting the standard, it does not define how the impact will occur, therefore, this research only clarifies that there is no relationship between the accuracy of the forecast of financial analysts and the adoption IFRS 15 in such sectors. As shown in Table 5, the sectors that were related to the dependent variable, significant at 5%, also comprise the subsectors with the highest PPA averages (Table 3). The results corroborate the studies by Khamis (2016), Oliveira and Girão (2018), and Jião et al. (2012) when assuming that the accuracy of profit forecasts varies from sector to sector.

Among the independent variables of interest, only IFRS15 was related to PPA. The AdCPC47 variable was not significant in the model, corroborating the results of previous studies by Tomi (2018), which lead to the fact that the adoption of CPC 47 based on IFRS 15 had no influence on the accuracy of the forecast of financial analysts when a *dummy* with a value of 1 is adopted for the period after adoption and 0 for the previous period. In the same way, EfCPC47, adopted in this study following what was determined by Domingues and Nakao (2017), which addresses the mandatory disclosure of the effects of adoption in the pronouncement in explanatory notes, was not significant in the tested models. Thus, hypotheses 1 and 2 were not verified in the tests that comprised this study.

The results of the correlation analysis (Table 4) were confirmed in the multiple regression analysis (Table 5) with respect to the independent variable IFRS15. This, in addition to presenting a significant positive correlation at 10% with PPA, was also significant to predict 10% PPA in the model with panel data. These results contradict previous research that did not perceive a relationship between the adoption of the IFRS 15 standard and the quality of the forecasts of financial analysts (Gonçalves & Gomes, 2018, Domingues & Nakao, 2017, Tomi, 2018), at the same time that it falls overland the proposition of the existence of a positive learning curve proposed by Martinez and Dumer (2014), going in the opposite direction to that proposed by hypothesis 3 adopted in this study. With a positive coefficient greater than 1, the results lead to the understanding that the more time that has passed since the adoption of the standard, the greater the distance between the forecast and realized profits, that is, the less accurate the forecast made by financial analysts.

5 FINAL CONSIDERATIONS

The objective of the research was to analyze the impact of the adoption of IFRS 15 on the forecast of analysts for the companies participating in the Brasil 100 Index in the period from 2016 to 2019. The sample included 71 publicly traded non-financial companies listed on Brasil Bolsa Balcão - B3 and participants in the Brazil 100 Index (IBrX100) with analyst forecast data for the period.

Adopted a methodology based on descriptive analysis, correlation analysis, and multiple linear regression, it was possible to specify the mathematical relationship between the accuracy of the financial analysts' forecast and the mandatory adoption of CPC 47, as well as other control variables indicated by the literature necessary for analysis. The control variables Company size (SIZ), Quantity of estimates by financial analysts (ESTIM), Result (RESULT),

and Sector (SET) were important for determining profit forecasts, corroborating the findings of Jião et al. (2012), Khamis (2016) and Domingues and Nakao (2017).

The result of the companies, adopted in this study as a dummy variable, assumes a value of 0 when the result is positive and 1 when negative, was mostly 0, revealing most of the positive results for the sample. The perceived correlation of a positive sign with the dependent variable revealed that companies with negative results tend to have less accurate earnings forecasts. The size of the company, treated using the natural logarithm of total assets, represented here by the independent variable SIZ, was significant in the 5% correlation analysis. The positive relationship of the variable with the precision of the financial analysts' forecast reveals that, for the analyzed sample, the larger the company, the larger the PPA variable and the lower the precision of the analysts' forecasts. ESTIM presented a perceived correlation at 5% and with a positive sign, leading to the understanding that the more analysts make profit estimates, the more accurate the forecast average will be.

The sectors of the economy were impacted in different ways by the adoption of IFRS 15 according to the literature. In the investigation, the relationship between B3 sectors and the dependent variable was analyzed. Descriptive statistics revealed that there is a considerable difference between the accuracy of the forecasts for the sectors analyzed. In the regression analysis, the sectors of cyclical consumer goods and non-cyclical consumption, significant at 5%, revealed a positive relationship, therefore, in the occurrence of the sectors, the forecasts are less accurate.

For the independent variable IFRS15 the results obtained in the correlation analysis were confirmed in the regression analysis with panel data. In this, the impact of adopting the standard on the accuracy of the analysts' forecast was perceived. Using the methodology of Domingues and Nakao (2017) and Tomi (2018), the independent variables of interest AdCPC47 and EfCPC47 were not significant in the models, corroborating with the results perceived by such authors, therefore, hypotheses 1 and 2 were not confirmed in this study. However, with the adoption of a progressive variable, according to the methodology proposed by Martinez and Dumer (2014) and which addresses a “learning curve”, the results led to the understanding that the more time that has passed since the adoption of the standard, the greater the the distance between predicted and realized profits, that is, less accurate is the forecast made by financial analysts. Thus, hypothesis 3 was contradicted, the existence of a relationship was perceived, however, differently from what was proposed by the literature, the proposed learning curve was negatively related to the quality of the forecasts made by analysts.

This study was a pioneer in using a progressive variable for the application of the IFRS 15 standard, and from this results were found not yet identified by the related literature. Results close to those found by the related studies were noticed when variables with identical metrics were also adopted, even for different samples. The analysis presented limitations regarding the availability of analyst forecast data, the impact of adopting the standard could not be analyzed in sectors for which there was no defined data. Regarding the independent variables of interest, it contemplated the adoption that should be perceived in the standard and did not verify the effective adoption of the standard by the companies participating in the study.

As a suggestion for future research, extend the analyzes performed here to the other companies listed on B3. Considering the limitations mentioned above, it is worth checking the effective adoption of IFRS 15 in the context of the research. The application of this research after approval by BACEN (Central Bank) of CPC 47 is necessary to understand how the financial sector will react when it comes to the quality of the forecasts of financial analysts.

REFERENCES

- Anthony, J. H.; & Ramesh, K. (1992). Association between accounting performance measures and stock prices. *Journal of Accounting and Economics*, 15, 203-227.
- Comitê de Pronunciamentos Contábeis. (2014). *Pronunciamento técnico CPC 47 receita de contrato com cliente - Correlação às Normas Internacionais de Contabilidade – IFRS 15*. Disponível em:
http://static.cpc.aatb.com.br/Documentos/527_CPC_47_Rev%2014.pdf. Acesso em: 23 dez. 2020.
- Dalmácio, F. Z.; Lopes, A. B.; Rezende, A. J.; & Sarlo Neto, A. (2013). Uma análise da relação entre governança corporativa e acurácia das previsões dos analistas do mercado brasileiro. *Revista de Administração Mackenzie*, São Paulo, 14(5), 104-139.
- Dechow, P. M.; Hutton, A. P.; & Sloan, R. G. (2000). The Relation between Analysts' Forecasts of Long-Term Earnings Growth and Stock Price Performance Following Equity Offerings. *Contemporary Accounting Research*, 17(1), 1-32.
- Domingues, J. C. De A.; & Nakao, S. H. (2017). Previsão dos analistas e adoção dos padrões IFRS em petrolíferas mundiais. *Revista Universo Contábil*, Blumenau, 13(2), 06-24.
- Fávero, L. P. & Belfiore, P. (2017). *Manual de análise de dados: estatística e modelagem multivariada com Excel, SPSS e Stata*. (1. ed.) Rio de Janeiro: Elsevier.
- Gonçalves, R. M.; & Gomes, G. G. (2018). *Impacto do novo pronunciamento técnico, CPC 47 – Receita de contrato com cliente, sobre as demonstrações financeiras de companhias abertas brasileiras*.
- Haggenmuller, S. (2019). *Revenue recognition under IFRS 15: A critical evaluation of predefined purposes and implications for improvement*. Tese de Doutorado, School of Business and Management, University Of Gloucestershire, Munich, Germany.
- Jiã, T.; Koning, M.; Mertens, G.; & Roosenboom, P. (2012). Mandatory IFRS adoption and its impact on analysts' forecasts. *International Review of Financial Analysis*, 21, 6-63.
- Khamis, A. M. (2016). Perception of Preparers and Auditors on New Revenue Recognition Standard (IFRS 15): Evidence From Egypt. *Jurnal Dinamika Akuntansi dan Bisnis*, 3(2), 1-18.
- Martinez, A. L. (2004). *Analisando os analistas: Estudo empírico das projeções de lucros e das recomendações dos analistas de mercado de capitais para as empresas brasileiras de capital aberto*. Tese de Doutorado, Escola de Administração de Empresas de São Paulo, Fundação Getúlio Vargas, São Paulo.
- Martinez, A. L.; & Dumer, M. C. R. (2014). Adoption of IFRS and the Properties of Analysts' Forecasts: The Brazilian Case. *Revista de Contabilidade e Organizações*, 20, 3-16.

- Martins, G. A.; Theóphilo, C. R. (2009). *Metodologia da investigação científica para ciências sociais aplicadas*. (2. ed.) São Paulo: Atlas.
- Myring, M.; & Wrege, W. (2009). Analysts' Earnings Forecast Accuracy And Activity: A Time-Series Analysis. *Journal of Business & Economics Research*, 7(5).
- Oliveira, A. S. De; & Girão, L. F. de A. P. (2018). Acurácia na previsão de lucros e os estágios do ciclo de vida organizacional: evidências no mercado brasileiro de capitais. *Revista de Educação e Pesquisa em Contabilidade (REPeC)*, Brasília, 12(1), 121-144.
- Oliveira, R. X. de; Crabbi, T. M.; & Rodrigues, J. M. (2020). Nível de aderência das empresas brasileiras listadas do setor de telecomunicações ao pronunciamento contábil CPC 47. *Revista Ambiente Contábil*, 12(1).
- Pereira, P. de M. R. (2017). *Análise da implementação de pronunciamento CPC 47 na perspectiva da gestão da inovação de processos*. Dissertação (Mestrado em Administração) Escola Brasileira de Administração Pública e de Empresas, Fundação Getúlio Vargas, Rio de Janeiro.
- Price Waterhouse Coopers (PWC). (2017). *IFRS o futuro está aqui*. Analisando o impacto da nova norma sobre o reconhecimento de receita nos seus negócios. Disponível em: https://www.pwc.com.br/pt/estudos/servicos/auditoria/2017/futuro_ifrs_17.pdf. Acesso em: 15 dez. 2020.
- Reis, E. A. & Reis I. A. (2002). *Análise Descritiva de Dados*. Relatório Técnico do Departamento de Estatística da UFMG. Disponível em: <http://www.est.ufmg.br/portal/arquivos/rts/rte0202.pdf>. Acesso em: 20 dez. 2020.
- Richardson, R. J. (1999). *Pesquisa Social: métodos e técnicas*. (3. ed.) São Paulo: Atlas.
- Tomí, K. (2018). *The impact of IFRS 15 on analysts' forecast accuracy*, Dissertação (Mestrado) Oulu Business School, University Of Oulu. Oulu.
- Zortea, C. T.; Galdi, F. C.; Monte-Mor, D. S.; & Beiruth, A. X. (2017). Eficiência do mercado de capitais após a adoção da IFRS no Brasil: aplicando o teste de Mishkin. *Revista Contemporânea de Contabilidade*, Florianópolis, 14(32), 141-156.