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# IFRS ADOPTION IN BRAZIL: AN ANALYSIS OF FINANCIAL REPORTS' COMPARABILITY AND THE ACCURACY OF ANALYSTS' CONSENSUS ESTIMATES

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## ABSTRACT

The increased comparability of financial reports across countries is one of the main motivations for the constant support towards the convergence with international accounting standards. Furthermore, comparability affects the end-users of financial reports, since market analysts can use information of companies from the same economic sector as a reference to build a consensus estimate. Thus, this research aims to investigate the impact of financial reports' comparability on the accuracy of consensus estimates made by investment analysts in the Brazilian market after the adoption of International Financial Reporting Standards (IFRS). The study is quantitative and descriptive. The analyzed period comprises the years from 2005 to 2015. Comparability was measured through the model proposed by the De Franco, Kothari, and Verdi (2011) and, to test the relationship between the variables, panel data analysis was used. The results showed that the average individual comparability between the companies did not vary significantly in the post-adoption period of the IFRS. However, the intertemporal comparability of companies over the period analyzed showed positive variations. As for accuracy, no significant impacts were observed in the periods before and after IFRS adoption. However, the mean and intertemporal comparability variables have a significant and negative influence on accuracy. Thus, our results show a significant association between the increased comparability of financial reports in Brazil and

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an increase in the accuracy of analysts' consensus estimates with the adoption of IFRS.

**Keywords:** IFRS. Comparability. Accuracy. Consensus Estimates Accuracy. Financial Reports.

## **ADOÇÃO DAS IFRS NO BRASIL: UMA ANÁLISE DA COMPARABILIDADE DOS RELATÓRIOS FINANCEIROS E DA ACURÁCIA DAS ESTIMATIVAS DE CONSENSO DOS ANALISTAS**

### **RESUMO**

O aumento da comparabilidade dos relatórios financeiros entre os países é uma das principais motivações para o apoio permanente à convergência às normas internacionais de contabilidade. Além disso, a comparabilidade afeta os usuários finais dos relatórios financeiros, uma vez que os analistas de mercado podem utilizar as informações das empresas do mesmo setor econômico como referência para a elaboração da estimativa de consenso. Assim, o objetivo desta pesquisa foi investigar o impacto da comparabilidade dos relatórios financeiros na acurácia da estimativa de consenso dos analistas de investimento no mercado brasileiro após a adoção das IFRS. O estudo é quantitativo, descritivo e o período analisado compreende os anos de 2005 a 2015. Além disso, a comparabilidade foi mensurada pelo modelo de De Franco, Kothari e Verdi (2011) e, para testar a relação das variáveis, optou-se pela análise de dados em painel. Os resultados mostraram que a comparabilidade individual média entre as empresas não apresentou variações significativas no período de pós-adoção das Normas Internacionais de Contabilidade (IFRS). Todavia, a comparabilidade intertemporal das empresas ao longo do período apresentou variações positivas. Quanto à acurácia, não foram observadas variações significativas nos períodos antes e após a adoção das IFRS. No entanto, as variáveis comparabilidade média e intertemporal influenciam na acurácia de forma significativa e negativa. Assim, os resultados mostram uma associação significativa entre o aumento da comparabilidade dos relatórios financeiros no Brasil e um aumento na precisão das estimativas de consenso dos analistas com a adoção do IFRS.

**Palavras-Chave:** IFRS. Comparabilidade. Acurácia. Estimativa de Consenso dos Analistas. Relatórios Financeiros.

### **1 INTRODUCTION**

The relationship between accounting information and investment decisions has been the focus of several studies (Watts & Zimmerman, 1990), since the financial market is one of the major interested parties on accounting information, due to its importance as an information source (De Franco, Kothari, & Verdi, 2011; Martinez, 2009; Martinez & Dumer, 2013). Additionally, the comparison between investment opportunities is one of the main reasons for the convergence of accounting standards. Accounting standards directly relate comparability with

the adoption of global standards for the preparation and disclosure of financial reports (Barth, Landsman, Lang, & Williams 2012). In this perspective, De Franco, Kothari, and Verdi (2011) examined comparability in American companies. Their results showed that comparability is associated with an increase in the number of analysts interested in the companies' financial statements and that it also reduces information acquisition costs and increases the quality of information available to analysts.

Further research points to other benefits of increasing financial reports' comparability, including the improvement of the informational environment, which is measured by the number of analysts (De Franco, Kothari, & Verdi, 2011), providing information to the private loan markets, and information regarding the markets' public debt (Kim, Kraff, & Ryan, 2013). In addition, developing countries benefit more from IFRS adoption than developed countries (Houqe & Monem, 2015). Besides, there is evidence that the forecasting accuracy of analysts that follow companies from several countries increased after the mandatory adoption of IFRS (Horton, Serafeim, & Serafeim, 2013).

The improvement of financial reports' comparability due to the adoption of IFRS and its effect on analysts' consensus estimates has been the focus of academic research, mainly in studies with European companies (Brochet, Jagolinzer, & Riedl, 2013; Yip & Young, 2012). Nevertheless, the changes in standards are expected to generate uncertainty in investors' comparability perception (Byard, Mashruwala, & Suh, 2017). In this context, the question that guided this research is: What is the influence of financial reports' comparability on the accuracy of market analysts' estimates consensus after the adoption of IFRS? Thus, this study aims to investigate the impact of comparability of financial reports on the accuracy of investment analysts' estimates consensus in the Brazilian market after the adoption of IFRS.

To answer this research problem, the following specific objectives were established: i) to identify the level of average and intertemporal comparability of each company based on their sector peers; ii) to assess the accuracy of financial analysts' forecasts; iii) to determine the relationship between comparability and accuracy of analysts' forecasts.

This research's justification is grounded on its provision of evidence regarding the effects of financial reports' comparability on analysts' estimates consensus in an environment where regulatory accounting standards were based on rules. Then, after the adoption of IFRS, these standards have become based on principles. This evidence can help users, regulators, and educators expand their knowledge and experience on the effects of IFRS adoption in Brazil. Additionally, analyzing the association between financial reports' comparability and the accuracy of analysts' estimates can demonstrate additional benefits of comparable reports, and consequently, of IFRS adoption. Finally, evidence from the researched causal association may enable analysts' estimates to be calibrated with those variables directly related to comparability.

This research is organized into five sections. After this first introductory section, the second section presents the theoretical platform addressing comparability of financial reports and consensus of analysts' estimates. In the third section, the research's methodological aspects are presented together with the data collection and analysis procedures and the equations used in the study. In the

fourth section, the results of the research and their analyses are presented. The fifth section presents the final considerations of the study.

## **2 THEORETICAL PLATFORM**

### **2.1 Comparability of Financial Reports**

The role of accounting in decreasing information asymmetry depends on certain characteristics that ensure information reliability and value. One of these characteristics is comparability. Comparability is one of the qualitative characteristics of accounting information that increases accounting usefulness, enabling companies to attract more national and foreign investors (Financial Accounting Standards Board, 1980; Kang & Stulz, 1997; De Fond, Hu, Hung & Li, 2011).

Barth (2014) defines the comparability of financial statements as the qualitative characteristic of accounting information that enables users of financial statements to evaluate similarities and differences between sets of economic phenomena. According to Iudícibus (2015, p. 66), "comparability must provide the user with information about the evolution of the entity analyzed over time or comparisons between different entities. However, it should not be an obstacle to the qualitative evolution of information".

The concept of comparability adopted by this research is that of the accounting regulatory bodies, FASB and IASB, which define comparability as the qualitative characteristic that allows users to identify and understand the similarities of the items and the differences among them. Unlike other qualitative characteristics, comparability is not related to a single item, that is, it requires at least two items (FASB, 2010; IASB, 2010).

The information is comparable only if it is similar enough that users of financial reports can compare it, as pointed out by Choi, Frost, and Meek (2001). These authors analyzed the accounting policy choice of companies located in the United Kingdom and Australia and, as a result, they developed a national comparability index for both countries. Barth, Landsman, and Lang (2008) studied the effect of IFRS adoption on non-US companies' comparability. They concluded that the convergence process improves comparability, but not enough to reach the process' objective by simply adopting the norm or convergence.

Jiao, Koning, Meterns, and Roosenboom (2012) examined the impact of IFRS adoption on the quality of earnings, which is reflected on the characteristics of analysts' forecasts. The authors found that analysts' forecasts have become more accurate and less dispersed after IFRS adoption. Furthermore, Pessotti and Costa (2013) verified the impact of adopting international accounting standards on the accuracy of Brazilian capital market analysts. The results showed indicate a relationship between the accuracy of market analysts' forecasts and the adoption of international standards.

Comparability is positively associated with forecast accuracy and negatively associated with investors' forecast optimism (De Franco, Kothari, & Verdi, 2011). In this sense, Gatsios (2013) analyzed the impact of IFRS adoption on the predictive quality of accounting information in Brazil. The author found that the

adoption has not yet contributed to improving the predictive quality of accounting information, although the forecast bias has decreased.

Petaibanlue, Walker and Lee (2015) investigated the benefits of increased cross-border comparability in the accuracy of analysts' forecasts projected earnings after the recent adoption of IFRS in the European Union. The results showed that the improvements in analysts' forecast accuracy are positively and significantly related to the increase in the score of the expected comparability benefit. These benefits can impact the accuracy of the forecasts based on the company's accounting principles. Additionally, Amato, Lima, Gatsios and Assaf (2016) analyzed the impact of IFRS adoption on the accuracy of profit estimates projected by market analysts in Brazilian financial companies. The results indicated that the accuracy of market analysts in Brazil decreased during IFRS partial adoption. Whereas, in the period of mandatory adoption, the findings did not allow to conclude that IFRS adoption led to improvements in analysts' accuracy.

Comparability reduces information acquisition costs and increases the quality of company's available information, which in turn is expected to reduce their cost of capital (Ball, 2006; Barth, 2013; De Franco, Kothari, & Verdi, 2011; Habib, & Hasan; Al-Hadi, 2017; Kim, Li, Lu, & Yu, 2016; Roychowdhury, Shroff, & Verdi, 2019; Shroff, Verdi, & Yost, 2017; Weichao, Daoguang, & Siyi, 2018). However, for De Franco, Kothari and Verdi (2011), comparability depends on the economic event and how companies translate such events into financial reports. Thus, two companies are considered to have comparable accounting systems if they produce similar financial statements for a given set of economic events (De Franco, Kothari, & Verdi, 2011; Barth et al., 2012).

Finally, one of the main reasons why financial accounting standards are needed is to allow investors to compare investment opportunities. Otherwise, each company would choose how to state its economic and financial performance (Barth, 2013). Barth (2013) mentions that, as capital is a scarce resource, comparability is a crucial characteristic as it helps to understand companies' disclosed information. Despite this, according to Neel (2016), the economic effects of IFRS mandatory adoption still need to be associated with the multiple impacts IFRS causes on accounting, such as analyzing the comparability and quality of companies' reports. The purpose of such standardization is to allow comparability to have a practical utility during users' decision making (Neel, 2016). Thus, comparability's usefulness will increase if it incorporates the economic effects related to the company and its sector; and if these effects influence the accuracy of analysts' consensus estimates in the Brazilian market.

## **2.2 Analysts' Consensus Estimates**

Analysts are characterized as external users of the accounting information who calculate, analyze, and forecast results from companies. Thus, analysts issue their recommendations for buying and selling shares and provide other information to brokers, fund managers, and investors in general (Amato, Lima, Gatsios, & Assaf, 2016; Martinez, 2007; Pessotti, & Costa, 2013). For Lopes and Iudícibus (2012), these professionals are responsible for recommending the acquisition, sale, and maintenance of assets based on projections of the company's future performance. Additionally, according to Martinez (2007), the analysts' role is focused on balancing the flow of information available between the actors.

However, analysts do not always reach a consensus on the projected results of the companies analyzed.

Studies with capital market analysts describe two categories of predictions: (i) individual forecasts and/or recommendations; and (ii) analyst consensus. In this sense, the category analyst consensus includes works that aim to identify the variables that influence analysts' recommendations or the average or median profit forecasts (Martinez, 2004; Pessotti, & Costa, 2013). According to Martinez (2009), the consensus represents the average or the median of the profit forecasts for a company on a given period (quarterly, annual, or long-term). This is known as the street consensus. Besides, the consensus analysis is supported by the assumption that the representation of market expectations can be obtained by measuring central tendency in the distribution of the projections made by analysts (Martinez, 2009). Thus, analysts are particularly responsive to financial reports' comparability due to their dependence on accounting information to make forecasts (Horton, Serafeim, & Serafeim, 2013; Petaibanlue, Walker, & Lee, 2015).

Analysts' projections of accounting results, individually or as part of a consensus, can be analyzed under several characteristics: (i) they can be used to identify the statistical properties of the analysts' projections, i.e. the accuracy; (ii) the bias and the precision of the projections are examples of measures to observe if the analysts are conducting a good and/or efficient work; and (iii) the precision or 'reliability' of an estimator is inversely related to its variance (or standard deviation). Thus, the smaller the variance, the greater the accuracy. Therefore, an estimator will be more accurate, the lower its bias and the greater its precision (Dalmácio, 2009; Martinez, 2007; Martinez, & Dumer, 2013).

The study by Acker, Horton and Tonks (2002) measured the impact of IFRS adoption on the forecast accuracy of earnings per share (EPS) made by analysts in the United Kingdom. The authors concluded that there was an increase in the error of analysts' consensus estimates in the first year of adoption. However, that initial error decreased after two years of adoption. In turn, Ernstbergerger and Krotter (2008) analyzed the impact of adopting different accounting standards on analysts' accuracy in Germany. As a result, the authors found that the accuracy is greater when the estimates are made based on financial reports using US-GAAP (Generally Accepted Accounting Principles in the United States) or IFRS in comparison to the standards adopted internally in Germany. The research from Bradshaw and Miller (2008) investigated the association between accounting method choices (as a proxy for accounting information comparability) and analysts' consensus estimates regarding American companies. The results showed that the reduction in the information comparability level is associated with greater dispersion and error in consensus estimates.

Improving the comparability of financial reports is on the agenda of regulatory agencies that aim to increase information effectiveness through IFRS adoption. Besides, comparability represents an advantage for financial analysts since it increases their ability to predict company results, consequently reducing the error of consensus estimates and analysts' dispersion in earnings forecasts (De Franco, Kothari, & Verdi, 2011). Thus, it is clear that the relationship between analysts' accuracy and accounting standards occurs because financial reports published using IFRS tend to be more informative than information published in other accounting standards (Ashbaugh and Pincus, 2001; Bae, Tan and Welker, 2008).

### 3 METHODOLOGICAL ASPECTS

The study was guided by the understanding that the increase in comparability, resulting from IFRS adoption, would positively impact analysts' consensus estimates.

Considering the relationship between comparability and analysts' forecasts described by the authors in the theoretical platform, the following hypothesis was tested in the study:

H1: The increase in financial reporting comparability by Brazilian companies is associated with an increase in the accuracy of market analysts' consensus estimates after IFRS adoption.

A positive association is expected for the H1 hypothesis test, that is, an increase in comparability would result in an increase in the accuracy of analysts' consensus estimates after the adoption of IFRS.

Data to test the study's hypothesis was collected from the Thomson Reuters Eikon and Economatica databases. The study sample was intentionally selected based on the Brazilian companies listed in Brasil, Bolsa, Balcão (B3), with data available for the period analyzed. Since comparability analysis requires a pairwise comparison, we selected data of sectors that had at least two companies. The companies were classified according to their economic activity sectors based on the North American Classification System - NAICS level 2, an international classification of all economic activities released by the United Nations.

This research sample comprises 37 companies from ten economic sectors: electricity, gas and water; steel and basic metals industry; metal products industry; telecommunications; transportation equipment industry; chemical industry; paper and cellulose; footwear; fabrics and apparel; and general stores.

The period analyzed in this article was from 2005 to 2015, however, data was collected up to 2002 because the comparability model proposed by De Fanco, Kothari, and Verdi (2011) requires data in  $t-2$  for the calculation of the accounting estimation.

The IFRS adoption process was divided into three phases: (i) pre-adoption period (2005-2007); (ii) transition period (2008-2009); and post-adoption period (mandatory adoption - 2010-2015).

Comparability was measured based on the similarity model for the accounting function proposed by De Fanco, Kothari, and Verdi (2011). The authors state that accounting results are a mapping of economic events that a company is subject to. Thus, a company's financial statements are considered a function of its economic events, as illustrated in Equation 1, that is, it assumes that financial statements are a representation of economic events.

$$\text{Financial Statements}_i = f_i(\text{Economic Events}_i) \quad (1)$$

Where:  $f_i(\dots)$  represents the accounting system of the company  $i$ .

The first phase for measuring the comparability model consists of calculating the accounting function for individual companies. So, we estimated the return on

asset in equation (2) using the data from the 12 previous quarters for each firm-year.

$$ROA_{it} = \alpha_i + \beta Retorno_{it} + \varepsilon_{it} \quad (2)$$

Where  $ROA_{it}$  represents the Quarterly net income of the final total assets of company  $i$  in period  $t$  unconsolidated;  $Retorno_{it}$  = Average quarterly return of company  $i$  in period  $t$  calculated based on the adjusted closing price for dividends and splits.

After estimating the parameters of the individual functions, we projected the expected ROA [ $E(ROA)$ ] of each company according to the regression estimations. First, the company's specific ROA in the period was estimated, according to Equation 3. Next, the  $E(ROA)$  for the same company was calculated based on the estimators of other companies in the same sector, according to Equation 4.

$$E(ROA)_{iit} = \hat{\alpha}_i + \hat{\beta}_i Retorno_{it} \quad (3)$$

$$E(ROA)_{ijt} = \hat{\alpha}_j + \hat{\beta}_j Retorno_{it} \quad (4)$$

To hold the economic event constant, we used one company's estimators in the other company's economic event. Thus, the comparability measure is the average distance between the two functions for each quarter [ $E(ROA_{iit}) - E(ROA_{ijt})$ ] (De Franco, Kothary, & Verdi, 2011). Also, according to the authors, the closer the two functions, the higher the comparability index between companies. In this sense, the final comparability measure is the distance between these two functions, where the proximity of the functions represents the comparability between companies (De Franco, Kothary, & Verdi, 2011). The metric used to calculate each accounting function's average proximity by period (quarter) is represented by Equation 5.

$$Compb_{ijt} = -\frac{1}{12} x + \sum_{t-11}^t |E(ROA_{iit}) - E(ROA_{ijt})| \quad (5)$$

Where:  $Compb_{ijt}$  = Measure of relative individual comparability of company  $i$  based on company  $j$ ;  $E(ROA_{iit})$  = Expected return on the asset of company  $i$  based on the estimators of company  $i$  and the return of company  $i$  in period  $t$ ;  $E(ROA_{ijt})$  = Expected return on asset of company  $i$  based on the estimators of company  $j$  and the return of company  $i$  in period  $t$ .

According to this measure, the higher the  $Compb_{ijt}$  value, the greater the comparability between companies, given that the comparability measure shown in Equation 5 describes the average distance between the functions of two different companies (De Franco, Kothary, & Verdi, 2011). The measure of general individual comparability was obtained by comparing companies in the sector. This measure was obtained based on the average distance between the companies, according to Equation 6.

$$COMPM_{it} = \frac{Compb_{ijt}}{n} \quad (6)$$

Where  $COMP_{it}$  is the Measure of individual comparability of each company in relation to its sector peers;  $Comp_{ij,t}$  = Measure of relative individual comparability of each pair of companies;  $N$  = number of companies in the sector.

For this measure, the closer to zero, the greater the level of comparability. Three adaptations were made from the original model for the Brazilian context, according to Ribeiro (2014): (i) instead of using operating profit, net profit was used; (ii) the individual accounting function was estimated based on data from the last 12 quarters and not the last 16 quarters, as it was done in the original article; and (iii) as net profit deflator, the total asset was used instead of the company's market value, according to Equation 7.

$$COMPT_{iit} = -\frac{1}{12} x + \sum_{t-11}^t |E(ROA_{iit}) - E(ROA_{iit-1})| \quad (7)$$

Where  $COMPT_{iit}$  is the Measure of relative comparability for company  $i$  based on the one-period lagged return ( $t-1$ ) of company  $i$ ;  $E(ROA_{iit})$  = Expected return on asset of company  $i$  based on the estimators of company  $i$  and the return of company  $i$  in period  $t$ ;  $E(ROA_{iit-1})$  = Expected return on asset of company  $i$  based on the estimators of company  $i$  and the return of company  $i$  in period  $t-1$ . Unlike the calculation of average comparability, the intertemporal comparability measure was calculated on an individual basis, as it uses the same company over time as basis (De Franco, Kothary, & Verdi, 2011).

The model used to measure analysts' forecasting consensus accuracy (consensus estimation) derives from previous studies conducted in Brazil by Martinez (2004), Martinez and Salim (2004), Martinez (2007), and Dalmácio (2009). The authors highlight that accuracy is measured by the proximity between the value of the consensus reached and the real value. That is, accuracy measures how precise the result is. Hence, the first step to measure accuracy was identifying analysts' forecasting performance. To that end, we calculated the forecasting error ( $ErrPrev$ ), which is the difference between the actual stock yield of a company and the average yield predicted by market analysts' consensus, as shown in Equation 8.

$$ErrPrev = LPA_{real} - LPA_{prev} / |LPA_{real}| \quad (8)$$

Where  $LPA_{real}$  = yield per stock effectively achieved by the company  $i$  in the year  $t$ ;  $LPA_{prev}$  = average return per stock in the last yearly yields forecasted by analysts for the company  $i$  before the company's release in year  $t$ ; and  $|LPA_{real}|$  = absolute value of stock's actual yield.

For the  $LPA$  variable, we used data from the annual forecasting of companies analyzed by analysts in December of each year to collect forecasts with the greater amount of information available. Additionally, such forecasts are less biased (Martinez, 2004). Analysts' forecasting errors were averaged. The average of forecasting error (MEP) results from the division of the sum of forecasting errors by the number of forecasting errors ( $n$ ), as displayed in Equation 9.

$$MEP = \left(\frac{1}{n}\right) \times \sum_{i=1}^n |ErrPrev| \quad (9)$$

MEP tests analysts' forecasting bias. Negative MEP indicates that, on average, the actual results were below those forecasted by analysts, which suggests that analysts were optimistic in their forecasts. In contrast, a positive MEP shows a pessimist forecasting bias. Since both negative and positive forecasting errors can be found, and when summed the result could approximate zero, analysts' accuracy was defined by the absolute average of forecasting errors (MEPA), not by MEP. MEPA results from the division of the sum of the absolute value of the forecasting errors by the number of observations. Hence, values far from zero for the MEPA variable indicate that forecasting errors are high (Martinez, 2004). Therefore, the ACUR variable was calculated by multiplying MEPA by (-1), as shown in Equation 10.

$$ACUR = (-1) \times MEPA \quad (10)$$

Multiplying the MEPA value by (-1) leads to a measure that increases as the accuracy of consensus estimates grows. Consequently, values closer to zero of ACUR indicate smaller divergence between the average of analysts' consensus estimates (Dalmácio, 2009).

We used Equation 11 to test the relationship between comparability and analysts' consensus estimates.

$$Accuracy_{i,t} = \alpha_i + \beta_1 Comparability_{it} + \beta_2 DSECTOR_{it} + \beta_3 IFRS_{it} + Y Control_{it} + \varepsilon_{it+1} \quad (11)$$

Equations 12 and 13 test whether an increase in the comparability of financial reports is associated with an increase in the accuracy of market analysts' consensus estimates after the IFRS adoption. To that end, Equation 12 was used to test the average individual comparability (COMPM) of companies from the same economic sector. Equation 13 was used to test each company's intertemporal comparability throughout time (COMPT).

$$Accuracy_{i,t} = \alpha_i + \beta_1 COMPM_{it} + \beta_2 DSECTOR_{it} + \beta_3 IFRS_{it} + Y Control_{it} + \varepsilon_{it+1} \quad (2)$$

$$Accuracy_{i,t} = \alpha_i + \beta_1 COMPT_{it} + \beta_2 DSECTOR_{it} + \beta_3 IFRS_{it} + Y Control_{it} + \varepsilon_{it+1} \quad (3)$$

Where COMPM and COMPT represent comparability, and the control variables are presented in Figure 1.

QANALYST: represents analyst coverage. That is, the number of analysts that follow company <i>i</i> in the period <i>t</i>
LNASSET: represents the natural logarithm of a company's total asset calculated for period <i>t</i>
PRICE-TO-BOOK (PTB): relationship between the market value and the equity value of company <i>i</i> in the period <i>t</i>
LOSS: dummy variable that assumes the value 1 in case of loss, and 0 if the company has presented yields in the period disclosed
BIAS FORECAST (VP): dummy variable that describes the bias in consensus estimates
DVPESTIMAT: measure of risk calculated by the standard deviation of estimates (forecasts) for company <i>i</i> in the period <i>t</i> scaled by the company <i>i</i> 's stock price in the period <i>t</i>
DPROE: the standard deviation of the three last annual returns on equity of company <i>i</i>
LNRISK: natural logarithm of the EMBI+Brasil index (which represents the country risk – Brazil)

**Figure 1** – Control variables

Source: Prepared by the authors.

Figure 2 shows the expected results for each variable of the model and the literature that serves as the basis of such expected results.

Model	Variable	/	Theoretical Background
Accuracy	COMPM	(+)	De Franco, Kothari, & Verdi (2011).
	COMPT	(-)/(+)	De Franco, Kothari, & Verdi (2011) and Ribeiro, Carmo, Fávero, & Carvalho (2016).
	QANALYST	(+)	Jiao et al. (2012) and Dalmácio (2009).
	LNASSET	(-)	Cotter, Tarca, & Wee (2012) and Jiao et al. (2012).
	PTB	(+)	Dalmácio (2009)
	LOSS	(-)	Cotter, Tarca, & Wee (2012) and Dalmácio (2009).
	VP	(-)	Dalmácio (2009).
	DVPESTIMAT	(-)	Dalmácio (2009).
	DROE	(-)/(+)	Gatsios (2013), Cotter, Tarca, & Wee (2012), Jiao et al. (2012).
	LNRISK	(-)/(+)	Gatsios (2013).
	SECTOR	(-)/(+)	Martinez (2004).
	IFRSANT	(-)/(+)	Ribeiro et al. (2016).
	IFRSTRANS	(-)/(+)	Gatsios (2013)
IFRSOBR	(-)/(+)	Cotter, Tarca, & Wee (2012), Jiao et al. (2012).	

**Figure 2** – Expected signals for the variables of the regression model.

Source: Prepared by the authors.

Note: For (-), a negative relation is expected, whereas for (+), a positive relation is expected.

Finally, the variables representing the pre, transition, and post-IFRS mandatory adoption periods are: IFRSANT – dummy variable used to analyze the accuracy before IFRS mandatory adoption (2005 to 2007). IFRSANT assumed the value 1 for periods before IFRS adoption and zero for the other periods. IFRSTRANS is a dummy variable to analyze the accuracy in the transition period (2008 and 2009), and it assumed the value 1 for the IFRS transition period and zero for the other periods. IFRSOBR is also a dummy variable, and it was used to analyze the accuracy in the post IFRS mandatory adoption period (2010 to 2015). IFRSOBR

assumed the value 1 for periods of IFRS mandatory adoption and zero for the other periods.

Regarding data treatment, we used panel data analysis as statistical approach. Three approaches characterize panel data: 1) POOLED – combined effect panel data; 2) RE – random effect panel data; and 3) FR – fixed effect panel data, according to Favero, Belfiore, Takamatsu, & Suzart (2014). Outliers were excluded by calculating *dfits* statistics, as proposed by Baum (2006). We performed the statistical tests using Stata.

Through the estimates of equations 12 and 13 that followed panel data analysis assumptions, we found that the most appropriate models are the models of heteroscedasticity robust errors and random effect models (RE).

## 4 RESULTS

### 4.1 Presentation of the Results

Table 11 summarizes the descriptive statistics of the main research variables.

**Table 1**  
Descriptive statistics of the main research variables

Variables	N	Mean	Min	Max	Std. Dev
COMPM	407	-1.099958	-6.450897	-.0014495	.9301324
COMPT	407	-.8572454	-8.029384	-.0024976	1.075772
ACCURACY	407	-.0738074	-.9206408	0	.1500215
LOSS	407	.1326781	0	1	.3396441
LNASSET	407	15.75794	12.14771	19.53772	1.419423
VP	407	.5454545	0	1	.4985424
PTB	407	1.75968	-.7338169	13.12852	1.675004
DVESTIMAT	407	.4393761	0	18.06404	1.913718
DPROE	407	.0818572	0	1.159094	.1252143
QANALIST	407	7.17199	1	18	5.121663
LNRISK	407	5.497749	4.955827	6.259581	.3666678

Source: Prepared by the authors.

In Table 1, the variable that measures a company's self-comparability throughout time (COMPT) was found to be higher than the measure of comparability between companies from the same sector (COMPM), since the closer to zero, the higher is the companies' comparability. That is, COMPT's mean was -0.85, while COMPM was on average approximately -1.10. These results were expected since the difference in the economic events for firms from the same sector was greater than that of a company throughout time. According to De Franco, Kothari, and Verdi (2011) and Ribeiro (2014), such a difference can be explained by other variables (such as size, risk, indebtedment, among others) that can influence this relationship and exert a minor effect on the same company throughout time when compared to different companies.

The behavior of the variable COMPM over time shows that the measures concentrated in the 90th percentile suffered greater variation in the period from 2010 to 2015. On average, 90% of the companies presented COMPM equal to or less than -0.12. In 2015, they presented the value -0.045 (the lowest value observed in the period from 2005 to 2015). This behavior was also observed for the measures

concentrated in the 10th percentile. On average, 10% of the companies showed a COMPM equal to or less than -2.32, from 2010 to 2015; and equal to -2.07 in 2015 (the lowest value from 2005 to 2015). Thus, these results show that, in general, comparability decreased in the transition period (years 2008 and 2009) and the average individual comparability increased in the IFRS post-adoption period (from 2010 to 2015).

Still based on Table 1, in 2008, there was a minor reduction in the comparability measure; nonetheless, between 2010 and 2015, the average individual comparability slightly increased. The latter period matches the IFRS post-adoption period in Brazil.

The results presented regarding the low comparability may be related to the subprime crisis caused by the fall in real-estate prices in the United States, which triggered an international financial crisis that may have impacted the comparability measure results (since the comparability variable used market return and net profit in its composition). Santos and Calixto (2010) found that the 2007 and 2008 financial crisis impacted the adoption of IFRS in Brazil. Costa, Reis, and Teixeira (2012) found that profit's relevance was significantly lower in 2007 and 2008 compared to the noncrisis years, which allows inferring that the comparability measure was affected by the crisis both in the IFRS pre-adoption and transition periods in Brazil.

The information presented in Table 2 shows that analysts' forecasts differ from the actual result of reported profits, with different mean and standard deviation values. This finding can be explained by the variability between the minimum and maximum values of the variable ACCURACY. The comparison of the values for the periods of IFRS adoption shows that, on average, the ACCURACY variable remained virtually stable in the pre and post IFRS compulsory adoption periods. There was also a minor reduction in the accuracy measure during the transition period, since the closer the ACCURACY result is to zero, the greater is the accuracy. This behavior was also found in the standard deviation of the ACCURACY variable, which increased in the transition period and, in general terms, returned to the levels found in the pre and post IFRS mandatory adoption. These results corroborate the findings of Pessotti and Costa (2013) and Gatsio (2013).

**Table 2**  
Variable comparison in the pre and post IFRS adoption

IFRS PRE MANDATORY ADOPTION PERIODO					
VARIABLES	N	Mean	Min	Max	Std. Dev
COMPM	111	-1.1569	-3.50	-0.01	0.86611
COMPT	111	-0.7326	-3.31	-0.01	0.72910
ACCURACY	111	-.07486	-0.862	0.00	0.148081
LOSS	111	0.06	Não	Sim	0.244
LNASSET	111	15.3897	12.15	18.58	1.37485
VP	111	0.59	Não	Sim	0.493
PTB	111	1.9306	0.00	6.87	1.37072
DVPESTIMAT	111	1.2295	0.00	18.06	3.45478
DPROE	111	0.0715	0.00	0.55	0.06758
QANALYST	111	5.89	1	14	3.878
LNRISK	111	5.4652	5.26	5.74	0.20343

<b>IFRS MANDATORY ADOPTION TRANSITION PERIOD</b>					
<b>VARIABLES</b>	<b>N</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Std. Dev</b>
COMPM	74	-1.2238	-5.00	0.00	1.08706
COMPT	74	-1.2790	-8.03	-0.01	1.58298
ACCURACY	74	-0.09867	-0.921	0.00	0.205497
LOSS	74	0.09	Não	Sim	0.295
LNASSET	74	15.62667	12.24	18.96	1.39416
VP	74	0.55	Não	Sim	0.500
PTB	74	1.7932	0.00	12.69	1.7539
DVPESTIMAT	74	0.1521	0.00	5.68	0.68559
DPROE	74	0.0968	0.01	1.13	0.15099
QANALYST	74	7.28	1	16	4.934
LNRISK	74	5.6583	5.26	6.06	0.40355
<b>IFRS POST MANDATORY ADOPTION PERIOD</b>					
<b>VARIABLES</b>	<b>N</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Std. Dev</b>
COMPM	222	-1.0302	-6.45	0.00	0.90222
COMPT	222	-0.7790	-7.32	0.00	0.97991
ACCURACY	222	-0.06499	-0.853	0.00	0.127270
LOSS	222	0.18	Não	Sim	0.385
LNASSET	222	15.9858	12.62	19.54	1.41154
VP	222	0.55	Não	Sim	0.500
PTB	222	1.6631	-0.73	13.13	1.78171
DVPESTIMAT	222	0.1400	0.00	3.35	0.44812
DPROE	222	0.0821	0.00	1.16	0.13737
QANALYST	222	7.77	1	18	5.610
LNRISK	222	5.4605	4.96	6.26	0.40254

Source: Prepared by the authors.

The standard deviation of return on equity (DPROE) showed lower mean values in the pre IFRS mandatory adoption periods. This result may be associated with greater accuracy in market analysts' estimates (Lang & Lundholm, 1996; Jial et al., 2012). As the PTB mean decreased over the period, we estimate that this factor may have negatively influenced forecasts' accuracy, since the literature shows that as PTB grows, the accuracy tends to increase (Martinez, 2004). The QANALYST variable shows that the number of analysts increased in the transition period and in the period of mandatory adoption. This result may explain why the standard deviation of the estimates (DVPESTIMAT) reduced throughout the period. Such a result confirms the findings from previous research that identified that consensus predictions are more accurate when a greater number of analysts participate in the consensus calculation process (Byard; Li; Weintrop, 2006; Conroy; Harris, 1987; Martinez, 2004; Martinez; Salim, 2004). That is, there are indications that the forecasts are more accurate during the IFRS transition and post-adoption periods, as shown in Table 2. Regarding the LNRISK variable, as there was no significant variation in the period, this may indicate that the international financial crisis did not influence accuracy.

The test of difference between means (Table 3) shows no significant differences between the periods since the p-value of the analysis of variance (ANOVA) test in all periods was greater than the discriminant interval of 0.05. Nonetheless, the ANOVA test shows that there are differences between the means of accuracy in the sectors analyzed. Whereas, there were no significant difference in the means of accuracy between the years.

**Table 3**

Analysis of variance for the ACCURACY variable

<b>Analysis of variance of ACCURACY in the pre IFRS mandatory adoption period</b>					
	<b>SS</b>	<b>DF</b>	<b>MS</b>	<b>F</b>	<b>Prob&gt;F</b>
Between groups	0,000	1	0,000	0,008	0,931
Within groups	9,137	405	0,023		
Total	9,138	406			
<b>Analysis of variance of ACCURACY in the transition period of IFRS mandatory adoption</b>					
	<b>SS</b>	<b>DF</b>	<b>MS</b>	<b>F</b>	<b>Prob&gt;F</b>
Between groups	0,056	1	0,056	2,493	0,115
Within groups	9,082	405	0,022		
Total	9,138	406			
<b>Analysis of variance of ACCURACY in the post IFRS mandatory adoption period</b>					
	<b>SS</b>	<b>DF</b>	<b>MS</b>	<b>F</b>	<b>Prob&gt;F</b>
Between groups	0,038	1	0,038	1,689	0,194
Within groups	9,100	405	0,022		
Total	9,138	406			

Source: Prepared by the authors.

Pearson's correlation coefficients show that the COMPT variable is positively (yet not significantly) correlated with the ACCURACY. The variables VP, DVPESTIMAT, SETOR, and LNRISK showed negative non-significant correlations with ACCURACY. On the other hand, the variables COMPM, QANALIST, PTB, and LNASSET are positively and significantly correlated with ACCURACY, and the variables LOSS and DPROE are negatively and significantly correlated with ACCURACY. Regarding QANALYST, results indicate that the number of analysts is positively correlated with the accuracy of forecasts, which is consistent with previous literature.

As for the IFRS variables, our findings show that: i) the pre IFRS adoption period shows positive and significant correlations with PERDA, QANALIST, DVPESTIMAT, and LNASSET; ii) the transition period shows positive and significant correlations with the variables COMPT and LNRISK; and iii) the post-adoption period presents positive and significant correlations with the variables LOSS, QANALYST, LNRISK, DVESTIMAT, and LNASSET. The fact that the QANALYST variable has a positive and significant correlation in the pre-IFRS adoption and in the IFRS adoption period confirms that the number of analysts increased in the transition period and in the mandatory adoption period.

Table 4 highlights the result of the COMPM and COMPT regression model. The objective of these models is to test the influence of COMPM and COMPT variables on the accuracy of investment analysts' consensus forecasts in the Brazilian market.

**Table 4**  
Resulto of the COMPM and COMPT regression models

<b>Variables</b>	<b>RE_COMPM</b>	<b>RE_COMPT</b>
COMPM	0.001*	-
COMPT	-	-0.00698*
Steel industry	-0.0177	-0.00948
Metal industry	-0.146	-0,146
Telecommunications	0.0148	0.0198
Transportation equipment	0.035**	0.0306
Chemical industry	0.0894	0.0184
Paper and cellulose	-0.0100	-0.00977
Footwear	-0.0282	-0.0348
Fabrics and apparel	-0.131	-0.140
General stores	-0.00287	-0.00671
IFRSTRANS	-0.0290	-0.0269
IFRSOBR	-0.000549	0.00449
QANALYST	0.004672**	0.00530**
LNASSET	0.00599	0.000919
PTB	0.00231	0.00428
LOSS	0.0149	0.0143
VP	-0.021**	-0.00916
DVPESTIMAT	0.000325	0.000122
DPROE	-0.224**	-0.255***
LNRISK	0.0149	0.0211
Constant	-0.237	-0.208
Observations	407	407
R-squared		
r2_a		
r2_w	0.0849	0.0760
r2_b	0.531	0.502
r2_o	0.263	0.245
F		
Chi2	116.6	37

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Prepared by the authors.

The findings in Table 4 show a positive and statistically significant association (10%) between ACCURACY and the COMPM variable, corroborating the findings of De Franco, Kothari and Verdi (2011). This result indicates that the improvement in comparability allows analysts to better understand the economic events based on accounting information. Also, the variable number of analysts (QANALYST) presented a positive and significant association with COMPM (5%), corroborating the evidence from previous studies, which show that a greater number of analysts following the company leads to greater the accuracy of analysts' consensus estimates (Brown, 1997; Conroy, & Harris, 1987; Dalmácio, 2009; Martinez, 2004; Martinez; Salim, 2004).

Table 4 shows that the variable "bias in consensus estimates" presented a negative and significant association with COMPM (p<0.05), indicating that optimistic forecasts were less accurate. This result corroborates the findings of Dalmácio (2009). Nevertheless, contrary evidence has been identified by Martinez and Salim (2004) and Martinez (2004). Another finding of our study (Table 4) was that the variation in companies' results (DPROE) presented a negative and significant association with COMPM (p<0.05). This result provides evidence that

contradicts the findings of Gatsio (2013) and Jiao et al. (2012) by suggesting that the error in analysts' consensus estimates' is greater when results' volatility is high. We also found that the transportation equipment sector showed a positive and significant association with COMPM ( $p < 0.05$ ), corroborating the findings of Martinez (2004) who indicates that analysts' consensus is not noticeably accurate. The other variables were not statistically significant.

When comparing accuracy with intertemporal comparability (COMPT), that is, a company's comparability over time, a positive and statistically significant association (10%) was observed between ACCURACY and COMPT, corroborating the evidence found by De Franco, Kothari, and Verdi (2011). The result also indicates that the improvement in comparability allows analysts to better understand the economic events based on accounting information. Further evidence regarding the variable number of analysts (QANALYST), which presented a positive and significant association with COMPT ( $p < 0.05$ ), corroborates previous studies that defend that a greater consensus accuracy is achieved with a greater number of analysts following the company (Brown, 1997; Conroy, & Harris, 1987; Dalmácio, 2009; Martinez, 2004; Martinez; Salim, 2004).

The standard deviation in company's results (DPROE) had a negative and significant association with COMPT ( $p < 0.05$ ). This finding contradicts the findings of Gatsio (2013) and Jiao et al. (2012), and it indicates that the error in the analysts' consensus estimates was greater when the results' volatility was high. The other variables were not statistically significant.

Based on the results presented for the COMPM and COMPT models, we can conclude that comparability positively influenced the ACCURACY of market analysts' consensus estimates. Thus, the hypothesis raised in this research that the increase in financial reports' comparability is associated with the increase in the accuracy of market analysts' consensus estimates cannot be rejected.

## 5 CONCLUSIONS

This study aimed to investigate the impact of financial reports' comparability on the accuracy of investment analysts' consensus estimates in the Brazilian market after IFRS adoption. Thus, by confirming hypothesis H1, our study provides evidence that the increased comparability of financial reports is associated with an increase in the accuracy of consensus estimates made by market analysts.

We found apparent differences in individual comparability between companies in the same economic sector. However, in general terms, our results show elements that allow inferring that there was an improvement in the comparability of the same company over time (COMPT) after the adoption of IFRS, corroborating the results of previous studies. However, when the average comparability (COMPM) was calculated for the pre-adoption, transition, and post-adoption periods, the findings do not allow to conclude such comparability improvement.

Regarding forecasting accuracy, no significant variations were observed in the periods before and after the regulatory transition. This result differs from the findings of Jiao et al. (2012), who show that analysts' consensus forecasts became more accurate after the IFRS adoption in European countries. Also, in the international context, De Franco, Kothari, and Verdi (2011) found that

comparability improves analysts' accuracy, thus showing that the adoption of IFRS improves financial statements' quality.

In the Brazilian context, Gatsio (2013) found evidence that partially corroborates this article's findings since, in both studies, no significant evidence of changes was found in analysts' accuracy. However, these results differ from those of Pessotti and Costa (2013), also in the Brazilian context. Additionally, we observed that the comparability of the same company over time and the comparability between companies from the same sector impact the forecast accuracy in a significant and negative way.

We can conclude that IFRS adoption has improved the quality of accounting information by improving financial reports' comparability since it influences the accuracy of analysts' consensus forecasts, thus benefiting analysts, investors, brokers, investment banks, and other users of accounting information who seek more useful information to meet their decision-making needs.

This research has the following limitations: i) the sample of this research is non-probabilistic, due to the need of a pairwise comparison to calculate comparability, which limits results generalization; ii) in the period analyzed, the financial market underwent a period of great volatility (subprime crisis), and its effects on the variables studied were not clearly identified; iii) accounting profit was used as the final product of the financial statements, and iv) the model used can be affected by the use of uniformity by companies.

Because of these limitations, some points need to be more directly analyzed due to specificities of the Brazilian market, such as low investor protection; low law enforcement; a large number of companies that fund their operations through the credit market, banks, or owners' capital; high ownership concentration; boards of directors predominantly composed of representatives from the controlling shareholders; adoption of IFRS in more than one phase; and unfavorable scenario to increase the quality of accounting information.

Furthermore, future research could advance in the analysis of the effect of law enforcement in improving comparability. In this perspective, studies could compare this effect by considering other countries that adopt different legal systems. Future research could also investigate the impact of comparability in decreasing countries' corruption levels and whether these levels are affected by countries' legal and regulatory systems. In addition, future studies could also investigate the effect of comparability on the cost of capital of Brazilian companies due to ownership concentration.

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