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## THE IMPACT OF INTERNATIONAL FINANCIAL REPORTING STANDARDS ON THE VALUATION OF COMPANIES

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### ABSTRACT

This article studies the effect of the International Financial Reporting Standards - IFRS in the companies' valuation, checking especially, if there was difference in the realized prices between the pre-IFRS and post-IFRS period. Ascertain whether a new accounting standard theoretically superior in fact brought positive reflexes in practice is of utmost importance in the discussion between costs and benefits of adopting a new accounting disclosure practice. We study the relationship between realized accounting data and share prices of companies listed on B3 (old BM&FBOVESPA) extracted from Economática software, for the ex-ante and ex-post period the IFRS adoption (2001 to 2016) through the Residual Income Valuation - RIV and Abnormal Earnings Growth - AEG models. The results indicate that, in general, the IFRS did not bring greater market reaction with the adoption of IFRS, by the Akaike criterion (AIC) and the Bayesian Information Criterion (BIC). However, it is highlighted that the post-crisis 2008 effects, such as an increase in market uncertainty, may be influencing the results.

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## INTRODUCTION

This work aims to identify the effect of the *International Financial Reporting Standards* - IFRS in the companies' valuation, through the *valuation* models, checking especially if there was difference in the realized prices between the pre-IFRS and post-IFRS period. Ascertain whether a new accounting standard theoretically superior in fact brought positive reflexes in practice is of paramount importance in the discussion between costs and benefits of adopting a new accounting disclosure practice. Literature evidences suggest that the IFRS have positive effect on the accounting standards, as well as, on the quality of financial reports, among others, which increased the company's credibility in the market. Thus, it can be inferred that, IFRS brought changes that relate to the assumptions of *valuation* models (Ahmeda et al., 2013, Almeida et al., 2012, Beiruth, 2012, Daske and Gebhardt, 2006, Gatsios et al., 2015, Martinez and Alves, 2013, Santos and Cavalcante, 2014). For example, among the various IFRS issued, there was standardization for fair value; as well as, for the adjustment to present value, for the earnings per share; for the payment based on shares; for taxes on profits, among others, Ohlson (1995) concluded that the present value of expected dividends determines the market value.

Santos and Cavalcante (2014) studied the effect of IFRS adoption and indicated that the use of IFRS increased the associative capacity of accounting profit. Harakeh et al. (2016) studied the impact of the mandatory adoption of IFRS on dividend payment policy and the relevance of the value of dividends in two of the largest economies in Western Europe - the United Kingdom and France - concluding that accounting standards have improved, under the effect of IFRS, by providing external financing, reducing excessive cash retention, stimulating the payment of dividends and, consequently, improving the credibility of the company in the market. Palea (2007) pointed out that companies in Europe that implemented IAS/IFRS obtained a comparative advantage in the stock market. Daske and Gebhardt (2006) analyzed three European countries and evidenced that the quality of financial reports increased significantly with the adoption of IFRS. In another study by Daske et al. (2008) found that in 26 countries around the world, IFRS adopters significantly increased market liquidity, which consequently reduced the cost of capital. The adoption of IFRS has brought quality to accounting reports and asset pricing, for example, Braga (2016, p. 17) studied the effect of IFRS adoption on the quality of financial statements in 15 countries and concluded that "the effects of IFRS adoption on the quality of *accruals* were more positive (or less negative) for jurisdictions with

common law legal system and stronger legal enforcement structure". Other articles have evidenced that accounting information of higher quality and lower information asymmetry enable a better evaluation of companies, such as Almeida et al. (2012, p. 15) which analyzed the residual valuation models, among them the discounted cash flow, concluding that "those estimated by means of the *Residual Income Valuation* - RIV and *Abnormal Earnings Growth* - AEG models are close to the values estimated by the Discounted Cash Flow available in the appraisal reports of the Takeover Bids<sup>1</sup>".

It is noteworthy that, in several research studies, valuation models are applied to explore the accounting pricing of companies and its implications for the capital market, as well as to verify the relevance of accounting data (Bolibok, 2014, Cupertino and Lustosa, 2006, Ferreira et al. (2008), Galdi et al., 2008, Lopes et al., 2007). Note that the existing studies have studied the effect of IFRS and others have verified which would be the "best" valuation model, but this work aims to present, in addition to the effect of IFRS on the value of companies, the evolution of the models over time thus performing an *ex-ante* and *ex-post* analysis of the IFRS adoption. It was studied here, the relationship between share price and accounting data of companies listed on B3, old BM&FBOVESPA extracted from the Economatica software, for the *ex-ante* and *ex-post* period the IFRS adoption (2001 to 2016) through the *Residual Income Valuation* - RIV and *Abnormal Earnings Growth* - AEG models. Applying the multiple linear regression to calculate annually the determination coefficients  $R^2$  and the Akaike tests (AIC) and the Bayesian Information Criterion (BIC). Brazil was chosen because it is among the fifteen largest economies in the world, occupying ninth place among the 15 largest economies in the world, considering the Gross Domestic Product - GDP (IPRI, 2017). In addition, Brazil is a country classified as a code-law, in which the tax legislation determines accounting practices and in which the IFRS adoption is mandatory (Black and Nakao, 2017).

We adopted the valuation models of Ohlson (1995, 2005) Ohlson-RIV defends that the market value of a company is related to the accounting variables (Ohlson, 1995) Ohlson-AEG argues that investments revolve around earnings and their respective growth (Ohlson, 1995). Beiruth (2012) verified that the Ohlson-Juettner (OJ) accounting pricing models are more accurate than the pricing models adopted by market analysts. Some studies point out that the Discounted Cash Flow would have greater explanatory power. Galdi et al. (2008) Some studies have pointed out that between the models of Ohlson (1995, 2005) and the Discounted Cash Flow, the latter presents greater explanatory power in the Brazilian environment. It was verified in this work that, in general, the IFRS did not bring greater market reaction, by the Akaike criterion (AIC) and the Bayesian Information Criterion (BIC). However, one cannot rule out that post-crisis 2008 effects, such as an increase in market uncertainty, may be influencing the results. It is expected with this work to contribute with the academic literature and the stock market on: a) the effect of the IFRS adoption on the predictive power of valuation models; b) the costs and benefits of adopting a new accounting disclosure practice (IFRS); c) the relationship between share price and balance sheet data; d) valuation models of companies based on the accounting values; and, finally e) the valuation models, specifically in Ohlson's theoretical framework (1995, 2005).

## MATERIALS AND METHODS

In 1995, Ohlson developed and analyzed a model for measuring the market value of a company in relation to the current and future book values. Thereafter, several researchers have verified the applicability of this model for valuation. Miranda (2006), for example, analyzed Ohlson's models and the equation of Black, Scholes and Merton to price companies listed on BOVESPA, seeking the relationship between these two approaches, finding that the models presented

similar values, whose results are equivalent to those traded on the Brazilian stock exchange.

Ohlson's model (1995) aims to evaluate the company by abnormal profit and has three direct assumptions, detailed below:

- i. the price is equal to the present value of expected dividends,

reducing to 
$$P_t = \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t [d_{t+\tau}]$$
, where  $P_t$  is the price of the company's equity at time  $t$ ,  $d_t$  is the net dividend paid at time  $t$ ,  $R_f$  = the risk-free rate plus one and,  $E_t [\ ]$  is the operator of the expected value conditioned on the information at date  $t$ ;

- ii. the *Clean Surplus ratio*, i.e., the amounts paid as dividends reduce the value of Equity, but do not affect the profit for the current year, given by  $b_t = b_{t-1} + x_t - d_t$  where,  $b_t$  is the book value of equity at time  $t$ , and  $x_t$  is the profit for the period  $(t-1, t)$  and,  $d_t$  is the net dividend paid at time  $t$ ; and
- iii. concerns the time series behavior of abnormal earnings and specifies the nature of the relationship between current information and the discounted value of future dividends. The third assumption is that abnormal earnings assume  $\{\tilde{x}_\tau^a\}_{\tau \geq 1}$  satisfying the following modified autoregressive process  $\tilde{x}_{t+1}^a = \omega x_t^a + V_t + \tilde{\varepsilon}_{1t+1} e$

According to Ohlson (1995), the three assumptions lead to a linear solution, ascertaining the book value, and it would be found through the following formula:

$$P_t = \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t [\tilde{d}_{t+\tau}] \quad (1)$$

In which:

$P_t$  = the market value, or price, of the company's equity at date  $t$ .

$d_t$  = net dividends paid at date  $t$ .

$R_f$  = the risk-free rate plus one unit ( $R = 1 + r$ ).

$E_t$  = the mathematical operator of the expected value conditional on information at date  $t$ .

The same equation can be represented as follows:

$$P_t = b_t + \sum_{\tau=1}^{\infty} R_f^{-\tau} E_t [\tilde{x}_{t+\tau}^a] \quad (2)$$

In which,

$P_t$  = is the market value of the company in period  $t$ .

$b_t$  = is the book value of the company's equity in period  $t$ .

$\tilde{x}_{t+\tau}^a$  = is the present value of expected abnormal (residual) profits.

$R_f = 1+r$ ,  $r$  is risk-free interest rate.

$E_t$  = the mathematical operator of the expected value conditional on information at date  $t$ .

According to Ohlson (1995) "normal" earnings should be related to the "normal" return on invested capital at the beginning of the period, that is, the net book value at date  $t-1$  multiplied by the interest rate. Thus, we interpret abnormal profit " $\tilde{x}_t^a$ ": as gain minus a fee for the use of capital, i.e., abnormal profit can be found as follows:

$$\tilde{x}_t^a = x_t - r \cdot b_{t-1} \quad (3)$$

In which,

$\tilde{x}_t^a$  = "abnormal" earnings per share at date  $t$ .

$x_t$  = net earnings per share in accordance with generally accepted principles at date  $t$ .

$r$  = risk-free interest rate.

$b_{t-1}$  = Shareholders' equity of the previous period per share.

According to equation (3) when ascertained a positive value of "abnormal" profit indicates a profitable period, since the rate of return

<sup>1</sup>Public Offering of Shares

on book, exceeds the company's cost of capital,  $R_f - 1$ . Chebaane and Othman (2014) applied the Ohlson-RIV model to verify the effect of IFRS in the emerging market in Africa and Asian regions and pointed out that there is an improvement in the relevance of earnings per share and equity book value for the selected emerging economies in the post-adoption period. Dani et al. (2017) specifically studied the effect of the early adoption of IFRS 15 on the accounting information quality, for the Brazilian construction sector, using the model proposed by Ohlson-RIV and stated that the early adoption directly impacted the stock price after the IFRS adoption. Kargin (2013) investigated the relevance of the book value before and after the adoption of IFRS by Turkish companies (1998 to 2011), using the Ohlson model (1995), identifying that there was improvement after the adoption of IFRS and they believe that this result occurred because of the presentation of fair value in financial reports, which consequently, would have approximated the value of the company to that of the market. In 2005, Ohlson created a model named *Abnormal Earnings Growth* (AEG), in which he values the expectation of abnormal earnings growth. Concluding that compared to RIV, AEG incorporates distinct advantages:

- I. the model does not require book value construction, does not rely on *Clean Surplus*, and the possibility of changes in outstanding shares has no adverse implications (Ohlson, 2005).
- II. investment practice revolves around earnings and their subsequent growth (Ohlson, 2005).

It is observed that, Ohlson-RIV advocated that future earnings were partially dependent on current book value, on the other hand, Ohlson-AEG advocated that, investments revolve around earnings and their respective growth, and would be found by means of the following formula:

$$P_0 = \frac{\text{eps}_1}{r} + \sum_{t=1}^{\infty} \frac{Z_t}{(1+r)^t} \quad (4)$$

Where:

$P_0$  = price of the company's shares at the end of period 0.

$\text{eps}_1$  = the value and of earnings per share at the end of period 1.

$r$  = is the risk-free interest rate.

$Z_t$  corresponds to the abnormal variation in profit, calculated using the following formula:

$$Z_t = \frac{1}{r} (\text{eps}_{t+1} - R \cdot \text{eps}_t + r \cdot \text{dps}_t) \quad (5)$$

In which:

$\text{eps}_t$  = the value of earnings per share at the end of period t.

$\text{eps}_{t+1}$  = the value and earnings per share at the end of period t+1.

$r$  = is the risk-free interest rate.

$\text{dps}_t$  the amount and dividends per share distributed for the period.

Ohlson's models (RIV and AEG) depend on the net equity book value as well as on current period profits. Thus, "accounting reports - such as the Balance Sheet, Fiscal Year Income Statement provide the basis for fixing the first two variables ( $b_t$  and  $x_t$ )" (Cupertino and Lustosa, 2006). Dechow et al. (1999) empirically evaluated the residual income proposed by Ohlson using three data sources, including i) historical accounting data, i.e., annual financial statement data, ii) stock return data and iii) analyst forecast data. Thus, to conduct this study, both accounting data and analysts' forecasts were sought because "market value is related to accounting data and other information" (Ohlson, 1995). However, when extracting Bloomberg's forecast data concerning a) share price, b) cash flow, c) earnings and d) growth, the report only presents data as of 2009. Thus, it does not meet the need of this research given that it only presents post-IFRS data. In view of this, data from companies with common or preferred shares traded on the Brazilian stock exchange (B3, oldBM & FBOVESPA) was extracted in the Economática software, related to the financial statements regarding the information of equity (financial statements), net income (financial statements), net income per share

(financial indicators), number of shares, unit price (quotations - up to 180 days behind 12/31), dividends paid per share (technical indicators). Only companies with trading in the interval from 2001 to 2016, with at least one year of trading and that have presented accounting data for the following four-year period were considered. The period is divided into pre-IFRS (2001 to 2007) and post-IFRS (2010 to 2016) periods. It is noteworthy that the transition period, i.e., 2008 and 2009, was expurgated from this analysis, because as analyzed by Choi et al. (2017, p. 766/767), when valuation models are used with the contribution of two different accounting regimes, the fundamental values have no correlation with the future price.

In addition, only shares with higher liquidity were considered, i.e., preferred shares. Saito (2003) The results show that, in most cases, the value of preferred shares is higher than the value of common shares, a fact arising from the greater liquidity of preferred shares. One must emphasize that companies that presented negative net equity or equal to zero as well as companies of the financial sector were excluded from the analysis (Dalmácio et al. 2005; Ferreira et al., 2008). The former signal financial problems that make the evaluation process more complex (Damodaran, 1997), while the latter are subject to different regulation from the others through the Central Bank. Furthermore, winsorization corresponding to 1% was applied to variables unit price per share, equity per share and net earnings per share, that is, 1% of extreme tail values were replaced by values closer to the median. The data was structured in *cross-section* format, i.e., it was admitted for time interval 2001 to 2003 (pre-IFRS) and 2010 to 2012 (post-IFRS) and the rest of the period 2004 to 2007 and 2011 to 2016, respectively pre- and post-IFRS, was admitted as *proxy* for the expected future results, i.e., the regressions were calculated from 2001 to 2005, 2002 to 2006, 2003 to 2007, 2010 to 2014, 2011 to 2015 and 2012 to 2016. The time frame of future results was limited to four years. Bernard (1995, p. 739) presents evidence arguing that there would be little to be gained by forecasting profits over this period. Considering that the models require an interest rate, it was opted to apply the CAPM (*Capital Asset Pricing Model*), because according to Damodaran (1999, p. 43) it "predicts multiple sources of market risks, as unforeseen changes in GDP, interest rates and inflation, and measures the sensibility degree of investments to these changes with betas of each factor", calculated as follows:

$$R_i = (1 + r_f + \beta_{\text{alav}}(\text{marketrisk premium}) + \text{embi}) \cdot \frac{(1 + \text{IPCA})}{(1 + \text{CPI})} - 1 \quad (6)$$

In which,

$R_i$  = CAPM (*Capital Asset Pricing Model*) the expected return on investment in a company.

$r_f$  = American risk-free rate (*T.Bond Rate*)<sup>2</sup>.

$\beta_{\text{alav}}$  = sectoral beta (*Levered and Unlevered Betas by Industry*)<sup>3</sup>.

premio risco mercado US = *Implied Premium* (FCFE)<sup>4</sup>.

embi = country risk (EMBI + Brazil risk)<sup>5</sup>.

IPCA = Projected Inflation Rate (Brazil)<sup>6</sup>.

CPI = Projected Inflation Rate (US)<sup>7</sup>.

Subsequently, abnormal profit, the variable required for the Ohlson-RIV model, was calculated using equation 3 and equation 5 was used to calculate the growth of abnormal profit, the variable required for the Ohlson-AEG model. It is noteworthy that for all models it was considered as dependent variable the unit price of the share extracted from the Economática database, based on the last day of the year, with a tolerance of up to 180 days prior to this date. For the Ohlson-RIV and Ohlson-AEG models, the interest rate (CAPM) was

<sup>2</sup>Availableat: <http://www.stern.nyu.edu/~adamodar/pc/datasets/histimpl.xls>.

<sup>3</sup>Availableat:

[http://people.stern.nyu.edu/adamodar/New\\_Home\\_Page/dataarchived.html](http://people.stern.nyu.edu/adamodar/New_Home_Page/dataarchived.html)

<sup>4</sup>Availableat: <http://www.stern.nyu.edu/~adamodar/pc/datasets/histimpl.xls>

<sup>5</sup>Availableat: <http://www.ipeadata.gov.br/Default.aspx>

<sup>6</sup>Availableat: <http://www.ipeadata.gov.br/Default.aspx>

<sup>7</sup>Availableat: <https://fred.stlouisfed.org/series/CPIAUCSL>

considered. However, each model required different independent variables, whereby, for the Ohlson-RIV model, equity per share and abnormal earnings were used, and for the Ohlson-AEG model, earnings and abnormal earnings growth were used. To operationalize RIV, considering the assumptions of the model: i) price equals the present value of expected dividends, ii) the amounts paid as dividends reduces the value of Equity, but does not affect the current year's profit and, iii) abnormal earnings time series behavior and then, (iv) they can be "substituted" by market value in a 1 to 1 ratio, because (v) prices reflect information about future profits that are not contained in current profits (Dechow et al., 1999).

Thus, using such arguments, the RIV model can be rewritten in the following ways:

$$P_t = \beta_0 + \beta_1 b_t + \beta_2 \frac{\tilde{x}_t^a}{(1+r)^1} + \beta_3 \frac{\tilde{x}_{t+1}^a}{(1+r)^2} + \beta_4 \frac{\tilde{x}_{t+2}^a}{(1+r)^3} + \beta_5 \frac{\tilde{x}_{t+3}^a/(r-g)}{(1+r)^4 \cdot r} + \varepsilon \quad (7)$$

In which,

$P_t$  = is the market value of the company in period  $t$ .

$\beta_0$  = is the intercept.

$b_t$  = is the book value of the company's equity in period  $t$ .

$\tilde{x}_t^a$  = the abnormal profit (equation 3).

$r$  = is risk-free interest rate.

$\varepsilon$  = error term of the regression.

Equation 7 was applied to the time interval from 2001 to 2003 (pre-IFRS) and 2010 to 2012 (post-IFRS) and the rest of the period from 2004 to 2008 and 2011 to 2016, respectively pre- and post-IFRS, was admitted as a *proxy* for expected future results. Considered as dependent variable the unit price of the share extracted from the Economática database, based on the last day of the year, with a tolerance of up to 180 days prior to this date and independent variables the accounting result per share, the deflated abnormal earnings and the risk-free interest rate (CAPM). As of Ohlson's (2005) model, with views to ascertaining abnormal growths in accounting results and considering that Ohlson-AEG investments

revolve around earnings and their respective growths, the following empirical model was built with views to ascertaining the market value of BOVESPA listed companies:

$$P_0 = \beta_0 + \beta_1 \frac{\text{Earnings}_{t+1}}{r} + \beta_2 \frac{\text{Abnormal Earnings Growth}}{(1+r)^1} + \beta_3 \frac{\text{Abnormal Earnings Growth}_{t+3}}{(1+r)^2} + \beta_4 \frac{\text{Abnormal Earnings Growth}_{t+4}/(r-g)}{(1+r)^3} + \varepsilon \quad (8)$$

In which:

$P_0$  = the company's share price in period 0.

$\beta_0$  = is the intercept.

$\frac{\text{Lucro}_{t+1}}{r}$  = Earnings per share at the end of  $t+1$  divided by  $r$ .

Abnormal Earnings Growth = abnormal growth of the company's earnings per share.

$\varepsilon$  = error term of the regression.

Equation 8 was applied for the period 2001 to 2003 (pre-IFRS) and 2010 to 2012 (post-IFRS) and remainder of the period 2004 to 2008 and 2011 to 2016, respectively pre- and post-IFRS, was admitted as a *proxy* for expected future results. In addition, the same principles of the RIV model were used, allowing for a comparison between Ohlson-RIV and Ohlson-AEG. Considered as dependent variable the unit price of the share extracted from the Economática base, based on the last day of the year, with a tolerance of up to 180 days prior to this date and independent variables the abnormal profit growth.

## RESULTS

The descriptive statistics showed that the unit prices of shares remained in line in the post-IFRS period, compared to the pre-IFRS period, higher than the average for the entire post-IFRS period, but not exceeding the margin of 10%. On the other hand, analyzing the average values for equity, it appears that there was a reasonable increase in the post-IFRS period compared to the previous period.

Table 1. RIV model comparison

For the pre-IFRS period						
Year	2001	P-value	2002	P-value	2003	P-value
N	88		90		86	
$\beta_0$	(0.32)	(0.75)	1.64	(0.09) **	2.86	(0.01) ***
Shareholders' Equity	0.16	(0.08) **	0.11	(0.20)	0.24	(0.00) ***
Abnormal Profit $_{t+1}$	(0.50)	(0.02) ***	(2.51)	(0.12)	3.12	(0.00) ***
Abnormal Profit $_{t+2}$	(3.21)	(0.01) ***	5.61	(0.00) ***	(2.11)	(0.03) **
Abnormal Profit $_{t+3}$	8.58	(0.00) ***	0.46	(0.80)	(0.50)	(0.18)
Abnormal Profit $_{t+4}$	0.01	(0.97)	0.05	(0.86)	0.21	(0.18)
stat. F	-		-		-	
$R^2$	1.00		0.99		1.00	
$R^2$ (Adjusted)	1.00		0.99		1.00	
AIC	611.71		631.42		585.43	
BIC	626.57		646.42		600.15	
For the post-IFRS period						
Year	2010	P-value	2011	P-value	2012	P-value
N	97		98		95	
$\beta_0$	16.71	(0.00) ***	16.04	(0.00) ***	10.47	(0.00) ***
Shareholders' Equity	(0.18)	(0.16)	(0.19)	(0.11)	0.12	(0.39)
Abnormal Profit $_{t+1}$	2.12	(0.06) **	0.54	(0.21)	(1.07)	(0.00) ***
Abnormal Profit $_{t+2}$	0.37	(0.33)	(2.71)	(0.00) ***	1.46	(0.14)
Abnormal Profit $_{t+3}$	(5.18)	(0.00) ***	0.29	(0.79)	(2.49)	(0.00) ***
Abnormal Profit $_{t+4}$	0.10	(0.10) *	(0.07)	(0.10) *	0.06	(0.01) *
stat. F	23.32		20.33		8.91	
$R^2$	0.84		0.71		0.39	
$R^2$ (Adjusted)	0.83		0.69		0.35	
AIC	869.93		872.74		873.03	
BIC	885.38		888.25		888.35	

Source: Prepared by the Authors

Note: \*\*\*, \*\*, \* significant at 1%, 5% and 10% level respectively (p-value)

Table 2. AEG model comparison

For the pre-IFRS period						
Year	2001	P-value	2002	P-value	2003	P-value
N	88		90		86	
$\beta_0$	(1.86)	(0.10) *	0.78	(0.45)	2.36	(0.03) **
Profit of the year t+1 / r	(0.21)	(0.01) ***	(0.44)	(0.16)	0.41	(0.00) ***
Abnormal profit growth $t+2$	(0.61)	(0.03) **	0.87	(0.00) ***	(0.26)	(0.01) ***
Abnormal profit growth $t+3$	1.50	(0.00) ***	0.01	(0.95)	(0.04)	(0.35)
Abnormal profit growth $t+4$	(0.03)	(0.20)	(0.02)	(0.15)	0.02	(0.11)
stat. F	.		-		-	
R <sup>2</sup>	1.00		0.99		1.00	
R <sup>2</sup> (Adjusted)	1.00		0.99		1.00	
AIC	612.41		622.26		578.98	
BIC	624.80		634.76		591.25	
For the post-IFRS period						
Year	2010	P-value	2011	P-value	2012	P-value
N	97		98		95	
$\beta_0$	19.30	(0.00) ***	19.77	(0.00) ***	18.56	(0.00) ***
Profit of the year t+1 / r	0.12	(0.29)	0.00	(0.86)	(0.08)	(0.00) ***
Abnormal profit growth $t+2$	(0.03)	(0.42)	(0.22)	(0.11)	0.07	(0.44)
Abnormal profit growth $t+3$	(0.40)	(0.15)	0.04	(0.75)	(0.08)	(0.10) *
Abnormal profit growth $t+4$	(0.00)	(1.00)	(0.01)	(0.18)	0.02	(0.10) *
stat. F	1.41		0.98		4.93	
R <sup>2</sup>	0.31		0.33		0.27	
R <sup>2</sup> (Adjusted)	0.28		0.30		0.23	
AIC	1,008.55		951.76		888.26	
BIC	1,021.42		964.68		901.03	

Source: Prepared by the Authors

Note: \*\*\*, \*\*, \* significant at 1%, 5% and 10% level respectively (p-value)

It is noted that, even after eliminating the shares with negative equity or equal to zero and the extremes, it is observed large variations in the data, verifying standard deviations greater than the means of the variables, however, it was not possible to identify the possible causes accurately. It can also be observed that, for the growth of abnormal profit ( $Z_t = \frac{1}{r}(eps_{t+1} - R.eps_t + r.dps_t)$ ), all averages were positive; on the other hand, negative results were found for abnormal profits ( $\tilde{x}_t^a = x_t - r.b_{t-1}$ ), even excluding negative or zero equity, possibly the cost of capital was higher than the net profit for the period. It is also possible that prices are incorporating analysts' optimism (therefore inflating prices), and consequently pointing to negative results for realized profits (Beyer et al., 2010). Richardson et al. (2010) show how the abnormal growth literature has evolved over the last decade, trying to provide information on the problems investors encounter in using current accounting data to correctly predict future earnings and returns. They also show that the main explanation for the negative relationship between accruals and future stock returns is that capital market participants fail to correctly use accrual information in their forecasts of future earnings. Perhaps this is because the balance sheet is a product of the accrual accounting system and its results do not unequivocally support the story of diminishing returns. Being that if you grow the asset base and depreciate it too slowly or over-capitalize assets, the future "return on assets" measured by the accounting system may decline relative to current rates of return due to growth in "assets" (Dechow et al., 2010).

Corroborating with the aforementioned research, Dechow et al. (2010) pointed out some alternative explanations for the decline in future return on assets: (a) a decline in selling prices (as suggested by the history of diminishing returns), (b) an increase in costs that then causes a decline in margins, or (c) a decline in efficiencies. Table 1 presents the comparative for the Ohlson-RIV model, between the pre-IFRS and post-IFRS period, resulting from the application of equation 7. The inferences based on the Ohlson-RIV empirical models (Equation 7) point out that, in most cases, at least three variables, in addition to the intercept, are significant, however, the R in <sup>2</sup>the pre-IFRS period were much higher in relation to the <sup>2</sup>post-IFRS R, as well as the AIC and BIC tests pointed out better results for the pre-IFRS period, thus the model did not obtain an increase in prediction after the IFRS mandatory. Studies indicate that there was no evidence of greater market reaction with the adoption of IFRS (Macedo et al., 2013, Pimentel and Silva, 2013, Santos and Cavalcante, 2014).

Table 2 presents the comparison for the Ohlson-AEG model, between the pre-IFRS and post-IFRS period, the result of Equation 8. It is observed that the result of the Ohlson-AEG model was similar to the result calculated for Ohlson-RIV, that is, in general, the variables, in addition to the intercept, are significant, however, the R in <sup>2</sup>the pre-IFRS period (mean 100%) were much higher in relation to the R <sup>2</sup>post-IFRS (mean 27%), as well as the AIC and BIC tests pointed to better results for the pre-IFRS period, thus the model did not obtain an increase in forecast after the IFRS mandatory. Contributing to the existing bibliographic evidence, according to Ambrozini et al. (2014) and Cunha et al. (2013) the *performance* of the financial indicators was not affected by the IFRS adoption. Analyzing the results for both models, it appears that the variables used, in general, are significant, however, the R in <sup>2</sup>the pre-IFRS period were much higher in relation to the <sup>2</sup>post-IFRS R, as well as the AIC and BIC tests pointed to better results for the pre-IFRS period, thus the model did not obtain an increase in forecast after the IFRS mandatory. Possibly, considering that the IFRS adoption leads to an increase in information costs borne by companies (de George et al., 2013, Griffin et al., 2009, Kim et al., 2012). However, the post-crisis 2008 effects should be highlighted, because since the transition period there has been an economic crisis, reflecting in the increased uncertainty of the markets, which may possibly be influencing the results. It is observed that the prices of Ibovespa component shares grew at an average rate of 15.60% per year, between the end of 2001 and 2008, and these prices grew at an average rate of 10.4% per year, between the end of 2001 and 2016, i.e., comparing one period with the other, there was a shrinkage in stock prices. Considering also the average growth rate of the price of the Ibovespa component shares<sup>8</sup> we have that between the pre-IFRS period (2001 to 2007) the growth corresponds to 29.5% per year, however, for the post-IFRS period (2010 to 2016) there was a decrease in the value of the price equivalent to -2.3% per year. This fact possibly caused changes in the characteristics of the variables that make up this work. Through Tables 1 and 2 it can be observed that the Ohlson-RIV and Ohlson-AEG models are equivalent, since the results obtained for the AIC and BIC tests are similar for both the pre-IFRS and the post-IFRS period, and no model was considered statistically significant, according to the results obtained.

<sup>8</sup>www.bmfbovespa.com.br/pt\_br/produtos/indices/indices-amplos/indice-ibovespa-ibovespa-estatisticas-historicas.htm

## CONCLUSION

This work analyzed whether the adoption of the International Financial Reporting Standards - IFRS has valued the companies listed on B3 (oldBM & FBOVESPA), directly increasing the realized prices, post-IFRS in comparison to the pre-IFRS period. It was found that the new accounting standard theoretically superior in fact brought positive reflexes, according to bibliographic evidence, including costs and benefits of adopting a new accounting disclosure practice. Previous literature evidence suggests that IFRS have a positive effect on accounting standards, and these affect *valuation model inputs*, i.e., share price, equity; and profit. Previous literature also presents that Ohlson's (1995, 2005) models have been applied to explore the market value of firms and its implications on capital markets, as well as to verify the relevance of accounting data (Bolibok, 2014, Cupertino and Lustosa, 2006, Ferreira et al., 2008, Lopes et al., 2007). To enable this research it was collected data from the financial statements referring to equity, net income, net income per share, number of shares, unit price, dividends paid per share, number of shares, unit price of shares, among others, of companies listed on the Brazilian stock exchange (B3, old BM&FBOVESPA), for the *ex-ante* and *ex-post* period the IFRS adoption (2001 to 2016) through the *Residual Income Valuation - RIV* and *Abnormal Earnings Growth - AEG* models. Applying the multiple linear regression to calculate annually the determination coefficients  $R^2$  and the Akaike tests (AIC) and the Bayesian Information Criterion (BIC). However, although there is a relevant improvement in the contribution of accounting information with direct impact on market prices (Chebaane and Othman, 2014, Choi et al., 2017, Dani et al., 2017, Harakeh et al., 2016, Kargin, 2013), after applying the empirical models, it is verified the IFRS did not bring greater market reaction with the adoption of IFRS, because there was no significant change in stock prices, based on the accounting data realized, by Akaike's criterion (AIC) and the Bayesian Information Criterion (BIC). What goes against the studies point out that there was no evidence of greater market reaction with the adoption of IFRS (Macedo et al., 2013, Pimentel and Silva, 2013, Santos and Cavalcante, 2014), or that the *performance of financial indicators* was not affected by the adoption of IFRS (Ambrozini et al., 2014, Cunha et al., 2013). In sum, the evidence on the relationship between disclosure, reporting and the cost of capital is quite mixed and is still evolving, with no evidence of market-wide effects and externalities from regulation (Leuz and Wysocki, 2016). Meanwhile, it is highlighted the post-crisis 2008 effects, in the increased uncertainty of the markets, which may possibly be influencing the results. It is observed that the share prices of the Ibovespa components in the pre-IFRS period (2001 to 2007) grew corresponding to 28% per year, however, for the post-IFRS period (2010 to 2016) there was a decrease in this value equivalent to -2.3% per year. This fact possibly caused changes in the characteristics of the variables that make up this work. To conclude, the results of this article create perspectives for new researches. Future research should compare the results of this work examining other economies around the world, as well as an analysis by sectors, and as some specificities linked to the IFRS adoption for example, a comparison between companies that adopted or not the fair value; or biological assets, among others.

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