

# Adoption Of IFRS Standards In Brazil: Impact Of Deemed Cost On Companies' Indebtedness Level (IL) And Return On Assets (ROA)

## Abstract

The adoption of the international accounting standards in Brazil allowed the companies to value fixed asset items at their fair value, using the deemed cost as an authorized procedure to lend a new monetary translation to these items, with the net equity and possible reflections in the liabilities serving as the counterparts. This permission was restricted to the year of the initial adoption of the International Financial Reporting Standards (IFRS), while its use was prohibited for subsequent periods. As the monetary update of the cost of the companies non-monetary assets had been revoked more than a decade earlier, the adoption of the deemed cost would signal a possibility of value recomposition and that this possibility could alter the magnitude of the structural indicators of the companies' equity status. In this context, the objective of the article is to investigate and evidence whether the use of the *deemed cost* by the Brazilian companies listed on BM&F, in the initial adoption of the IFRS standard in 2009 significantly altered the quantum of the structural indicators *Indebtedness Level (IL)* and *Return on Assets (ROA)*. To obtain the results, quantitative models were used, based on the variance analysis through the test of means, Pearson's correlation matrix and descriptive statistics. The results, with a 95% confidence level, suggest that, in statistical terms, the use of the deemed cost in Brazil was not attractive for the companies, did not produce significant alterations in the Indebtedness Level (IL) and Return on Assets (ROA) and did not reveal any significant undervaluation of the corporate fixed assets.

**Key words:** Fair Value, Deemed Cost, Indebtedness Level (IL), Return on Assets (ROA), Adoption of IFRS standards.

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## 1. Introduction

In this paper, the conclusions of a comparative study of the structural indicators called Indebtedness Level (IL) and Return on Assets (ROA) are discussed, calculated based on the standardized financial statements for 2009 of a sample of 57 Brazilian companies listed on BM&Bovespa which used the deemed cost on the occasion of the initial adoption of the IFRS (International Financial Reporting Standards).

The deemed cost, as defined in Attachment A to the Technical Pronouncement CPC 37 (R1) (CPC, 2010a), is the amount used as a substitute for the cost (or depreciated or amortized cost) at a certain date. The pricing of the deemed cost depends on the selected model, which can be the market value minus sales expenses or the value in use, which corresponds to the discounted cash flow of the projected benefits across the rest of the good's economically useful life. The research proposal that resulted in the present paper does not involve the investigation of which of the two methods the company used to price the deemed cost.

The permission to use the deemed cost was the opportunity the Brazilian companies taxed based on their taxable income were expecting to revalue fixed asset items at their fair value. More than one decade earlier, the price-level restatement mechanism, which permitted the incorporation of the inflation into the asset cost, had been revoked, in accordance with Law 9.249 (1995). The revoked price-level restatement mechanism related to the monetary updating of non-monetary items, incorporating the inflation effects and the counterpart in the income. In that context, the permission to use the deemed cost could rest on the premise that the Brazilian companies' non-monetary assets could be undervalued in function of the value loss due to the non-incorporation of the inflation process.

In their comparative standardized financial statements for 2010, the sample companies published the use of the deemed cost mechanism in 2009, whose data were processed and compared to permit the calculation of the structural indicators *Indebtedness Level* and *Return on Assets*, in the contexts with and without the deemed cost effects.

As known, the adoption process of the International Financial Reporting Standards (IFRS) demands significant modifications in the communication form and contents of the financial information in the standardized financial statements. These modifications are required in the financial statement structure as well as in the preparation and disclosure form, with a view to the qualitative improvement of the information that supports the decision making process in the general business context.

Focused on the need to produce reliable and comparable information, to reduce existing asymmetries between the global accounting practices recommended by the International Accounting Standards Board (IASB) and the domestic practices, countries like Brazil and others migrated to the unique accounting model regulated by and based on the IFRS standards.

In Brazil, the Federal Accounting Council (CFC), through the Accounting Pronouncements Committee (CPC), shares the adoption of the international accounting standards with other regulatory institutions. Based on this shared experience, the CPC has issued pronouncements, which are submitted to the appreciation and approval of the main regulatory entities in the Brazilian market since 2008. Then, these pronouncements gain the status of standards.

Among these standards, this study is focused on the standard originating in Pronouncement 37 (R1) (CPC, 2010a) and Interpretation ICPC 10 (CPC, 2009b), which discusses different exemptions that can be applied in the transition period to the international standard, like the deemed cost, in accordance with IFRS 01 – First Time Adoption of International Financial Reporting Standard (IASB, 2012)

This normative structure permits the adoption of the deemed cost for translation to the fair value of the fixed asset items and investment property items in the transition phase to the international standard. In this paper, however, only the adoption of the deemed cost for fixed assets is discussed.

The monetary translation of the assets at the *deemed cost* implies recognizing the fair value of these assets on the date of the initial adoption. Through IFRS 1, IASB (2003) defines fair value as the value of a transaction between knowledgeable, willing parties in an arm's length transaction. This recognition refers to the correction in the book value of the goods, in view of their probable cash generation, whose book

value can be significantly lower or higher than the fair value measured on the disclosure date, which Brazil implemented in 2009. As this procedure permits incorporating the surplus worth of the asset item in the positive or negative sense, it differs from the revoked standard in which the incorporation of the surplus worth was only permitted when the difference between the value of the new monetary translation of the item and its cost was positive.

It is believed that the adoption of the fair value on the transition date to the international accounting standards could be significant for the fixed asset items, considering that this procedure aims to correct disparities across these items' useful life, provoked by (a) the lack of incorporation of the inflation rates over more than a decade and (b) the use of depreciation rates for tax purposes with a view to recognizing usage-related economic losses.

Although the permission to use the deemed cost intends to attend to the specific goal of fair-value adjustment, the literature evidences that accounting choices are sometimes used to attend to other goals as well, which are more convenient to companies in general, as shown by Fields, Lys and Vincent (2000). Knowing that the application of the deemed cost would imply an asset price variation, distributed to the net equity in counterpart and to the liabilities for tax reasons, with a probable recognition in the income, this application could influence the companies' structural indicators *Indebtedness Level* (IL) and *Return on Assets* (ROA).

In that context, the objective in this article is to investigate and evidence whether the use of the deemed cost by the Brazilian companies listed on BM&Bovespa, in the initial adoption of the IFRS standard in 2009, significantly altered the quantum of the structural indicators *Indebtedness Level* (IL) and *Return on Assets* (ROA). To reach this objective, a positivist method is used, based on statistical techniques, to answer the following research question: **Were the *Indebtedness Level* (IL) and *Return on Assets* (ROA) of the Brazilian companies listed on BM&Bovespa who used the deemed cost in the initial adoption of the IFRS standards in Brazil significantly affected?**

As an expected answer, it is reasonable to expect that the *Indebtedness Level* (IL) and *Return on Assets* (ROA), in the alternative form, behaved as follows:

**H<sub>1</sub>:** When the deemed cost is incorporated in the fixed asset items, on average, the IL and ROA are statistically different from the IL and ROA without the adoption of the deemed cost.

In that context, as the Brazilian inflation process had not been incorporated into the companies' financial statements for more than a decade and depreciation rates were used for tax purposes to measure the asset items' economically useful life, it seems reasonable to expect that the adoption of the deemed cost can correct these value anomalies and, consequently, produce significant changes in the companies' asset and net equity values.

The year 2009 was chosen as many companies chose to anticipate the initial adoption of the IFRS standards in Brazil, which had been established for the year starting on January 1<sup>st</sup> 2010.

The choice of the *Indebtedness Level* (IL) and *Return on Assets* (ROA) as the sole research variables is justified because the IL captures the change in the indebtedness relation provoked by the changes in the asset and long-term debt values to different extents, and because the ROA captures the profitability change provoked by the depreciation adjustment in the income. These characteristics of the two variables are sufficient to measure the changes provoked by the use of the deemed cost in the companies' equity status and, therefore, the measures are taken before and after the adoption.

## 2. Theoretical Discussion

Although other studies that are indirectly related to the research problem have been investigated, in this part, only those studies that offer relevant contributions are discussed.

## 2.1 Accounting Choices

The decision to use the deemed cost as a procedure to adjust the value of fixed asset items to the market value on the occasion of the initial adoption of the IFRS standard can be considered an accounting choice. An accounting choice is any decision aimed at influencing, through the substance or form, the output of the accounting system in a specific manner. It includes not only information from the financial statements, but also factors like tax measuring and regulatory entities' perception. These choices are influenced by market imperfections, such as agency costs related to contractual issues, information asymmetry generally associated with the relation between managers and investors, as well as external factors that interfere in the relations with third parties, including the improvement in the indebtedness capacity studied by Fields, Lys and Vincent (2000).

Other influences, such as the contractual influence on accounting choices, aim to reduce restrictions with a view to maximizing the managers' wellbeing, as evidenced by Heflin, Kwon and Wild (2002). It should also be highlighted that accounting choices consider not only the influence on the company income. Watts (1992) discusses that, although the choices can influence the income, not all accounting choices involve earnings management, as the management can be one of the ways to use existing alternatives in the standards to intervene purposefully in the financial reporting with a view to gaining advantage.

The study by Waweru, Ntui and Mangena (2010) supports the position by Watts (1992), as the authors identified different choices that influence the income, among with the need for funding was highlighted as a driver of accounting choices.

## 2.2 Revaluation of Assets and Indebtedness Level

The positive revaluation of fixed assets is a controversial issue in accounting research, as well as in the accounting convergence process with the international accounting standards, in accordance with Lopes and Walker (2010). In CPC 27 (CPC, 2009a), the historical cost is maintained as the value based for the fixed assets, previewing the revaluation procedure in line with the local standard. In Brazil, this practice was revoked in Law 11.638 (2007).

The technical interpretation ICPC 10 (Interpretation on the Initial Application to Fixed Assets and Investment Property of Technical Pronouncements CPCs 27, 28, 37 and 43) (CPC, 2009b) recommends the application of the deemed cost in the initial adoption of the international accounting standards. In function of this recommendation, the deemed cost is considered an accounting choice, like in Missonier-Piera (2007), as a kind of asset revaluation. In Brazil, the deemed cost closes off the cycle of the asset revaluation procedures. In the literature, countless authors have investigated the asset revaluation and its motivations in different periods, such as knowing the relation between the indebtedness level and the asset revaluation.

Studies about asset revaluation have associated the encouragement of increases in the indebtedness capacity to the use of this practice, as demonstrated in Brown, Izan and Loh (1992); Easton, Edey and Harris (1993); and Lopes and Walker (2010). Despite its implementation cost and null effect on the cash, asset revaluation was investigated in Australia and the results showed that it is related to the potential to affect the political costs, information asymmetry and loan contracts, as shown in Brown, Izan and Loh (1992).

In the same country, one of the motivations for the research by Cotter (1999) was to investigate the correlation between the asset revaluation practice and the companies' indebtedness. The research results show that the relation between the asset revaluation practice and the indebtedness has been decreasing over time due to a greater emphasis on funding in banks, lower inflation rates and cost provoked by legal requirements for periodical revaluations every three years. It also evidences that the revaluation costs, in that study's Australian context, seem to surpass the reduction of the debt costs.

Political costs and funding needs (indebtedness) were discussed in Barlev, Fried, Haddad and Livnat (2007) when they investigated the correlation between the future performance and use of asset revaluation in 35 countries (including Brazil), and the obtained results suggest that the drivers of the accounting choices differ according to the characteristics of the country the company is active in.

In Switzerland, Missonier-Piera (2007) observed that companies with a higher degree of leverage are more prone to adopting positive asset revaluation, so as to signal a better indebtedness capacity and reduce the risk of non-compliance with requirements in debt contracts.

In Brazil, according to Lopes and Walker (2010), asset revaluation is negatively related with company performance. The authors conclude that, although the adoption of asset revaluation contributes to show a better indebtedness structure, it can be influenced by the negative impact on the calculation of the minimum dividend on the net profit.

In France, Cazavan-Jeny and Jeanjean (2007) investigated the effect of the adoption of the IFRS and observed that the companies tend to make accounting choices that improve their indebtedness level.

### 2.3 The Adoption of the Deemed Cost

As presented, the application of the fair value to fixed asset items through the deemed cost is an exception justified by the initial adoption of the IFRS standards in Brazil. This adoption corrects the value lags of fixed asset items, adjusting them in the positive or negative sense.

According to the European Parliament and the European Council (2002) and ICAEW (2007), in the European Union, publicly traded companies are obliged to present their financial statements in IFRS since 2005. As this continent is the cradle for the international standards, it was also the first to fully apply them. Since then, some studies have been developed on the adherence to the deemed cost and the initial adoption of these standards, as verified in the following approaches.

Christensen and Nikolaev (2008) investigated the companies from the United Kingdom and Germany that used the fair value in the year of the compulsory adoption of the IFRS standards. Their research results show that, in both countries, companies are less prone to the use of the fair value when the historical cost is another option. Consequently, in these two countries, the adoption of the deemed cost reached a smaller percentage of the companies.

In the study by Cazavan-jeny and Jeanjean (2007), it is shown that, in France, the deemed cost was attributed in approximately 20% of the companies listed on the index of the *Société des Bourses Françaises* (SBF 120). This result is supported in Demaria and Dufour (2007), who studied the companies' choice of the fair value during the adoption of the IFRS as a fixed asset valuation method. Their results also concluded that most of the companies maintained the conservative option of the historical cost instead of translating it to the fair value, as permitted in IFRS 1.

In Spain, 23% of the non-financial companies listed on the *Spanish Continuous Market* adopted the deemed cost for the fixed assets, corresponding to 33% of the applicable cases in the sample, discounting those companies in which the exemption does not apply or was not disclosed, as shown in Aledo, García-Martínez and Diazaraque (2009).

In a study of the use of fair value in the comparability of the financial statements companies from Australia and the United Kingdom published in the initial year of the IFRS adoption, Cairns, Massoudi, Taplin and Tarca (2011) observed the low use of this valuation type and suggested that the managers consider the historical cost method more appropriate for fixed asset valuation purposes. Cairns et al. (2011) also assessed the adoption of the deemed cost and found that, despite the possible attraction of the fair value during the transition, without the obligatory periodical revaluations, most of the companies did not use this exemption.

Fixed assets were also focused on in a relevant study presented by the European Commission (2007). As regards IFRS 1, some companies applied the deemed cost but, in the sample, the use of the historical cost was predominant as the valuation base for these assets in European companies.

### 3. Methodological Background

The financial information without the deemed cost for the financial year 2009, of the companies listed on BM&Bovespa were retrieved from the financial statements available in the Economática database, and the deemed cost information was accessed in the comparative standardized financial statements for 2010 available on the website of BM&Bovespa. The information in the explanatory notes was read to identify the use of the deemed cost in the sample companies' initial adoption of the IFRS. The data were initially treated by separating the asset, liability and income values from the comparative financial statements, with and without the deemed cost, and by organizing them per company in order to permit the data input into the statistical software *gretl*, used for the calculations.

#### 3.1 Description of the Model

The analytic technique adopted for the treatment of the variables the model intends to explain is capable of providing sufficient answers to test the relations between the research variables *Indebtedness Level* (IL) and *Return on Assets* (ROA), using the variance analysis by means of the test of means and *F* statistics of Pearson's correlation matrix, like in Bruni (2011), Missio and Jacobi (2007).

Initially, to identify the sample's behavior, the descriptive statistics were calculated, whose results were analyzed in part 4.

To measure the impact of the deemed cost on the structural indicators *Indebtedness Level* (IL) and *Return on Assets* (ROA), the test of means model in equation 1 below is used, whose final results are analyzed in section 4.

$$Statistics_{test} = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \quad (1)$$

Where:

$\bar{x}_1$  is the mean IL;  $\bar{x}_2$  is the mean ROA;  $s_1^2$  is the variance in the mean IL;  $s_2^2$  is the variance in ROA;  $n_1$  is the quantity of observations of IL and  $n_2$  the quantity of observations of ROA. The variables of the model represent the scenarios with and without the deemed cost.

To support the test results produced by the model in equation 1, the *F*-test is used for the variance analysis of a single factor, whose model is demonstrated in equation 2 below.

$$Statistics_F = \frac{S_{\pi cdc}^2}{S_{\pi sdc}^2} \quad (2)$$

Where:

$S^2$  is the variance in the structural indicator IL or ROA;  $\pi$  is the structural indicator IL or ROA; *cdc* indicates the use of the deemed cost; *sdc* indicates the non-use of the deemed cost.

The Return on Assets (ROA) is obtained through the relation between the net profit ( $\pi$ ) and the total Asset value (A), as demonstrated in equation 3.

$$RSA = \frac{\pi}{A} \quad (3)$$

The Indebtedness Level (IL) is obtained by the relation between the sum of the Current Liabilities (CL) and Non-Current Liabilities (NCL) and the total Assets (A), as demonstrated in equation 4.

$$GE = \frac{(PC + PNC)}{A} \quad (4)$$

The correlation between the variables with and without the impact of the deemed cost is obtained through Pearson's correlation matrix, according to the model demonstrated in equation 5.

$$r = \frac{n(\sum GE \times RSA) - \sum GE \times \sum RSA}{\sqrt{\sqrt{nGE^2 - (\sum RSA)^2} \times \sqrt{n \sum GE^2 - (\sum RSA)^2}}} \quad (5)$$

### 3.2 Theoretical Model of Deemed Cost

Conceptually, the deemed cost, as declared in attachment A to Technical pronouncement 37, can be modeled as the net realizable value, that is, the market value minus the sales expenses, or the value in use of the good. The market value can simply be obtained in the active market where the item is traded. The value in use depends on obtaining the cash flow discounted at the present value. To obtain the cash flow at present value, however, the evaluator needs to know the remaining economically useful life of the good in order to protect the future benefits and elect a discount rate that is compatible with the business return. In that context, the analytical model to measure the value that is to be used as the deemed cost can be obtained as proposed in equations 6 and 7. Equation 6 models the deemed cost through the difference between the market value and the expenses required for the sale, identical to the net realizable value.

$$CA \equiv VRL = VM - DV \quad (6)$$

Where:

CA is the deemed cost; VRL the net realizable value of the good (cash inflow); VM is the value the market is willing to pay for the good; DV is the expenses required to sell the good.

Equation 7 models the deemed cost by adding up the sum of the projected cash flow, minus the present value, utilizing a rate that best represents the opportunity cost of maintaining the good.

$$CA \equiv FC_d = \frac{FC_1}{(1+i)^1} + \frac{FC_2}{(1+i)^2} + \dots + \frac{FC_n}{(1+i)^n} \quad (7)$$

Where:

CA is the deemed cost;  $FC_d$  is the discounted cash flow;  $i$  is the discount rate;  $n$  is the number of periods in the good's economically useful life.

The surplus value (MV) of the deemed cost to be incorporated into the asset item is obtained through the difference between the book value (VC) and the deemed cost (CA), as shown in equation 8.

$$MV = [VC - CA]^{\pm} \quad (8)$$

Replacing (6) or (7) in (8) show the greater or lesser value that is to be recognized in the initial adoption. This recognition will influence the cost of the asset item positive or negatively, with an opposite influence in the net equity as a counterpart. If the impact is positive, depending on the kind of item assessed, the deferred tax liabilities can increase.

### 3.3 Sample

The sample consists of 57 companies that signaled, through their standardized financial statements for 2009, that they used the deemed cost in the initial adoption of the IFRS standards in Brazil. This number of companies that signaled having used the deemed cost in the initial adoption of the IFRS standards in Brazil corresponds to approximately 15% of all companies listed on BM&Bovespa, a percentage that follows the global trend, as shown in Aledo, García-Martínez and Diazaraque (2009), Christensen and Nikolaev (2008), Cairns et al. (2011), Cazavan-Jeny and Jeanjean (2007).

In view of the premise of ICPC 10 (CPC, 2009b), in order to retrieve the standardized financial statements of the companies that used the deemed cost in 2009, the explanatory notes about the fixed assets and accounting practices were read, checking the terms related to this exemption (deemed, fair, revalued) for those cases in which this information was not published among the adopted exemptions.

The primary data correspond to the Total Assets, Total Liabilities and Net Income for the year, with and without the use of the deemed cost. Based on these data, the Indebtedness Level (IL) and Return on Assets (ROA) were calculated, used for data input in the models. The data for the IL and ROA in the sample, with and without the deemed cost, are shown in the Attachment.

## 4. Analyses and Results

Using the models and sample described in the previous part, in this part, the calculations of the data variability, the relation between the variables, the analysis and discussion of the results obtained through the application of the quantitative models have been demonstrated.

As a preliminary result, the correlation matrix of the variables demonstrated in Table 1 signals the presence of a direct relation between the ILs with and without the adoption of the deemed cost, corresponding to 95.46%, suggesting that the growth trend of this indicator in both scenarios, with and without the deemed cost, is opposite and of medium intensity, ranging between -32.67% and -36.04%, showing that, independently of the use of the deemed cost, the relation between ROA and IL already behaved in the opposite sense. When comparing the ROA growth with and without the deemed cost, a direct behavior of 97.74% is verified, similar to the ILs' behavior in the same conditions. The behavior of the inverse relation of the IL and ROA increases, from -32.67% to -36.04%, indicates that most of the surplus worth of the deemed cost, as expected, was allocated to the net equity and, consequently, that a lesser part of this value was recognized in the tax liabilities. On the other hand, the direct relation of 97.74% between the ROA with and without the deemed cost also suggests that, when maintaining the company performance, on average, the asset growth resulting from the addition of the deemed cost was not relevant enough to significantly reduce the return rate.

Table 1  
Correlation Matrix between IL and RA

ILsdc	ILcdc	ROAsdc	ROAcdc	
1.0000	0.9546	-0.3604	-0.3483	ILsdc
	1.0000	-0.3480	-0.3267	ILcdc
		1.0000	0.9774	ROAsdc
			1.0000	ROAcdc

Obs.: ILsdc = indebtedness level without deemed cost; GEcdc = indebtedness level with deemed cost; ROAsdc = return on assets without deemed cost; ROAcdc = return on assets with deemed cost

Source: Elaborated by the authors.

The descriptive statistical results are demonstrated in Table 2. These data show that more than half of the IL observations, with and without the deemed cost, are below the average. This conclusion is based on the fact that the median is lower than the mean value. The position of these two parameters (median and mean) suggests that less companies in the sample tried out a higher indebtedness level not provoked by the adoption of the deemed cost, as this indebtedness was already higher in the context without the deemed cost, as the average dropped from 0.7490 to 0.6505 and the median also dropped from 0.6916 to 0.6074.

The relation between the ROA behavior with and without the deemed cost, as opposed to the IL behavior, shows that more than half of the observations are above average, as the median is higher than the mean value. These parameters signal that the impact of the deemed cost in the assets and the net income, the latter through the depreciation, was significant enough to reduce the return rate from 3.56% to 1.97% for a small number of companies in the sample. Despite the clear contribution of the surplus value the deemed cost adds to the fixed asset items, due to the reduction in the parameters, it cannot be generalized whether this surplus value is significant in the total sample.

On the other hand, the data also signal that the sample does not follow a normal trend, considering the significant distance between the mean and the median. In that context, it is observed that the greatest dispersions are located in the ROA. When the deemed cost is used, the standard deviation corresponds to 6.77 times the mean and, without the deemed cost, this relation amounts to 4.85 times, as illustrated by the variation coefficient. Concerning the IL, the dispersion is smaller, reducing the distancing between the standard deviation and the mean, corresponding to 0.48 times with and 0.56 times without the deemed cost, as evidenced by the variation coefficient as well.

Thus, the magnitude of the variation coefficient signals that the ROA, without adding the surplus value of the deemed cost, and the IL, with this addition, show a more cohesive frequency distribution within the variation intervals (minimum/maximum), while the ROA with the surplus value of the deemed cost and the IL without this addition show a less cohesive frequency in their respective variation intervals.

Table 2

**Descriptive Statistics of IL and RA**

Parameters	ILsdc	ILcdc	ROAsdc	ROAcdc
Mean	0.7490	0.6505	0.0356	0.0197
Median	0.6916	0.6074	0.0394	0.0298
Standard deviation	0.4211	0.3111	0.1726	0.1333
Variation coeff.	0.5622	0.4782	4.8487	6.7688
Minimum	0.1228	0.1559	-0.6337	-0.4795
Maximum	2.4818	1.8435	0.7491	0.6099

Source: Elaborated by the authors.

The test used to compare the mean Indebtedness Level (IL) and Return on Assets (ROA) with and without the adoption of the deemed cost has been demonstrated in Table 3, with a 95% confidence level. The test result evidences that, as signaled by the descriptive statistics and correlation coefficients, despite quantitatively different means, in statistical terms, the scores show that there is not sufficient statistical dispersion to admit differences between the mean IL and ROA coefficients with and without the deemed cost. This discussion is based on the fact that the test-statistics of the Return on Assets (ROA), corresponding to 0.5106, and of the Indebtedness Level (IL), corresponding to 0.628, are both considered as two-tailed  $\pm 1.96$ , which permits the interpretation that the  $z$  parameter of the two variables (test-statistics) is not significant, with a 95% confidence level.

On the other hand, when considering the test-statistics as one-tailed, it is also verified that the  $z$  parameters (0.628 and 0.5106) of both variables, ROA and IL, are located to the left of the critical statistics 1.6449, also showing that the differences are not significant at a 95% confidence level, and are therefore included in the non-rejection area that would confirm the null hypothesis of the statistical theory.

In that context, the alternative hypothesis ( $H_1$ ) of different means is rejected. This assertion is supported by the results of the  $F$ -statistical tests shown in Table 3.1, in which the test-statistics (calculated) is inferior to the standardized  $F$  statistics for the two indicators (F calculated 2.01 and 0.30 and F critical 3.92).

The  $F$  statistics, with a critical value superior to the calculated values, signals that the differences in means of IL and ROA, with and without the deemed cost, are not statistically significant, confirming the results of the  $z$  test. Therefore, based on this signal, the recognition of the *surplus or lesser value of the deemed cost* to the companies' fixed-asset items on the occasion of the initial adoption of the IFRS standards in Brazil does not confirm the expectations that the annulment of the authorization to incorporate the inflation effects into the companies' financial statements is undervaluing the asset value.

Table 3

**Z-test of means of IL and ROA**

Parameters	ILsdc	ILcdc	ROAsdc	ROAcdc
Mean	0.7490	0.6505	0.0356	0.0197
Z	0.6288		0.5106	
z critical one-tailed	1.6449		1.6449	
z critical two-tailed	1.96		1.96	

Source: Elaborated by the authors.

Table 3.1

**F-test of Variance IL and ROA**

Source of variation IL	SQ	gl	MQ	F	P-value	F critical
Between groups	0.2767	1	0.2767	2.0187	0.1581	3.9258
Within groups	15.3492	112	0.1370			
Total	15.6259	113				
Source of variation RSA	SQ	gl	MQ	F	P-value	F critical
Between groups	0.0072	1	0.0072	0.3030	0.5831	3.9258
Within groups	2.6646	112	0.0238			
Total	2.6718	113				

Source: Elaborated by the authors.

As the tests demonstrated in Tables 3 and 3.1 suggest that there are no statistically significant differences between the mean coefficients of the indicators calculated with and without the use of the deemed cost, at a 95% confidence level, it seems that, on average, the algebraic sum of the surplus or lesser value of the deemed cost did not exert significant impacts on the companies' Indebtedness Level (IL) and Return on Assets (ROA), which is why the alternative hypothesis of different means is rejected.

In principle, these test results seem to go against the expectations that the legal prohibition to incorporate the inflation effects into the financial statements of the Brazilian companies taxed based on their taxable income for over one decade would provoke relevant variations in these companies' assets and net equity. Based on the test results, these variations were not significant to significantly influence the quantum of the two structural indicators selected for the test. On the other hand, these non-significant results seem to justify the low percentage of companies that used the deemed cost in the initial adoption of the IFRS standards (around 15%), supported by the lack of interest demonstrated by companies from other countries (20%, 23% and 33%), as confirmed in earlier studies by Aledo, García-Martínez and Diazarique (2009), Christensen and Nikolaev (2008), Cairns et al. (2011), Cazavan-jeny and Jeanjean (2007).

## 5. Final Considerations

As the research objective is to verify if the use of the deemed cost by the Brazilian companies listed on BM&Bovespa on the occasion of the initial adoption of the IFRS standards in 2009 significantly altered the Indebtedness Level (IL) and Return on Assets (ROA), a method based on quantitative tests was selected to verify the difference in means.

The test results evidence that, with a 95% confidence level, the use of the deemed cost did not significantly affect the financial information of the 57 companies in the sample with regard to the structural indicators IL and ROA. This conclusion rests on the response of the tests of means and *F*-statistics, which recommend the rejection of the alternative hypothesis ( $H_1$ ). As a result of this rejection, the test results permit the conclusion that, statistically, there is no difference between the mean values of the IL and the ROA, both calculated with and without the surplus or lesser value of the deemed cost.

These results are in accordance with Cotter (1999), who had already predicted a gradual untying of the revaluation procedure to improve the composition of the Indebtedness Level. In the same sense, the low attraction of the deemed cost for Brazilian companies (around 15% of adherence) is in line with the lack of interest demonstrated by companies from other countries (20%, 23% and 33%) in earlier studies disseminated by Aledo, García-Martínez and Diazaraque (2009), Christensen and Nikolaev (2008), Cairns, Massoudi, Taplin and Tarca (2012), Cazavan-Jeny and Jeanjean (2007).

Hence, statistically, the test results conclusively signal that the use of the deemed cost by the Brazilian companies listed on BM&Bovespa, on the occasion of the initial adoption of the IFRS standards in 2009, was not attractive and did not provoke relevant impacts in the structural indicators *Indebtedness Level (IL)* and *Return on Assets (ROA)*.

In addition, the test results signal that the legal prohibition, for more than one decade, to incorporate the loss of purchasing power of the currency provoked by the inflationary process did not lead to a significant undervaluation of the Brazilian companies' non-financial assets. It is alerted, however, that this conclusion cannot be generalized rationally, as the companies not listed on BM&Bovespa, as they are private, were not included in the sample.

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## Attachment

GE and RSA of the 57 companies listed on BM&BOVESPA who used the attributed cost in the initial adoption of the IFRS standards in Brazil in 2009

Company	Without deemed cost		With deemed cost	
	IL	ROA	IL	ROA
E_1	1.1452	0.0137	0.8306	0.0071
E_2	0.7774	0.3467	0.5623	0.1386
E_3	0.4318	0.0394	0.4255	0.0367
E_4	0.7495	0.0186	0.6636	0.0131
E_5	1.4026	0.7491	1.2051	0.6099
E_6	0.4647	0.023	0.4595	0.0172
E_7	0.806	0.0255	0.7434	0.0221
E_8	0.4633	0.0078	0.429	-0.0008
E_9	0.6025	0.0293	0.5895	0.0264
E_10	0.8269	0.0847	0.6074	0.0298
E_11	0.644	0.0645	0.6264	0.052
E_12	0.4776	0.0467	0.453	0.0181
E_13	0.2057	0.1716	0.2078	0.1703
E_14	0.7335	0.0338	0.2086	0.0002
E_15	0.3617	0.0742	0.3582	0.0497
E_16	0.4704	0.1132	0.419	0.0562
E_17	1.0737	-0.5149	1.0193	-0.4795
E_18	0.1883	0.0131	0.242	-0.0047
E_19	0.3968	0.1742	0.3912	0.157
E_20	1.8541	-0.3062	1.4256	-0.2472
E_21	0.826	0.0349	0.8055	0.0328
E_22	0.5779	0.0586	0.5527	0.0455
E_23	0.5543	0.0832	0.5222	0.0588
E_24	0.339	0.0944	0.3391	0.0809
E_25	1.1543	0.0119	0.7562	0.0061
E_26	0.4688	0.0694	0.4542	0.0505
E_27	0.8772	0.0193	0.8638	0.0173
E_28	0.8112	0.0334	0.7446	0.0307

Company	Without deemed cost		With deemed cost	
	IL	ROA	IL	ROA
E_29	0.7867	0.0304	0.7188	0.0258
E_30	0.7015	0.0416	0.6384	0.0344
E_31	0.6916	0.0646	0.663	0.0594
E_32	0.7631	0.0397	0.7407	-0.0028
E_33	0.6346	0.0593	0.5996	0.0522
E_34	0.5886	0.0393	0.5447	-0.0091
E_35	1.9378	-0.6337	1.335	-0.4175
E_36	0.4311	0.043	0.3337	0.0333
E_37	0.5882	0.0321	0.5713	0.0179
E_38	0.7207	0.0369	0.6718	0.032
E_39	0.9653	0.1808	0.6532	0.06
E_40	0.6569	0.0539	0.6263	0.0416
E_41	0.9033	0.0017	0.9012	0.0001
E_42	1.0185	0.1699	0.7531	0.0839
E_43	0.754	0.0675	0.6767	0.0279
E_44	0.4866	0.0071	0.4756	0.0021
E_45	0.7193	0.0174	0.6786	0.0145
E_46	0.6564	0.0688	0.5643	0.0477
E_47	1.2811	-0.1353	1.1472	-0.1201
E_48	0.1228	0.0858	0.1559	0.0552
E_49	2.4818	-0.1352	1.8435	-0.101
E_50	0.6187	0.1175	0.5888	0.0942
E_51	0.5176	0.0317	0.4736	0.011
E_52	0.3307	-0.0532	0.3355	-0.0391
E_53	0.8495	0.0778	0.8225	0.0711
E_54	0.5603	0.1021	0.5159	0.0668
E_55	0.8795	0.0006	0.8765	0.0004
E_56	1.1074	-0.0497	0.9974	-0.0515
E_57	0.2562	0.0539	0.2701	0.0377

Source: Author.

Calculations based on primary data from standardized financial statements, using equations (3) and (4).