

**MANDATORY IFRS ADOPTION IN BRAZIL (2010): INDEX OF COMPLIANCE WITH
DISCLOSURE REQUIREMENTS AND EXPLANATORY FACTORS OF FIRMS
REPORTING**

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ABSTRACT

We evaluate firms' compliance with required IFRS disclosure in the first mandatory adoption year of IFRS in Brazil (2010), by comprehensively examining 638 disclosure required items from 28 encompassing IFRSs in the Notes to Financial Statements of all (366) Brazilian non-financial corporations listed on the Brazilian stock exchange (BM&FBovespa). We measure disclosure compliance levels by calculating the respective index, both overall and for each standard, and investigate associations between disclosure levels and firm's characteristics as potential explanatory disclosure compliance factors. Our findings show overall low levels of disclosure compliance in the analyzed year. We find significant positive correlations between compliance levels and some firms' characteristics, mainly size and being audited by a "Big 4" global accounting firm.

Keywords: Compliance; Mandatory disclosure; IFRS; Explanatory factors; Brazil

Área temática: Contabilidade para usuários externos

1 INTRODUCTION

The mandatory adoption of full IFRS in Brazil, after a transition starting in 2008, was effective in 2010. However, an encompassing, perfect implementation of a common law rooted system, as the IFRS, in the accounting practice of a code law emerging country, as

Brazil, could hardly be expected in the first full adoption year. With the aroused interest to study that implementation, this work investigates the level of compliance with IFRS disclosure requirements of the Brazilian listed corporations in the first IFRS mandatory adoption year (2010) and examines key factors influencing disclosure as well.

With the IFRS convergence, Brazil participates on a global comparable and transparent information system that can enhance accounting quality and result in capital market benefits, as capital cost reduction, higher liquidity with lower bid-ask spreads and decrease of analyst forecast errors (BALL, 2006; HODGDON et al., 2008; LEUZ; WYSOCKI, 2008; DASKE et al., 2008; ARMSTRONG; BARTH; RIEDL, 2010). Nevertheless, the obtainment of such benefits, despite founded in the comparative excellence of the IFRS *per se*, or *de jure*, depend on the effective implementation in firms' reports, that is, on compliance *de facto*.

Yet, some relevant surveys (as STREET; GRAY, 2002) show "a significant extent of non-compliance" with international standards, especially with disclosure requirements. Recently, an encompassing analysis conducted by the SEC (2011) of 183 worldwide IFRS adopting firms, including some from Brazil, concluded that

"(...) many companies did not appear to provide sufficient detail or clarity in their accounting policy disclosures to support an investor's understanding of the financial statements, including in areas they determined as having the most significant impact on the amounts recognized in the financial statements. (...) diversity in the application of IFRS presented challenges to the comparability of financial statements across countries and industries" (SEC, 2011, p. 2).

In face of this heterogeneous implementation quality, Daske et al. (2008, p. 1085) found that "the capital-market benefits occur only in countries where firms have incentives to be transparent and where legal enforcement is strong, underscoring the central importance of firms' reporting incentives and countries' enforcement regimes for quality of financial reporting". Armstrong, Barth and Riedl (2010) verified an incrementally negative market reaction to IFRS adoption for firms domiciled in code law countries, consistent with investors' concern over enforcement of IFRS in those countries. Daske et al. (2009) propose a distinction between "label" and "serious" IFRS adopters firms, and confirm that market liquidity increase and capital cost reduction are obtained only by "serious" adopters.

In this context, two interrelated questions arise as focus of this study: What is the level of compliance by the Brazilian firms with the IFRS disclosure requirements in the first adoption year? What factors and firms characteristics could explain differences of disclosure compliance levels among firms?

To answer the first question, this study examined compliance with all (638) disclosure required items of 28 encompassing IFRSs in the Notes to Financial Statements of all (366) Brazilian non-financial listed corporations.

The second question was approached by testing associations between IFRS disclosure compliance level and firms' characteristics as size, profitability, leverage, international listing, auditing by one of the "Big 4" (Ernst Young, Deloitte, KPMG and PWC), corporate governance, and industry.

Some prior studies approach similar questions by examining disclosure on one country, as Cooke (1992) on Japan, Raffournier (1995) on Switzerland, Leuz and Verrechia (2000) on Germany and Lanzana (2004) on Brazil. Other compare disclosure in several countries, like Zarzesky (1996) and Archambault and Archambault (2003). Several studies focus IFRS required disclosure in one adopting country, as Miihkinen (2008) in Finland, Palmer (2008) in Australia, and Lima et al. (2010) in Brazil. Cross-country IFRS required disclosure is studied by Street and Gray (2002), Daske et al. (2009), Hodgdon et al. (2008), among others.

This work differs from previously issued studies on IFRS disclosure in Brazil: Lima et al. (2010) investigate 50 of the largest listed firms' disclosure compliance with some norms of

the first transition phase (2008) to IFRS and found associations with influencing factors. Other studies approach specific norms, either in the first initial transition phase (SANTOS; CALIXTO, 2010; PONTE; LUCA; CAVALCANTE, 2010, PONTE et al., 2010) or in the final full IFRS adoption phase (MAPURUNGA et al., 2011; MAIA; FORMIGONI, 2011). A qualitative analysis on 16 accounting subjects, including disclosure, from 56 listed firms' financial statements after full IFRS adoption (2010) was presented by Ernest & Young and Fipecafi (2011).

We structured the remainder of this article as follows: in Section 2 we discuss the prior related research and elaborate the testable hypotheses of this study; in Section 3 we describe the research model with disclosure metric, sample, data collection and testing determination; in Section 4 we present and discuss our results, and; in Section 5 we synthesize and conclude our study.

2. PRIOR RESEARCH AND HYPOTHESES DEVELOPMENT

Firms' disclosure is a fundamental component of market efficiency by enhancing market awareness *ex ante* for investment decisions, and assuring *ex post* the accomplishment of agency contracts between shareholders and managers (JENSEN; MECKLING, 1976; HEALEY; PALEPU, 2001).

Voluntary disclosure as "a special case of game theory", means that entities tend to disclose favorable information and not to disclose the unfavorable ones. Research has to consider both, firms' incentives to disclose and the reasons for non-disclosure, in order "to interpret silence" – as when a seller does not answer a particular question from a buyer, or when an employer finds a gap period in the personal resume of a job candidate (DYE, 2001, p. 184).

Indeed, financial markets anticipate and price not only positive or negative information, but also lacking information, so that deficient disclosure can lead to large market shifts, distancing investors, increasing capital costs and under-valuating good firms by adverse-selection (HEALY; PALEPU, 2001; VERRECHIA, 1983, 2001; DYE, 2001; LOPES; ALENCAR, 2010).

As voluntary disclosure empirically appears to be insufficient to eliminate market failures and to protect unsophisticated investors, accounting information is considered a "public good" (HEALY; PALEPU, 2001, p. 401) or a governable externality (DYE, 1990) which demands and justifies mandatory disclosure (HEALEY; PALEPU, 2001; DYE, 1990; LEUZ; WYSOCKI, 2008). This is evidenced by that "in successful markets and economies, firms' reporting and disclosure activities are often heavily regulated" (LEUZ; WYSOCKI, 2008, p. 68).

Verrechia (2001, 99ff) distinguishes three disclosure research categories: *association-based disclosure* which considers the market impacts of disclosure, related to investors decisions and to trading volume; *discretionary based disclosure*, examining how managers/firms exercise discretion in disclosing information; and *efficiency-based disclosure*, examining unconditionally optimal disclosure arrangements (as a Pareto optimum). For this author, a disclosure theory has to integrate the three categories; however, in more efficient markets, as in the US, disclosure improvements are only incremental and not easy to detect. So the author suggests that researchers on disclosure focus on "less developed capital markets" (VERRECHIA, 2001, p. 173-174) - which certainly emphasizes the relevance of our investigation on IFRS disclosure in Brazil.

This study aims at establishing a firms' disclosure compliance index, and at examining its association with following firms' characteristics as explanatory factors of enhanced disclosure: size, profitability, leverage, type of auditing, international listing, corporate governance and industry belonging.

Our hypotheses regarding the potential explanatory factors are:

Size

Numerous studies converge on the existence of a positive association between the firm's size and disclosure level: large firms can better support and dilute the disclosure costs, are more sensible to market visibility for better to attract expressive capital at the cheapest costs, normally have multiple and institutional shareholders that demand disclosure, and are more subject to political and social transparency scrutiny (COOKE, 1992; RAFFOURNIER, 1995; STREET; GRAY, 2002; ARCHAMBAULT; ARCHAMBAULT, 2003; ZARZESKI, 1996; LIMA et al., 2010). Thus, we formulate following hypothesis:

H1: The level of compliance with mandatory IFRS disclosure requirements by Brazilian firms is positively associated with firm's size.

Profitability

Prior research on the association between profitability and disclosure compliance level is not convergent (STREET; GRAY, 2002). Some authors (COOKE, 1992; ZARZESKI, 1996; LIMA et al., 2010) do not include profitability among the explanatory factors of firms' disclosure. Other authors, despite including this factor on their studies, could not detect statistical significance (RAFFOURNIER, 1995; STREET; GRAY, 2002; MIIHKINEN, 2008; PALMER, 2008). On the other side, association between profitability and enhanced disclosure seems "obvious" (RAFFOURNIER, 1995). Therefore, we formulate following hypothesis:

H2: The level of compliance with mandatory IFRS disclosure requirements by Brazilian firms is positively associated with firm's profitability.

Leverage

Several authors observe that association between firm leverage and disclosure compliance is not always univocal (ARCHAMBAULT; ARCHAMBAULT, 2003; RAFFOURNIER, 1995; GALLERY; COOPER; SWEETING, 2008). Often indebted firms are pressed by creditors to increase disclosure and monitoring (PALMER, 2008; LANZANA, 2004) or their disclosure can increase also before issuing new bonds (MIIHKINEN, 2008; LIMA et al., 2010), mainly if entering the international financial market (RAFFOURNIER, 1995). In other cases, private covenants with creditors soften this disclosure pressure, but again, disclosure can increase when these agreements end or are breached (GALLERY; COOPER; SWEETING, 2008). Other studies find that firms with low debt tend to increase investor-oriented disclosure in order to better attract market benefits (lower capital costs, higher liquidity) (ZARZESKY, 1996; GALLERY; COOPER; SWEETING, 2008). On leverage, we formulate following hypothesis:

H3: The level of compliance with mandatory IFRS disclosure requirements by Brazilian firms is positively associated with firm's leverage.

International Listing

Prior research shows that the listing status of a firm can be associated with enhanced disclosure (ARCHAMBAULT; ARCHAMBAULT, 2003; LEUZ; WYSOCKY, 2008), mainly when a firm is listed on a US stock exchange (STREET; BRYANT, 2000) or in multiple international exchanges (COOKE, 1992; RAFFOURNIER, 1995). Enhanced disclosure arises from experiencing the accounting demands and culture of two or more countries (ZARZESKI, 1996; RAFFOURNIER, 1995). Compliance with IFRS required disclosures with ADR-listed firms also increases (STREET; BRYANT, 2000). In this respect, we formulate the hypothesis:

H4: The level of compliance with mandatory IFRS disclosure requirements by Brazilian firms is positively associated with firm's international listing.

“Big 4” Auditing

The type of auditor, mainly if being a global accounting firm, is found by Street and Gray (2002) to be significantly associated with enhanced disclosure compliance with IAS procedures. It is also associated with increased voluntary disclosure as showed by Raffournier (1995). Palmer (2008) finds that the quality of disclosure is higher for firms using one of the “Big 4” auditing firms (Deloitte, Ernst Young, KPMG and PWC) than the ones using smaller audit firms. All these authors point out that big auditing firms are under special scrutiny from regulators and exercise influence on disclosure policies of client firms. With regard to the type of auditing, our hypothesis is:

- H5.** The level of compliance with mandatory IFRS disclosure requirements by Brazilian firms is positively associated with being audited by one of the “Big 4” auditing firms.

Corporate Governance

Strong corporate governance association with enhanced compliance with IFRS required disclosure is emphasized by Archambault and Archambault (2003) and Gallery, Cooper and Sweeting (2008), among others. In Brazil, Lanzana (2004) shows significant associations of corporate governance with voluntary disclosure. In the year 2000, BM&FBovespa created special listing segments of “Novo Mercado” (New Market) designed for shares issued by companies that voluntarily undertake to abide by corporate governance practices and transparency requirements in addition to those already requested by the Brazilian Law and CVM (BM&FBovespa, 2008). Thus, we formulate the hypothesis:

- H6.** The level of compliance with mandatory IFRS disclosure requirements by Brazilian firms is positively associated with being listed in BM&FBovespa, a corporate governance special segment.

Industry

Compliance with IFRS disclosure requirements can vary among industries (depending on globalization level, specific regulations other industry characteristics). Cooke (1992) finds that Japanese manufacturing firms disclose significantly more information than other firms. To some extent this is also found by Raffournier (1995) studying Swiss manufacturing firms, as they are also the most internationalized of the country. Daske et al. (2009) control for the variable industry the capital effects associated with voluntary IFRS adoption. In this respect, we formulate a broader hypothesis enabling us to better detect compliance level variations among industries:

- H7.** The level of compliance with mandatory IFRS disclosure requirements by Brazilian firms is associated with belonging to specific industries.

3. METHODOLOGY

3.1 Sample Selection and Data Sources

The initial sample comprised all 445 Brazilian Stock Exchange (BM&FBovespa)-listed companies as of 31 December 2010. Financial industry companies (66) that are specifically regulated by the Brazilian Central Bank and (13) firms whose 2010 annual reports were not available on the BM&FBovespa website at the time of this study were excluded; the final sample totaled 366 companies.

Firms’ total assets, ROE, leverage and industry-classification data were obtained from the Economática (ECOW) database. Brazilian firms traded on international stock exchanges, their respective auditing firms, and firms listed in the BM&FBovespa special segments of corporate governance were identified from the BM&FBovespa website (www.bovespa.com.br).

3.2 Assessing Compliance with IFRS Required Disclosure: Checklist Construction

Initially, we collected all accounting standards applicable to 2010 issued by the Comitê de Pronunciamentos Contábeis (CPC) – the Brazilian accounting standard setting committee created for the convergence from BR GAAP to IFRS. Standards that did not mention disclosure requirements and those related to specific activities and unusual events were excluded. We obtained 28 remaining standards including 26 pronouncements (CPCs), 1 technical orientation (OCPC) and 1 interpretation (ICPC). In order to facilitate data collection and analysis, we decoupled 2 standards and combined 1, thus obtaining 30 thematic standards. Hereafter the term standard is used *lato sensu* referring to the 30 thematic standards.

We developed a comprehensive checklist by extracting from the standards all paragraphs that mention disclosure requirements, thus obtaining 183 paragraphs. As several paragraphs contain more than one disclosure requirement, we subdivided the paragraphs into items, obtaining 638 required disclosure items.

On applying the checklist, each IFRS-required disclosure item was coded as disclosed (1), not disclosed (0), or not applicable (NA).

To minimize subjective bias during verification of firms compliance, each standard (and respective items) was attributed to the same trained researcher, who coded the same items for all (366) firms.

3.3 Criteria for Applicability of a Standard to a Firm

For some firms, the applicability of a standard could be verified directly from an account disclosed in the Balance Sheet or Income Statement. For others, the information on applicability of a standard could be found only in the Notes (for example, the applicability of the Financial Lease standard to a firm can be verified by existence of a non-zero balance in the account Fixed Assets Leased in the Balance Sheet; but for Operational Lease, there is no specific expense account in the Income Statement, thus the applicability of this standard to a firm is verifiable only if a specific disclosure is reported in Notes).

Yet, we found that numerous firms did not mention in their Notes some standards; therefore, no conclusion could be drawn regarding their applicability to the firm. We also found some companies that explicitly reported in Notes that a specific standard was not applicable to them. As it is not possible to assume that one standard is not applicable to a firm simply because nothing is mentioned about this standard in its Notes, we established for these cases two alternative criterion to measure the compliance with IFRS disclosure requirements:

1. **Criterion 1 (strict):** If there is no information in Notes about one standard, it is considered applicable (assuming that firms must report all cases of non-applicability); therefore all its items are coded as not disclosed (0).
2. **Criterion 2 (tolerant):** If there is no information in Notes about one standard, it is considered not applicable (assuming that firms do not need to report non-applicability cases); so its items are excluded from the score.

3.4 Disclosure Compliance Index Approaches

Two different approaches have been employed in prior studies to measure disclosure indices, as described by Tsalavoutas et al. (2010):

- (1) “*dichotomous disclosure index approach*” (DD) and
- (2) “*partial compliance unweighted*” approach (DP).

In the dichotomous approach, each disclosure item receives equal weighting, thus giving greater weights to standards which contain more items to be disclosed. The total number of required disclosure items provided by the company (for all IFRSs under analysis) was divided by the number of applicable disclosure items (COOKE 1992; CRAIG; DIGA,

1998; STREET; GRAY, 2002; HODGDON et al., 2008; TSALAVOUTAS; EVANS; SMITH, 2010; and others), using the equation (1):

(1)

$$DD_x = \frac{TT_x}{AT_x} = \frac{\sum_y^m Tx,y}{\sum_y^m Ax,y} DD_x = \frac{TT_x}{AT_x} = \frac{\sum_y^m Tx,y}{\sum_y^m Ax,y}$$

where:

DD_x is the disclosure compliance index of firm x according to the dichotomous approach ($0 \leq DD_x \leq 1$); TT_x is the total number of items disclosed by firm x for all standards m applicable to firm x ; and AT_x is the number of items applicable to firm x for all standards m applicable to firm x .

The partial compliance unweighted approach assumes that each standard is of equal importance and consequently gives equal weight to each standard (STREET; GRAY, 2002; TSALAVOUTAS; EVANS; SMITH, 2010). According to this method, the index is calculated stepwise using two equations:

First, the compliance disclosure score for one standard of a firm is calculated using the equation (2):

(2)

$$D_{x,y} = \frac{Tx,y}{Ax,y} D_{x,y} = \frac{Tx,y}{Ax,y}$$

where:

$D_{x,y}$ is the compliance disclosure score for the standard y ($0 \leq D_{x,y} \leq 1$) of the firm x ; $T_{x,y}$ is the total number of items disclosed by firm x for the standard y ; and $A_{x,y}$ is the number of items applicable to firm x for the standard y .

Secondly, the compliance disclosure index of the firm is calculated using the equation:

(3)

$$DP_x = \frac{\sum_{y=1}^m D_{x,y}}{m} DP_x = \frac{\sum_{y=1}^m D_{x,y}}{m}$$

where:

DP_x is the compliance disclosure index of firm x according to the partial compliance unweighted approach ($0 \leq DP_x \leq 1$); $D_{x,y}$ is the compliance disclosure score of standard y for the firm x ; and m is the number of standards applicable to firm x .

The partial compliance approach has the advantage of avoiding the dichotomous approach problem of giving greater weight to standards that contain more items. Besides, it allows researchers to analyze non-compliance by standard, sets or clusters, and to explore their correlations with other variables as size, auditing type, etc. (TSALAVOUTAS; EVANS; SMITH, 2010). Following these authors, this study uses both approaches simultaneously to minimize measurement bias.

3.5 Statistical Modeling

The following linear regression model (equation 4) was used to test the hypothesis on explanatory factors of compliance with IFRS disclosure requirements:

(4)

$$DISC_n = \beta_0 + \beta_1 SIZE_n + \beta_2 PROF_n + \beta_3 LEV_n + \beta_4 INT_n + \beta_5 BIG4_n + \beta_6 GOV_n + \beta_7 \Sigma IND_n + \varepsilon$$

where:

- DISC*: disclosure compliance index
- SIZE*: company size (logarithm of the total asset)
- PROF*: profitability (ROE)
- LEV*: financial leverage (debt/total asset ratio)
- INT*: international listing (1 if the company is listed in international stock exchange and 0 otherwise)
- BIG4*: audit firm (1 if the company is audited by Ernest & Young, Deloitte, PWC or KPMG and 0 otherwise)
- GOV*: corporate governance (1 if the company is in BM&FBovespa corporate governance listing segment and 0 otherwise)
- IND*: 19 industries as per Economática classification (1 if the company is included in one of the 19 industries and 0 otherwise)
- β : coefficients of the model
- ε : error of the model

4. RESULTS

4.1 Firms' Compliance Level by Standard

For 15 standards, the applicability to the firms could only be verified in the Notes to the financial statements, as introduced in the methodology section.

Some firms, despite confirming the applicability of a given standard in their Notes, did not disclose the required information (for example, 17 firms, although declaring that they had business combinations, did not report any required disclosure about this standard). In this case, the firms were clearly aware of the requirements but chose not to comply.

Other firms reported the non-applicability of a given standard, which was then excluded from the firm metric.

But a considerable number of firms did not mention the applicability of some standards. For example, 9 standards were not mentioned by more than half the firms in the sample. As explained in the methodology section, in such cases we employed two criteria to establish compliance: by criterion 1 (strict), the standard was assumed to be applicable and compliance with required disclosure was considered null (0); by criterion 2 (tolerant), the standard was assumed to be not applicable to the firm and excluded of the metric.

Table 1 presents descriptive statistics of the disclosure compliance index for each standard and indicates the number of firms to which each standard was considered applicable or not applicable. The standards whose applicability could be verified by a specific account in financial statements are shown in Panel A and the standards whose applicability could only be verified in Notes are shown in Panel B, according to criteria 1 and 2.

TABLE 1

Descriptive Statistics of the Disclosure Compliance Index for Each Unit of Analysis

PANEL A: Compliance Disclosure Index for Units of Analysis whose Applicability could be Verified by a Specific Account

Unit of analysis	Criteria	NOT	Applicable	Mean	SD
		Applicable		(%)	(%)
		<i>N</i>	<i>N</i>		
1 Intangible Assets (CPC 04 - IAS 38)	NA	45	321	22.18	12.1

2	Related Party Disclosures (CPC 05 - IAS 24)	NA	0	366	11.42	81.57
3	Financial Lease for the Lessee (CPC 06 - IAS 17)	NA	235	131	33.33	24.76
4	Inventories (CPC 16 - IAS 2)	NA	78	288	25.07	11.12
5	Investments in Associates (CPC 18 - IAS 28)	NA	131	235	43.2	14.31
6	Interests in Joint Ventures (CPC 19 - IAS 31)	NA	346	20	25.83	16.42
7	Property, Plant and Equipment (CPC 27- IAS 16 and ICPC 10-IFRS 1)	NA	34	332	25.21	12.01
8	Investment Property (CPC 28 - IAS 40)	NA	307	59	6.51	8.35
9	Revenue (CPC 30 - IAS 18)	NA	3	363	42.97	18.97
10	Non-current Assets Held for Sale and Discontinued Operations (CPC 31 - IFRS 5)	NA	326	40	33.33	20
11	Income Taxes (CPC 32 - IAS 12)	NA	0	366	29.81	18.55
12	Consolidated and Separate Financial Statements (CPC 36 - IAS 27)	NA	98	268	44.44	22.53
13	First-time Adoption of International Financial Standards (CPC 37 - IFRS 1)	NA	0	366	57.49	30.94
14	Earnings per Share (CPC 41 - IAS 33)	NA	0	366	32.96	20.37
15	Accounting for the Payment of Proposed Dividends (ICPC 08 - NA)	NA	83	283	87.58	33.02

PANEL B: Compliance Disclosure Index for Units of Analysis whose Applicability could only be Verified by Notes

	Unit of analysis	Criteria	NOT	Applicable	Mean	SD
			Applicable		(%)	(%)
			<i>N</i>	<i>N</i>		
1	Impairment of Assets (CPC 01 - IAS 36)	1	60	306	1.89	5.14
		2	324	42	13.74	5.46
2	Operating Lease for the Lessee (CPC 06 - IAS 17)	1	11	355	11.03	21.17
		2	247	119	32.91	24.87
3	Transaction Costs and Premium on the Issuance of Securities (CPC 08 - parts of IAS 32 and 39)	1	0	366	0.54	5.31
		2	354	12	16.67	25.34
4	Share-based Payment (CPC 10 - IRFS 2)	1	70	296	8.8	12.87
		2	248	118	22.09	11.03
5	Adjustments to Present Value (CPC 12 - NA)	1	51	315	8.48	11.04
		2	228	138	19.17	8.39
6	Business Combinations (CPC 15 - IRFS 3)	1	23	343	2571,0	66.38
		2	294	72	12.48	9.5
7	Borrowing Costs (CPC 20 - IAS 23)	1	0	366	7.92	25.21
		2	330	36	78.37	27.74
8	Operating Segments (CPC 22 - IRFS 8)	1	3	363	16.98	19.53
		2	182	184	33.5	14.09
9	Accounting Policies (CPC 23 - IAS 8)	1	4	362	17.14	10.36
		2	82	284	21.75	5.89
10	Changes in Accounting Estimates (CPC 23 - IAS 8)	1	4	362	22.25	39.02
		2	271	95	81.12	27.35
11	Errors (CPC 23 - IAS 8)	1	3	363	1.24	9.59

		2	360	6	64.28	28.34
12	Events After the Reporting Period (CPC 24 - IAS 10)	1	0	366	49.69	23.79
		2	35	331	54.8	18.54
13	Provisions, Contingent Liabilities and Contingent Assets (CPC 25 - IAS 37)	1	20	346	33.21	16.45
		2	45	321	35.79	14.1
14	Employee Benefits (CPC 33 - IAS 19)	1	59	307	24.7	35.69
		2	212	154	49.25	36.49
15	Financial Instruments (CPC 40 / OCPC 03 - IAS 39 / IFRS 7)	1	155	211	32.03	25.1
		2	224	142	47.63	13.91

Criterion 1 (strict): If there is no information in Notes about one standard, it is coded as not disclosed (0), as well as its respective items.

Criterion 2 (tolerant): If there is no information in Notes about one standard, it is considered not applicable and its respective items were not considered in the score.

SD: Standard Deviation.

Table 1 shows that the disclosure level was low for most standards, especially when criterion 1 (strict) was applied. One main reason is that no information was provided from many firms about several standards. This shows how the compliance level is sensible to the criterion employed. For example, for the standard related to correction of “errors”, the Brazilian firms complied with only 1.24% of the IFRS required disclosures according to strict criterion; but the index rises to 64.28% according to tolerant criterion, as it assumes that this standard is not applicable to the 357 firms that provided no information about this standard in their Notes.

It is important to emphasize that some standards had very low disclosure, independent of the criterion employed. In the case of “Impairment”, in which firms complied with 1.89% of IFRS required disclosure by strict criterion, the compliance level remains low at 13.74% even if the tolerant criterion is used. This is also the case for “Business Combinations”, which obtained an index of 2.57% by criterion 1 and 12.48% by criterion 2.

Nevertheless, for several other standards whose applicability was verified by a specific account in the firms’ financial statements (therefore non-dependent from information on Notes), as “Investment Property” and “Related Parties Disclosures”, the compliance levels were also very low, at 6.51% and 11.42% respectively. Moreover, it is noteworthy that only two standards reached a compliance level higher than 80%: “Accounting for Payment of Proposed Dividends” at 87.58% and “Changes in Accounting Estimates” at 81.12% if criterion 2 (tolerant) is used.

4.2 Overall Firms’ Compliance Level

Table 2 presents descriptive statistics of the overall disclosure compliance index according to four measurement models obtained by combining the two standard applicability criteria with the two approaches to accumulate the overall index.

Model	Approach Employed in Index Accumulation	Criteria for Applicability of a Subject to a Firm	Mean	Standard Deviation	Minimum	Maximum
			(%)	(%)	(%)	(%)
1°	Dichotomous approach	Criteria 1 (Strict)	16.04	7.84	0	36.02
2°	Dichotomous approach	Criteria 2 (Tolerant)	23.69	8.27	0	45.43
3°	Partial compliance unweighted approach	Criteria 1 (Strict)	24.19	9.32	0	44.05

4°	Partial compliance unweighted approach	Criteria 2 (Tolerant)	33.72	10.39	0	53.4
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Criteria 1 (strict): If there is no information in Notes about one unit of analysis, it is coded as not disclosed (0) and also their respective items. **Criteria 2 (tolerant):** If there is no information in Notes about one unit of analysis, it is considered not applicable and their respective items were not considered in the score.

Dichotomous Approach: Gives equal weight to each 683 disclosure items considered applicable and implicitly gives more weight to standards with more items of disclosure required. **Partial Compliance Unweighted Approach:** Gives equal weight to each unit of analysis (standard).

The average level of compliance with IFRS required disclosure was very sensible to the approach employed, varying from 16.04% (strict criterion and dichotomous approach) to 33.72% (tolerant criterion and partial compliance unweighted approach), but the overall level was low for all models.

Regardless of the model, none of the 366 firms in the sample complied with more than 55% of the applicable disclosure requirements, confirming our prior results showing low compliance with IFRS required disclosure.

4.3 Regression Analysis

We ran four regression analyses according to the four measurement models (previously described in Table 2) of the dependent variable, in order to test the explanatory power of the factors described in the defined hypothesis.

Initially, correlations were analyzed for testing evidence of multicollinearity between independent variables. Six outliers were excluded, leaving a sample of 360 firms. The analyses revealed no evidence of multicollinearity between the independent variables.

Moreover, the normality assumption of the residues was met as required by the central limit theorem in view of the large number of firms in the sample. The residues were submitted to the Breusch-Pagan test and found to be homoscedastic. Since the sample was cross-sectional and no time series were used, autocorrelation was not an issue.

The regression analysis with the dependent variable calculated by the four models (see Table 2) was preceded by a correlation analysis verifying the existence of associations between the dependent variable and the independent variables.

TABLE 3

Correlation Matrix Between Independent Variables and Compliance Disclosure Index

Panel A: Correlation Matrix Between Independent Variables and Dependent Variable as per Model 1								
		SIZE	PROF	LEV	INT	BIG4	GOV	DISC
DISC ₁	Pearson							
	Correlation	.714(***)	0.024	.121(**)	.410(***)	.533(***)	.389(***)	1
	Sig. (2-tailed)	0	0.651	0.021	0	0	0	.
	N	360	360	360	360	360	360	360

Panel B: Correlation Matrix Between Independent Variables and Dependent Variable as per Model 4								
		SIZE	PROF	LEV	INT	BIG4	GOV	DISC
DISC ₄	Pearson							
	Correlation	0,684(***)	0,034	60,64	0,314(***)	0,589(***)	0,357(***)	1
	Sig. (2-tailed)	0	0,515	0,227	0	0	0	
	N	360	360	360	360	360	360	360

SIZE: Company size (natural logarithm the firm total asset); PROF: Profitability (ROE); LEV: Financial leverage (debt/asset ratio); INT: International listing (1 if the firm is listed in international stock exchanges and 0 otherwise); BIG4: Type of auditor (1 if the firm is audited by Ernest Yong, Deloitte, PWC or KPMG and 0 otherwise); GOV: Corporate governance (1 if the firm is in the BM&FBovespa corporate governance special listing and 0 otherwise).

DISC₁: Disclosure compliance index applying Model 1 (Disclosure compliance index obtained when both the strict criteria for applicability of a subject to a firm and the dichotomous approach to calculate the overall index were adopted).
DISC₄: Disclosure compliance index applying Model 4 (Disclosure compliance index obtained when both the tolerant criteria for applicability of a subject to a firm and the partial compliance approach to calculate the overall index were adopted).

The corresponding correlation matrices using models 2 and 3 were also calculated and obtained very similar results, so they were not presented here.

*, **, *** Indicate that the estimated coefficient is statistically significant at the 5 percent, and 1 percent levels, respectively.

Four significant and positive associations were identified (Table 3). Company size, international listing, “Big 4” auditing and inclusion in the BM&FBovespa corporate governance special listing were positively and significantly associated with the dependent variable at the 1% significance level, independent of the model used, indicating that higher levels of disclosure were associated with higher values for these independent variables. The association of financial leverage and the disclosure compliance was significant at the 5% level only if the dichotomous approach was employed (models 1 and 2).

Furthermore, the high coefficients observed for the independent variables company size and “Big 4” auditing indicate a strong association with the dependent variable.

The corresponding correlation matrices using models 2 and 3 (see Table 2) were also calculated and obtained very similar results, so they were not presented here.

Table 4 shows the results of the regression analysis using all the four models as dependent variable.

The results displayed in Table 4 indicate that on the whole, all four models are significant at the 1% significance level, with an *F* value of 0.00 and an R²-adjusted explanatory power of 59.61% for model 1, 57.04% for model 2, 60.98% for model 3, and 59.92% for model 4.

TABLE 4
Regression Analysis with Dependent Variable Calculated as per Models 1, 2, 3 and 4
Coefficient (significance)

Independent Variables	Expectation	<i>t</i> test			
		Model 1	Model 2	Model 3	Model 4
SIZE	+	0.0406(***) (13.00)	0.0392(***) (11.68)	0.0473(***) (13.08)	0.0525(***) (12.92)
PROF	+	0.0092 (1.45)	0.0116(*) (1.7)	0.0093 (1.27)	0.0104 (1.26)
LEV	+	0.0146 (1.58)	0.0073 (0.73)	0.0016 (0.15)	-0.0127 (-1.05)
INT	+	0.0165(**) (2.26)	0.0091 (1.15)	0.0092 (1.09)	0.0023 (0.25)
BIG4	+	0.0464(***) (6.66)	0.06524(***) (8.71)	0.0682(***) (8.41)	0.0841(***) (9.27)
GOV	+	0.0086 (1.26)	-0.0009 (-0.12)	0.0086 (1.08)	0.0013 (0.15)
AG_I	?	0.0121 (0.42)	0.0036 (0.11)	0.0303 (0.90)	0.0027 (0.07)
FB_I	?	0.0076 (0.52)	0.0273(*) (-1.73)	0.0266 (1.57)	0.0301 (1.58)
TR_I	?	0.0174	0.0248(*)	0.0378(**)	0.0300(*)

		(1.32)	(1.76)	(2.49)	(1.75)
CO_I	?	- 0.0345(***)	-0.0317(***)	-0.0143	-0.0152
		(-3.16)	(-2.71)	(-1.14)	(-1.07)
EL_I	?	- 0.0164	0.0002	-0.0184	-0.0019
		(-0.83)	(0.01)	(-0.81)	(-0.07)
EP_I	?	0.0095	0.0001	-0.0208(**)	-0.0116
		(-1.05)	-0.01	(-1.98)	(-0.98)
IM_I	?	0.0339	-0.0256	-0.0023	0.0128
		(-1.46)	(-1.02)	(-0.09)	(0.042)
M_I	?	- 0.0184	-0.0427(*)	-0.0424(*)	-0.0733(***)
		(-0.88)	(-1.91)	(-1.76)	(-2.70)
NM_I	?	0.0239	0.0249	0.0440	0.0532
		(0.95)	(0.92)	(1.51)	(1.62)
PP_I	?	0.0064	0.0209	0.0301	0.0427
		(0.31)	(0.93)	(1.24)	(1.56)
OG_I	?	- 0.0418	-0.0361(*)	-0.0466(**)	-0.0501(**)
		(-2,27)	(-1.82)	(-2.19)	(-2.09)
CH_I	?	- 0.0011	0.0028	0.0120	0.0058
		(-0.07)	-0.17	(0.68)	(0.29)
BM_I	?	- 0.0114	-0.0029	0.0096	0.0120
		(0.12)	(-0.24)	(0.73)	(0.81)
SD_I	?	- 0.1136	-0.0384	-0.0182	-0.0203
		(-0.44)	(-1.39)	(-0.61)	(-0.61)
TC_I	?	0.0087	-0.0174	0.0096	-0.0078
		(0.57)	(-1.06)	(0.55)	(-0.39)
TX_I	?	0.0075	0.0166	0.0353(***)	0.3774(***)
		(0.69)	-1.41	(2.79)	(2.65)
TS_I	?	- 0.1874	-0.0056	0.0052	0.0208
		(-1.54)	(-0.43)	(0.37)	(1.31)
VP_I	?	0.0090	0.0284(*)	0.0162	0.0272
		(0.66)	(1.94)	(1.03)	(1.53)
	R ² a	59.61%	57.04%	60.98%	59.92%
	F test	0.00(***)	0.00(***)	0.00(***)	0.00(***)
	N	360	360	360	360

Models 1 and 2: Disclosure compliance index obtained employing the dichotomous approach to calculate the overall index and the strict criteria (Model 1) and the tolerant criteria (Model 2) for establishing applicability of a subject to a firm.

Models 3 and 4: Disclosure compliance index obtained employing the partial compliance unweighted approach to calculate the overall index and the strict criteria (Model 3) and the tolerant criteria (Model 4) for establishing applicability of a subject to a firm.

SIZE: Company size (natural logarithm the firm total asset); PROF: Profitability (ROE); LEV: Financial leverage (debt/asset ratio); INT: International listing (1 if the firm is listed in international stock exchanges and 0 otherwise); BIG4: Type of auditor (1 if the firm is audited by Ernest Yong, Deloitte, PWC or KPMG and 0 otherwise); GOV: Corporate governance (1 if the firm is in the BM&FBovespa corporate governance special listing and 0 otherwise). Industries (1 if the firm belongs to the respective industry and 0 otherwise).

AG_I: Agri & Fisheries Industry; FB_I: Food & Beverage Industry; TR_I: Trade Industry; CO_I: Construction Industry; EL_I: Electric Electronic Industry; EP_I: Electric Power Industry; IM_I: Industrial Machines Industry; M_I: Mining Industry; NM_I: Nonmetallic Minerals Industry; PP_I: Pulp & Paper Industry; OG_I: Oil & Gas Industry; CH_I: Chemical Industry; BM_I: Basic & Fac Metal Industry; SD_I: Software & Data Industry; TC_I: Telecommunication Industry; TX_I: Textile Industry; TS_I: Transportation Services Industry; VP_I: Vehicle & Parts Industry.

*, **, *** Indicate that the estimated coefficient is statistically significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

In parenthesis: *t* test results.

Some findings vary depending of the model adopted, but company size and “Big 4” auditing significantly and positively influenced the disclosure compliance index at the 1% significance level, independent of the model used to determine the compliance disclosure index. Thus, the hypothesis 1 and 5 of this study could not be rejected, making it possible to conclude that these factors produce a significant positive impact on compliance with the IFRS disclosure requirement levels of Brazilian firms.

The significant positive influence of company size on disclosure behavior, as observed in the present study, matches the findings of several international studies of voluntary disclosure and/or mandatory disclosure requirements by international standards (COOKE, 1992; RAFFOUNIER, 1995; and others). These findings are also consistent with Brazilian studies on disclosure (LANZANA, 2004; LIMA et al., 2010; MAPURUNGA et al., 2011; and others).

Our observations regarding the variable audit firm are supported by the findings reported by Raffounier (1995), Street and Gray (2002), and Murcia and Santos (2010).

Depending on the model used, we also found positive significant influence of two other explanatory factors: international listing (at 5% if model 1 is used), and profitability (at 10% if the model 2 is used). This is not a surprise, as firms traded on both domestic and international markets are subject to greater information demands than their single market counterparts. Besides, our findings on profitability are a contribution to the previously mentioned discussion about the relevance of using profitability as an explanatory factor of the disclosure level.

The results for industry were mixed, as expected. For trade, mining, and oil & gas industries results were statistically significant in three models (2, 3 and 4): the association with the disclosure compliance index was positive for the trade industry, but negative for the mining and oil & gas industries. For two other industries, significance depended on the approach employed: the association of the construction industry was significant and negative when the dichotomous approach was used (models 1 and 2); and the association of the textile industry was significant and positive when we applied the partial compliance approach (models 3 and 4). The food & beverage, and the vehicle & parts industries showed significant positive association when model 2 was used, and the electric power industry showed significant negative association when model 3 was used.

5 CONCLUSION

This study evaluated the compliance level with IFRS disclosure requirements – measuring a disclosure compliance index – of Brazilian firms listed on Brazilian stock exchange (BM&FBovespa) and identified some factors strongly associated with the variability of this index among firms.

Using descriptive statistics, the disclosure compliance index of the 366 firms in our sample was calculated by analyzing 638 items of mandatory disclosure required by 28 encompassing IFRS standards, providing a comprehensive overview of the level of compliance with IFRS requirements in Brazilian firms both overall and for each standard.

In general, compliance with IFRS disclosure requirements was partial at best, especially for standards whose applicability to each firm could only be inferred from the Notes (many firms showed little interest in making this information explicitly available to external users).

Using correlations matrix and regression analysis, we tested four disclosure

compliance index models to investigate associations between disclosure levels and firm's characteristics as potential explanatory disclosure compliance factors.

In all our analyses, company size and "Big 4" auditing were positively associated with the dependent variable, independent of the model employed to determine the compliance disclosure index, making it possible to conclude that these factors produce a significant positive impact on compliance with the IFRS disclosure requirement levels of Brazilian firms. Depending on the model applied to determine the dependent variable in regression analysis, profitability, international listing and belonging to some industries (mainly trade, oil & gas and mining) also influenced disclosure levels significantly.

The comprehensiveness of our study makes our findings so far unique, relevant and useful not only for researchers but also for regulators, auditors and companies, contributing to the process of continuously improving the quality of the IFRS implementation in Brazil.

It should be pointed out that, despite the relatively low level of compliance with IFRS disclosure requirements observed among Brazilian firms, the IFRS adoption in Brazil, aimed at increasing transparency, has added a considerable amount of information disclosures that were not required by the previous BR GAAP, thus demanding a large adaptation effort from many firms. On the other hand, we could hypothesize that, even with low compliance levels with IFRS required disclosures, the first-adoption year has increased firms' transparency. For example, Ernest Young and Fipecafi (2011) found an increase on disclosure levels associated with the adoption of stricter regulations, but observed that many firms submitted standardized Notes or presented insufficient information on certain items.

However, in line with other countries experience illustrated by the international literature, the adoption of IFRS by itself certainly will not be sufficient for the Brazilian companies to reach the high levels of disclosure required by IFRS. In this sense, our findings emphasize the importance of increasing institutional support conditions for enhanced enforcement mechanisms, enabling the Brazilian firms to better attain the full economic benefits of IFRS adoption.

Among limitations of our study, it can be mentioned that it was conducted by simply verifying the presence or absence of disclosure requirement items in the Notes, without analyzing the quality of informed content. Moreover, firms' judgment on materiality, relevance and other standard applicability/non-applicability conditions could not be reached by this study. These limitations may inspire us and others to further research.

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