

# Mandatory IFRS Adoption in Brazil (2010): Index of Compliance with Disclosure Requirements and some Explanatory Factors of Firms Reporting\*

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## ABSTRACT

We evaluated firms' compliance with required International Financial Reporting Standards (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 measured disclosure compliance levels by calculating the respective index, both overall and for each standard, and investigated associations between disclosure levels and firm's characteristics as potential explanatory disclosure compliance factors. Our findings showed overall low levels of disclosure compliance in the analyzed year: the average level of compliance with IFRS required disclosure was very sensitive to the approach employed, varying from 16.04% (strict criterion and dichotomous approach) to 33.72% (tolerant criterion and partial compliance unweighted approach). In line with other countries experience illustrated by the international literature, these results 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. 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.

**Keywords:** Compliance. Mandatory disclosure. Explanatory factors. IFRS. Brazil.

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## 1 INTRODUCTION

The mandatory adoption of full IFRS in Brazil, after a transition starting in 2008, was effective in 2010. However, despite that transition period, 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 study 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 in 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 in analyst forecast errors; nevertheless, the obtainment of such benefits, despite founded in the comparative excellence of the IFRS *per se*, or *de jure*, depends on the effective implementation in firms' reports, that is, on compliance *de facto* (Ball, 2006; Daske & Gebhardt, 2006; Barth, Landsman, & Lang, 2008; Hodgdon, Tondkar, Harless, & Adhikari, 2008; Leuz & Wysocki, 2008; Daske, Hail, Leuz, & Verdi, 2008; Armstrong, Barth, & Riedl, 2010).

Yet, among other relevant studies, Street and Gray (2002) show "a significant extent of non-compliance" with international standards, especially with disclosure requirements. Recently, an encompassing analysis conducted by the Securities and Exchange Commission (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, Hail, Leuz, and Verdi (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 (see also Christensen, Lee, & Walker, 2007; Hail & Leuz, 2007). Daske, Hail, Leuz and Verdi (2013) 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.

The relevance to examine the quality of IFRS implementation in Brazil derives from that, on the one hand, there is a growing capital market in the country (in 2011 the Brazilian Stock Exchange – BM&FBovespa – was the world's eighth in volume). On the other hand, Brazilian traditional accounting stems from code law, euro-continental postures that for centuries have prioritized legal formalistic and fiscal approaches over economic reality. For instance, the transition to IFRS inaugurated the separation between financial and tax accounting, thus changing patterns of accounting cultural values that traditionally favored a tendency to statutory control over professionalism, uniformity over flexibility in accordance with perceived circumstances of individual firms, conservatism over optimism in measurement, and secrecy over transparency (Gray, 1988; Dounnick & Riccio, 2006; Santos & Calixto, 2010; Santos, Cia, & Cia, 2011). Besides, different from Europe, that determined the full IFRS adoption at once in 2005, Brazilian regulators chose to establish the convergence process in two phases: the first transition phase starting in 2008 with a partial package of IFRSs, and the second and final phase, as full IFRS adoption starting in 2010. In each of these phases, IFRSs have been adapted with small local differences (not allowing revaluation of fixed assets, adjustments in the definition of cash equivalents, among others). IFRSs have been rendered obligatory for consolidated and individual reports, beginning by listed corporations and big private companies and more recently for all firms, including the Small and Medium-Sized Entities (SMEs).

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

Some prior studies approach similar questions by examining disclosure on one country, as Cooke (1992) on Japan, Raffournier (1995) on Switzerland, Leuz and Verrecchia (2000) on Germany, and Lanzana (2004) on Brazil. Others compare disclosure among 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, Fekete, Matis, and Lukács (2008) in Hungary, Chen and Zangh (2010) in China, Bova and Pereira (2012) in Kenya, and Lima, V., Lima, G., Lima, I., and Carvalho (2010) in Brazil. Cross-country IFRS/IAS (International Accounting Standard) required disclosure is studied by Street and Gray (2002), Daske and Gebhardt (2006), Daske et al. (2009), Hodgdon, Tondkar, Harless, and Adhikari (2008), and Verriest, Gaereminck, and Thornton (2012), among others.

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. This enabled us to identify the compliance level of Brazilian

firms with IFRS disclosure requirements in the first year (2010) of its plain adoption in Brazil. Our findings show an overall low level of compliance with the IFRS disclosure requirements by the Brazilian companies. We were also able to detect compliance with individual standards, which can be especially useful to regulators and market agents in the IFRS implementation process in Brazil.

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. Our findings show significant correlations between compliance levels and some of these characteristics, mainly size and "Big 4" auditing, and are consistent with prior research.

This study differs from previously issued studies on IFRS disclosure in Brazil: for example, 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; and Maia and Formigoni (2011) measured a mandatory disclosure index which includes 72 disclosure items required by CPCs applied in 2008 and 2009. Other studies approach specific norms, either in the first initial transition phase (Santos & Calixto, 2010; Ponte, Luca, & Cavalcante, 2010a; Ponte, Luca, Oliveira, & Aquino, 2010b, Loureiro, Gallon, & Luca, 2011, among others) or in the final full IFRS adoption phase (Mapurunga, Ponte, Coelho, & Meneses, 2011, among others). Also, a qualitative analysis on 16 accounting subjects, including disclosure, from 56 listed firms' financial statements after full IFRS adoption 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). Firms engage in voluntary disclosure to obtain market benefits (lower capital costs and higher market liquidity) by reducing investors' uncertainty about their performance (Leuz & Verrecchia, 2000; Healey & Palepu, 2001).

Voluntary disclosure as "a special case of game theory", means that entities tend to disclose favorable information and not to disclose information unfavorable to the entity. 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).

Some authors take the example from Informational Economics on the used car market, in which auto sellers, by hiding from buyers the defects of the bad cars, turn them to "lemons", which in the end over-depreciates all used cars, including the good ones ("cherries"); this distances the good car sellers from the market and can destroy the market (Akerlof, 1970). Similarly, 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-valuing good firms by adverse-selection (Healy & Palepu, 2001; Verrecchia, 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 (Sengupta, 1998; Healey & Palepu, 2001; Dye, 1990; Leuz & Wysocki, 2008). This is evidenced by the fact that "in successful markets and economies, firms' reporting and disclosure activities are often heavily regulated" (Leuz & Wysocki, 2008, p. 68).

In fact, mandatory disclosure is advantageous not only in local markets but among countries' informational competition in the international capital markets (Sunder, 2002). Indeed, when a firm from an emerging country chooses to cross-list in the US, being subject to "substantially increase its disclosure (via Form 20-F)", it is signaling that the US stricter security laws would "afford stronger rights to foreign investors" (Leuz & Wysocki, 2008, p. 55). This means that in the global informational market, compliance with IFRS mandatory disclosure, independent of (always necessary) enforcement, appears as a competitive firm's choice to advantageously obtain the same market benefits that attract IFRS voluntary adoption.

Verrecchia (2001, p. 99) 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 Verrecchia, 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. Thus, the author suggests that researchers focus on "less developed capital markets" (Verrecchia, 2001, pp. 173-174) - which emphasizes the relevance of our investigation on IFRS disclosure in Brazil.

This study aimed at establishing a firms' disclosure compliance index. Additionally, in line with the internatio-

nal literature (commented as per hypotheses below), this study examined the association of this index with following firms' characteristics as some possible explanatory factors of enhanced disclosure: size, profitability, leverage, type of auditing, international listing, corporate governance and industry. Following the two-model Informational Economics example that "education enhances human capital and also serves as a signal" (Spence, 2002, p. 414), these factors first signal expectation of a higher disclosure compliance level, as expressed by our below formulated hypotheses. Secondly, by corroboration, the factors appear as confirmed signals of additional accounting excellence (new compliance with IFRS disclosure requirements).

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, V., Lima, G., Lima, I., & Carvalho, 2010). Thus, we formulate the 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). Conversely, association between profitability and enhanced disclosure seems "obvious" (Raffournier, 1995). In fact, managers are motivated to disclose the firm's profitability, which enhances market shares valuation, shareholders confidence in management, and managers' compensation and reputation (Verrecchia, 2001; Dye, 2001; Raffournier, 1995). To solve this problem of apparent contradictory tendencies on profitability and disclosing, Verrecchia (1983) shows that (voluntary) full-disclosure does not always create the best value (costs against benefits) for managers, shareholders and potential investors. He proposes the consideration of a "threshold level" that separates "bad" news (to be disclosed) and "not quite good enough" news to justify disclosure, which remain subjected to managers' disclosure discretion, depending on a cost-benefit weighing (for instance in face of proprietary sensible information, pending hostile take-over, etc.). Therefore, we formulate the 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 et al., 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) (Zarzeski, 1996; Gallery et al., 2008). On leverage, we formulate the 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 stock 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 it is 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 do exercise influence on disclosure policies of client firms and are under special scrutiny from regulators. 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 Verriest et al. (2012) among other studies (Archambault & Archambault, 2003; Daske & Gebhardt, 2006; Gallery et al., 2008). 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”:

Novo Mercado (New Market) is a listing segment 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 (Brazilian Securities and Exchange Commission). It is based on the premise that stock valuation and liquidity are positively impacted and assured by shareholder's rights and by the quality of companies' information. The admission to Novo Mercado implies the compliance with corporate rules, known as "good practices of corporate governance", which are more rigid than those required by the current legislation in Brazil (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 one of the BM&FBovespa's corporate governance special segment.

### Industry

Compliance with IFRS disclosure requirements can vary among industries (depending on globalization level, specific regulations and 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 in 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

### Sample Selection and Data Sources

The initial sample was comprised of 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 followed a different IFRS adoption process from the other listed firms, were excluded. We also excluded (13) firms whose 2010 annual reports were not available on the BM&FBovespa website at the time of this study. The final sample totaled the annual financial reports<sup>1</sup> of 366 companies.

Firms' total assets, ROE [ $\text{Net Income} / \text{Shareholders Equity (final balance)}$ ], leverage ( $\text{Financial Liabilities} / \text{Total Assets}$ ) and industry-classification data were obtained from the Economática (ECOW) database for consolidated data. Firms with negative ROE were excluded from the regression analysis.

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.bmfbovespa.com.br](http://www.bmfbovespa.com.br)).

### 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 Generally Accepted Accounting Principles in Brazil (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 some standards and combined others, thus obtaining 30 thematic standards. Hereafter the term standard is used *lato sensu* referring to the 30 thematic standards. Table 1 presents the 30 standards and their corresponding CPCs and IFRSs.

**Table 1** Standards considered in the disclosure compliance index and reference to IAS/IFRSs

N.	Standards	(CPC and IAS/IFRS)
1	Impairment of Assets	CPC 01 (IAS 36)
2	Intangible Assets	CPC 04 (IAS 38)
3	Related Party Disclosures	CPC 05 (IAS 24)
4	Financial Lease for the Lessee	CPC 06 (IAS 17)
5	Operating Lease for the Lessee	CPC 06 (IAS 17)
6	Transaction Costs and Premium on the Issuance of Securities	CPC 08 (parts of IAS 32 and 39)
7	Share-based Payment	CPC 10 (IFRS 2)

continuous

<sup>1</sup> Note that the financial reports of all listed firms are by law submitted to external auditing, but the data collection focused on the Notes and did not analyze the content of the external auditing reports.

continued

N.	Standards	(CPC and IAS/IFRS)
8	Adjustments to Present Value	CPC 12 (NA)
9	Business Combinations	CPC 15 (IFRS 3)
10	Inventories	CPC 16 (IAS 2)
11	Investments in Associates	CPC 18 (IAS 28)
12	Interests in Joint Ventures	CPC 19 (IAS 31)
13	Borrowing Costs	CPC 20 (IAS 23)
14	Operating Segments	CPC 22 (IFRS 8)
15	Accounting Policies	CPC 23 (IAS 8)
16	Changes in Accounting Estimates	CPC 23 (IAS 8)
17	Errors	CPC 23 (IAS 8)
18	Events After the Reporting Period	CPC 24 (IAS 10)
19	Provisions, Contingent Liabilities and Contingent Assets	CPC 25 (IAS 37)
20	Property, Plant and Equipment	CPC 27 (IAS 16) and ICPC 10 (IFRS 1)
21	Investment Property	CPC 28 (IAS 40)
22	Revenue	CPC 30 (IAS 18)
23	Non-current Assets Held for Sale and Discontinued Operations	CPC 31 (IFRS 5)
24	Income Taxes	CPC 32 (IAS 12)
25	Employee Benefits	CPC 33 (IAS 19)
26	Consolidated and Separate Financial Statements	CPC 36 (IAS 27)
27	First-time Adoption of International Financial Standards	CPC 37 (IFRS 1)
28	Earnings per Share	CPC 41 (IAS 33)
29	Accounting for the Payment of Proposed Dividends	ICPC 08 (NA)
30	Financial Instruments	CPC 40 and OCPC 03 (IAS 39 and IFRS 7)

CPC is the Brazilian Equivalent for each IAS/IFRS. ICPC is CPC's Interpretation and OCPC is CPC's Orientation. "NA" indicate that there is no corresponding IAS/IFRS for the Brazilian CPC.

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 – although, of course, it is impossible to completely exclude researcher subjectivity.

#### Criteria for Applicability of a Standard to a Firm

In some cases, the applicability of a standard could be verified directly from an account disclosed in the Balance Sheet or Income Statement. In 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<sup>2</sup> 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. However, we also found several companies that explicitly reported in Notes that a specific standard was not applicable to them. Indeed, it is not possible to assume that one standard is not applicable to a firm simply because nothing is mentioned about this standard in the firm's Notes. Conversely, it is not formally declared in the norms that firms have to explicitly indicate in Notes that a standard is not applicable to them. As this matter is subjected to firms' judgment, we established for these cases two alternative criteria to measure the compliance with IFRS disclosure requirements:

**Criterion 1 (strict):** If there is no information in Notes about one standard, it is considered applicable (that is, it is interpreted that the firm must explicitly indicate that a norm is not applicable to it); therefore all its items are coded as not disclosed (0) This stricter criterion emphasizes a penalty for the firms that hide relevant information by inducing the user to believe that a standard is not applicable to them, whereas in fact it is applicable. On the other side, this criterion assumes the risk of penalizing firms that omitted only the information not applicable to them.

**Criterion 2 (tolerant):** If there is no information in Notes about one standard, it is considered not applicable (thus interpreting that firms do not need to report non-

<sup>2</sup> Of course, it is not to exclude the possibility of financial leasing on Investment Property; however, this could not be verified in this study, due to lack of available data. In fact, the CVM does not require the disclosure of this information by the firms in the structure of the annual final reports (DFPs - Annual Financial Statements).

applicability cases); so its items are excluded from the score. This criterion does not penalize a firm that correctly left out information not applicable to it. On the other side, this criterion assumes the risk of considering that all omitted information are due to non-applicable standards.

This two criteria approach enables to measure the compliance level for each of the two possible interpretations in case of a standard non-applicability: non-applicability explicitly declared or simply omitted. Moreover, this approach permits to establish a maximum (tolerant) and minimum (strict) compliance level, thus enabling to assess the results sensitivity to the chosen interpretation.

### Disclosure Compliance Index Accumulation Approaches

Two different approaches have been employed in prior studies to measure disclosure indices, as described by Tsalavoutas, Evans, and Smith (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):

$$DD_x = \frac{TT_x}{AT_x} = \frac{\sum_y^m Tx,y}{\sum_y^m Ax,y} \quad 1$$

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  $x$ . ( $T_{x,y}$  is explained bellow)

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 et al., 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):

$$D_{x,y} = \frac{T_{x,y}}{A_{x,y}} \quad 2$$

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 num-

ber of items applicable to firm  $x$  for the standard  $y$ .

Secondly, the compliance disclosure index of the firm is calculated using the equation (3):

$$DP_x = \frac{\sum_{y=1}^m D_{x,y}}{m} \quad 3$$

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 such as size, auditing type, etc. (Tsalavoutas et al., 2010). Following these authors, this study uses both approaches simultaneously to minimize measurement bias.

### Statistical Modeling

We employed the Kruskal-Wallis and the Mann-Whitney  $U$  tests to assess significance of mean differences of the compliance disclosure index for each qualitative explanatory factor (industry, international listing, "Big 4" auditing and corporate governance). Non-parametric tests were employed because the Kolmogorov-Smirnov test showed non-normal distribution.

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

$$DISC_n = \beta_0 + \beta_1 SIZE_n + \beta_2 PROF_n + \beta_3 LEV_n + \beta_4 INT_n + \beta_5 BIG4_n + \beta_6 GOV_n + \beta_6 \Sigma IND_n + \varepsilon \quad 4$$

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)

$\beta$ : coefficients of the model

$\varepsilon$ : error of the model.

## 4 RESULTS

In this section, we first present firms' compliance level with IFRS required disclosures for each standard, and then the overall disclosure compliance index. Next, we compare mean values for the qualitative explanatory factors and test these differences. Finally, we proceed with regression

analyses for testing the hypothesis of associations among explanatory factors and firms' compliance level variability.

### 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. This is presented in Table 2 which shows: (1) number of firms declaring the applicability of the standard; (2) number of firms declaring

the non-applicability of the standard; and (3) number of firms providing no information regarding the applicability of the standard.

**Table 2** *Applicability analyses: results for standards whose applicability could only be verified in notes*

Standards	Declared Applicability				Non-Applicability Declared		Nothing informed	
	Required Information Disclosed		Required Information not Disclosed					
	N	%	N	%	N	%	N	%
1 Impairment of Assets (CPC 01 - IAS 36)	42	11%	0	0%	60	16%	264	72%
2 Operating Lease for the Lessee (CPC 06 - IAS 17)	110	30%	9	2%	11	3%	236	64%
3 Transaction Costs and Premium on the Issuance of Securities (CPC 08 - parts of IAS 32 and 39)	4	1%	8	2%	0	0%	354	97%
4 Share-based Payment (CPC 10 - IFRS 2)	118	32%	0	0%	70	19%	178	49%
5 Adjustments to Present Value (CPC 12 - NA)	138	38%	0	0%	51	14%	177	48%
6 Business Combinations (CPC 15 - IFRS 3)	55	15%	17	5%	23	6%	271	74%
7 Borrowing Costs (CPC 20 - IAS 23)	36	10%	0	0%	0	0%	330	90%
8 Operating Segments (CPC 22 - IFRS 8)	184	50%	0	0%	3	1%	179	49%
9 Accounting Policies (CPC 23 - IAS 8)	284	78%	0	0%	4	1%	78	21%
10 Changes in Accounting Estimates (CPC 23 - IAS 8)	95	26%	0	0%	4	1%	267	73%
11 Errors (CPC 23 - IAS 8)	6	2%	0	0%	3	1%	357	98%
12 Events After the Reporting Period (CPC 24 - IAS 10)	331	90%	0	0%	0	0%	35	10%
13 Provisions, Contingent Liabilities and Contingent Assets (CPC 25 - IAS 37)	320	87%	1	0%	20	5%	25	7%
14 Employee Benefits (CPC 33 - IAS 19)	142	39%	12	3%	59	16%	153	42%
15 Financial Instruments (CPC 40 / OCPC 03 - IAS 39 / IFRS 7)	142	39%	0	0%	155	42%	69	19%

This table presents the number of companies that explicitly declared the applicability or non-applicability of each standard in their Notes and the number of companies that nothing informed about one standard, as well as their percentage of total sample (366 companies).

As shown in Table 2, 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. The standards most frequently declared by the firms as non-applicable were financial instruments (155 firms), share-based payment (70 firms) and impairment of assets (60 firms).

A considerable number of firms did not mention the

applicability of some standards. For example, 9 standards were not mentioned by more than half of the firms in the sample. As explained in the methodology section, to address this problem we employed two criteria to establish compliance, as presented in Table 3.

Table 3 presents the 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 3** *Descriptive statistics of the disclosure compliance index for each standard*

PANEL A: Compliance Disclosure Index for Standards whose Applicability could be Verified by a Specific Account						
Standards		Criteria	NOT Applicable	Applicable	Mean	SD
			N			
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

continuous



continued

PANEL B: Compliance Disclosure Index for Standards whose Applicability could only be Verified by Notes						
Standards		Criteria	NOT Applicable	Applicable	Mean	SD
			N	N	(%)	(%)
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 - IFRS 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 - IFRS 3)	1	23	343	2.57	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 - IFRS 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 3 shows that the disclosure level was low for most standards, especially when criterion 1 (strict) was applied. One main reason is that, as shown in Table 2, no information was provided from many firms about several standards. This shows how the compliance level is sensitive 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 (Table 2) 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 Com-

binations”, 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.

#### Overall Firms’ Compliance Level

Table 4 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.

**Table 4** Descriptive statistics of the disclosure compliance index according to each model

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 <sup>3</sup>	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

Criteria 1 (strict): If there is no information in Notes about one standard, it is coded as not disclosed (0) and also their respective items. Criteria 2 (tolerant): If there is no information in Notes about one standard, it is considered not applicable and their respective items were not considered in the score. Dichotomous Approach: Gives equal weight to each 638 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 standard.

The average level of compliance with IFRS required disclosure was very sensitive to the model employed, varying more than 100%, that is, from 16.04% (model 1) to 33.72% (model 4). Regardless of the model, none of the 366 firms in the sample complied with more than 55% of the applicable disclosure requirements.

According to the Table 4, the compliance level was lower (around 50%) for standards containing more numerous required disclosure items. Indeed, the compliance levels by attributing equal weight to each required item (dichotomous approach) were lower than the levels obtained by attributing equal weight to each standard (partial unweighted), respectively, 16.04% and 24.19%, and 23.69% and 33.72%.

Our findings confirm the usefulness of the adopted two criteria for assessing standard non-applicability. In fact, variations between the criteria 1 (strict) and the criteria 2 (tolerant) reached up to almost 50% (respectively, 16.04% to 23.69%, and 24.19% to 33.72%). This high variation is assumed to constitute a relevant information for standards setters and the market to evaluate firms' adoption behavior.

Moreover, this combination enables to conclude that –

whatever the interpretation about how firms have to disclose in case of a standard non-applicability, and the weight attribution in each accumulation approach – the overall compliance index of the Brazilian firms in the first IFRS adoption year was not lower than 16%, and not higher than 34%. Whether this firms' performance is to be considered low or not depends on the valuer and on further research.

### Testing Mean Differences for Qualitative Explanatory Factors

In order to verify the possible relation between disclosure level and company industry, international listing, "Big 4" auditing and corporate governance, findings were averaged and compared statistically.

Table 5 shows the results obtained when model 1 (previously described in Table 4) was applied.

Table 5 shows that the highest average levels of compliance disclosure index were observed for firms: with an international listing, from the telecommunication industry, included in special BM&FBovespa listing segments of corporate governance, and audited by one of the "Big 4".

**Table 5** Comparison of average disclosure compliance indexes for each group of qualitative firm characteristic - Model 1

Variable	Groups	N	Mean	Standard Deviation	Minimum	Maximum	Z test
Industry	Agri & Fisheries	3	16%	7%	8%	23%	25.47
	Food & Beverage	16	16%	10%	3%	36%	
	Trade	17	19%	7%	7%	35%	
	Construction	28	14%	6%	1%	27%	
	Electric Electronic	7	14%	8%	5%	26%	
	Electric Power	57	18%	7%	3%	35%	
	Industrial Machines	5	14%	7%	2%	19%	
	Mining	7	13%	12%	1%	28%	
	Nonmetallic Mining	4	16%	7%	9%	22%	
	Pulp & Paper	6	20%	7%	8%	28%	
	Oil & Gas	8	15%	7%	7%	31%	
	Chemical	12	18%	6%	9%	29%	
	Basic & Fac Metal	25	15%	10%	2%	31%	
	Software & Data	4	20%	4%	17%	26%	
	Telecommunication	14	21%	9%	2%	31%	
	Textile	27	15%	6%	1%	25%	
	Transportation Services	22	17%	7%	2%	31%	
	Vehicle & Parts	18	15%	9%	2%	30%	
Others	86	15%	8%	0%	33%		

continuous

<sup>3</sup> Only one firm obtained the overall index zero. It belongs to the industry Others and had only financial results. This firm had applicable items even according to the more tolerant criteria 2. As also several other firms obtained low indexes and the sample size is large, we did not exclude any firm from the descriptive statistics. Outliers were eliminated only in testing.

continued

Variable	Groups	N	Mean	Standard Deviation	Minimum	Maximum	Z test
International listing	Yes	89	22%	5%	12%	36%	-6.467***
	No	277	14%	8%	0%	35%	
"Big4" auditing	Yes	260	19%	6%	3%	36%	-10.076***
	No	106	9%	7%	0%	30%	
Corporate governance	Yes	150	20%	5%	3%	35%	-7.711***
	No	216	13%	8%	0%	36%	

Model 1: Compliance disclosure 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.

Findings for the variable "industry" were submitted to the Kruskal-Wallis test. The other variables were analyzed with the Mann-Whitney *U* test.

\*, \*\*, \*\*\* Indicate that estimated means are statistically significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

The statistical tests for mean values show that, with the exception of industry, all groups presented differences at the confidence level of 1%. In other words, firms traded on international stock exchanges and/or audited by one of the "Big 4" and/or included in special BM&FBovespa listing segments for corporate governance were significantly more compliant with IFRS disclosure requirements than the remainder of the sample.

When model 4 (previously described in Table 4) was adopted, the compliance disclosure indexes were slightly better (Table 6). However, despite minor differences (for example, the industry of the firm became significant) behavior was similar for the two approaches: compliance to IFRS disclosure requirements was best explained by the companies' characteristics analyzed.

**Table 6** Comparison of average disclosure compliance indexes for each group of qualitative firm characteristic - Model 4

Variable	Groups	N	Mean	Standard deviation	Minimum	Maximum	Z test
Industry	Agri & Fisheries	3	31%	10%	20%	40%	31.543**
	Food & Beverage	16	33%	12%	9%	50%	
	Trade	17	37%	8%	22%	51%	
	Construction	28	33%	10%	6%	50%	
	Electric Electronic	7	32%	9%	18%	40%	
	Electric Power	57	36%	6%	16%	48%	
	Industrial Machines	5	34%	14%	10%	45%	
	Mining	7	23%	16%	4%	40%	
	Nonmetallic Mining	4	34%	7%	24%	43%	
	Pulp & Paper	6	42%	8%	26%	50%	
	Oil & Gas	8	32%	8%	22%	49%	
	Chemical	12	37%	5%	28%	44%	
	Basic & Fac Metal	25	32%	13%	9%	51%	
	Software & Data	4	38%	10%	24%	46%	
	Telecommunication	14	38%	11%	9%	46%	
	Textile	27	34%	10%	3%	46%	
	Transportation Services	22	39%	9%	9%	51%	
	Vehicle & Parts	18	32%	12%	10%	53%	
Others	86	31%	11%	0%	53%		
International listing	Yes	89	40%	6%	24%	51%	-6.148***
	No	277	32%	11%	0%	53%	
"Big4" auditing	Yes	260	38%	7%	11%	53%	-10.251***
	No	106	24%	11%	0%	46%	
Corporate governance	Yes	150	38%	6%	20%	53%	-6.453***
	No	216	31%	12%	0%	51%	

Model 4: Compliance disclosure index obtained when both the indulgent criteria for applicability of a subject to a firm and the partial compliance unwhinged approach to calculate the overall index were adopted.

Findings for the variable "industry" were submitted to the Kruskal-Wallis test. The other variables were analyzed with the Mann-Whitney *U* test.

\*, \*\*, \*\*\* Indicate that estimated means are statistically significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

The statistics of corresponding tables applying models 2 and 3 (previously described in Table 4) were also calculated and resulted in similar values; therefore, they were not presented here.

### Regression Analysis

We ran four regression analyses according to the four measurement models (previously described in Table 4) 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 (Table

4). Six outliers were excluded, leaving a sample of 360 firms.

The analyses revealed no evidence of multicollinearity between the independent variables (Table 7).

**Table 7** Correlation matrix between independent variables

		SIZE	PROF	LEV	INT	BIG4	GOV
SIZE	Pearson Correlation	1					
	Sig. (2-tailed)	.					
	N	360					
PROF	Pearson Correlation	-0.062	1				
	Sig. (2-tailed)	0.241	.				
	N	360	360				
LEV	Pearson Correlation	0.132(*)	0.178(**)	1			
	Sig. (2-tailed)	0.012	0.001	.			
	N	360	360	360			
INT	Pearson Correlation	0.410(**)	0.001	0.071	1		
	Sig. (2-tailed)	0	0.99	0.177	.		
	N	360	360	360	360		
BIG4	Pearson Correlation	0.420(**)	0.106(*)	0.048	0.258(**)	1	
	Sig. (2-tailed)	0	0.044	0.369	0	.	
	N	360	360	360	360	360	
GOV	Pearson Correlation	0.349(**)	0.008	0.021	0.469(**)	0.415(**)	1
	Sig. (2-tailed)	0	0.878	0.698	0	0	.
	N	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).

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

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 (previously described in Table 4) was preceded by a correlation analysis verifying the existence of associations between the dependent variable and the independent variables.

Four significant and positive associations were identified (Table 8). 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).

**Table 8** 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 <sub>1</sub>	Pearson Correlation	0.714(***)	0.024	0.121(**)	0.410(***)	0.533(***)	0.389(***)	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 <sub>4</sub>	Pearson Correlation	0.684(***)	0.034	0.060	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).

DISC<sub>1</sub>: 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).

DISC<sub>4</sub>: 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).

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 4) were also calculated and obtained very similar results, so they were not presented here.

Table 9 shows the results of the regression analysis using all the four models as dependent variable.

**Table 9** Regression analysis with dependent variable calculated as per Models 1, 2, 3 and 4

Independent Variables	Expectation	Coefficient (significance)			
		t 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 (1.32)	0.0248(*) (1.76)	0.0378(**) (2.49)	0.0300(*) (1.75)
CO_I	?	0.0345(***) (-3.16)	-0.0317(***) (-2.71)	-0.0143 (-1.14)	-0.0152 (-1.07)
EL_I	?	-0.0164 (-0.83)	0.0002 (0.01)	-0.0184 (-0.81)	-0.0019 (-0.07)
EP_I	?	0.0095 (-1.05)	0.0001 -0.01	-0.0208(**) (-1.98)	-0.0116 (-0.98)
IM_I	?	0.0339 (-1.46)	-0.0256 (-1.02)	-0.0023 (-0.09)	0.0128 (0.042)
M_I	?	-0.0184 (-0.88)	-0.0427(*) (-1.91)	-0.0424(*) (-1.76)	0.0733(***) (-2.70)
NM_I	?	0.0239 (0.95)	0.0249 (0.92)	0.0440 (1.51)	0.0532 (1.62)
PP_I	?	0.0064 (0.31)	0.0209 (0.93)	0.0301 (1.24)	0.0427 (1.56)
OG_I	?	-0.0418 (-2,27)	-0.0361(*) (-1.82)	-0.0466(**) (-2.19)	-0.0501(**) (-2.09)
CH_I	?	-0.0011 (-0.07)	0.0028 -0.17	0.0120 (0.68)	0.0058 (0.29)
BM_I	?	-0.0114 (0.12)	-0.0029 (-0.24)	0.0096 (0.73)	0.0120 (0.81)
SD_I	?	-0.1136 (-0.44)	-0.0384 (-1.39)	-0.0182 (-0.61)	-0.0203 (-0.61)
TC_I	?	0.0087 (0.57)	-0.0174 (-1.06)	0.0096 (0.55)	-0.0078 (-0.39)
TX_I	?	0.0075 (0.69)	0.0166 -1.41	0.0353(***) (2.79)	0.3774(***) (2.65)
TS_I	?	-0.1874 (-1.54)	-0.0056 (-0.43)	0.0052 (0.37)	0.0208 (1.31)
VP_I	?	0.0090 (0.66)	0.0284(*) (1.94)	0.0162 (1.03)	0.0272 (1.53)
R <sup>2</sup> 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.

The results displayed in Table 9 indicate that on the whole, all four models are significant at the 1% significance level, with an *F* value of 0.00 and an *R*<sup>2</sup>-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.

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, 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.

These findings confirm the existence, also in Brazil, of a positive association between firm’s size and disclosure level. In fact, large firms better support disclosure costs, are more sensitive to visibility in order to attract capital, and normally are subjected to higher disclosure demands from multiple and institutional shareholders and from political and social stakeholders. These results match 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).

Besides, our findings also confirm the influence of “Big 4” auditing firms in enhancing compliance performance of Brazilian firms, as these auditors exercise influence on disclosure policies of client firms and are under special scru-

tiny from regulators. Moreover, one can assume that these multinational auditors tend to transfer to their Brazilian clients world class disclosure best practices. 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 with 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 realized a comprehensive diagnostic of the level of compliance with IFRS disclosure requirements in its first adoption year in Brazil, by measuring both the overall compliance index and indices by each standard. We analyzed 638 items of mandatory disclosure required by 28 encompassing IFRSs, for (all) 366 non-financial Brazilian firms listed on Brazilian stock exchange (BM&FBovespa).

In the analysis, we combined the two possible interpretations about how firms should disclose in case of a standard non-applicability (either to declare explicitly its non-applicability or simply not mentioning it in Notes), with two weight attribution approaches for index accumulation (by item or by standard). We found that the overall compliance index of the Brazilian firms in the first IFRS adoption year was not lower than 16%, and not higher than 34%. That is, the overall compliance index was partial at best.

This seemingly low level of compliance with IFRS disclosure requirements contrasts with the market perception (see, for example, Martins, 2011 and Torres, 2012) that the Notes became too big after the IFRS adoption in Brazil, indicating that such increase of information volume was not proportionally matched by informational content.

Among possible reasons of firms’ low compliance, it could be mentioned that 2010 was a first adoption year, therefore a first learning step for Brazilian firms to assimilate in full a new accounting system, inasmuch based on different cultural-institutional traditions (common law) from Brazilian accounting roots (civil law). Besides, institutional enforcement – according to international research, considered lower in civil law countries in comparison with common law countries – could hardly be expected to be radically enhanced in this first adoption year in Brazil.

Conversely, we have to take into account that deficient disclosure is today not only an issue in Brazil, but a major discussion within the US (FASB, 2012), Europe (EFRAG, 2012, 2013) and also in the IASB context (IFRS, 2013), which points out possible standard future improvements.

In this sense, our study found that the compliance level was around 50% lower for standards containing many required disclosure items in contrast to standards containing few items. This suggests that the recent standard setters’ policy of increasing the number of disclosure requirements in a standard for enhancing transparency should not be taken as necessarily effective, as

firms tend to compensate numerous requirements by bypassing some of them.

Another implication of our findings for normative discussion derives from the expressive variation (50%) between the overall index values obtained depending on the interpretation about how firms should disclose in case of a standard non-applicability (explicit declaration of non-applicability or no mention in case of a non-applicable standard), thus suggesting the relevance for standard setters to discuss the best disclosure policy in these cases.

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 consider that, even revealing low compliance levels with IFRS required disclosures, the first-adoption year generated an enhancement of 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.

We also investigated some key factors associated with the disclosure level, as per studies of the international literature, and found confirmation that company size and "Big

4" auditing were positively associated with differences in compliance disclosure level among Brazilian firms in the first IFRS adoption year.

Among limitations of this study it can first be mentioned that it focuses only on the first adoption year and that it cannot be completely immune from researchers' judgment bias. Besides, it aimed at verifying compliance by the presence or absence of disclosure required items' contents in the Notes, obviously without questioning the quality of the required information, nor evaluating clarity and relevance of the disclosed content. These limitations open the way to new research about these issues, as well as possible associations between the disclosure compliance index with attributes and implications of accounting information quality. Our approach to explanatory factors of differences in the disclosure compliance level among firms, despite being supported by international research, can be also considered as a limitation, as it remains open to a deeper analysis, including other factors specific to the Brazilian reality. Although international studies on compliance rarely analyze materiality of the informed content, we consider the lack of materiality analysis also as a limitation of this study. May these limitations inspire us and others to future research.

In spite of these limitations that make this study somehow exploratory, this censual, and in this regard unique research expects to have contributed with relevant findings to the present international discussion on Notes, and to IFRS consolidation in Brazil.

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