



# Has it become more readable? Empirical evidence of key matters in independent audit reports<sup>\*,\*\*</sup>

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## ABSTRACT

The aim of this study was to analyze the effect of the adoption of Brazilian Accounting Standard – Auditing Technique 701 (NBC TA 701, in its Portuguese initialism) over the readability of audit reports. The study fills a gap in the literature by obtaining empirical evidence regarding the effect of NBC TA 701 on the readability and comprehensibility of audit reports. The study is important for verifying whether the disclosure of key audit matters (KAMs) improves the ease of reading and understanding audit reports after the adoption of NBC TA 701. Unlike in the previous literature, it was observed that the effect of KAMs has a non-linear, U-shaped relationship, which suggests additional benefits to readability based on a certain quantity of key matters reported. The data from a sample of 240 listed companies on the B3 S.A. – *Brasil, Bolsa, Balcão* (B3), in the period from 2013 to 2018, were assessed using content analysis, descriptive statistics, difference of means tests, and panel data correlation and regression analyses. The results showed that the adoption of NBC TA 701 significantly affected the Flesch readability index (FRI) of the independent audit reports. They also confirmed that the quantity of KAMs reported increases the FRI in a non-linear way, and that the types of key matters affect readability differently according to their complexity. The results provide evidence that the new audit report improves the level of readability in a non-linear way, thus contributing to the informational content of the audit report used by the various users for decision making.

**Keywords:** audit report, NBC TA 701, KAMs.

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## 1. INTRODUCTION

The aim of this study was to analyze the effect of the adoption of Brazilian Accounting Standard – Auditing Technique 701 (NBC TA 701, in its Portuguese initialism) on the readability of independent audit reports (IARs). Cases of accounting frauds in the last two decades have led to regulatory changes aiming to improve risk analysis and to provide a better understanding of the important aspects in the process of auditing financial statements (Kitiwong & Sarapaivanich, 2020; Reid et al., 2019).

In Brazil, the Federal Accounting Council (CFC, in its Portuguese initialism) altered the set of NBC TA (Santos et al., 2020). Standing out among these is NBC TA 701, the equivalent of International Standard of Auditing 701 (ISA 701), which attributed to the auditor the duty of communicating, through the IAR, which aspects required most attention during the auditing process – the so-called Key Audit Matters (KAMs). Note that as NBC TA 701 is the translation of ISA 701, the term NBC TA 701 is used throughout this text, even in the discussions of foreign studies.

Despite the expectation that the disclosure of these data can potentially increase the utility of audit reports, the literature remains controversial (Gold & Heilmann, 2019). According to Asay et al. (2017), the increase in data may, in specific situations, hinder the readability of the text and cause an adverse effect on the parties involved, encouraging them to use other sources of information they are familiar with.

Boritz et al. (2016) verified that, unlike what has been observed in studies such as that of Dyer et al. (2017), an increase in the size of the report does not necessarily reduce its readability, as users tend to be accustomed to the language used in such reports. In turn, Lo et al. (2017) observed that the readability level of the reports is associated with the manipulation of accounting information, as companies with modified results tend to present more complex reports to conceal earnings management. However, such evidence remains divergent.

In light of the change in the IAR and the need to understand its empirical implications, the previous literature has sought to: (i) identify the KAMs reported and their association with company characteristics (Abdullatif & Al-Rahahleh, 2020; Ferreira & Morais, 2020; Kend & Nguyen, 2020); (ii) analyze the effects of adoption on the fees, litigation risk, and quality of the audit (Gold et al., 2020; Kitwong & Sarapaivanich, 2020); (iii) analyze the effect of KAMs over the decision making of investors and other users (Coram & Wang, 2020; Moroney et al., 2020; Sirois et al., 2018; Vinson et al., 2018); (iv) verify the association between

KAMs and the market value of companies (Alves & Galdi, 2020); (v) analyze the effect of the adoption of NBC TA 701 over the quality of the financial information reported (In et al., 2020; Reid et al., 2019; Santos et al., 2020); and (vi) analyze the effect of the adoption of NBC TA 701 over the readability of IARs (Pinto et al., 2020; Velte, 2018, 2019).

However, the studies mentioned remain inconclusive regarding the cost/benefit of disclosing KAMs, specifically in terms of verifying whether the increase in data contained in the IAR has resulted in improved readability, especially in emerging countries, in which the institutional environment can weaken the expected benefits from altering the rules (Gold & Heilmann, 2019). In light of this context, this study sought to answer the following question: what is the effect of the adoption of NBC TA 701 on the readability level of the audit reports of Brazilian companies listed on the B3 S.A. – *Brasil, Bolsa, Balcão* (B3)?

For this, we analyzed the hypothesis that the adoption of NBC TA 701 has affected the readability of IARs. In addition, we verified whether the types of KAMs affect the Flesch readability index (FRI) differently. The descriptive, documental, and quantitative study analyzed data covering the period from 2013 to 2018 (the three years prior and subsequent to NBC TA 701 coming into effect) from the 240 most liquid companies on the Brazilian stock exchange. We used content analysis techniques, descriptive statistics, difference of means tests, and panel data correlation and regression analyses.

The study differs from previous investigations as it focuses on analyzing data from Brazilian listed companies, thus filling a gap in the empirical literature on auditing. It also complements the evidence observed in other markets (Pinto et al., 2020; Velte, 2018, 2019) and verifies whether the types of KAMs reported influence the readability of IARs differently, as indicated in the studies of Kitwong and Sarapaivanich (2020), Santos et al. (2020), and Sirois et al. (2018). This analysis is important since, as observed by Hermelo and Vassolo (2012) and Torre and Schmukler (2007), the Brazilian capital market is an environment with less investor protection and more concentrated control, among other characteristics that differentiate it from the American and European markets. So, the analysis of the impact of standards that seek to reduce informational asymmetry contributes to making it possible to verify the effectiveness of the efforts to improve this environment. For the readability analysis, the FRI was used, which is considered to be suitable for applying to texts in Portuguese, unlike the Gunning fog index, which is also used in the literature on readability (Martins & Filgueiras, 2007).

As this is a recent topic and given the importance of the IAR for accounting information users, the analysis of the effect of the adoption of NBC TA 701 and of the types of KAMs over readability enables us to verify the effectiveness of this standard in terms of improving the informational content of such reports. The results have the potential to provide contributions for researchers, who will have information on the specificities in the relationships observed between the adoption of NBC TA 701, the types of KAMs, and the readability of the IAR. They also provide a contribution for managers, accountants, and auditors, as readability is relevant in the analysis and decision-making process. Finally, they also help regulators, by providing insights regarding the need to monitor the application of the standard in question.

This investigation contributes to verifying whether the disclosure of KAMs has resulted in greater comprehensibility of IARs, measured using the FRI. The core argument is that, besides reducing informational

asymmetry, the disclosure of KAMs increases the credibility and relevance of audits (Coram & Wang, 2020; Moroney et al., 2020). However, the disclosure of data that reduce the readability of IARs may hinder the decision-making process, as well as supporting questions regarding the risk of adverse effects or of effects not desired by the regulator in relation to these processes on the auditing segment (Abdullatif & Al-Rahahleh, 2020; Segal, 2019).

The paper is divided into five topics, including this introduction. The literature review retrieves contemporary research on readability, it discusses the importance of KAMs, and it ends with the previous evidence and analyzed hypotheses. The methodological procedures section describes the collection, the data techniques, the choices, and the decision-making parameters used. The data analysis and results section presents and discusses the evidence found. Finally, the concluding remarks highlight the main contributions and suggest questions for future research.

## 2. LITERATURE REVIEW

### 2.1 Why Disclose a KAM?

The IAR is an instrument used for reducing asymmetry between managers and shareholders that summarizes the opinion of auditors regarding the veracity and adequacy of the information disclosed. Abdullatif and Al-Rahahleh (2020) and Segal (2019) observed that in recent years regulators have sought to alter its structure with the aim of making it more informative.

In Brazil, this responsibility is attributed to the CFC, which has altered various NBC TA, including NBC TA 701, which concerns KAMs and established that the auditor was responsible for reporting them in their report covering the financial statements (Alves & Galdi, 2020; Santos et al., 2020). Thus, events and situations that have required greater attention from the auditor, and that are potentially useful for the user, should be disclosed in order to improve the assessment and reliability of the financial statements and the risks associated with the performance of these companies (Ferreira & Morais, 2020).

With this alteration, KAMs have been given emphasis in the IAR, as the critical points identified in the auditing of financial statements should be reported. For Coram and Wang (2020), despite this being an important step, there is persisting concern about the effectiveness of their application. Abdullatif and Al-Rahahleh (2020) and Segal (2019) highlighted that, despite the obligation to record KAMs, such disclosure depends on the professional's judgment regarding the relevance or not for external users.

Brasel et al. (2016) observed that the disclosure of KAMs can increase the risk of litigation in circumstances in which the auditors omit or incompletely disclose a KAM that is subsequently associated with fraud or material error. Sirois et al. (2018) added that KAMs have the potential to increase the informational content of IARs; however, there is concern that some users may use them inappropriately as substitutes for reading the financial statements in full (Segal, 2019).

### 2.2 Does Disclosing More Mean Users are More Informed? The Readability Problem

The problem of readability has already been studied in the field of accounting and auditing. Recent studies have consolidated the evidence on its determinants (Seifzadeh et al., 2020), as well as observing its implications in relation to audit quality (Salehi et al., 2020), earnings quality (Luo et al., 2018), cost of capital (Bonsall & Miller, 2017), and the adoption of the International Financial Reporting Standards (IFRS) (Cheung & Lau, 2016).

Among the factors that influence the readability level of financial statements, Seifzadeh et al. (2020) highlighted that bigger firms with greater growth potential and performance and that operate in more complex sectors tend to present a lower level of readability in their reports as, on one hand, the size and complexity require greater details or the use of technical terms. On the other hand, better performance and growth potential make them

naturally attractive to investors, discouraging managers from elaborating more readable reports. Other factors, such as the occurrence of republications and the size of the report, reduce the readability level. The type of auditor (Big 4) and the inexistence of internal controls shortcomings, in turn, are factors associated with greater readability of these reports.

The analysis of the association between the readability of financial statements and aspects related to the audit is inherent to this discussion. For Blanco et al. (2020), auditors are responsible for ensuring the reliability of financial reports and readability is a desired characteristic. Blanco et al. (2020) and Salehi et al. (2020) found an association between less readability and higher audit fees and a longer audit delay and a greater probability of the IAR expressing a modified opinion. This phenomenon shows that low readability of the reports can generate additional agency costs and, consequently, a higher capital cost, as capital providers and auditors seek to mitigate their risks and, in this case, the risk premium tends to increase.

Bonsall and Miller (2017) reinforce the idea that less readable financial reports tend to reduce ratings classifications, which in turn result in an increase in the capital costs set by the respective (capital) providers. This relationship may reinforce the role of debt as a mechanism of control through contractual clauses. On the other hand, the aforementioned authors revealed that greater readability can reduce the perception of risk, improving the probability of fundraising.

Cheung and Lau (2016) and Jang and Rho (2016) sought to verify whether the readability of financial reports altered with IFRS adoption. The results showed that the adoption of homogenous accounting standards does not necessarily result in similar implications, as cultural, social, and institutional factors influence this relationship. While in the Australian context Cheung and Lau (2016) observed an improvement in the readability level of the reports, Jang and Rho (2016) demonstrated that, compared with the Korean normative standard, IFRS adoption did not result in greater readability; however, it did moderate the relationship between factors such as firm age and ownership structure, reinforcing an improvement in readability level.

### 2.3 Previous Evidence and Development of the Hypotheses

The empirical literature on the adoption of NBC TA 701 has sought to understand how the disclosure of KAMs affects the various economic agents (Gold & Heilmann, 2019). However, according to Abdullatif and Al-Rahahleh (2020) and Segal (2019), auditors have perceived that the

adoption of this standard can increase litigation risk and that the KAMs may not receive due attention from users. This hypothesis has been analyzed in experimental studies that have sought to assess the litigation risk for auditors (Vinson et al., 2018), as well as the informational content of KAMs for the decision-making process (Köhler et al., 2020).

With regards to litigation risk, the evidence is contradictory (Gold & Heilmann, 2019). Vinson et al. (2018) observed that the increase in litigation risk for the auditor depends on the perception of intentionality. Within this context, when the auditor omits a previously reported KAM and then there is a problem associated with this, they will tend to suffer a more severe penalty; but, if the problem is related to a systematically reported KAM, the auditor tends not to be penalized. However, the results of Gimbar et al. (2016) indicated that in countries with rules-based accounting standards the litigation risk for auditors tends to increase after the adoption of NBC TA 701.

This pseudo-paradox occurs in the analysis of the informativeness of KAMs in the decision-making process. In general terms, the evidence reinforces the idea that KAMs influence the decision making of the various users (Gold et al., 2020; Köhler et al., 2020; Sirois et al., 2018). Within this context, Sirois et al. (2018) highlight that an excessive amount of KAMs can redirect users' attention, which would be an undesired effect of the standard.

From another perspective, studies such as those of Alves and Galdi (2020), In et al. (2020), Reid et al. (2019), and Santos et al. (2020) have sought to analyze the empirical implications of KAMs for the capital market. Alves and Galdi (2020) observed that there is a positive association between the adoption of NBC TA 701 and share price behavior. In turn, In et al. (2020), Reid et al. (2019), and Santos et al. (2020) presented initial evidence that the adoption of the standard has worked to discourage earnings management practices.

Along this line of thinking, the expected improvement in decision making, in the relevance of accounting numbers, in earnings quality, and in auditor accountability (Abdullatif & Al-Rahahleh, 2020; Segal, 2019) has also occurred in terms of an improvement in the readability level of IARs. According to Pinto et al. (2020) and Velte (2018, 2019), the adoption of NBC TA 701 is rooted in the expected improvement in the informational content of IARs. For this, the text needs to be readable for the various users, as the increase in textual content in itself can confuse users (instead of improving their understanding) and redirect their attention toward relevant data in the financial statements (Sirois et al., 2018).

The evidence provided by Pinto et al. (2020) and Velte (2018, 2019) indicated that the improvement in the readability of IARs, based on the disclosure of KAMs, has

varied according to the level of precision of the accounting standards; however, in any environment, the hypothesis raised is that the adoption of NBC TA 701 improves the readability level of IARs. So, we sought to analyze the following hypothesis (H<sub>1</sub>):

H<sub>1</sub>: the adoption of NBC TA has positively affected the readability of IARs.

In addition, Kitiwong and Sarapaivanich (2020) observed that the types of KAMs have different associations

with audit quality. Santos et al. (2020), in turn, raised the hypothesis that the types of KAMs can have different effects on the proxies for earnings management, as each matter is associated with an account that may be more or less susceptible to this practice. Considering that the matters reported have different contents and complexity levels, depending on the item, and that these can affect readability differently, we sought to verify the following hypothesis (H<sub>2</sub>):

H<sub>2</sub>: the types of KAMs affect the readability of IARs differently.

### 3. METHODOLOGICAL PROCEDURES

#### 3.1 Sample and Data Collection

The study, classified as descriptive, documental, and quantitative, analyzed data from 240 companies listed on the B3. The sample was formed of more liquid companies due to their importance to the Brazilian capital market, as the prices of their assets tend to behave more closely to the concept of (semi-strong) market efficiency. Moreover, using companies with low liquidity could bias the effect of one of the control variables that captures the return on company stocks.

The audit reports were collected from the website of the *Comissão de Valores Mobiliários* (CVM), the Brazilian capital market regulator, while the data relating to the economic and financial information of the companies participating in the sample were obtained from the website of the *Comdinheiro* database. These reports were downloaded in PDF (Acrobat Reader) format, converted to DOC (Microsoft Word), and analyzed

using content analysis. The KAMs were coded using a coding book.

The period analyzed covered the years from 2013 to 2018, including the three years prior and subsequent to NBC TA 701 coming into effect. For the analysis we used descriptive statistics, difference of means tests, and panel data correlation and regression analyses. All the quantitative variables were winsorized between 1% and 99%. The statistical procedures related to the econometric assumptions and adaptation of the panels were carried out based on the work of Baltagi (2005) and Wooldridge (2016) and the main statistics were reported in table footnotes.

#### 3.2 Models and Variables

To analyze the research hypotheses, models 1, 2, and 3 were used, adapted based on the studies of Boritz et al. (2016), Lo et al. (2017), Pinto et al. (2020), and Velte (2018, 2019).

$$FRI_{it} = \alpha + \beta_1 LengthT_{it} + D_1 AdoptionNBCTA701_{it} + \beta_2 LengthT_{it} \times AdoptionNBCTA701_{it} + \beta_3 Age_{it} + \beta_4 Ri_{it} + \beta_5 ROE_{it} + \beta_6 Indebt_{it} + \beta_7 Size_{it} + \beta_8 AudFee_{it} + D_2 Restate_{it} + D_3 ModOpin_{it} + \sum_{i=1}^4 D_n(Big4) + \sum_{i=1}^5 D_n(Year) + \epsilon_{it} \quad 1$$

$$FRI_{it} = \alpha + \beta_1 LengthT_{it} + D_1 EffectNBCTA701_{it} + \beta_2 LengthT_{it} \times EffectNBCTA701_{it} + \beta_3 Age_{it} + \beta_4 Ri_{it} + \beta_5 ROE_{it} + \beta_6 Indebt_{it} + \beta_7 Size_{it} + \beta_8 AudFee_{it} + D_2 Restate_{it} + D_3 ModOpin_{it} + \sum_{i=1}^4 D_n(Big4) + \sum_{i=1}^5 D_n(Year) + \epsilon_{it} \quad 2$$

$$FRI_{it} = \alpha + \beta_1 QtyKAM + \beta_2 QtyKAM_{it}^2 + \beta_3 Age_{it} + \beta_4 Ri_{it} + \beta_5 ROE_{it} + \beta_6 Indebt_{it} + \beta_7 Size_{it} + \beta_8 AudFee_{it} + D_2 Restate_{it} + D_3 ModOpin_{it} + \sum_{i=1}^4 D_n(Big4) + \sum_{i=1}^5 D_n(Year) + \epsilon_{it} \quad 3$$

##### 3.2.1 Dependent variable – Readability level

The dependent variable in both models was FRI, which considers the length and complexity of the text (Pinto et al., 2020; Velte, 2018) and has already been used in

the accounting literature (Dyer et al., 2017). Initially developed to apply to English language texts, Martins and Filgueiras (2007) observed that this index could also be easily applied to Portuguese.

The FRI classifies the text on a scale varying from 0 to 100 points and its result defines the level of reading difficulty. According to this metric, the higher the index is, the more readable and understandable the text will be. The FRI was obtained using the Microsoft Word software, version 2010, in (Brazilian) Portuguese. The IAR classification was carried out based on a scale varying from 0 to 100, as according to Table 1.

**Table 1**

*Scales of the Flesch readability index (SRI)*

Scale	Classification	Level
0-30	Very difficult	1
30-50	Difficult	2
50-60	Reasonably difficult	3
60-70	Simple language	4
70-80	Reasonably easy	5
80-90	Easy	6
90-100	Very easy	7

**Source:** Martins and Filgueiras (2007) and Velte (2018, 2019).

Besides the FRI, as complementary (robustness and sensitivity) tests, two other readability metrics were used: length of the text (LengthT) and file size (FSize). According to Li (2006), texts with a greater number of words require a higher processing cost, so they tend to present greater complexity.

### 3.2.2 Independent variables

#### 3.2.2.1 Operationalization of the effect of NBC TA 701

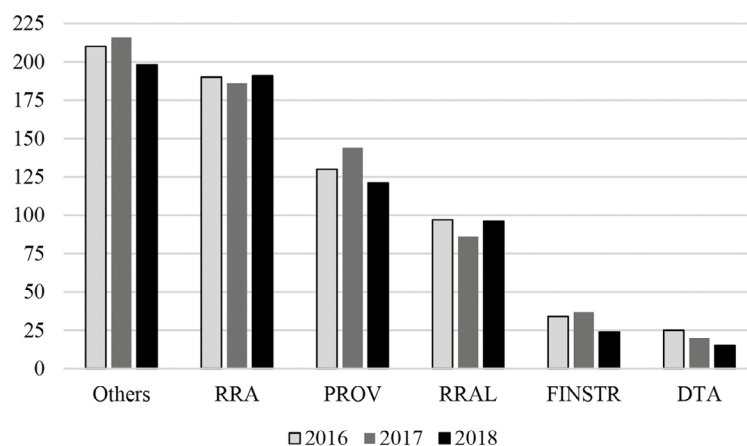
Given the hypotheses analyzed, three variables were operationalized to capture the effect of the adoption of NBC TA 701 over the readability of the IARs. The first

consisted of a dummy variable for the year of initial adoption of NBC TA 701. This variable (NBCTA701<sub>it</sub>) took the value 1 for the year 2016 and 0 for the rest. The second sought to capture the effect of the adoption of NBC TA 701 (EFFECTNBCTA701<sub>it</sub>) using a dummy variable that took the value 0 for the period prior to the standard (2013-2015) and 1 for the period subsequent to its adoption (2016-2018). Finally, the quantity of KAMs variable (QtyKAM<sub>it</sub>) was operationalized, as according to Santos et al. (2020) and Velte (2018, 2019), as a proxy for the normative effect since, for the years from 2013 to 2015, it took the value 0, while for the rest it took the total KAMs reported in each firm-year. Note that after various tests to assess functional form, the QtyKAM<sub>it</sub> variable showed that the quadratic functional form was the most appropriate one for explaining readability. In line with Wooldridge's (2016) proposal, the original variable was inserted into the model along with its quadratic form, which consisted of the quantity of KAMs in each firm-year to the power of two. Like the normative effect, the effect of the quantity of KAMs is expected to be positive and significant.

In line with the expectation of regulators and the previous evidence (Pinto et al., 2020; Velte, 2018, 2019), the coefficients of NBCTA701<sub>it</sub>, EffectNBCTA701<sub>it</sub>, and QtyKAM<sub>it</sub> are expected to have a positive and significant sign, thus reinforcing H<sub>1</sub>.

#### 3.2.2.2 Operationalization of the types of KAM

The types of KAM were operationalized as individual dummies for each type of KAM. They were categorized according to their nature, resulting in 38 categories, of which five (RRA, PROV, RRAL, FINSTR, and DTA) represented 69% of the total KAMs disclosed each year (Figure 1).



**Figure 1** Frequency distribution of the five categories of key audit matters (KAMs) most reported in the period from 2016 to 2018. DTA = deferred tax assets; FINSTR = financial instruments; Others = other key audit matters; PROV = provisions and contingencies; RRA = reduction in recoverable amount; RRAL = recognition of regulatory assets/liabilities.

**Source:** Elaborated by the authors.

It was verified that an average of 673 KAMs were reported per year. Moreover, the mean KAMs reported per firm/year was 2.88, 2.90, and 2.71 in 2016, 2017, and 2018, respectively. The Dunn test revealed that, in the comparison between the initial years of adoption, no statistically significant differences were verified. This homogeneity may derive from the observed repetition rate, which was 56.96% in 2017, while in 2018 it was 60.96%. When analyzing data from Australian companies from 2017 and 2018, Kend and Nguyen (2020) observed that 70% of the KAMs were reported in that period.

### 3.2.2.2.1 Control variables

In line with the previous literature (Alves & Galdi, 2020; Ferreira & Morais, 2020; Pinto et al., 2020; Santos et al., 2020; Velte, 2018, 2019), we sought to control the effect of characteristics of the firms analyzed. As highlighted by Pinto et al. (2020), the length of the text ( $LengthT_{it}$ ), measured by the logarithm of the total words in the IAR, seeks to control the effect of inserting words in the report. A positive effect over the readability level is expected, as, at the limit, this insertion tends to provide users with more information.

According to Pinto et al. (2020) and Velte (2018, 2019), managers and auditors have incentives related to the various capital providers to engage in greater readability. For this reason, we sought to control the effect of the return on the stocks ( $Ri_{it}$ ), the return on net equity ( $ROE_{it}$ ), and the level of indebtedness ( $Indebt_{it}$ ).  $Ri_{it}$  was operationalized using the natural logarithm of the stock price in  $t$  divided by the price in  $t-1$ . ROE was calculated by dividing net income (NI) by net equity (NE). In both cases, in firms with better returns (ROE and  $Ri$ ), managers are expected to engage less in publishing more readable reports (Boritz et al., 2016; Pinto et al., 2020; Velte, 2018).

With regards to the incentives related with the level of indebtedness, it can be hypothesized that managers have incentives to increase or reduce readability (Souza et al., 2019). However, it is known that the level of indebtedness is a proxy for continuity risk; so, auditors will strive to mitigate associated problems. Therefore, the level of

indebtedness is expected to have a positive effect over readability (Pinto et al., 2020; Velte, 2018, 2019).

Meanwhile, we also sought to control for firm size, by inserting the variables firm size ( $Size_{it}$ ), operationalized using the natural logarithm of total assets, and firm age ( $Age_{it}$ ), operationalized using the logarithm of the years the firm has been registered with the CVM, which is consistent with previous studies (Pinto et al., 2020; Velte, 2018, 2019). Less readability of the reports is expected as a result of firm size, this being due to the complexity of operations, which increases as the company “matures” and grows (Pinto et al., 2020; Boritz et al., 2016). However, while bigger companies are expected to have less readable reports, younger ones tend to strive to disclose more understandable reports.

Finally, in line with the work of Pinto et al. (2020) and Velte (2018, 2019), we sought to control factors related to the auditor ( $AudFee_{it}$ ) and to the auditing company ( $DTT_{it}$ ,  $EY_{it}$ ,  $KPMG_{it}$ , and  $PWC_{it}$ ), as well as to the financial statement and the IAR ( $ModOpin_{it}$  and  $Restate_{it}$ ). The audit fees were operationalized using their natural logarithm in each firm-year, in line with the work of Segal (2019). With this, we sought to capture the greatest auditing risk and complexity of the work – a scenario from which a negative association is expected between audit fees and the FRI, as already observed by Boritz et al. (2016). Following the same logic, we controlled the effect of the Big 4 auditing firms ( $DTT_{it}$ ,  $EY_{it}$ ,  $KPMG_{it}$ , and  $PWC_{it}$ ), which are generally hired by bigger and more complex companies. So, these companies will tend to present reports with a lower readability level, due to the risk and complexity of the work.

We also sought to control the auditor’s opinion type ( $ModOpin_{it}$ ) and whether the financial report was republished ( $Restate_{it}$ ), in accordance with Santos et al. (2020). While the opinion type controls the specific content of the IAR, which can affect its readability, republication, in turn, controls the quality characteristic of the financial statements. In both cases, their coefficients are expected to have positive and statistically significant associations with the FRI.

## 4. DATA ANALYSIS AND RESULTS

### 4.1 Descriptive Statistics of the Variables

First, we analyzed the textual structure, readability level of the IARs, and the descriptive statistics of the variables of the models (Table 2). We observed that in the period prior to the adoption of NBC TA 701 the files had a smaller textual structure, with a mean of 928

words and 47 paragraphs per IAR. After the adoption, the reports had a mean of 2,576 words and 77.50 paragraphs. These differences were statistically significant, reinforcing the idea that, in most cases, after the adoption of NBC TA 701 the textual structure of the IARs increased. This structure is partly consistent with evidence observed in the European market (Ferreira & Morais, 2020; Velte, 2018).

**Table 2**

Descriptive statistics of the (quantitative and qualitative) variables used in the models

Variables	Before the adoption of NBC TA 701			After the adoption of NBC TA 701			Dif $\mu$
	(n = 686)			(n = 716)			
	$\mu$	$\sigma$	CV	$\mu$	$\sigma$	CV	
<b>Panel A – Textual structure of the IAR</b>							
Kbytes	170.80	63.68	0.37	106.33	9.04	0.09	- 64.47***
Words	928.19	475.96	0.51	2,576.19	579.71	0.23	1,648.00***
Characters	5,537.02	2,411.85	0.44	15,931.75	3,589.71	0.23	10,394.73***
Paragraphs	47.31	12.38	0.26	77.50	104.19	1.34	30.19***
Sentences	67.54	232.53	3.44	122.65	459.15	3.74	55.11***
Sentences/paragraph	1.16	0.10	0.09	1.46	0.19	0.13	0.30***
Words/sentence	16.61	5.82	0.35	24.49	2.81	0.11	7.88***
Characters/paragraph	6.11	0.15	0.02	6.19	0.11	0.02	0.08***
<b>Panel B – Explained variables (readability metrics)</b>							
FRI <sub>it</sub>	3.20	0.17	0.05	2.62	0.25	0.09	-0.58***
LengthT <sub>it</sub>	6.77	0.32	0.05	7.83	0.25	0.03	1.06***
FSizeT <sub>it</sub>	4.86	1.06	0.22	4.66	0.10	0.02	-0.20***
<b>Panel C – Explanatory (quantitative) variables used in the models</b>							
QtyKAMs <sub>it</sub>	0.00	0.00	0.00	2.83	1.45	0.51	2.83***
QtyKAMs <sub>it</sub> <sup>2</sup>	0.00	0.00	0.00	10.11	9.45	0.93	10.11***
AudFee <sub>it</sub>	13.14	1.39	0.11	13.24	1.45	0.11	0.10*
Ri <sub>it</sub>	-0.16	0.65	-4.04	0.24	0.74	3.06	0.40***
ROE <sub>it</sub>	0.09	4.11	46.47	0.06	1.18	19.98	-0.03
Size <sub>it</sub>	21.59	1.88	0.09	21.66	1.98	0.09	0.06
Age <sub>it</sub>	2.83	0.90	0.32	2.89	0.93	0.32	0.07*
Indebt <sub>it</sub>	1.01	3.81	3.79	1.10	3.26	2.96	0.10*
<b>Panel D – Explanatory (qualitative) variables used in the models</b>							
	Proportion	Standard error	95%CI	Proportion	Standard error	95%CI	
AdoptionNBCTA701	0.00	0.00	0.00-0.00	0.17	0.10	0.15-0.18	0.17***
EffectNBCTA701	0.49	0.01	0.46-0.51	0.51	0.13	0.48-0.53	0.02***
Restate	0.29	0.02	0.02-0.26	0.24	0.02	0.21-0.29	-0.05***
ModOpin	0.07	0.01	0.01-0.05	0.07	0.01	0.06-0.10	-0.00
DTT	0.17	0.01	0.01-0.14	0.12	0.01	0.10-0.15	-0.05***
EY	0.18	0.01	0.01-0.16	0.17	0.01	0.15-0.20	-0.01
KPMG	0.18	0.01	0.01-0.16	0.25	0.02	0.22-0.28	0.07***
PWC	0.21	0.02	0.02-0.18	0.14	0.01	0.12-0.17	-0.07***

**Note:** Difference of means (t test) and proportions between the variables were used.

DTT<sub>it</sub>, EY<sub>it</sub>, KPMG<sub>it</sub>, and PWC<sub>it</sub> = dummy variables that take the value 1 for each of the Big 4 firms and 0 for the rest; Characters = total characters in the independent audit report (IAR); LengthT = natural logarithm of total words; CV = coefficient of variation; Sentences/paragraph = total sentences/paragraph in the IAR; Sentences = total sentences in the IAR; AudFee = natural logarithm of the total paid to the auditors in each firm-year; 95%CI = 95% confidence interval; Age = natural logarithm of the total years registered with the CVM (Brazilian capital market regulator); FRI = Flesch readability index; Kbytes = File size of the IAR in bytes; NBC TA 701 = Brazilian Accounting Standard – Auditing Technique 701; Indebt = level of indebtedness calculated based on total liabilities divided by total assets; ModOpin = dummy variable that takes the value 1 when there was a modified opinion (with reservation, adverse opinion, or abstention) in the IAR; QtyKAMs = total key audit matters (KAMs) reported in each firm-year; QtyKAMs<sup>2</sup> = total KAMs reported in each firm-year squared; Restate = dummy variable that takes the value 1 when the financial statement was republished and 0 otherwise; Ri = stock return calculated based on the natural logarithm of the Price/Price<sub>t-1</sub> in each firm-year; ROE = return on net equity (NE) calculated based on net income divided by NE; t = t test; Size = firm size obtained based on the natural logarithm of total assets; FSize = natural logarithm of the file size; w = Wilcoxon-Mann-Whitney test. \* = p < 0.10; \*\* = p < 0.05; \*\*\* = p < 0.01.

**Source:** Elaborated by the authors.



Note that FSize, one of the proxies analyzed, presented a certain level of incongruence, as there was a reduction in the mean file size. However, this paradox derives from the change in data compiling technology, which resulted in a greater capacity to store files, thus hindering the analysis and highlighting the weakness of this metric, as previously observed. From another perspective, it was verified that, in general, the respective indicators presented less homogeneity after the adoption of NBC TA 701. It was verified in the supplementary analyses that in the comparison between the years after adoption the respective metrics did not present statistical differences.

With the aim of obtaining initial evidence that the NBC TA affected the level of readability of IARs, it was observed that the FRI and LengthT increased after the adoption of NBC TA 701 and the difference between the periods was statistically significant ( $p < 0.001$ ). In average terms, the *a priori* interpretation indicates that the IARs became more complex and less readable, which is consistent with what was proposed by Li (2006), who states that reports with a higher word count tend to be more complex. However, the author highlights that one thing is not synonymous with the other. Using the length of the text (LengthT) has the advantage of making the calculation easy and the disadvantage of not being directly related to the complexity of the text, since, with the intention of providing a clearer text, the person writing it may use more words, thus increasing the file size.

When analyzing the FRI, it was verified that this had a mean of 14, the reports thus being classified as “very difficult,” with a coefficient of variation (CV) below 0.30, suggesting homogeneity, and a range of 52, which indicates that the lowest value was 0 and the highest was 52 – all classified as very difficult (0-30) and difficult (31-50). These factors enable it to be inferred that the audit reports are highly difficult to read. Pinto et al. (2020) and Velte (2019) also verified that, on average, IARs are classified between difficult and very difficult; however, the reports published in the European context presented a mean FRI of 27, which lies in the very difficult category.

The results indicate that the level of readability of the audit reports is low and this is consistent with the observations made by Pinto et al. (2020) and Velte (2019), suggesting the need for reader expertise – which can imply inefficiency in achieving the objectives of the standard and mean that users seek other sources of information, as highlighted by Asay et al. (2017). In addition, the disclosure of content that hinders readability can result in deviating attention toward other relevant data for decision making, which could only be obtained by reading the accounting statements in full (Sirois et al., 2018).

When the other variables are analyzed and the study objective is considered, significant differences are observed in the means and proportions before and after the adoption of NBC TA 701 for most of the explanatory variables (quantitative and qualitative), except for  $ROE_{it}$ ,  $Size_{it}$ ,  $ModOpin_{it}$ , and  $EY_{it}$ , revealing that, in these cases, the means and proportions were the same. In general, the adoption of NBC TA 701 significantly affected the mean of the respective variables.

## 4.2 Analyzing the Association between the KAMs and the Proxies for Readability

Next, we sought to understand the (univariate) associations between the types and quantities of KAMs and the proxies for readability. In general terms, according to Evans (1996), the correlations between the types of KAMs reported by the companies and the proxies for readability were below 0.80, thus suggesting weak correlations. The strongest correlation observed (0.799<sup>\*\*\*</sup>) was between LengthT and QtyKAMs, which is evidence that the adoption of KAMs is associated with a longer text. In turn, the correlation between QtyKAMs and FRI was -0.652<sup>\*\*\*</sup>, demonstrating that KAMs can reduce the level of readability of IARs. It was also verified that the FRI presented a negative and significant correlation with LengthT, reinforcing the lower readability after NBC TA 701.

It was also observed that the KAMs presented different and significant correlations, which would be initial indications relating to H<sub>2</sub>. Note that the reduction in recoverable amount (RRA) and the provisions and contingencies (PROV) presented positive and significant correlations (0.656<sup>\*\*\*</sup> and 0.634<sup>\*\*\*</sup>, respectively) with QtyKAMs and negative and significant correlations (-0.489<sup>\*\*\*</sup> and -0.404<sup>\*\*\*</sup>) with FRI. In this area, similar correlations were observed for other KAMs, but to a lesser extent.

Meanwhile, it was noted that file size (FSize) presented weak and non-significant correlations in most cases, but, as already mentioned, such evidence may derive from the change in compiling technology, which would explain the smaller size consumed after the adoption of NBC TA 701. The results partly reinforce the findings of Pinto et al. (2020), which shed light on the trade-off observed in the literature regarding the decision between increasing the quantity of information and the risk of disclosing “useless” data (Boritz et al., 2016).

The problem with greater complexity (and less readability) is that this can override or compromise the initial aim of the standard. Sirois et al. (2018) found

evidence that KAMs can hinder users' attention though cognitive bias, as they may judge the information highlighted in the KAMs to be more relevant than other notably important information.

Next, with the aim of analyzing  $H_1$ , we estimated models 1, 2, and 3 for the FRI in three ways (Table 3). In the first, we observed the effect of the initial adoption of the standard (AdoptionNBCTA701<sub>t</sub>) in 2016. In the second, we observed the effect of the standard as of its adoption (EffectNBCTA701<sub>t</sub>), comparing the periods before and after. The third observed the effect of the standard based on the quantity of KAMs reported (QtyKAMs<sub>it</sub>).

It is verified in models 1.1 and 2.1 that the length of the text (0.045\*\* and 0.074\*\*\*) had a positive effect on the FRI, which suggests an increase in readability of the IAR. Observing the coefficients relating to AdoptionNBCTA701<sub>t</sub> (0.325) and EffectNBCTA701<sub>t</sub> (0.263), a positive sign is verified, despite it not being significant. Thus, it cannot be observed that the adoption of the standard improved the readability of the IAR. In addition, it is possible to note the negative moderating effect of the standard over LengthT<sub>it</sub> (-0.123\*\* and -0.124\*\*), suggesting that the adoption of the standard may have made the IARs more

complex and less readable. It should be mentioned that this evidence does not mean that the IARs became less readable, as, according to Dyer et al. (2017), one of the assumptions made when disclosing financial information is that the users understand the language of the reports. However, given the nature of KAMs, it is possible that some actually reduce the readability to IARs.

The analysis of the effect of NBC TA 701 based on the quantity of KAMs reported (Table 3) demonstrates a significant effect, using the quadratic, U-shaped functional form. According to Wooldridge (2016), in models with this type of relationship, the variable of interest is included in its original and quadratic form, presenting coefficients with negative and positive signs, respectively (-0.024 | 0.006\*\*).

This type of relationship is consistent with the idea that increases and reductions in the length of the text (LengthT) do not cause linear informational gains or losses. This evidence differs from that observed by Pinto et al. (2020), who found a negative relationship between the quantity of KAMs reported and readability. However, the authors concluded that, in environments with more precise standards, the effect of this relationship is positive.

**Table 3**

*Marginal effect of the adoption of Brazilian Accounting Standard – Auditing Technique 701 (NBC TA 701) over the Flesch readability index (FRI) in the period from 2013 to 2018*

		FRI (1.1)		FRI (2.1)		FRI (3.1)	
Intercept	(+/-)	3.230***	(0.18)	3.020***	(0.21)	3.541***	(0.10)
LengthT <sub>it</sub>	(+)	0.045**	(0.02)	0.074***	(0.02)		
AdoptionNBCTA701 <sub>t</sub>	(H <sub>t</sub> )	0.325	(0.37)				
AdoptionNBCTA701 <sub>t</sub> x LengthT <sub>it</sub>	(H <sub>t</sub> )	-0.123**	(0.05)				
EffectNBCTA701 <sub>t</sub>	(H <sub>t</sub> )			0.263	(0.31)		
EffectNBCTA701 <sub>t</sub> x LengthT <sub>it</sub>	(H <sub>t</sub> )			-0.124***	(0.04)		
QtyKAMs <sub>it</sub>	(H <sub>t</sub> )					-0.024	(0.02)
QtyKAMs <sub>it</sub> <sup>2</sup>	(H <sub>t</sub> )					0.006**	(0.00)
Age <sub>it</sub>	(+)	0.014*	(0.01)	0.0129	(0.01)	0.015*	(0.01)
R <sub>it</sub>	(-)	0.005	(0.01)	0.005	(0.01)	0.005	(0.01)
ROE <sub>it</sub>	(-)	-0.001	(0.00)	-0.000	(0.00)	-0.001	(0.00)
Indebt <sub>it</sub>	(+/-)	0.001	(0.00)	0.001	(0.00)	0.001	(0.00)
Size <sub>it</sub>	(-)	-0.006	(0.01)	-0.005	(0.01)	-0.007	(0.00)
AudFee <sub>it</sub>	(-)	-0.013*	(0.01)	-0.014*	(0.01)	-0.012*	(0.01)
Restate <sub>it</sub>	(+)	0.022**	(0.01)	0.020*	(0.01)	0.023**	(0.01)
ModOpin <sub>it</sub>	(+)	0.157***	(0.02)	0.147***	(0.03)	0.166***	(0.02)
DTT <sub>it</sub>	(+)	-0.099***	(0.02)	-0.097***	(0.02)	-0.097***	(0.02)
EY <sub>it</sub>	(-)	-0.084***	(0.02)	-0.081***	(0.02)	-0.080***	(0.02)
KPMG <sub>it</sub>	(-)	-0.108***	(0.02)	-0.107***	(0.02)	-0.107***	(0.02)
PWC <sub>it</sub>	(-)	-0.017	(0.02)	-0.013	(0.02)	-0.017	(0.02)
Wald (X <sup>2</sup> )		2,658.00***		2,540.56***		2,668.20***	
Observations		1,321		1,321		1,321	

**Table 3**

Cont.

	FRI (1.1)	FRI (2.1)	FRI (3.1)
No. of companies	227	227	227
Panel type	RE	RE	RE
Year control	Yes	Yes	Yes
Sector control	No	No	No
VIF (multicollinearity)	2.16	2.09	4.75
Chow test (pooled vs FE)	2.87***	2.89***	2.84***
Breusch-Pagan test (pooled vs RE)	179.37***	181.79***	177.73***
Hausman test (FE vs RE)	19.81	20.84	16.29
Wooldridge test (autocorrelation)	13.63***	11.35***	8.98***

**Note:** Models estimated using generalized least squares (GLS). Standard errors in parentheses.

*AdoptionNBCTA701* = effect of the initial adoption of NBC TA 701; *LengthT* = length of the text; *DTT<sub>it</sub>*, *EY<sub>it</sub>*, *KPMG<sub>it</sub>*, and *PWC<sub>it</sub>* = dummy variables for each of the Big 4 firms; RE = random effects; FE = fixed effects; *EffectNBCTA701* = effect of NBC TA 701; *AudFee* = audit fee; *Age* = age of the firm; *Indebt* = level of indebtedness calculated; *ModOpin* = modified auditor's opinion in the independent audit report (IAR); *QtyKAMs* = quantity of key audit matters (KAMs); *QtyKAMs<sup>2</sup>* = quantity of KAMs squared; *Restate* = financial restatement; *Ri* = stock return; *ROE* = return on net equity (NE); *Size* = firm size; *VIF* = variance inflation factor.

\* =  $p < 0.10$ ; \*\* =  $p < 0.05$ ; \*\*\* =  $p < 0.01$ .

**Source:** Elaborated by the authors.

From analyzing the control variables, it is verified that the time registered with the CVM (*Age<sub>it</sub>*), restatement (*Restate<sub>it</sub>*), and an IAR with a modified opinion (*ModOpin<sub>it</sub>*) presented positive and significant associations, suggesting a higher level of readability of the IARs. In turn, audit fees (*AuditFee<sub>it</sub>*) and being auditing by one of the Big 4 firms (*DTT<sub>it</sub>*, *EY<sub>it</sub>*, *KPMG<sub>it</sub>*, and *PWC<sub>it</sub>*) presented negative associations, suggesting less readability.

In this area, it should be highlighted that the practical interpretation of both results needs to be contextualized. In the case of republications, this higher readability level may be associated with potentially greater transparency, since, as highlighted by Marques et al. (2016), most republications of financial statements carried out in Brazil are spontaneous and relate to qualitative data. The observation of the positive and significant effect of a modified opinion in an IAR (with a reservation, adverse opinion, or abstention) is interesting evidence that is consistent with good auditing practices. This is because when the auditor issues a modified opinion, the IAR needs to be clearer and more transparent, so that readers adequately understand the reasons for modifying the opinion.

With regards to the observation of negative and significant effects of the audit fees and the Big 4 auditors, this association may again derive from characteristics of the sample, which is made up of big companies with a relative degree of complexity and visibility, as well

as the greater auditing effort after the adoption of the standard. It was verified that the audit fees significantly increased after NBC TA 701, which was expected by the auditors and other economic agents (Abdullatif & Al-Rahahleh, 2020; Gimbar et al., 2016). Moreover, some economic sectors presented a lower FRI with statistically significant differences, which suggests greater complexity. These results converge with previous evidence that, in turn, suggests the need for a greater auditing effort and greater risk perception (Reid et al., 2019). With regards to the negative and significant effect of the Big 4 auditors, Boritz et al. (2016) already verified that, in general, these companies present more readable reports. In addition, the authors observed that it should be considered that factors such as the greater complexity (and less readability) and the combination of the firm's sector, reputational risk, and litigation risk can make its reports less readable.

Subsequently, we sought to analyze H<sub>2</sub> regarding whether KAMs affect the readability level in different ways (Table 4). The results already observed in Table 3 regarding the effect of the adoption of NBC TA 701 were persistent, with the inclusion of the dummy variables for the specific types of KAM. The evidence observed reinforces the differentiated effects of the various types of KAM over the IAR. Santos et al. (2020) indicated that the size and content of KAMs depend on the complexity covered; so, the associations with the FRI may be different.

**Table 4***Marginal effect of the types of key audit matters (KAMs) over the Flesch readability index (FRI) in the period from 2013 to 2018*

		FRI (2.1)		FRI (2.2)		FRI (2.3)	
Intercept	(+/-)	3.243***	(0.17)	3.063***	(0.21)	3.542***	(0.09)
LengthT <sub>it</sub>	(+)	0.044*	(0.02)	0.067**	(0.02)		
AdoptionNBCTA701 <sub>t</sub>	(H <sub>1</sub> )	0.250	(0.38)				
AdoptionNBCTA701 <sub>t</sub> x LengthT <sub>it</sub>	(H <sub>1</sub> )	-0.113**	(0.06)				
EffectNBCTA701 <sub>t</sub>	(H <sub>1</sub> )			0.139	(0.31)		
EffectNBCTA701 <sub>t</sub> x LengthT <sub>it</sub>	(H <sub>1</sub> )			-0.108***	(0.04)		
QtyKAMs <sub>it</sub>	(H <sub>1</sub> )					-0.029*	(0.02)
QtyKAMs <sub>it</sub> <sup>2</sup>	(H <sub>1</sub> )					0.007***	(0.00)
ALI <sub>it</sub>	(H <sub>2</sub> )	0.214***	(0.08)	0.214***	(0.08)	0.211***	(0.07)
ITE <sub>it</sub>	(H <sub>2</sub> )	-0.093**	(0.04)	-0.086**	(0.04)	-0.112***	(0.04)
PEB <sub>it</sub>	(H <sub>2</sub> )	-0.043	(0.03)	-0.0382	(0.03)	-0.061*	(0.03)
Flnstr <sub>it</sub>	(H <sub>2</sub> )	-0.039	(0.03)	-0.0369	(0.03)	-0.049*	(0.02)
Prop <sub>it</sub>	(H <sub>2</sub> )	-0.260	(0.16)	-0.267	(0.16)	-0.281*	(0.16)
Rec <sub>it</sub>	(H <sub>2</sub> )	0.155***	(0.04)	0.158***	(0.00)	0.158***	(0.04)
RRA <sub>it</sub>	(H <sub>2</sub> )	0.124*	(0.06)	0.132**	(0.01)	0.126**	(0.06)
Age <sub>it</sub>	(+)	0.0139*	(0.01)	0.013*	(0.01)	0.016**	(0.00)
Ri <sub>it</sub>	(-)	0.005	(0.01)	0.005	(0.01)	0.005	(0.00)
ROE <sub>it</sub>	(-)	-0.001	(0.00)	-0.001	(0.00)	-0.001	(0.00)
Indebt <sub>it</sub>	(+/-)	0.001	(0.00)	0.001	(0.00)	0.001	(0.00)
Size <sub>it</sub>	(-)	-0.005	(0.01)	-0.004	(0.01)	-0.005	(0.00)
AudFee <sub>it</sub>	(-)	-0.014**	(0.01)	-0.014**	(0.01)	-0.014**	(0.01)
Restate <sub>it</sub>	(+)	0.017	(0.01)	0.017	(0.01)	0.019*	(0.01)
ModOpin <sub>it</sub>	(+)	0.163***	(0.02)	0.157***	(0.02)	0.171***	(0.02)
DTT <sub>it</sub>	(-)	-0.106***	(0.02)	-0.107***	(0.02)	-0.103***	(0.02)
EY <sub>it</sub>	(-)	-0.081***	(0.02)	-0.080***	(0.02)	-0.076***	(0.02)
KPMG <sub>it</sub>	(-)	-0.111***	(0.02)	-0.112***	(0.02)	-0.109***	(0.02)
PWC <sub>it</sub>	(-)	-0.020	(0.02)	-0.019	(0.02)	-0.019	(0.02)
Wald (X <sup>2</sup> )		2,836.42***		2,832.54***		2,865.52***	
Observations		1,321		1,321		1,321	
No. of companies		227		227		227	
Panel type		RE		RE		RE	
Year control		Yes		Yes		Yes	
Sector control		No		No		No	
VIF		1.88		1.83		3.81	
Chow test (pooled vs FE)		2.82***		2.82***		2.79***	
Breusch-Pagan test (pooled vs RE)		165.62***		166.99***		167.34***	
Hausman test (FE vs RE)		30.28		31.35		27.49	
Wooldridge test (autocorrelation)		23.753***		20.346***		16.724***	

**Note:** Models estimated using generalized least squares (GLS). Standard errors in parentheses.

AdoptionNBCTA701 = effect of the initial adoption of NBC TA 701; ALI = alienation of assets; ITE = information technology environment; LengthT = length of the text; DTT<sub>it</sub>, EY<sub>it</sub>, KPMG<sub>it</sub>, and PWC<sub>it</sub> = dummy variables for each of the Big 4 firms; RE = random effects; FE = fixed effects; EffectNBCTA701 = effect of NBC TA 701; AudFee = audit fee; Age = age of the firm; Indebt = level of indebtedness calculated; ModOpin = modified auditor's opinion in the independent audit report (IAR); O = Others; Prov = Provisions and contingencies; QtyKAMs = quantity of key audit matters (KAMs); QtyKAMs<sup>2</sup> = quantity of KAMs squared; REIC = judicial receivership; Restate = financial restatement; Ri = stock return; ROE = return on net equity (NE); Size = firm size; VIF = variance inflation factor; RAA = residual asset amount, which takes the value 1 when they were reported and 0 when they were not.

\* =  $p < 0.10$ ; \*\* =  $p < 0.05$ ; \*\*\* =  $p < 0.01$ .**Source:** Elaborated by the authors.

The evidence demonstrated that the KAMs presented negative associations with the FRI relating to the information technology environment (ITE), post-employment benefits (PEB), financial instruments (FInstr), and properties for investments (PropI), while regarding alienation of assets (ALI), recognition of revenues (Rec), and residual asset amount (RRA) they presented positive and statistically significant effects in one or more models, suggesting greater readability.

These results reinforce  $H_2$ , first because the types of KAM relate differently with the FRI, and second because the KAMs that presented negative statistical significance are, in fact, relatively complex topics that require the use of relatively more technical language, and so have a negative effect over the FRI.

In turn, those KAMs that presented a positive association involve topics that most average accounting information users generally understand. This difference in the associations between the types of KAM was verified in the studies of Kend and Nguyen (2020) and

Kitiwong and Sarapaivanich (2020), who observed that the types of KAM have different implications according to their content and size. It is worth noting that the results for the controls also did not change in terms of sign and significance; however, the coefficients altered slightly, as the inclusion of dummies for each type of KAM may have reduced existing biases in the models that omitted them.

#### 4.2.1 Additional and robustness analyses

With the aim of verifying the consistency of the results, we analyzed the effect of the adoption of NBC TA 701 over the other two proxies for readability (length of the text and file size). The results observed for the length of the text (LengthT) reinforced both the evidence related to  $H_1$  and to  $H_2$ . However, it is worth noting that an increase in LengthT means greater complexity of the text. In this scenario, as Li (2006) observes, it is assumed that the average user has a sufficient level of understanding of accounting language.

**Table 5**

*Effect of the adoption of Brazilian Accounting Standard – Auditing Technique 701 (NBC TA 701) over the length of the text (LengthT) and file size (FSize)*

<b>Panel A – LengthT</b>	<b>(3.1)</b>	<b>(3.2)</b>	<b>(3.3)</b>	<b>(4.1)</b>	<b>(4.2)</b>	<b>(4.3)</b>
Intercept	6.262*** (0.12)	6.262*** (0.12)	6.534*** (0.11)	6.470*** (0.11)	6.470*** (0.11)	6.542*** (0.11)
AdoptionNBCTA701 <sub>t</sub>	0.866*** (0.02)			0.622*** (0.03)		
EffectNBCTA701 <sub>t</sub>		0.959*** (0.02)			0.731*** (0.03)	
QtyKAMs <sub>it</sub>			0.206*** (0.02)			0.164*** (0.03)
QtyKAMs <sub>it</sub> <sup>2</sup>			-0.0186*** (0.00)			-0.0161*** (0.00)
Previous controls	Yes	Yes	Yes	Yes	Yes	Yes
Wald (X <sup>2</sup> )	5,024.65***	5,024.65***	6,272.10***	5,985.40***	5,985.40***	6,415.52***
<b>Panel B – FSize</b>	<b>(5.1)</b>	<b>(5.2)</b>	<b>(5.3)</b>	<b>(6.1)</b>	<b>(6.2)</b>	<b>(6.3)</b>
Intercept	2.581*** (0.61)	2.708*** (0.72)	4.691*** (0.36)	2.629*** (0.61)	2.727*** (0.72)	4.633*** (0.35)
LengthT <sub>it</sub>	0.313*** (0.08)	0.296*** (0.09)		0.301*** (0.08)	0.288*** (0.09)	
AdoptionNBCTA701 <sub>t</sub>	-0.913 (1.26)			-1.013 (1.25)		
AdoptionNBCTA701 <sub>t</sub> x LengthT <sub>it</sub>	0.0622 (0.17)			0.0711 (0.16)		
EffectNBCTA701 <sub>t</sub>		-0.990 (1.06)			-0.991 (1.06)	
EffectNBCTA701 <sub>t</sub> x LengthT <sub>it</sub>		0.0675 (0.14)			0.0642 (0.14)	

**Table 5**

Cont.

QtyKAMs <sub>it</sub>			0.112*			0.123**
			(0.06)			(0.06)
QtyKAMs <sub>it</sub> <sup>2</sup>			-0.00925			-0.0139
			(0.01)			(0.01)
Previous controls	Yes	Yes	Yes	Yes	Yes	Yes
Wald (X <sup>2</sup> )	216.31***	216.78***	199.65***	234.99***	235.75***	221.19***

**Note:** The other statistics of the model were omitted for space reasons.

\* =  $p < 0.10$ ; \*\* =  $p < 0.05$ ; \*\*\* =  $p < 0.01$ .

**Source:** Elaborated by the authors.

Therefore, it is verified that the adoption of NBC TA 701 resulted in an increase in text, with a potential reduction in readability up to a certain point. As can be verified in the results regarding the effect of KAMs, these were statistically significant with opposite signs to those observed in the models estimated for the analysis of the effect over the FRI. The results were also similar for the effects of the specific types of KAM. However, in the case

of length of the text, the differences observed between each type consist of the magnitude, as the inclusion of a KAM may not reduce the size of the text. It is also noted that the Big 4 auditors presented negative coefficients, which suggests that, compared with non-Big 4 auditors, the text of their IARs is shorter. The other variables reinforce the previous evidence (Tables 3 and 4) that used the same readability metrics.

## 5. CONCLUDING REMARKS

The aim of this study was to analyze the effect of the adoption of NBC TA 701 over the readability of the IARs of the 240 most liquid companies listed on the B3, in the period from 2013 to 2018 – the three years prior and subsequent to NBC TA 701.

The results revealed that the most reported KAMs were a reduction in recoverable amount (RRA), provisions and contingencies (PROV), recognition of regulatory assets/liabilities (RRAL), and deferred tax assets (DTA), which represented 69% of the total KAMs disclosed by the companies in the sample. Moreover, it was verified that 13 types of KAM account for 86% of the total reported in the period and that, in 2017 and 2018, approximately 60% of the KAMs had already been previously reported, as observed by Kend and Nguyen (2020).

It was also verified that the types of KAM have a positive association with the length of the text and file size and that some, such as recognition of regulatory assets and liabilities (RRAL) and reduction in recoverable amount (RRA), have negative correlations with the FRI. These predominant KAMs are partly consistent with those observed by Abdullatif and Al-Rahahleh (2020), Ferreira and Morais, (2020), and Kend and Nguyen (2020). Similarly, the level of complexity of IARs was already previously observed (Boritz et al., 2016); however, Pinto et al. (2020) and Velte (2018, 2019) also reinforced the

idea that IARs present a low readability level from the FRI perspective. Yet, this does not mean that all users will have difficulty understanding their content after NBC TA 701, since users are generally familiar with the language used.

The results revealed that, in general terms, the adoption of NBC TA 701 increased the length of the text (LengthT) and reduced the readability of IARs. However, when the effect of the quantity of KAMs was analyzed, it was observed that these increase readability, but in a quadratic, U-shaped relationship.

Consistently with the positive effect of an increase in text (LengthT) and negative effect of the adoption of NBC TA 701, the quadratic relationship of the quantity of KAMs suggests that this reduction caused by NBC TA 701 occurs up to a certain limit, after which the insertion of content in KAMs improves the level of readability and understanding. These results differ from those of studies that have tested a linear relationship between KAMs and readability (Pinto et al., 2020; Velte, 2018, 2019), which have generally found a negative (and/or positive, but not significant) association.

Furthermore, it was observed that KAMs have different effects over the FRI. It was also revealed that those with the highest level of complexity tend to reduce readability, while those on topics that are better understood by the average user tend to increase it. These findings are important and

consistent with experimental and/or documental studies that have observed that, depending on the matter in the KAM, users decide differently (Köhler et al., 2020) and/or they have a higher probability of being reported (Kitiwong & Sarapaivanich, 2020).

The results provide contributions for the various interested parties. For academics, the evidence reinforces the need to consider the content and nature of KAMs in the modeling of associated phenomena, as the quantitative consideration inappropriately suggests, for example, the loss of readability, as observed by Pinto et al. (2020). The evidence raised by this study reinforces the idea that the effect of KAMs is U-shaped, so there will be a loss from an isolated increase in content. However, after a certain limit, the insertion of content in KAMs increases the readability of IARs.

From the regulators' perspective, the study indicates the need for greater monitoring of the content of IARs, as, according to Abdullatif and Al-Rahahleh (2020) and Segal (2019), weak monitoring can mean the standard becomes yet another requirement that will be fulfilled "pro forma." Considering that a 60% rate of repetition of KAMs was observed and that evidence in other markets has verified similar behavior, efforts need to be made to mitigate the problem of repetition and/or reduce its occurrence when, for example, such repetition derives from specific characteristics of the firm and/or sector and are, therefore, a permanent KAM.

Finally, for managers and auditors, the results provide evidence that the KAMs reported have potential informational content, but their strength and magnitude depend on the nature and size of the matter. In particular, for more complex KAMs, despite containing technical

language understood by the average accounting information user, using language that can be more easily understood by the public in general could be useful for improving the informational content of IARs.

Despite its contributions, this study has some limitations. First, as the sample was restricted to the most liquid companies in the capital market, inferences of more or less readability should be made considering variations in contexts, as more or less readability does not necessarily result in the same practical effect for all users, since the users' level of knowledge on the matter was not controlled. Moreover, the analysis of this relationship, using data from low-liquidity companies, may present differences due to the incentives associated with companies with that characteristic. The models used also did not control some potential effects of the governance structure, market structure, and availability of credit, among other factors. Another limitation of this study is the assumption that the IAR as a whole is an item of interest to the accounting information user, despite the possibility of them only being interested in fragments of it. In light of this, for future studies we suggest carrying out survey-type studies with representative samples that enable an effective understanding of the level of importance of IARs.

The findings of this research, with its evidence that KAMs have different effects on the readability of IARs, consequently enable experiments to identify the causality between the informational content of KAMs and other components of IARs. Moreover, they enable event studies that can provide more conclusive evidence regarding the implications of this standard for the various users.

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