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EKAETE EFRETUEI AND KEMI YEKINI

Clarity and Conciseness of Financial Narrative Disclosures: Does the Practice Statement Matter?

The International Accounting Standards Board has issued the exposure draft *Management Commentary* ED 2021/6 towards a revised Practice Statement, targeting deficiencies in narrative reporting practices. However, the work process remains on hold. Within this exposure draft, question 11a addresses the need for clarity (using plain language, avoiding jargon, and excessive technical terms) and conciseness (minimizing unnecessary repetition) in management commentary. We investigate whether the implementation of International Financial Reporting Standards (IFRS) influences the clarity and conciseness of management commentary, employing a new multidimensional complexity measure aligned with the 'clear and concise' criteria outlined in question 11a of the exposure draft. Our analysis reveals a decline in the clarity and conciseness of narratives when firms adopt IFRS, offering insights that directly address question 11a of the exposure draft. These findings support the proposals outlined in chapter 13 of the exposure draft and advocate for a metric-based approach consistent with the objectives of providing well-structured guidelines to enhance the preparation of management commentary. Furthermore, this research contributes to the broader domain of disclosure quality by focusing on narrative complexity.

Key words: Annual report textual analysis; Disclosure complexity; Exposure Draft ED 2021/6; IFRS Practice Statement; Management commentary.

In an effort to address ongoing deficiencies in narrative reporting practices, the International Accounting Standards Board (IASB) issued the exposure draft (ED) *Management Commentary* ED 2021/6, proposing a revised Practice Statement aimed at enhancing the quality of such disclosures. Although the standard-setting process is currently on hold, the draft explicitly emphasizes, particularly in question 11a, the importance of *clarity* through the use of plain language and the avoidance of jargon and excessive technical terminology, and *conciseness* by minimizing unnecessary repetition in management commentary. In

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this context, we examine whether the adoption of International Financial Reporting Standards (IFRS) is associated with improved clarity and conciseness in management commentary. Specifically, we employ a multidimensional complexity measure aligned with the ‘clear and concise’ criteria set out in question 11a. This measure is constructed to identify and isolate narrative complexity that arises from non-industry-specific and other non-specialist sources, thereby offering insight into the extent to which IFRS implementation may influence the accessibility of financial disclosures.

Our objective is to evaluate the need for regulatory actions outlined in the IFRS Practice Statement ED on the revised *Management Commentary* ED 2021/6 (IFRS Foundation, 2021). While existing accounting literature acknowledges the increasing complexity of narrative disclosures (Dyer *et al.*, 2017), the extent to which regulation influences changes in narrative complexity remains understudied (De George *et al.*, 2016; Lang and Stice-Lawrence, 2015), and the need for regulatory interventions in this regard has not been thoroughly examined. Thus, the contribution of our study to the existing literature is to assess whether the observed textual complexity associated with IFRS annual reports is a function of the disclosure of more complex words in the reports, consistent with the ED recommendations. The 20 years of IFRS have seen several changes, including the introduction of key standards such as IFRS 9 (*Financial Instruments*), IFRS 15 (*Revenue from Contracts with Customers*), and IFRS 16 (*Leases*) that have reshaped how companies report their financials. These standards have led to an increase in accounting complexity. Other notable changes include impairment testing and fair value measurement. These changes brought with them additional levels of complexity. This contribution is pertinent to the IFRS ED on the revised *Management Commentary* ED 2021/6.¹ The ED identifies several attributes of information in management disclosure, notably emphasizing ‘Clarity and Conciseness’ as critical for understanding and contextualizing the commentary. Management commentary, broadly defined by the ED (section IN3), serves as a complement to an entity’s financial statements, aiming to demonstrate the firm’s intrinsic values. The disclosure objectives outlined in section IN14 of ED 2021/6 further highlight the alignment of management commentary with the objectives of other narrative disclosures in annual reports. This underscores the importance of making narrative disclosures understandable and meaningful to users, as highlighted by Yekini *et al.* (2021).

Paragraph 13.14 of ED 2021/6 defines ‘Clarity and Conciseness’ as the use of plain language, avoidance of jargon, and unnecessary technical terminology in management commentary. Paragraph 13.17c emphasizes the importance of simple, clear language, and succinctly structured sentences and paragraphs. The basis for the identification of ‘Clarity and Conciseness’ as an attribute of narrative disclosure in the IFRS ED 2021/6 stems from its replacement of the enhancing characteristics of financial disclosures, namely ‘understandability’

¹ <https://www.ifrs.org/content/dam/ifrs/project/management-commentary/ed-2021-6-management-commentary.pdf>

(BC99) (IFRS Foundation, 2021). Thus, our study aims to address broad questions concerning the ‘understandability’ problem, including its pervasiveness and changes with IFRS application, as well as the impact of IFRS disclosures on the clarity and conciseness of narratives. We employ several complexity measures, including a novel measure tailored to financial disclosures, to unpack the structural tensions in language and complexity of narrative disclosures, building on previous linguistic tools explored by Cooren (2020), Feix and Philippe (2020), and Yekini *et al.* (2021).

Our study distinguishes itself from existing research on IFRS and complexity/readability measures. Garefalakis *et al.* (2013) investigated how the implementation of IFRS influenced the quality of management commentary within Greek banks, finding notable improvements following IFRS adoption. Stent *et al.* (2013) explored the role of management commentary in communicating the effects of IFRS, observing limited disclosures among the sampled companies during the initial adoption phase. They suggested that management might have either refrained from commenting or provided negative commentary where IFRS was perceived as overly complex. Similarly, Wee *et al.* (2014) assessed the extent of disclosures related to the accounting impact of IFRS adoption in its early years, revealing that firms with adverse changes in earnings disclosed more, while those with stronger performance disclosed less. Further, while Lang and Stice-Lawrence (2015) investigated IFRS as an exogenous shock and its impact on textual attributes of disclosure using an international sample, Cheung and Lau (2016) focused on Australian firms’ notes to accounts, Morunga and Bradbury (2012) observed report length changes for New Zealand IFRS-adopting firms, and Efretuei *et al.* (2022) investigated changes in the information and obfuscation components of narratives following IFRS adoption. By contrast, we explore how IFRS adoption influenced the textual characteristics of management commentary as identified by ED 2021/6. We applied two measures of word complexity, namely the complex words component of the Fog Index and complexity words (Loughran and McDonald, 2024),² to directly contribute to question 11a of ED 2021/6 and offer recommendations.

Our findings reveal that the narrative complexity of annual reports changes with mandatory IFRS adoption. This study contributes to the literature on narrative disclosures and their increasing complexity (Dyer *et al.*, 2017; Hasan, 2020), providing empirical evidence on the relationship between IFRS adoption and narrative complexity and extending our understanding of factors influencing financial disclosures’ quality. Moreover, we go beyond identifying the initial impact of IFRS adoption, examining the persistence of complex narratives over time. By demonstrating the lasting impact of IFRS on narrative complexity, even after accounting for various factors, our study offers valuable insights for standard-setters and practitioners, particularly focusing on complexity at the word level.

² Loughran and McDonald (2024) differentiate between the complex words component of the Fog Index and their measure of complexity by terming their new measure complexity words.

INSTITUTIONAL CONTEXT, RELEVANT LITERATURE, AND HYPOTHESIS DEVELOPMENT

Institutional Context—Exposure Draft ED 2021/6

The IASB ED 2021/6 emphasizes the need to revise management commentary to meet the evolving information needs of investors and creditors, which have shifted significantly since the 2010 Practice Statement. IASB research highlights several shortcomings in current company management commentaries, such as the omission of key information, inclusion of irrelevant details, and reliance on generic rather than entity-specific insights. The revised Practice Statement aims to improve clarity and depth, helping stakeholders better assess an entity's long-term performance and prospects. It also seeks to incorporate recent advancements in narrative reporting, including sustainability reporting, and to address emerging needs by reflecting diverse perspectives. Although the ED was paused in 2021 to consider implications for new sustainability standards, the IASB announced in September 2024 that it plans to issue the revised Practice Statement by mid-2025, in collaboration with the International Sustainability Standards Board (ISSB), by making targeted refinements relevant to sustainability-related disclosures to the 2021 proposals.

The IASB ED 2021/6 proposals on attributes of disclosure remain broadly supported in the September 2024 update. Some respondents suggested consistency in the reference to the attributes in line with the language of the qualitative characteristics of financial reporting. The attributes of disclosure in the ED 2021/6 include: completeness, balance, accuracy, clarity and conciseness, comparability, verifiability, and coherence. In this study we focus on the clarity and conciseness attribute in relation to the understandability enhancing characteristics of financial reporting because (i) it forms the basis of the fulfillment of the purpose of the management commentary and (ii) the ED notes that information is more useful to investors and creditors if it is also clear and concise. The academic literature has studied clarity and conciseness, extensively reporting its economic consequences for investors and creditors (Bai *et al.*, 2019; Chen *et al.*, 2024; Lawrence, 2013; Leheavy *et al.*, 2011; Li, 2008; Lo *et al.*, 2017; Miller, 2010). Hence, we investigate whether clarity and conciseness matter post-IFRS adoption. Given there is currently no research into the supported proposals, this paper provides academic evidence for the revised statement about to be issued in the first half of 2025, while also providing evaluation tools, using its clarity and concise theoretical construct.

Institutional Context—Exposure Draft Question 11a

The exposure draft question 11a poses the following question:

Chapter 13 proposes to require information in management commentary to be complete, balanced and accurate and discusses other attributes that can make that information more useful ... Do you agree with these proposals? Why or why not? If not, what do you suggest instead and why? (ED 2021/6)

Chapter 13 of the IFRS exposure draft identifies seven attributes of disclosure, with a focus on ‘Clarity and Conciseness’ to assess whether users agree with the proposals requiring management commentary to adhere to these standards. We aim to determine if IFRS application impacts the clarity and conciseness of narrative disclosures as outlined in the ED, thereby justifying the need for these attributes. Our expectation is to support the proposals if we find a significant impact of IFRS application on the clarity and conciseness of disclosures, and to disagree if such a relationship is not evident. Additionally, based on our findings, we will make suggestions regarding which aspects of clarity and conciseness are affected by the application of IFRS.

Numerous studies, including those by Armstrong *et al.* (2010) and Kajüter and Nienhaus (2017), have demonstrated a positive association between IFRS adoption and improved financial reporting transparency, along with reduced information asymmetry. However, the IASB, in its ‘Disclosure Initiative’ discussion paper, recognized the need for a standard on disclosure complexity due to the use of unclear descriptions or technical jargon in financial disclosures (IASB, 2017). This led to the publication of the IFRS Foundation document in October 2017, titled ‘Better Communication in Financial Reporting—Making Disclosures More Meaningful’, aiming to enhance companies’ communication effectiveness using principles similar to those considered in the discussion paper. Despite this, the IASB did not further develop the principles at that time.³ The latest follow-up aligned with the disclosure attributes is question 11a of ED 2021/6, which this paper addresses.

Our analysis examines whether IFRS adoption contributes to increased disclosure complexity by assessing changes in word length and linguistic intricacy within annual reports. A rise in word-level complexity would indicate a shift toward more sophisticated and less accessible vocabulary in IFRS-related narratives. Key standards such as IFRS 9, IFRS 15, and IFRS 16 exemplify this trend. IFRS 9 introduces intricate classification and measurement rules, along with forward-looking expected credit loss models, requiring significant judgement and detailed explanation. IFRS 15 involves complex revenue recognition through a five-step model, demanding extensive narrative disclosure around performance obligations and pricing. IFRS 16 mandates balance sheet recognition of lease liabilities and right-of-use assets, further increasing disclosure demands through judgements related to lease terms and discount rates. Collectively, these standards expand the technical and judgemental content of financial narratives, thereby heightening their complexity and reducing accessibility for non-specialist users. These findings would support the idea that the post-IFRS era has witnessed changes in the principles of ‘Clarity and Conciseness’ as identified in the IFRS Practice Statement (ED 2021/6), thereby validating the subsequent definition of its scope as a desirable attribute of disclosure.

³ Page 9 of project summary <https://www.ifrs.org/content/dam/ifrs/project/disclosure-initiative/disclosure-initiative-principles-of-disclosure/project-summary/di-principles-of-disclosure-project-summary.pdf>

Relevant Literature

Textual complexity in accounting research has a long history, with studies indicating that annual reports are often challenging for investors to read and comprehend (Barnett and Leoffler, 1979; Smith and Smith, 1971). Courtis (1995) suggests that annual reports are beyond the understanding of most adults and are becoming increasingly complex over time. Therefore, the adoption of IFRS might be expected to reduce complexity by providing clearer financial statement numbers and narratives, assuming the standards are of high quality. However, managers may have incentives to increase textual complexity to obscure negative information from investors, despite the increased transparency brought by IFRS adoption. This is because IFRS enhances the reporting enforcement regime (Christensen *et al.*, 2013), which heightens management scrutiny, resulting in more aggressive disclosure management (Ipino and Parbonetti, 2017).

While IFRS adoption is associated with positive effects on capital markets (Ahmed *et al.*, 2013), including improved financial reporting quality and reduced earnings management (Dayanandan *et al.*, 2016), its impact on narrative complexity remains uncertain. Studies such as Lang and Stice-Lawrence (2015) observed longer, more comparable IFRS narratives, interpreted as enhanced accounting quality. Although IFRS adoption aims to enhance transparency, management incentives may lead to complex narratives, driven by the desire to maintain favourable public opinion. For example, Lo *et al.* (2017) show that firms that manage earnings have more complex disclosures. Several studies show that narrative complexity increases with management incentives such as tax avoidance (Nguyen, 2021), financial distress (Bodnaruk *et al.*, 2015; Tiwari and Chatterjee, 2024), poor earnings (Dalwai *et al.*, 2021; Li, 2008), employment quality (Murphy *et al.*, 2024; Tan *et al.*, 2023), and political corruption amongst others (Xu *et al.*, 2022). This suggests that observed increases in narrative complexity associated with IFRS adoption could stem from management incentives to obfuscate information, rather than compliance with accounting standards.

From an economic perspective, the adoption of IFRS alone does not ensure enhanced capital market benefits, particularly in environments with weak legal enforcement or adverse reporting incentives. However, in the UK, enforcement changes closely coincided with IFRS adoption. Christensen *et al.* (2013) note that this transition included a shift from reactive reviews by the Financial Reporting Review Panel (FRRP) to proactive reviews, increasing scrutiny of corporate financial reports. Although UK standards were largely aligned with IFRS, notable differences affecting disclosure complexity included IFRS 2 (compensation expenses and disclosures), IFRS 3 (goodwill impairments and earnings volatility), and IFRS 8 (segmental disclosures highlighting business and geographical complexity) (Horton and Seraphim, 2010; Labro and Pierk, 2023). Enhanced enforcement likely intensified disclosure obfuscation incentives, as management might obscure negative information in disclosure to influence stock prices. This aligns with the incomplete revelation hypothesis (IRH), reinforcing the concept of obfuscation in financial reporting.

Regulatory intervention may be necessary to ensure greater comparability and transparency in financial reporting. However, concerns persist regarding whether the mandatory adoption of IFRS is indeed associated with higher quality in information disclosure, raising questions about the effectiveness of standardization in addressing reporting incentives and ensuring transparency. For example, within the European Union, despite the mandatory adoption of IFRS, changes in liquidity benefits were seen in five countries that also introduced changes in regulatory enforcement (Christensen *et al.*, 2013). These enhance scrutiny factors can change management incentives post-IFRS adoption, which increases obfuscation.

Theoretical Framework and Hypothesis Development

While IFRS adoption is intended to enhance transparency and uniformity, our argument is that the IFRS requirements can increase narrative complexity. Previous research has extensively investigated the effects of IFRS adoption on narrative disclosures, focusing on the clarity and conciseness of financial reporting. Scholars have examined management practices such as obfuscation through complex narratives, analysing the economic implications and theoretical foundations of these changes. Bloomfield (2002) introduced the IRH, demonstrating how managers could obscure unfavourable information within footnotes, thereby reducing information accessibility. Subsequent studies, such as those by Li (2008) and Lo *et al.* (2017), applied the IRH framework to narrative complexity research, providing robust evidence of its use through strategies like complex vocabulary and convoluted structures.

Bushee *et al.* (2018) delineated two theoretical perspectives on textual complexity: the information perspective, which involves technical and informative disclosure about business activities (Lang and Stice-Lawrence, 2015); and the obfuscation perspective, which uses linguistic complexity to diminish the informativeness of disclosures (Li, 2008). From both perspectives, IFRS adoption is expected to result in longer and more complex disclosures, potentially compromising clarity and conciseness. This study aims to explore the relationship between IFRS adoption and narrative complexity, drawing on these theoretical viewpoints.

The hypothesis aligns with the IFRS Practice Statement on management commentary, which emphasizes clarity and conciseness as essential attributes of disclosure. However, textual analysis studies of financial reports indicate that complexity often reflects a combination of both information and obfuscation. Loughran and McDonald (2014) highlight the intricate nature of these measures, Lang and Stice-Lawrence (2015) stress the informational aspects, and Li (2008) and Lehavy *et al.* (2011) focus on obfuscation and its limitations in capturing overall complexity. Bloomfield (2008) contends that complexity is firm-specific and context-dependent. Few studies separate informational content from obfuscation, with notable efforts addressing management incentives (Bushee *et al.*, 2018) or isolating commonly used complexity-inducing words (Bonsall *et al.*, 2017; Kim *et al.*, 2019).

We argue that if the management obfuscation hypothesis is valid, poorly performing firms will exhibit greater complexity in their disclosures, as managers may aim to obscure unfavourable results. However, it is expected that the mandatory adoption of IFRS could enhance the uniformity and transparency of financial reports, potentially curbing earnings manipulation and improving informativeness and comparability. Nonetheless, the expanded disclosure requirements under IFRS may lead to increased complexity.

Building on these theoretical foundations, we propose a model for clarity and conciseness, employing various complexity measures to capture both obfuscation and informational dimensions. A one-dimensional complexity measure, such as the length and complex word component of the Fog Index, may primarily reflect obfuscation but include some informational aspects. In contrast, a multi-dimensional measure tailored to business and disclosure contexts could better isolate obfuscation and exclude purely informational elements. Importantly, our hypothesis design does not seek to isolate the informative versus obfuscating intent within disclosures. Rather, it captures changes in the clarity (via word complexity) and conciseness (via disclosure length and fog).

Accordingly, we propose:

H1: The adoption of IFRS leads to increased complexity in narrative disclosures, resulting in reduced clarity and conciseness in financial reporting.

RESEARCH DESIGN

Sample Selection

In our study, we focus on a sample from the UK FTSE all-share index to test our hypothesis. While previous research has explored the readability of IFRS disclosures in single-country contexts like New Zealand (Morunga and Bradbury, 2012; Richards and Staden, 2015) and Australia (Cheung and Lau, 2016), we choose the UK for several reasons. The UK's capital market economy, characterized by high demand for information and a mix of voluntary and mandatory disclosures in annual reports, makes it particularly susceptible to the propositions of the IRH. Research in accounting suggests that environments with strong enforcement and governance regimes often feature increased private information in disclosure settings (Brochet *et al.*, 2013), aligning with the IRH's assertions about narrative obfuscation.

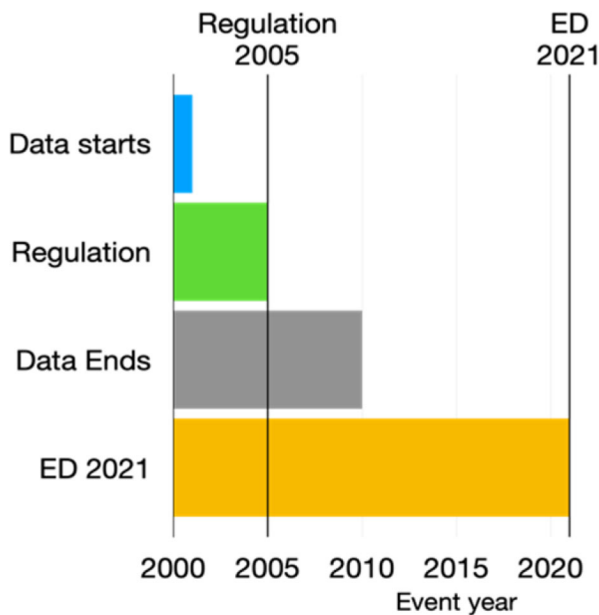
Additionally, the choice of IFRS adoption policies has been shown to vary across countries (Stadler and Nobes, 2014), indicating the importance of considering country-specific factors, especially given the discretionary reporting components involved. In the UK case, there were limited but notable differences in specific standards and enforcement regime changes that coincided with the

IFRS application. Despite the observed benefits of IFRS adoption in countries with weaker investor protection (Dayanandan *et al.*, 2016), the UK had standards similar to IFRS and a robust enforcement regime before adoption. Therefore, changes in narrative complexity within the UK regulatory environment offer valuable insights into the effects of IFRS on annual report disclosures in comparable settings.

We retrieved annual reports for firm years ending between 2000 and 2010 for narrative analysis. The European Union (EU) directive mandated companies traded in regulated markets within EU member states to adopt IFRS for accounting years starting on or after 1 January 2005. As a result, we excluded the year 2005 from our analysis due to the transition period. This provides two distinct sample groups, pre-IFRS (2000-2004) and post-IFRS (2006-2010), with five years each for analysis. Figure 1 illustrates how our hypotheses translate into data to address the research question directly, particularly in responding to question 11a of ED 2021/6.

FIGURE 1

HYPOTHESIS-TO-DATA TIMELINE ADDRESSING ED 2021/6 QUESTION 11A



The figure shows the data start date; regulation date; data end date; and exposure draft timeline. ED 2021/6 page 15, question 11a, asks if clarity and conciseness of disclosures is important. We ask why this should bother the IFRS regulators. If regulation (IFRS) disclosures are associated with decreased clarity and conciseness, then yes it should be within the jurisdiction of IFRS regulators. Therefore, we hypothesize as follows: H1: The adoption of IFRS leads to increased complexity in narrative disclosures, resulting in reduced clarity and conciseness in financial reporting.

TABLE 1
DATA COLLECTION

Event	Firm Years
Initial annual report collections/downloads (2000–2010)	4,044
Eliminate observations with firm year-end 2005	(378)
Eliminate observations/reports with less than 2,000 words	(7)
Final firm-year observations (for textual analysis)	3,659
Final firm-year observations (for regression analysis)	2,127

This table reports the sample filtering process for the sample of firms used in this study. It describes the sample selection process. We start with all firms included in the initial annual report download (2000–2010). We exclude firm years, that have a fiscal year end as of 2005. This excludes 378 firm years. Seven firm years with reports that have fewer than 2,000 words were excluded. Altogether, the final sample comprises 3,659 firm-year observations for our variables capturing textual attributes. We collect data on several control variables for 2000–2010, for the regression analysis. Further reductions of the sample are due to missing observations for some control variables.

Table 1 shows the results of the sample selection process. The final sample consists of 3,659 firm years. Table 2 shows the firm-year analysis of 509 unique firms for 2010. Earlier years have less data due to the limited availability of historical annual reports for the sample of firms. Data on the textual variables is based on a textual analysis of firms' annual reports, whereas accounting data and controls are collected from the Thomson database. However, not all the firms have data available in the database, which explains why the subsequent regression analyses rely on 2,127 observations.

Measuring Clarity and Conciseness: IASB Textual Definitions

From ED 2021/6 Ch. 13, we identify the scope of definitions for 'clarity and conciseness' relevant to the complexity measures as indicated in Table 3.

TABLE 2
FIRM YEAR FREQUENCY

Year	Frequency	Percent	Cumulative
2000	146	3.99	3.99
2001	200	5.47	9.46
2002	238	6.50	15.96
2003	287	7.84	23.80
2004	330	9.02	32.82
2006	431	11.78	44.60
2007	488	13.34	57.94
2008	507	13.86	71.80
2009	523	14.29	86.09
2010	509	13.91	100.00
Total	3,659	100.00	

This table reports the firm year frequency for the sample of firms used in this study.

NARRATIVE DISCLOSURE CLARITY

TABLE 3

IFRS CLARITY AND CONCISE DEFINITIONS (ED 2021/6)

Complexity of Narrative Language	Scope and Range of Narrative Content
	
Clarity	Conciseness
Complex Words – words with three or more syllables (par. 13.14 Plain Language)	Length – Natural log of number of words (par 13.17a – avoid generic information) (par. 13.17b – avoid duplication of information)
Complexity Words – Words in Loughran and McDonald (2024) Word list (par. 13.14 –avoid jargon) (par. 13.14 – avoid unnecessary technical Language)	Fog Index – average word per sentence + complex words (par 13.17c – use simple, clear language and short, clearly structured sentences and paragraphs)

In our study, we aim to capture both clarity and conciseness in annual reports using various measures suggested by previous research and aligned with the definitions provided in ED 2021/6. To capture conciseness, we adopt two primary metrics. The first is length, measured as the natural logarithm of total word count, as suggested by Li (2008). Shorter reports indicate higher conciseness. The second is the Fog Index, a readability metric from computational linguistics. It is based on average sentence length and word complexity. A lower Fog Index score indicates better readability and hence, greater conciseness. While the Fog Index has been debated in the literature regarding its suitability for business text, we choose to include it in our analysis for several reasons. First, it has been widely used in relevant literature (Li, 2008; Lo *et al.*, 2017; Efretuei and Hussainey, 2023). Second, it has been utilized as a measure of conciseness in prior research (Melloni *et al.*, 2017), aligning with our aim to capture conciseness consistent with the exposure draft definitions. Third, the Fog Index incorporates a component of word complexity, which can also contribute to assessing clarity. Therefore, results from the Fog Index allow for a comprehensive understanding of both conciseness and clarity.

To capture clarity, we employ two metrics. The first is complex words. We calculate the proportion of words with three or more syllables, following Efretuei *et al.* (2022). A higher percentage suggests reduced clarity due to increased linguistic complexity. The second is complexity words (Loughran and McDonald, 2024). We calculate complexity words as the proportion of 53 specific terms that indicate operational and informational complexity as used by Loughran

and McDonald (2024)⁴. These terms, such as ‘derivatives’ and ‘revaluation’, hinder user understanding and are considered markers of reduced clarity. Higher percentages of complexity words indicate lower clarity in the narrative disclosures.

While the 53-word list originally measures firm-level complexity, we apply it at the disclosure level to assess narrative difficulty. This approach reflects the view that complexity in operations and reporting is intertwined (Leuz and Wysocki, 2016) and aligns with recent research (Reichmann, 2023; Chen *et al.*, 2025). Our intent is not to attribute complexity to managerial obfuscation but to assess the inherent difficulty of business topics.

For conciseness, the Fog Index also reflects potential obfuscation, as more complex writing reduces predictive accuracy and may align with managerial incentives (Lehavy *et al.*, 2011; Li, 2008). While length is sometimes interpreted as obfuscatory (Li, 2008), it may also reflect informational richness due to regulatory demands (Lang and Stice-Lawrence, 2015). We treat it as a general indicator of verbosity, acknowledging both informative and obfuscatory elements (Chircop and Tarsalewska, 2019).

Empirical Model

Our hypothesis explores how IFRS disclosures impact narrative complexity. We use four dependent variables: report length (natural logarithm of total word count); complex words (Fog Index component), which is the percentage of words with ≥ 3 syllables, representing word complexity (Li, 2008); Fog Index, calculated as $0.4 \times (\% \text{ complex words}) + 0.4 \times (\text{average sentence length})$; complexity words, based on the frequency of the 53 complexity words identified by Loughran and McDonald (2024), weighted by word count and scaled by 100. The 53-complexity word list is included in Appendix C. A sample analysis (Figure 2) compares complexity word distribution in British American Tobacco’s 2004 and 2006 reports, showing broader dispersion post-regulation.

The general equation used to test the hypothesis is as follows:

$$\begin{aligned} \text{Complexity}_{it} = & \text{Intercept} + \beta_1 \text{year_ifrs}_{it} + \beta_2 \text{firm_size}_{it} + \beta_3 \text{firm_age}_{it} + \beta_4 \text{earn_vol}_{it} \\ & + \beta_5 \text{price_vol}_{it} + \beta_6 \text{bus_comp}_{it} + \beta_7 \text{geo_comp}_{it} + \beta_8 \text{earn}_{it} \\ & + \beta_9 \text{US_Listing}_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

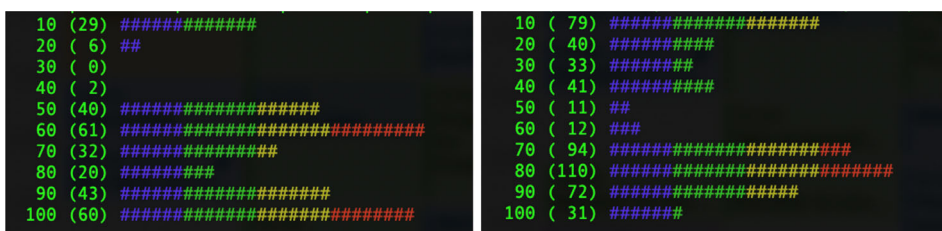
Where *Complexity* is the dependent variable (length, word complexity measures, or fog of firm *i* at time *t*), *year_ifrs* is the IFRS indicator variable, which equals one when firm *i* annual report at time *t* is prepared using IFRS standards and zero otherwise, *firm_size* is the total assets of the firm *i* at time *t*. It captures the operational aspects of a firm and explains disclosure complexity, as larger

⁴ IASB staff paper for Management commentary project update in December 2023 notes that feedback highlighted that the Exposure Draft proposals reflect investors’ information needs and focus on information that would help investors understand how an entity creates value.

NARRATIVE DISCLOSURE CLARITY

FIGURE 2

COMPLEXITY WORD DISTRIBUTION: PRE- AND POST-REGULATION COMPARISON



A graph illustrating in what percentage of BAT 2004 complexity words occur.

A graph illustrating in what percentage of BAT 2006 complexity words occur.

firms tend to have more intricate operations, leading to more complex disclosures. *firm_age* is the age of the firm based on the incorporation date; older firms tend to have reduced information asymmetry, which typically results in lower disclosure complexity. *earn_vol* is the movement in firm earnings, *price_vol* is the movement in share price. Firms with more volatile operations are likely to have more complex communications, as uncertainty and fluctuations in performance require more detailed and nuanced disclosures. *bus_comp* is the number of business segments of firm *i* at time *t*, *geo_comp* is the number of geographical segments of firm *i* at time *t*. Firms with complex business operations are more likely to produce complex disclosures, as the complexity of their activities requires more detailed and comprehensive reporting. *earns* is operating earnings scaled by total assets. as firms with lower earnings tend to have more complex narrative disclosures, and *US_Listing* equals one if the firm is listed in a US security market and zero otherwise to control for firms not adopting IFRS by 2005. These variables are included as control variables given the arguments and consistent with prior literature (Lang and Stice-Lawrence, 2015; Li, 2008; Lo *et al.*, 2017; Mekhaimer *et al.*, 2024). The variable definitions are in Appendix A.

Textual Data Collection Process

We adopt the following approach consistent with existing literature to retrieve and analyse the relevant textual data. For data collection, we downloaded annual reports for companies listed in the 2012 FTSE ALL SHARE index from their respective company websites. These reports cover the accounting years from 2000 to 2010.

As the annual reports are presented in PDF format, we converted them to text files using the ‘pdftotext’⁵ program from the Xpdf software (Lang and

⁵ ‘Pdftotext converts Portable Document Format (PDF) files to plain text. Pdftotext reads the PDF file, PDF-file, and writes a text file, text-file’ (pdftotext command line manual).

Stice-Lawrence, 2015) so that we could analyze them. This ensures that only the text content is extracted for analysis, excluding any tables or images.

A Perl code was used to parse the text files, removing text encodings and full stops between two numbers. This step helps clean the text and reduce noise in the subsequent analysis.⁶ The numbers are retained, as they are not counted as words by the readability program.

For the purposes of readability analysis, the cleaned text files were put into the Lingua EN Fathom Perl readability module. This module calculates various text-based statistics, including readability measures, of the input files. The Lingua EN Fathom Perl module is a well-established tool used in previous studies for similar analyses⁷.

Cleaning the text is an essential pre-processing step to reduce noise in the outputs and ensure accurate analysis. This pre-processing involves removing any extraneous elements and formatting from the text files, focusing solely on the textual content of the annual reports. See Appendix B and Figure B1.

EMPIRICAL RESULTS

Descriptive Analysis

Table 4 presents summary statistics for the narrative and control variables. Panel A offers descriptive statistics for the entire sample, while Panel B and Panel C present statistics for the pre-IFRS and post-IFRS groups, respectively. The average length of the reports is 36,000 words. Panels B and C reveal that report lengths are shorter in the pre-IFRS period compared to the post-IFRS period. Additionally, both the Fog Index and word complexity increase during the IFRS years, indicating the disclosure of complex topics. The range of the Fog Index is from the 25th percentile (p25: 21.3) to the 75th percentile (p75: 22.8), suggesting a relatively narrow range. However, there is significant variation in the number of words, with p25 at 20,277 and p75 at 43,704. According to the interpretation of the Fog Index provided in Appendix A, a score of ≥ 18 indicates unreadable text. Therefore, with p25 at 21.3, all the documents fall into the category of unreadable text. This narrow range and the prevalence of unreadable text observed using the Fog Index (Li, 2008; Loughran and McDonald, 2014) raises concerns about its suitability for business documents. Nonetheless, Figure 3 illustrates that while the range of the Fog Index is typically narrow, consistent with previous studies, it still

⁶ Cleaning the text by removing full stop between numbers eliminates errors, which can recognize numeric decimals as a sentence termination (Bushee *et al.*, 2018). Thus, parsing the decimals adequately addresses the concerns of sentence overestimation.

⁷ This module is used to measure the readability of English text and has been used in accounting studies (for example, Li, 2008).

NARRATIVE DISCLOSURE CLARITY

TABLE 4

DESCRIPTIVE STATISTICS

Panel A: Full sample

Variable	mean	std. dev	p25	p50	p75	N
number of words	35906	23928	20277	30645	43704	3659
Fog Index	22.009	1.350	21.305	22.076	22.844	3659
%_ComplexWords	26.763	1.373	25.921	26.798	27.602	3659
%_ComplexityWords	0.400	0.192	0.265	0.385	0.509	3522
firm size (total assets)	6.653	1.941	5.345	6.342	7.617	3571
earnings (£/year)	0.076	0.119	0.023	0.069	0.123	3569
price volatility	28.866	10.357	21.521	27.147	34.117	3026

Panel B: year_ifrs = 0

Variable	mean	std.dev	p25	p50	p75	N
number of words	24152	15509	15896	20390	26624	1389
Fog Index	21.689	1.480	20.908	21.755	22.633	1389
%_ComplexWords	26.407	1.386	25.587	26.457	27.278	1389
%_ComplexityWords	0.358	0.212	0.217	0.325	0.457	1323
firm size (total assets)	6.419	1.989	5.019	6.112	7.428	1343
earnings (£/year)	0.065	0.113	0.019	0.061	0.113	1341
price volatility	28.252	11.276	20.489	25.645	32.726	1171

Panel C: year_ifrs = 1

Variable	mean	std.dev	p25	p50	p75	N
number of words	43098	25289	28271	38047	50118	2270
Fog Index	22.205	1.224	21.528	22.231	22.939	2270
%_ComplexWords	26.980	1.320	26.170	27.010	27.768	2270
%_ComplexityWords	0.427	0.173	0.306	0.419	0.5333	2199
firm size (total assets)	6.794	1.898	5.509	6.450	7.737	2228
earnings (£/year)	0.083	0.123	0.027	0.073	0.127	2228
price volatility	29.253	9.716	22.294	27.863	34.887	1855

Panel D: Two-sample T test for pre- and post-IFRS period comparison

Variable	Pre (N)	Post (N)	Mean (Pre)	Mean (Post)	difference (Post-Pre)	t value
number of words	1389	2270	24152	43098	18946*	25.173
Fog Index	1389	2270	21.689	22.205	0.516*	11.413
%_ComplexWords	1389	2270	26.407	26.980	0.573*	12.508
%_ComplexityWords	1323	2199	0.358	0.427	0.069*	10.503

This table presents descriptive statistics for the sample of firms used for this study. The sample was constructed from the sample of firms in the UK FTSE ALL SHARE Index downloaded from Thomson. The sample spans the period of accounting year-end 2000 to 2010 and comprises 3,659 firm-year observations. Panels A, B, and C report the distribution of various firm characteristics for key variables used in the data analysis of the total sample, pre-IFRS period and post-IFRS period, respectively. All variables are reported at the 25th, 50th, and 75th percentiles. Panel D reports the T-Tests substantiating the differences between the pre- and post-IFRS periods. * Indicates significance at 5% level or less. See Appendix A for variable definitions.

FIGURE 3

ANNUAL FOG INDEX TRENDS BEFORE AND AFTER REGULATION

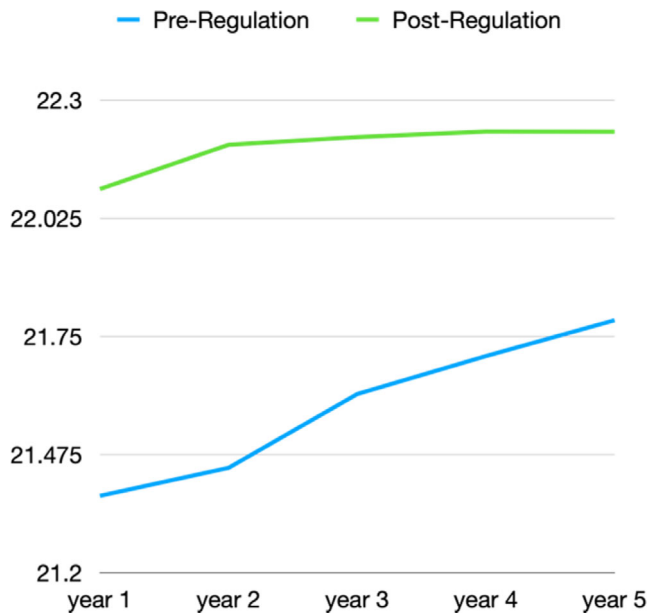


Figure 3 shows the mean fog for each year in the sample. Year 1 represents the first year for the pre-regulation period (2001) and the first year for the post-regulation period (2006) and year 5 represents the last year for the pre-regulation period (2004) and last year for the post-regulation period (2010).

provides descriptive evidence of a change between the pre- and post-IFRS regulation periods.

We further utilize two complexity measures, ‘%_ComplexWords’ (Efretuei *et al.*, 2022; Ertugrul *et al.*, 2017) and ‘%_ComplexityWords’ (Loughran and McDonald, 2024), to evaluate the clarity of the text, while employing the length measure as an additional indicator of conciseness. The mean value for ‘%_ComplexWords’ is 26.7, indicating that, on average, firms’ reports contain approximately 26.7% complex words (words with three or more syllables). This measure ranges between 25% and 28%. The mean value of ‘%_ComplexityWords’ for the overall sample is 0.40. It increases from an average of 0.36 in the pre-IFRS years to 0.43 in the post-IFRS period. The average standard deviation of ‘%_ComplexityWords’ for the overall sample is 0.19. These statistics of ‘%_ComplexityWords’ are akin to those reported for 10-K filings (Loughran and McDonald, 2024), which alleviates concerns that the words may not be as prevalent in the UK company reporting context. Industries with the lowest average values of ‘%_Complexity’ include Basic materials (0.37), Financials (0.37), and Technology (0.36), while those with the highest values include Health care (0.44) and Utilities (0.56). Table 4, Panel D shows that the observed differences in mean between the

pre-and post-IFRS years are statistically significant at less than the 5% level. Descriptive statistics for the determinant variables are also displayed in Table 4.

Table 5 displays the correlation results of the variables incorporated in our model. The correlations among the narrative variables are approximately below 30%, in line with findings by Lang and Stice-Lawrence (2015). As anticipated, longer reports exhibit higher Fog Indexes and contain more complex words. Notably, the correlation between the Fog Index and word complexity is around 42%, as expected given that word complexity contributes to the Fog Index. Additionally, the %_ComplexityWords measure correlates with length at 0.34, consistent with the recommendation by Loughran and McDonald (2024) to use this measure alongside file size.

The correlations between the narrative variables and the control variables align with expectations from prior studies: earnings are negatively associated with the Fog Index and word complexity measures (Li, 2008) and positively correlated with length, indicating that firms with positive earnings tend to produce more informative (longer) annual reports that are less complex. Larger firms tend to generate longer reports, consistent with the notion that regulatory demands for larger firms leads to increased complexity in narrative communication. Moreover, earnings volatility and geographical complexity are positively correlated with report length, the Fog Index, and word complexity, indicating that riskier firms with more complex operations tend to produce more complex narratives.

The variable *year_ifrs* exhibits a positive correlation with length (47%), suggesting that regulation increases the length of disclosures (Dyer *et al.*, 2017). Additionally, the Fog Index and word complexity measures correlate positively with IFRS, offering preliminary evidence for the hypothesis that narrative complexity rises with the adoption of IFRS. The significance of these correlations at the 5% level suggests that the variables included in the regression model exhibit predictable relationships with the narrative measures. These variables are included in the regression model alongside other controls and firm fixed effects to test the hypothesis.

Narrative Complexity and Mandatory IFRS Adoption

Table 6 displays the results for the estimation of equation (1), examining the relationship between narrative complexity (disclosure length, word complexity, and fog) and the mandatory adoption of IFRS. We assess the effect of IFRS adoption on narrative complexity using a fixed effects (FE) panel data regression model, where IFRS firm-years are assigned a value of one, and non-IFRS firm-years are assigned a value of zero. Our key variable of interest is the indicator for the IFRS variable *year_ifrs*, which indicates the difference in disclosure between firm-years affected by IFRS mandatory adoption compared to the control sample (firm-years without IFRS adoption). The model utilized is the FE model with robust standard errors.

Table 6 presents the initial examination of H1. In this analysis, *year_ifrs* is interpreted as increasing with the mandatory adoption of IFRS. This implies that

TABLE 5
CORRELATION MATRIX: NARRATIVE MEASURES AND SELECT CONTROL VARIABLES

	1	2	3	4	5	6	7	8	9
<i>length</i>	1								
<i>fog</i>	0.135*								
<i>%_ComplexWords</i>	0.134*	0.422*							
<i>%_ComplexityWords</i>	0.3352*	0.0939*	0.1048*	1.0000					
<i>firm_size</i>	0.619*	0.027	0.061*	0.4026*					
<i>eam_vol</i>	0.353*	0.058*	0.114*	0.0874*	0.500*				
<i>geo_comp</i>	0.301*	0.107*	0.213*	0.2426*	0.261*	0.156*			
<i>earns</i>	0.048*	−0.036*	−0.102*	−0.0167	−0.024	−0.004	0.059*		
<i>US_Listing</i>	0.316*	0.029	0.031	0.1650*	0.398*	0.402*	0.182*	0.043*	
<i>year_ifrs</i>	0.476*	0.186*	0.203*	0.1743*	0.094*	0.031	0.0437*	0.072*	−0.0610*

Note: This table reports the correlation coefficients of the variables employed in our regressions.
*Indicates significance at 5% level or less. See Appendix A for variable definitions.

NARRATIVE DISCLOSURE CLARITY

TABLE 6

NARRATIVE COMPLEXITY AND MANDATORY IFRS: HYPOTHESIS TEST

	length	%_ComplexWords	fog	%_ComplexityWords
	(1)	(2)	(3)	(4)
<i>year_ifrs</i>	0.232*** (7.61)	0.512*** (5.85)	0.203* (2.75)	0.106*** (14.71)
<i>firm_size</i>	0.0494* (2.57)	0.0740 (1.48)	−0.0259 (−0.60)	0.0325* (3.15)
<i>firm_age</i>	0.0732*** (12.77)	0.00854 (0.82)	0.0652** (4.27)	−0.00757*** (−6.12)
<i>earn_vol</i>	−0.00000660 (−0.39)	0.0000637 (1.38)	−0.0000859 (−1.49)	−0.00000752 (−0.82)
<i>price_vol</i>	0.00204 (1.48)	−0.00571 (−0.74)	0.00582 (1.09)	0.000716 (1.56)
<i>bus_comp</i>	0.0440 (1.79)	−0.00659 (−0.08)	−0.0297 (−0.45)	0.0132 (1.29)
<i>geo_comp</i>	0.0449* (2.34)	0.0386 (0.33)	−0.0250 (−0.31)	0.0293 (1.93)
<i>earnings</i>	0.00807 (0.10)	−0.631* (−3.04)	−0.370 (−0.98)	−0.116 (−1.87)
<i>US_Listing</i>	0.144 (1.62)	0.360 (1.52)	0.433* (3.02)	−0.0338 (−1.02)
<i>_cons</i>	7.175*** (53.13)	25.66*** (54.19)	19.60*** (51.29)	0.355** (4.70)
<i>N</i>	2127	2127	2127	2059
<i>adj. R-sq</i>	0.693	0.114	0.087	0.229

t statistics in parentheses

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$

This table presents the results of estimating the narrative complexity of annual reports across the sample firm years with firm-fixed effects. *Length*, *%_ComplexWords*, *fog*, and *%_ComplexityWords* are the dependent variables. *Year_ifrs* is an indicator variable equal to one for the IFRS adoption years and zero for the pre-adoption years. The control variables are firm size (*firm_size*), firm age (*firm_age*), earnings volatility (*earn_vol*), price volatility (*price_vol*), business complexity (*bus_comp*), geographical complexity (*geo_comp*), and earnings (*earn*). See Appendix A for variable definitions. Given observations from the same industry are likely to be more similar than observations from different industries (Efretuei, 2021) we use robust regression and cluster at the industry level to account for this.

the variable is a dummy variable assigned zero for the years before mandatory adoption and one for the year of mandatory adoption and onward. Consistent with H1, mandatory IFRS adoption is linked with a rise in the length (coefficient 0.232, p -value <0.001), *%_ComplexWords* (coefficient 0.512, p -value <0.001), fog (coefficient 0.203, p -value <0.05), and *%_ComplexityWords* (coefficient 0.106, p -value <0.001) of annual reports relative to the control sample. This reflects the increased complexity of narratives and longer disclosures associated with IFRS adoption, as suggested by Lang and Stice-Lawrence (2015).

Four different dependent variables are employed in this analysis of the annual report: length; *%_ComplexWords*; Fog Index (fog); and *%_ComplexityWords*. We observe a surge in disclosure length. Both dependent variables on word

complexity (%_ComplexWords and %_ComplexityWords) increase with IFRS adoption, indicating a rise in complex words in annual reports following the mandatory adoption of IFRS. The significant coefficient of the fog variable indicates that the Fog Index of annual reports has also increased with the adoption of IFRS. These findings suggest a decrease in the clarity and conciseness of annual reports post-IFRS adoption. Considering the definitions of clarity, the increase in jargon and unnecessary technical language is reflected in the elevated count of complex words. This underscores the necessity to avoid jargon in disclosures. Moreover, the results support the requirement for using simple, unambiguous language and short, structured sentences and paragraphs (conciseness), given the significant increase in length and fog.

Additional Analysis: Economic/Time Effects

One concern arising from the results is whether they accurately capture an increase in annual report narrative complexity, considering potential external effects over time. The variable *year_ifrs*, measuring the period of adoption, might inadvertently encompass broader time-related changes (Iatridis, 2012). Despite controlling for fixed effects in the initial model, it is prudent to explore additional time-related factors to enhance the robustness of our findings. Thus, it becomes necessary to evaluate the effects of time on the dependent variables. We propose that narrative complexity increases over time, consistent with prior literature, such as Dyer *et al.* (2017), who identify a significant upward trend in annual report complexity even after accounting for firm-level characteristics. Following Dyer *et al.* (2017), we include a 'Time1' variable, incrementing by 1 each year, to control for this trend. Additionally, 'Time2' accounts for changes in complexity due to economic shifts and the application of complex accounting standards post-IFRS adoption. Moscariello *et al.* (2014) highlight that accounting numbers may better reflect economic factors in the post-IFRS era, increasing the relevance of financial reporting. Therefore, we set pre-IFRS years to zero and use Dyer *et al.*'s (2017) trend framework to control for post-IFRS complexity trends.

Therefore, we adjusted the regression model for the hypothesis test to include two additional control variables. First, *time1* represents a variable that increments with each passing year, reflecting the assumption that annual report complexity estimates are on the rise annually. Second, *time2* accounts for an increasing trend specifically after the adoption of IFRS. This variable captures the anticipated surge in economic activities associated with the introduction of the new mandatory regulation. It is assigned a value of zero for pre-IFRS adoption years and increments by 1 for each post-IFRS adoption year. Including these additional time-related variables allows for a more nuanced examination of the impact of IFRS adoption on narrative complexity while controlling for broader temporal trends.

NARRATIVE DISCLOSURE CLARITY

TABLE 7

HYPOTHESIS TEST WITH TIME1 AND TIME2 VARIABLES

	length	%_ComplexWords	fog	%_ComplexityWords
	(1)	(2)	(3)	(4)
<i>year_ifrs</i>	0.250*** (7.90)	0.495*** (5.55)	0.226* (2.74)	0.0995*** (14.25)
<i>time1</i>	−0.590*** (−4.82)	0.310 (0.97)	−0.914** (−4.21)	−0.102 (−1.93)
<i>time2</i>	−0.0539*** (−10.50)	0.0528* (2.29)	−0.0710 (−1.82)	0.0176*** (5.52)
<i>firm_size</i>	0.0615* (3.08)	0.0618 (1.26)	−0.0101 (−0.25)	0.0283* (2.71)
<i>firm_age</i>	0.697*** (5.73)	−0.335 (−1.02)	1.025** (4.41)	0.0833 (1.52)
<i>earn_vol</i>	−0.00000972 (−0.58)	0.0000668 (1.42)	−0.0000900 (−1.65)	−0.00000632 (−0.68)
<i>price_vol</i>	0.00263 (2.26)	−0.00626 (−0.79)	0.00660 (1.36)	0.000544 (1.10)
<i>bus_comp</i>	0.0504 (2.14)	−0.0129 (−0.15)	−0.0211 (−0.32)	0.0112 (1.10)
<i>geo_comp</i>	0.0523* (2.66)	0.0313 (0.27)	−0.0153 (−0.19)	0.0270 (1.81)
<i>earnings</i>	0.0192 (0.29)	−0.642* (−2.87)	−0.356 (−1.00)	−0.120 (−2.09)
<i>US_Listing</i>	0.151 (1.63)	0.360 (1.47)	0.446* (3.05)	−0.0280 (−0.79)
<i>_cons</i>	−10.75* (−3.09)	35.63** (3.89)	−7.897 (−1.20)	−2.132 (−1.37)
<i>N</i>	2127	2127	2127	2059
<i>adj. R-sq</i>	0.701	0.115	0.089	0.244

t statistics in parentheses

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$

This table presents the results of estimating the narrative complexity of annual reports across the sample firm years with firm-fixed effects. *Length*, *%_Complex_Words*, *fog*, and *%_Complexity_Words* are the dependent variables. *Year_ifrs* is an indicator variable equal to one for the IFRS adoption years (2006–2010) and zero for pre-adoption years. *time1* and *time2* are independent variables; *time1* indicates the increasing complexity of annual reports, and *time2* indicates additional increasing complexity only in the IFRS years. All control variables are included in the regression model; see Appendix A for variable definitions. Given observations from the same industry are likely to be more similar than observations from different industries (Efretuei, 2021) we use robust regression and cluster at the industry level to account for this.

As demonstrated in Table 7, the coefficients of *year_ifrs* continue to hold significance across all dependent variables. Of particular interest is the notable increase in the word complexity variables (*%_ComplexWords* and *%_ComplexityWords*), primarily driven by the mandatory adoption of IFRS. Interestingly, the effect of *time1* on these variables is not significant, suggesting that the rise in the disclosure of complex words is not linked to the year-to-year increasing trend of annual report disclosure changes. Instead, it appears to be

predominantly influenced by the effects associated with IFRS adoption (*year_ifrs*) and the post-adoption trend (*time2*). This indicates that the observed increase in word complexity is more closely tied to the implementation of IFRS regulations rather than general temporal changes in annual report disclosures.

Additional Analysis: UK Context Specification Economic/Time Effects

UK firms adopted IFRS simultaneously, posing challenges for difference-in-differences (DID) analysis, as noted by Doukakis (2014), who highlights the advantages of using voluntary adopters as controls. However, finding a control sample with similar institutional and governance characteristics in the UK is difficult. Consequently, many studies on UK IFRS adoption use a fixed shift approach, with a single interaction variable, as seen in Moscariello *et al.* (2014) and Almaharmeh and Masa'deh (2018). Moscariello *et al.*, (2014) defines IFRS as a dummy variable: IFRS = 1 for IFRS users and IFRS = 0 for domestic GAAP users, consistent with our paper.

Other UK IFRS studies compare coefficient magnitudes under UK GAAP and IFRS (Dargenidou *et al.*, 2021; Horton and Serafeim, 2010; Paananen and Parma, 2008) or use cross-country samples (Christensen *et al.*, 2007). The suitability of a DID approach in the UK context remains debated. Consistent with the literature, we define IFRS as the interaction between post-adoption and IFRS adoption indicator (Cheung and Lau, 2016; Lang and Stice-Lawrence, 2015; Saravanan *et al.*, 2024). This interaction implies single-country studies often use a dummy for IFRS (Cheung and Lau, 2016; Saravanan *et al.*, 2024), while using an international sample. Lang and Stice-Lawrence (2015) employ an interaction variable ($POST \times MANDATORY$) and omit main effects due to collinearity with fixed effects.

As an alternative to the DID model and to capture changes in a robust manner following IFRS adoption, we apply Moscariello *et al.*'s (2014) specification, which adjusts both the constant term and coefficients of accounting variables in the post-IFRS period through an interactive approach. This approach reflects how post-IFRS accounting complexity may better explain disclosure complexity, consistent with the literature highlighting IFRS-driven changes. Key IFRS impacts include IFRS 2 (compensation expenses and disclosure), IFRS 3 (goodwill impairments and earnings volatility), and IFRS 8 (segmental disclosures showing business and geographical complexity) as noted by Horton and Seraphim (2010) and Labro and Pierk (2023). To empirically capture these, we add interaction terms for segmental disclosures, business/geographical complexity, and earnings variable. Unreported results show that while interactions are insignificant, the *year_ifrs* variable remains significant.

We also considered an alternative DID model commonly used in UK IFRS studies (for example, Dargenidou *et al.*, (2021)). However, this approach is unsuitable for our research design, as our primary variable of interest, *year_ifrs*,

would need to be omitted to compare pre- and post-IFRS coefficients, leaving no coefficients for comparison.

Additional Analysis: Industry Interaction and Boilerplate Language

To ensure the robustness of the results observed for H1, further analyses are conducted to examine whether the increased complexity is industry-specific, that is, whether industry-specific factors contribute to narrative complexity post-IFRS adoption. In this analysis, industry indicators are interacted with the *year_ifrs* variable and included as control variables in the regression model of equation (1). Table 8 illustrates that *year_ifrs* remains statistically significant even after controlling for industry interaction.

Additionally, it is important to address the issue of boilerplate language, where firms may use repetitive or standardized language in narrative disclosures without adding new information (Brown and Tucker, 2011). Given the focus of this study on clarity and conciseness of disclosure, it is essential to account for the potential carryover of conciseness issues from one year to the next. Therefore, the study incorporates the prior year's word complexity as a control variable, referred to as boilerplate, although the emphasis remains on conciseness as defined by the revised management commentary (ED/2021/6). This approach aligns with previous studies that control for lagged disclosure attributes when evaluating changes (Lee, 2012; Bozanic *et al.*, 2019), considering the persistence of these attributes over time.

To assess whether the observed increase in narrative complexity is influenced by boilerplate disclosure, lagged dependent variables are incorporated into the regression model of equation (1). Specifically, the complexity of the prior year's report is included as a control variable. The hypothesis is that narrative complexity would be influenced by the complexity of the narrative in the previous year's report.

The results presented in Table 9 demonstrate that *year_ifrs* remains statistically significant even after controlling for the complexity of the prior year's report. This indicates that the observed results for H1 are not primarily driven by boilerplate text carried forward from the prior year. Instead, *year_ifrs* continues to exhibit a significant association with narrative complexity, suggesting that the adoption of IFRS increases narrative complexity irrespective of the complexity of the narrative in the preceding year's report.

Additional Analysis: Matched Sample and Alternative Text Cleaning

We conducted a re-analysis using a matched sample of pre- and post-IFRS firm years. The matched sample includes only firms with 10 consecutive years of data from 2000–2004 and 2006–2010. To create this matched panel, firms without a complete 10-year data set are excluded. For instance, Renold Plc and Mothercare Plc, with only nine years of data, are dropped from the

TABLE 8

HYPOTHESIS TEST WITH IFRS AND INDUSTRY INTERACTION

	length	%_ComplexWords	fog	%_ComplexityWords
	(1)	(2)	(3)	(4)
<i>year_ifrs</i>	0.386*** (16.91)	0.535*** (6.64)	0.182 (2.01)	0.0542** (3.51)
<i>firm_size</i>	0.0568* (3.12)	0.0694 (1.31)	−0.0202 (−0.53)	0.0290* (2.47)
<i>firm_age</i>	0.453** (3.85)	−0.201 (−0.71)	0.808** (4.25)	0.0184 (0.35)
<i>earn_vol</i>	0.00000141 (0.06)	0.0000667 (1.87)	−0.0000638 (−1.99)	−0.00000305 (−0.44)
<i>price_vol</i>	0.00151 (1.41)	−0.0110 (−1.36)	0.00706 (1.28)	0.000412 (0.81)
<i>bus_comp</i>	0.0569 (2.25)	0.0424 (0.40)	−0.0353 (−0.51)	0.0124 (1.23)
<i>geo_comp</i>	0.0543* (2.76)	0.0279 (0.22)	0.0197 (0.27)	0.0316 (2.25)
<i>earns</i>	0.00230 (0.03)	−0.485 (−1.91)	−0.278 (−0.66)	−0.117 (−2.07)
<i>US_Listing</i>	0.142 (1.61)	0.350 (1.47)	0.431* (3.12)	−0.0318 (−0.90)
<i>_cons</i>	−3.880 (−1.16)	31.80** (4.07)	−1.630 (−0.31)	−0.265 (−0.18)
<i>time1 & 2 vars</i>	Yes	Yes	Yes	yes
<i>Industry#year_ifrs</i>	Yes	Yes	Yes	yes
<i>N</i>	2127	2127	2127	2059
<i>adj. R-sq</i>	0.703	0.130	0.093	0.268

t statistics in parentheses

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$

This table presents the results of estimating the narrative complexity of annual reports across the sample firm years with the firm- and time-fixed effects. *Length*, *%_Complex_Words*, *fog*, and *%_Complexity_Words* are the dependent variables. *Year_ifrs* is an indicator variable equal to one for the IFRS adoption years and zero for pre-adoption years. The interaction of the *year_ifrs* and industry dummies has been included as the industry and *year_ifrs* (*industry#yearIFRS*) variable. Time variables indicate the *time1* and *time2* variables. All control variables are included in the regression model. See Appendix A for variable definitions. Given observations from the same industry are likely to be more similar than observations from different industries (Efretuei, 2021) we use robust regression and cluster at the industry level to account for this.

analysis, significantly reducing the sample size. The limited number of companies is due to the strict inclusion criteria and the requirement for a complete 10-year set of company reports in a machine-readable format. The results, as presented in Table 10, remained statistically significant, indicating that narrative complexity changes with the adoption of IFRS. A *t*-test was performed with the matched sample, consisting of 830 firm years. The results in Table 10 reveal significant differences between pre- and post-IFRS firm

NARRATIVE DISCLOSURE CLARITY

TABLE 9

HYPOTHESIS TEST WITH THE LAGGED DEPENDENT VARIABLE

	length	%_ComplexWords	fog	%_ComplexityWords
	(1)	(2)	(3)	(4)
<i>year_ifrs</i>	0.210*** (8.88)	0.407*** (5.25)	0.302*** (5.92)	0.0684*** (8.18)
<i>firm_size</i>	0.0495*** (5.16)	0.0629 (1.06)	−0.0331 (−0.62)	0.0175 (1.76)
<i>firm_age</i>	0.0931*** (7.91)	−0.00613 (−0.50)	0.105*** (6.83)	−0.0124*** (−6.60)
<i>earn_vol</i>	−0.0000280* (−2.40)	0.0000541 (1.46)	−0.0000676 (−2.06)	−0.00000177 (−0.35)
<i>price_vol</i>	0.00195 (1.83)	−0.00107 (−0.19)	0.00494 (1.64)	0.000394 (1.03)
<i>bus_comp</i>	0.0465 (1.85)	−0.0151 (−0.19)	−0.00988 (−0.17)	0.00993 (1.33)
<i>geo_comp</i>	0.0549* (2.77)	0.0204 (0.18)	0.0117 (0.12)	0.0187* (2.34)
<i>earnings</i>	0.0370 (0.70)	−0.409 (−1.10)	0.108 (0.19)	−0.146* (−2.31)
<i>US_Listing</i>	0.0970 (1.38)	0.250 (0.88)	0.352 (2.08)	−0.0252 (−1.22)
<i>L.length</i>	0.166* (2.60)			
<i>L.%_ComplexWords</i>		0.325*** (12.56)		
<i>L.fog</i>			0.265*** (4.81)	
<i>L.%_ComplexityWords</i>				0.381*** (8.90)
<i>_cons</i>	4.959*** (10.44)	17.54*** (14.74)	12.65*** (10.46)	0.476*** (5.52)
<i>time1 & 2 vars</i>	yes	yes	yes	yes
<i>N</i>	1658	1658	1658	1572
<i>adj. R-sq</i>	0.719	0.199	0.166	0.375

t statistics in parentheses

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$

This table presents the results of estimating the narrative complexity of annual reports across the sample firm years for the lagged dependent variable for each dependent variable (L.1). The model includes firm-fixed effects. *Length*, *%_Complex_Words*, *fog*, and *%_Complexity_Words* are the dependent variables. *Year_ifrs* is an indicator variable equal to one for the IFRS adoption years and zero for preadoption years. Controls indicate all control variables, and time variables indicate the *time1* and *time2* variables. All control variables are included in the regression model. See Appendix A for variable definitions. Given observations from the same industry are likely to be more similar than observations from different industries (Efretuei, 2021) we use robust regression and cluster at the industry level to account for this.

years. Unreported univariate matched sample statistics indicate that IFRS firm year reports, on average, contain 27,000 (*t*-stat 15.550, *p*-value <0.001) more words than pre-IFRS firm year reports. Additionally, they have 0.5%

TABLE 10

HYPOTHESIS TEST WITH TIME1 AND TIME2 VARIABLES FOR THE MATCHED SAMPLE

	length	%_ComplexWords	fog	%_ComplexityWords
	(1)	(2)	(3)	(4)
<i>year_ifrs</i>	0.276*** (5.94)	0.432** (3.51)	0.260 (1.59)	0.0997*** (9.69)
<i>firm_size</i>	0.0638* (2.80)	0.0434 (0.64)	0.0976 (1.35)	0.0284 (1.73)
<i>firm_age</i>	0.500** (4.48)	−0.186 (−0.42)	0.929** (4.46)	0.146* (2.65)
<i>earn_vol</i>	0.00000701 (0.38)	0.000112*** (5.72)	−0.0000491** (−4.11)	−0.00000807 (−0.70)
<i>price_vol</i>	0.00678** (4.78)	−0.0224 (−1.88)	0.00475 (0.51)	−0.000734 (−1.04)
<i>bus_comp</i>	0.0471* (2.38)	−0.0422 (−0.45)	−0.0549 (−0.31)	−0.00275 (−0.20)
<i>geo_comp</i>	0.0484* (2.87)	0.0798 (0.37)	−0.145 (−1.78)	0.0289 (2.30)
<i>earns</i>	−0.0977 (−1.20)	−0.588 (−1.30)	−0.607 (−1.27)	0.0226 (0.76)
<i>US_Listing</i>	−0.0163 (−0.23)	0.550 (1.65)	0.381* (3.24)	0.00478 (0.13)
<i>time1</i>	−0.399** (−3.58)	0.158 (0.36)	−0.817** (−4.28)	−0.163* (−3.11)
<i>time2</i>	−0.0483** (−3.55)	0.0799* (2.32)	−0.0714* (−2.42)	0.0162* (2.79)
<i>_cons</i>	−4.787 (−1.62)	31.67* (2.63)	−5.094 (−0.91)	−3.815* (−2.39)
<i>N</i>	658	658	658	658
<i>adj. R-sq</i>	0.819	0.180	0.105	0.316

t statistics in parentheses

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$

This table presents the results of estimating the narrative complexity of annual reports across the sample firm years with firm-fixed effects. *Length*, *%_Complex_Words*, *fog*, and *%_Complexity_Words* are the dependent variables. *Year_ifrs* is an indicator variable equal to one for the IFRS adoption years (2006–2010) and zero for pre-adoption years. *time1* and *time2* are independent variables; *time1* indicates the increasing complexity of annual reports, and *time2* indicates additional increasing complexity only in the IFRS years. All control variables are included in the regression model; see Appendix A for variable definitions. Given observations from the same industry are likely to be more similar than observations from different industries (Efretuei, 2021) we use robust regression and cluster at the industry level to account for this.

(*t*-stat 5.8, *p*-value <0.001) more complex words, a 0.7 higher Fog Index, and 0.08% (*t*-stat 6.5, *p*-value <0.001) more complexity words compared to pre-IFRS firm years.

Previous literature has highlighted that cleaning text for textual analysis may introduce noise to textual measures, particularly in identifying relevant text for analysis. To address this concern, we adopted an alternative text cleaning process consistent with Lang and Stice-Lawrence (2015). The process used for text

cleaning in this study follows established procedures in the existing literature, applied to the matched sample.

1. Download pdf files from company websites.
2. Convert pdf files to text files using Xpdf.
3. Clean the text file of full stops between numbers (Bushee *et al.*, 2018) and remove text encoding added by conversion error (Lang and Stice-Lawrence, 2015)
4. Break the text of each file into sentences and then remove all sentences that do not contain at least 50% alphabetic characters (Lang and Stice-Lawrence, 2015).⁸
5. Exclude reports with fewer than 2,000 words (Li, 2008).
6. Calculate fog readability statistic.⁹

The results following the above variable calculation remain significant and in line with the earlier results. Unreported univariate matched sample statistics using the new sample, similarly, reports that IFRS firm year reports have on average 27,000 (*t*-stat 15.35, *p*-value <0.001) words more than pre-IFRS firm years. They have 0.2 (*t*-stat 5.8, *p*-value <0.001) more complex words than pre-IFRS firm years and 0.6 (*t*-stat 9.25, *p*-value <0.001) higher Fog Index than pre-IFRS firm years.

The findings of this study highlight that the mandatory adoption of IFRS leads to an increase in the textual complexity of annual reports, even after accounting for various factors influencing complexity. This study's insights offer valuable information that can contribute to enhancing communication in financial reports. While the IASB has focused less on regulating narratives, this study's evidence underscores the importance for the IASB to consider its involvement in overseeing narrative disclosures and addressing the level of complexity driven by regulations.

This research adds to the exploration of the 'understandability' issue following the implementation of IFRS. By addressing key questions such as the pervasiveness of the problem, the post-IFRS changes, and the impact of IFRS on the clarity and conciseness of narratives, this study sheds light on the understandability challenges that warrant attention, as highlighted in the revised Practice Statement.

The results indicate a reduction in the clarity of disclosure post-IFRS adoption, evident in the increased use of complex words. This may stem from heightened use of technical language or jargon. Moreover, the findings suggest a decrease in conciseness post-IFRS, as evidenced by longer and more

⁸ According to Lang and Stice-Lawrence (2015), 'This procedure does not successfully delete all table labels because the PDF conversion process can separate the numbers and labels in tables into separate "sentences". This .adds noise to the fog measure, which is not designed to analyse this type of content'. To mitigate this, step three, which cleans the files of all full stops between numbers reduces the error in the recognition of sentences (Bushee *et al.*, 2018). However, this mitigates this to a limited extent.

⁹ We calculated only the fog measure, its word complexity component and length to assess if the results differ.

convoluted reports. These implications for regulators underscore the evidence of an understandability problem, aligning with the priorities outlined in the exposure draft (ED 2021/6 Ch. 13).

CONCLUSIONS

We explore how IFRS adoption influenced the textual characteristics identified by ED 2021/6, applying two measures of word complexity, namely the complex words component of the Fog Index and complexity words (Loughran and McDonald, 2024), to directly contribute to question 11a of ED 2021/6 and offer recommendations. Our study addressed the broad questions concerning the ‘understandability’ problem, including its pervasiveness and changes with IFRS application, as well as the impact of IFRS disclosures on the clarity and conciseness of narratives. We employ several complexity measures, including a novel measure tailored to financial disclosures, building on a novel complexity measure.

Our research reveals several key findings. First, we observe a notable increase in textual disclosure following the adoption of IFRS. Second, this rise in the number of words is accompanied by a corresponding increase in the complexity of words disclosed in annual reports. Third, we find that the Fog Index of annual report narratives also rises with the application of IFRS. These results offer valuable insights into the broader effects of adopting IFRS on annual report narratives, an area with limited evidence in the accounting literature. Our findings suggest a significant uptick in the narrative complexity of annual reports due to mandatory IFRS adoption, potentially leading to reduced transparency and diminished capital market benefits.

To ensure the robustness of our findings, we employed a rigorous approach that accounted for potential biases such as time effects, boilerplate language, and industry-specific jargon. Furthermore, through additional analysis, we confirmed that the association between complex narratives and IFRS adoption remains significant even after controlling for these factors. Notably, the increase in narrative complexity is predominantly driven by IFRS adoption, even after excluding the effects of time, boilerplate language, and industry-specific factors.

Our study makes several contributions to the existing body of knowledge. First, we establish a clear relationship between the regulatory IFRS regime and the narrative complexity of annual reports, shedding light on the impacts of regulatory changes on financial reporting practices. Second, we extend beyond merely identifying the initial impact of IFRS adoption and explore the persistence of complex narratives over time. Third, by focusing on narrative complexity, our study enriches the broader field of disclosure quality research, offering empirical evidence on the relationship between IFRS adoption and narrative complexity.

The implications of our findings extend to standard-setting bodies, regulators, and practitioners. By highlighting the enduring complexity of narratives associated with IFRS adoption, our study underscores the need to address this issue in financial reporting standards. Efforts should be directed towards ensuring that narratives are clear, concise, and informative, facilitating improved stakeholder decision-making. Additionally, our findings provide valuable insights to IASB projects aimed at enhancing communication in financial reporting.

However, our study is limited to investigating the effect of IFRS adoption on annual report narrative complexity. Future research could explore the economic consequences of increased word complexity or its implications for investors. Moreover, further investigation could consider the establishment of direct causality between IFRS adoption and narrative complexity, considering factors such as mandate, standards, enforcement, and reporting incentives.

In conclusion, our study contributes significantly to the 'Better Communication in Financial Reporting and Disclosure Initiative' project of the IASB, advocating for a focus on disclosure attributes of clarity and conciseness. It underscores the importance of developing a narrative standard beyond the management commentary Practice Statement issued by the IASB, aligning with the goals of enhancing communication in financial reporting.

Data Availability

Data are available from the public sources cited in the text.

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APPENDIX A VARIABLE DEFINITIONS

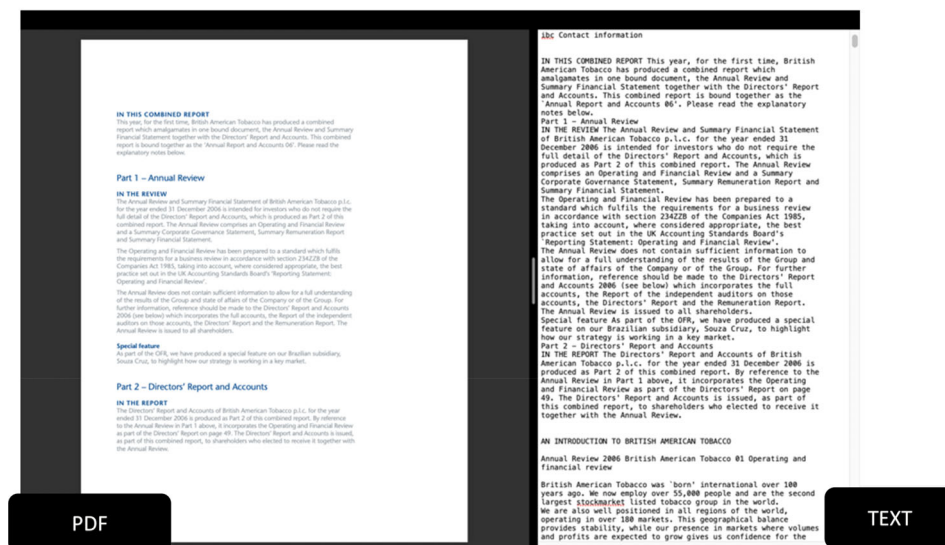
Variable	Full Name	Definitions
length	Length	Log of the number of words in the annual report.
fog	Fog	$[(\text{word_complexity} + \text{wordpersentence}) * 0.4]$. 'The interpretation of the Fog Index is score ≥ 18 = unreadable text, 14 – 18 = difficult text, 12 – 14 = ideal, 10 – 12 = acceptable, and 8 – 10 = childish text' (Li, 2008).
%_ComplexWords	Complex words	$[(\text{Number of complex words in the annual report} / \text{total number of words in the same report}) * 100]$. Complex words are words with three or more syllables.
%_ComplexityWords	Complexity words	The count of words listed in Appendix C that were retained based on the model selection process off Loughran and McDonald (2024), divided by the total number of words appearing in the Form report x100.
firm_size	Firm size	The natural logarithm of a firm's total assets.
firm_age	Firm age	(date of 02/07/relevant year-end) less date of incorporation).
earn_vol	Earnings volatility	The standard deviation of the annual earnings (operating earnings after depreciation) of the five years before the analysis.
price_vol	Price volatility	A stock's average annual price increases or decreases from the mean price for each year. For example, a stock price volatility of 20% indicates that the stock's annual high and low price has shown a historical variation of +20% to –20% from its annual average price.
bus_comp	Business complexity	Natural logarithm of the number of business segments.
geo_comp	Geographical complexity	The natural logarithm of the number of geographical segments.
earn	Earnings	The operating income after depreciation scaled by total assets of the firm scale the firm.
year_ifrs	IFRS adoption	Equal to one for an IFRS adoption year and zero otherwise.
US_listing	US listing	Variable equals one if the firm is listed in a US security market and zero otherwise.
time1	Time 1	The variable increases with the year, with an additional value of 1 for each year.
time2	Time 2	Takes the value of zero for pre-IFRS adoption years with an additional value of 1 for every post-IFRS adoption year.
Industry	Industry	Industry Classification Benchmark

APPENDIX B TEXT EXTRACTION PROCESS

Step 1: Convert the PDF files to text files using the 'pdf-to-text' textual analysis program.
Step 2: Exclude text files with less than 2,000 words.
Step 3: Parse the text by removing text encodings and full stops between two numbers.
Step 4: Input each file into the Lingua EN Fathom Perl readability module.

FIGURE B1

PDF TO TEXT FILE CONVERSION PDF TO TEXT FILE CONVERSION



This figure shows the pdf to text file conversion of British American Tobacco's 2006 annual report. Pdftotext converts Portable Document Format (PDF) files to plain text. Pdftotext reads the PDF file, PDF-file, and writes a text file, text-file" (pdftotext command line manual).

APPENDIX C
LOUGHRAN AND MCDONALD (2024) COMPLEXITY WORD LIST

ACCUES AFFILIATES BANKRUPTCIES CARRYBACK CARRYFORWARD
CARRYFORWARDS COLLATERAL COLLATERIZATION COMPLEX CONVERTIBLE
COUNTERPARTIES COUNTERPARTY COVENANT COVENANTS DERIVATIVE
DERIVATIVES ENTITIES FLOATING GLOBAL HEDGED HEDGES INFRINGEMENT
INTANGIBLES INTERNATIONAL LAWSUIT LAWSUITS LEASEHOLD LEASES LESSORS
LICENSING LITIGATION MERGERS MERGING OUTSOURCE PARTNERING
RECLASSIFIED REPATRIATE REPATRIATED REPATRIATION RESTRUCTURE
RESTRUCTURED RESTRUCTURING REVALUATION REVOCATION SECURITIZATIONS
SECURITIZED SEGMENTS SOVEREIGN SUBLEASES SUBSIDY SWAPS VENTURES
WORLDWIDE
