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Institutionally endorsed reputation for CSR leadership and the textual characteristics of CEO letters in CSR reports

Abstract

Purpose – This study examines the readability and disclosure length of CEO letters in the CSR reports of the US firms included in the North America DJSI Eligible Universe.

Design/methodology/approach – Data analysis is based on regression models.

Findings – Firms with reputation for CSR leadership (those in the Dow Jones Sustainability Index [DJSI firms]) present larger CEO letters, but within these firms those with lower financial performance stand out for presenting even lengthier narratives. Only firms with reputation for leadership in CSR enjoying high financial performance present more readable CEO letters when compared to firms lacking such reputation.

Research limitations/implications – This study contributes to the literature by proposing a multi-signal approach to the study of CSR reporting and emphasizing the importance of looking at institutional endorsements of CSR performance and financial performance in an interconnected manner.

Practical implications – This study can help managers and organizations become aware of the various forces that could drive the need for CSR communication and help them to be responsive to stakeholder audiences by communicating information about the organization's socially responsible strategies and activities.

Social implications – This study's theoretical argument and findings suggests the corporate stakeholders and policy makers should examine differently CSR reports from firms with and without institutionally endorsed CSR performance while also considering their levels of financial performance.

Key words: Corporate social responsibility; Readability; Legitimacy theory; Signaling theory.

1. Introduction

A common feature that financial reports and corporate social responsibility (CSR) reports share is the CEO letter (Barkemeyer et al., 2014). As argued by Aerts and Yan (2017, p. 406), because it is a "personalized and signed" document, the CEO letter is considered to represent the top management's view of the most relevant events and results and to provide both a depiction of these and relevant insights to assess them.

Although intended for a different audience and focused on different aspects, CEO letters in CSR reports serve a similar purpose to those in financial reports: offering a synthetic view of the company's performance (Barkemeyer et al., 2014). If CSR reports "constitute the company-stakeholder interface of a largely functioning (sustainability) performance evaluation mechanism", CSR performance is likely to determine the narratives in the CSR letters in these reports (, p. 244).

As Smeuninx et al. (2020, p. 64), we consider CEO letters as "a separate subgenre" compared to the CSR report proper, given that "they address the reader directly through an idiosyncratic rhetoric". These researchers analyzed separately the CEO letters and the rest of the CSR reports and found that the former documents seem to be more widely read and present different textual characteristics than the reports proper, being more accessible to the reader. In addition, they seem to be highly valued.

Regarding CEO letters importance as means of communication of firms sustainability efforts, Arvidsson (2023) notes the recent growth in the engagement of CEOs in such communication. This researcher offers as an example of the growing attention to what CEOs write regarding sustainability in such letters the appearance of Larry Fink's 2020 BlackRock CEO letter on The New York Times's front page. She also refers to the important role that CEOs have been found to play in articulating the sustainability

vision of their firms and in the clarification of questions pertaining to it. Arvidsson (2023, p. 28) argues that this is a testimony of the importance of CEO letters and emphasizes their importance as a source of information regarding "corporate visions, operations and performance" to be used by investors and financial analysts.

In view of the above, we have decided to study only the CEO letters in CSR reports. Although there are other studies that examined CEO letters in CSR reports (e.g., Fuller, 2018; Liu and Liu, 2023), as far as we are aware, only two studies have focused on the readability of such documents (Barkemeyer et al., 2014; Smeuninx et al., 2020). Other studies have examined the readability and to a lesser degree the disclosure length[1] of CSR information included in financial annual reports (Bakar and Ameer, 2011; Ben-Amar and Belgacem, 2018) and the readability of CSR reports (Clarkson et al., 2020; Du and Yu, 2021; Harjoto et al., 2020; Hoozé et al., 2019; Li et al., 2023; Mahmoudian et al., 2021; Muslu et al., 2019; Nazari et al., 2017; Wang et al., 2018). Most of these studies reveal that on average CSR information remains difficult to read and that readability is associated positively with financial or CSR performance. The studies that have also examined disclosure length (Ben-Amar and Belgacem, 2018; Clarkson et al., 2020; Mahmoudian et al., 2021; Nazari et al., 2017) provide evidence that it is positively associated with CSR performance.

In this paper, we advance an explanation based on signaling theory (Connelly et al., 2011; Spence, 1973, 2002). We put forward that CSR narratives may be thought of as a signaling device, but that the way in which they are used must be examined considering the existence of other signals, namely institutional endorsements of CSR performance, such as belonging to the Dow Jones Sustainability Index (DJSI), and indicators

[1] We use the term "length" (e.g. disclosure length or document length) to refer to the number of words in the CEO letter. However, this is not a consensual terminology. For example, whereas Clarkson et al. (2020) used "disclosure length" to refer to number of words and sentences, Mahmoudian et al. (2021) use the term "disclosure volume".

of financial performance. To our knowledge, this is the first study taking this multi-signal approach to CSR reporting.

Hummel and Schlick (2016, p. 456) argue that the notion that good CSR performers disclose information to enhance its market value, which signaling theory shares with voluntary disclosure theory, and the legitimacy theory's prediction that poor CSR performers are incentivized to disclose to obscure their poor performance may be two sides of the same coin. Their reasoning is that poor CSR performers disclose low-quality information to manipulate stakeholders' perceptions regarding their performance, while good CSR performers disclose high-quality information as a way of signaling to the market their better performance. We accept this reasoning, acknowledging that there may be an "opportunistic disclosure motive" at play (Du and Yu, 2021, p. 257) and discuss it through the lens of legitimacy theory.

Given that CSR is strongly associated with important intangible resources that affect financial performance (Lee and Maxfield, 2015; Lourenço et al., 2014), presenting a reputation of superior CSR performance acts as a signal of possessing the resources required to obtain enhanced financial performance in the future. CSR engagement signals the unobserved characteristics of a company, such as better superior resources and capabilities (Su et al., 2016).

CSR reports' narratives can be used to influence firms' investors to have a more optimistic view of their future financial performance, but the examination of the way in which such narratives are used must consider other (possibly more effective) signals of reputation for CSR performance as well as signals of financial performance. We argue that firms with institutionally endorsed reputation for leadership in CSR (those in the DJSI [DJSI firms]) are more likely to offer lengthier and more readable CEO letters compared to firms without such endorsement (those not belonging to the Dow Jones

Sustainability Index [Non-DJSI firms]). These are our baseline hypotheses. However, we also put forward that financial performance is likely to have a moderator role in these relationships, thus offering novel insights into the literature. We put forward that the narratives offered by firms with institutionally endorsed reputation for CSR leadership but having poorer financial performance, compared to those with similar endorsement but better financial performance, are lengthier and less readable. We suggest that this occurs not because of any intention of being less transparent, but because they offer stakeholders a more contextualized and complex account of firms' CSR and its interaction with financial performance. We also acknowledge the possibility that the institutional endorsement of reputation for CSR leadership may act as a deterrent to information distortion intentions.

Findings suggest that DJSI firms present CEO letters that are lengthier. However, it seems that only high-profit DJSI firms present more readable CEO letters when compared to firms not belonging to the DJSI. This is possibly related to the need of firms with lower profitability to offer more detailed and complex explanations, namely regarding the relation between CSR investments and profitability. Findings also indicate that high-profit DJSI firms present CEO letters with higher length, but not as high as the DJSI firms with a lower level of profitability, when compared to firms not belonging to the DJSI.

This study contributes to the literature in the following ways. Existing research on the textual characteristics of CSR reports generally focuses on the relationship between readability and financial performance (Bakar and Ameer, 2011; Smeuninx et al., 2020) or CSR performance (Clarkson et al., 2020; Mahmoudian et al., 2021; Nazari et al., 2017; Wang et al., 2018). We extend this literature by examining the impacts of the reputation for leadership in CSR performance and the interactions between such reputa-

tion and financial performance on the readability and length of CSR narratives. By having as main variable of interest the institutional endorsement of superior CSR performance and using a lens of analysis based on signaling theory, we add to the literature by examining how CSR narratives are used as one of several signals offered by firms regarding both their CSR performance and their financial performance. In this way, we also add to the literature applying signaling theory to examine CSR information (e.g., Bakar and Ameer, 2011; Friske et al., 2023; Lys et al., 2015; Manzi et al., 2024), which, as far as we know, has not explored the influence of other CSR-related signals (such as possessing CSR-related certifications or belonging to sustainability indices) on the disclosure of such information. By offering a legitimacy theory-based interpretation of our findings, we also offer some insights to this theory, namely by discussing the effect of institutional endorsements of CSR reputation on the use of CSR narratives as legitimacy building instruments. As far as we are aware, this is the first study hinting at the importance of the examination of both instruments.

2. CSR narratives' readability and length

We find it important to distinguish between readability and length of a document (Mahmoudian et al., 2021). Whereas the former concerns how complex its language is and the levels of difficulty readers experience in reading it, the latter pertains to "the length or size of a text in terms of either total number of words or total number of sentences" (p. 343). While Ben-Amar and Belgacem (2018) equate higher levels of disclosure length with lower readability, Nazari et al. (2017, p. 169) consider it as an indicator of "disclosure transparency and informativeness". Although disclosure length may dissuade the careful reading of text because of its number of words and sentences, it should not be roundly equated with lower readability (Mahmoudian et al., 2021). Several exist-

ing studies associate length of disclosure with higher levels of information (Clarkson et al., 2020; Du & Yu, 2021; Muslu et al., 2019; Nazari et al., 2017). As argued by Bonsall IV et al. (2017, p. 333), "quantity-based readability measures", such as document length and file size, "are based on the notion of overwriting" and have "the potential down-side" of potentially capturing "constructs other than readability".

We also consider it important to distinguish the length of the sentences from the disclosure length of the document. The latter concerns the entire document and not the individual sentences. It is possible to have a document with the same number of total words and very different readability levels because one uses shorter sentences and the other has fewer and longer sentences.

Clarkson et al. (2020) acknowledge that existing studies' research findings suggest that increased levels of disclosure length may be tantamount to increased levels of information disclosed. Their own findings suggest that firms with good CSR performance do use more words and sentences in presenting their CSR engagement. But they also reveal a negative association between CSR performance and readability. Seeking to explain their findings (which are partially inconsistent with those reported elsewhere in the literature), Clarkson et al. (2020) advance the idea that the CSR narratives of good CSR performers offer analyses which are more sophisticated but lack in accessibility to analysts and the layperson. Departing from this observation, we suggest an explanation based on signaling theory, although acknowledging that there may be an "opportunistic disclosure motive" at play (Du & Yu, 2021, p. 257) and discussing it through the lens of legitimacy theory.

We acknowledge that the readability and the length of a text are interdependent characteristics of a text and that poor readability and increased length of a text can be motivated by the intention of obscuring the information disclosed. Notwithstanding,

based on the literature discussed above, we consider that document length should not be roundly equated with lower readability, and we analyze readability and document length as different characteristics of the text that should be interpreted differently. We suggest that CEO letters in CSR reports that are less readable and present a higher disclosure length may not be an expression of lower levels of transparency. Less readable accounts may be necessary to offer stakeholders a more contextualized and complex account of firms' CSR and its interaction with financial performance. We consider that this consideration of financial performance could add to Clarkson et al.'s (2020) analysis and explain why they found less readable accounts by good CSR performers and the conflicting results obtained by existing studies.

3. Theory and hypotheses

3.1. Signaling theory and CSR

Signaling theory can be traced back to works in the field of economics by Michael Spence (Spence, 1973, 2002). Signaling may be defined as referring to actions by one party designed to show the possession of certain characteristics that cannot otherwise be observed by external parties (Montiel et al., 2012). This difference in knowledge regarding relevant characteristics by one party over other(s) in a market context has been called asymmetry of information (Akerlof, 1970).

This concept of information asymmetry is one of the core concepts in signaling theory. Connelly et al. (2011) emphasizes this theory's usefulness to describe the behaviors of parties who have different access to information. Considering a firm (and its managers) as the signaler, and its stakeholders as the receivers, the firm signals to its stakeholders to reduce information asymmetry. Connelly et al. (2011) emphasize that

this theory's primary focus is on the purposeful communication of information conveying the positive attributes of an organization.

Two crucial aspects in the evaluation of the effectiveness of signals are their observability and costliness (Connelly et al., 2011; Manzi et al., 2024). The first refers to the facility with which outsiders can take notice of the signal, whilst the second has to do with divergences in the capacity of absorbing the costs of signaling by different signalers (Connelly et al., 2011). Regarding costliness, some researchers note that whilst costly signals can be sent only by high-quality firms, less costly ones can be sent by these firms but also by low-quality ones (Montiel et al., 2012; Di Pietro et al., 2023).

Manzi et al. (2024) put forward that CSR reporting serves as an observable and costly signal that is also relevant for investors. As these researchers argue, not only CSR reports are usually publicly available, but the analyses conducted on them by rating organizations are becoming more and more influential. They also note the costliness of such reporting using sustainability reporting standards and frameworks that act as deterrents for misleading signals and mandate the measurement and subsequent verification of sustainability-related impacts.

Acknowledging that the value of engaging with CSR for a firm is in signalling its good prospects to outsiders, Epure (2022) argues that CSR listing can be tantamount to an efficacious signal as it possesses the two characteristics mentioned above. Referring to the case of such a signal coming from an external evaluator, which also acts as gatekeeper of the assessment, this researcher emphasizes the importance of such costliness and of the difficulty of imitation, for which the existence of strict requirements to obtain and maintain a CSR listing is crucial. This researcher also calls attention to the importance of the gatekeeper, who can also play the role of information disseminator. In their study on sustainability labels for mutual funds, Brito-Ramos et al. (2024, p. 1383),

argue that government and nonprofit organizations' issued labels amount to signals that are regarded as "more credible and trustworthy" compared to self-declared ones and that costly signals seem to be useful in distinguishing between high-quality and low-quality funds.

Signaling theory has been used in many studies on CSR-related issues, ranging from CSR expenditures (Lys et al., 2015) to sustainable finance (Brito-Ramos et al., 2024). There is now a wealth of studies both on CSR reporting (e.g., Friske et al., 2023; Lys et al., 2015; Manzi et al., 2024; Yu et al., 2017) and CSR reports assurance (e.g., Baier et al., 2022; Clarkson et al., 2019) grounded on signaling theory. It has also been used in the study of CSR reports' textual characteristics (Bakar and Ameer, 2011). The application of this theory to CSR reporting focuses on the importance of disclosing CSR information to investors and other stakeholders in a setting of information asymmetry if a firm wishes to reap the rewards of its engagement with CSR (Lourenço et al., 2014). The application of this approach to the issue of readability can be succinctly described as follows: in situations characterized by information asymmetry, good performers will endeavor to encounter ways to signal their performance's better quality including that of disclosing clearer information (Bakar and Ameer, 2011).

An issue that, as far as we are aware, has not been examined is the use by firms of different CSR-related signals m. We propose to do that in this study. We add to the literature applying signaling theory to CSR-related issues, particularly the literature on CSR reporting, by considering in an articulated manner how the existence of a powerful signal such as the institutional endorsement of reputation for CSR leadership impacts the use of CSR reporting as a signaling instrument, while also considering the moderating role of financial performance. To our knowledge, this is the first study taking such a multi-signal approach to CSR issues. Manzi et al. (2024) also take a multi-signal ap-

proach to explain the early adoption of sustainability reporting, but the other signals are not CSR-related.

3.2. The role of opportunistic motives

In their interesting attempt at reconciling legitimacy theory and voluntary disclosure theory by redirecting the focus from reporting quantity to reporting quality, Hummel and Schlick (2016) rewrite the most common legitimacy theory's prediction that the worst performing firms use CSR reporting as a legitimation strategy to influence stakeholders' perceptions of their CSR performance. They present it as: worst performing firms tend to disclose lower-quality information (characterized by opacity, incompleteness and superficiality) with a view to obscuring their poor performance whilst at the same time simultaneously aiming at legitimacy maintenance. These researchers argue that both theories are not mutually exclusive. Voluntary disclosure theory would apply mainly to good-quality disclosure, transparent enough to be simultaneously comparable to that of other companies and reliable. Good performers offer good-quality information, whilst their counterparts prefer poor-quality information, avoiding transparency in the attempt to protect their image. Although basing our theoretical framework on signaling theory, we take the view that, when examining the textual characteristics of CSR narratives, Hummel and Schlick's theoretical approach is a good one to take. Hence, we will also offer some hints at how our hypotheses could be framed based on legitimacy theory.

As emphasized by Du and Yu (2021, p. 257), "the opportunistic disclosure motive is likely to play a role as well in CSR reporting", given that CSR reporting regulation, where it exists, is still in its infancy and it is not easy to verify information on CSR performance. This opportunistic disclosure motive is often associated with legitimacy

theory and/or impression management (e.g., Barkemeyer et al., 2014; Nazari et al., 2017; Ben-Amar and Belgacem, 2018).

Several studies use legitimacy theory and provide evidence of the use of CSR communication for the purposes of greenwashing and impression management (e.g., Barkemeyer et al., 2014; Cho et al., 2010). Based on Suchman's (1995, p. 574) definition of legitimacy as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions", Barkemeyer et al. (2014, p. 245) puts forward the need for showing congruence between a firm's CSR activities and performance and society's expectation regarding them, and emphasizes the cruciality of CSR reporting for this endeavor to be successful.

Both Barkemeyer et al. (2014) and Wang et al. (2018) refer to the readability of CSR narratives as a tool that firms may use with the purpose of obscure or mask poorer CSR results. According to Wang et al. (2018, p. 67), companies with subpar CSR performance are likely to offer CSR reports with poor readability to sooth their stakeholders' reactions to such subpar performance.

But this opportunistic disclosure motive is constrained by mechanisms such as the DJSI. As argued by Du and Yu (2021, p. 257), besides firms' CSR reports, stakeholders' sources of information also include independent "third party information intermediaries" which can act as deterrents to managers intentions to distort information presented in CSR reports.

3.3. Hypotheses development

Doh et al. (2010) emphasize the concern of investors regarding firms' CSR performance and the importance of institutional endorsements as a mechanism of conveying information to them. These researchers view such endorsements as critical signaling mechanisms through which information on firms' CSR is conveyed to the market., and in CSR reporting to "signal their reputation to stakeholders". Robinson et al. (2011, p. 504) consider that applying for institutional endorsements of good corporate citizenship, such as the DJSI, could constitute "an effective way to signal sustainability leadership in a credible manner". They conclude from their findings that the benefits of being listed on the DJSI "far outweigh the considerable cost and effort involved in seeking this certification" (p. 501). Also grounded on signaling theory, Lourenço et al. (2014) examined how the market values DJSI listing, finding that it leads to higher valuation. We suggest that firms' CSR reporting strategies should be examined considering the existence or absence of such powerful signals.

If a firm does not have the underlying quality associated with a signal such as DJSI listing, it may be motivated to attempt false signaling by other means, such as CSR reporting. This is an important issue when one is analyzing different signals, such as we do in this study. We have two CSR-related signals, both costly, DJSI listing and CSR reporting, with one of them, the latter, lacking in terms of credibility and trustworthiness compared to the other (Epure, 2022; Brito-Ramos et al., 2024). We put forward that the way in which CSR narratives are construed by firms is arguably influenced by the existence of the other signal. A firm that enjoys such a strong signal (institutional endorsement of its CSR reputation) does not need to provide its stakeholders information that is as contextualized and complex regarding its CSR and its interaction with financial performance as firms that do not enjoy said signals.

As pointed out by a referee, in our argument the dependent variables not only reflect CRS reporting/communication strategies but are also CSR signals themselves. Also based on signaling theory, Manzi et al. (2024) apply a similar reasoning to a different setting. These researchers examined the impact of family ownership on the early adoption of sustainability reporting and the moderating role of two other signals: having the founder as CEO and employee degrowth. These researchers view family ownership and early adoption of sustainability reporting (in advance of regulatory enforcement) as two key signals of legitimacy and credibility. But they also acknowledge that the voluntary signal that early adoption of sustainability reporting represents may be emitted to gain legitimacy and the approval of stakeholders without reflecting real higher quality. They further argue that beyond a certain level of family ownership "given the strength of the signal of the family nature of the business", the need for additional signals, like the early adoption of sustainability reporting, no longer exists.

In this study, we depart from the idea that firms with institutionally endorsed reputation for leadership in CSR are viewed differently by agents in the market and use CSR reporting, including the CEO letters in CSR reports, as a way of reinforcing their reputation for leadership in a different way than those that do not enjoy such a reputation. They do this by offering longer (given that they are likely to have more and/or more complex CSR policies and practices in place) and more readable narratives about their CSR. Given that they enjoy a powerful signal of superior CSR performance they are also likely to offer more readable narratives given that they do not feel the need to offer contextualized and complex explanations of such performance.

From a legitimacy theory point of view, one can argue that non-DJSI firms' opportunistic disclosure motive is not constrained by such institutional endorsement and that this independent third-party information source that stakeholders have does not act

as a mechanism constraining managers' intentions to distort information. Companies with poor CSR performance may resort to harder to understand language and produce distorted narratives without such constraining mechanism.

In view of the above, we make the following baseline hypotheses:

H1a: There is a positive association between the reputation for leadership in CSR and the length of disclosure of the CEO letters in CSR reports.

H1b: There is a positive association between the reputation for leadership in CSR and the readability of the CEO letters in CSR reports.

Not only firms that engage in CSR and its reporting do so to signal to their stakeholders "the unobservable attributes that make the firm capable of filling institutional voids and considering society at large" (Su et al., 2016, p. 481), but they also increasingly do so to indicate prospects of future financial performance, as investors become increasingly aware of the relationship between good CSR performance and such performance. CSR and its reporting yield value for financial performance by providing information on how good a company's stakeholder management is (Lee and Maxfield, 2015). Existing literature provides evidence that investors do value CSR performance (Lo and Sheu, 2007), and that superior CSR performance provides long-term benefits (Lourenço et al., 2014). The CSR image of these firms is relevant to their target audiences who scrutinize them very carefully.

In view of the link between CSR performance and financial performance (Lee and Maxfield, 2015; Lys et al., 2015; Lourenço et al., 2014), we argue that within firms with institutionally endorsed reputation for CSR performance, firms enjoying lower levels of financial performance feel the need to offer more complex and nuanced ac-

counts, most likely offering more complex explanations of the relationship between the two types of performance and the relevance of their CSR performance to financial performance. These latter firms are likely to offer narratives presenting more disclosure length and lower readability levels. But it is also possible that firms with inferior financial performance will use CSR narratives to obscure such performance in the quest of protecting their legitimacy.

Hence, we posit that among firms with institutionally endorsed reputation for CSR leadership those presenting high profitability are likely to offer shorter and more readable narratives. That is, profitability exerts a negative moderating role concerning the relationship between institutional endorsement of CSR reputation and disclosure length and a positive one regarding the relationship of between institutional endorsement of CSR reputation and readability. For low profitability firms, the need to offer more detailed and complex explanations, namely regarding the relation between CSR investments and profitability may imply the provision of lengthier accounts and a substantial decrease in the readability of the narratives. From a legitimacy theory point of view, these firms presenting a poorer financial performance are likely to try to obscure their inferior performance by presenting less readable narratives.

In view of the above, we make the following hypotheses:

H2a: Financial performance negatively moderates the relationship between reputation for leadership in CSR and the disclosure length of the CEO letters in CSR reports.

H2b: Financial performance positively moderates the relationship between the reputation for leadership in CSR and the readability of CEO letters in CSR reports.

4. Research design

4.1. Sample and data

The empirical analysis relies on the US firms in the North America DJSI Eligible Universe, which includes the 600 largest firms from Canada and the United States of America in the S&P Global Market Index plus any existing index constituents whose free-float market capitalization is above US$ 500 million. We started by collecting from the Thompson Reuters Eikon Database the list of the 567 US firms that meet the criteria to be in the DJSI Eligible Universe in 2018. Since the present study assesses the impact of the institutionally endorsed superior reputation for leadership in CSR performance and financial performance on the length and readability of CEO statements in CSR reports, we focus our analysis on two groups of firms: firms that constantly have a superior reputation for CSR leadership (those included in the DJSI [DJSI firms] in an ongoing basis during the period under analysis), and firms that constantly do not have such reputation (those not included in the DJSI [Non-DJSI firms] in an ongoing basis during the period under analysis), thereby representing an ongoing lack of reputation for CSR leadership. Firms that are persistently included in the DJSI have a more substantial CSR performance than firms that are only occasionally included, the reason why the latest were excluded from the sample. Consequently, we selected a total of 458 firms composed of two groups of firms (Table 1, Panel A): a) 76 DJSI firms; and b) 382 Non-DJSI firms). We excluded 109 firms for not being constantly included (or not included) in the DJSI during the five-year period 2014-2018 or for not being included in the North America DJSI Eligible Universe during the five-year period 2014-2018. We limit the period of analysis to years 2014-2018, due to two major reasons: COVID-19 pandemic crisis and the Ukrainian war. The analysis performed to some CEO statements included in the CSR reports (e.g. from Abbott Laboratories) allowed us to conclude that from 2019 onwards many companies needed to develop huge sustainability efforts to contrib-

ute to the world's progress against the COVID-19 disease and also stepped up in a variety of ways in response to the crisis in Ukraine. Thus, to avoid that any potential COVID pandemic crisis and Ukrainian war effects reflected in the financial statements from 2019 onwards could influence the CEO letters. We also used a multi-year period of analysis to provide a more comprehensive and reliable understanding of corporate behavior. More specifically, since sustainability efforts often take time to materialize, a multi-year period of analysis helps: a) tracking the evolution of sustainability practices/disclosures, rather than just capturing a static snapshot that may not reflect deeper trends; b) distinguishing between companies that are genuinely committed to sustainability and those merely maintaining appearances without actual improvement; c) evaluating how companies respond to changing external conditions over time; d) linking the disclosure with actual performance and outcomes; e) and, finally, it allows a more meaningful comparison across companies and industries by revealing who is making incremental or transformative changes over time.

After identifying the set of 458 firms to be analyzed, we first collected the 2014 to 2018 CSR reports (or similar) available on the website of each of these firms, and then selected only those whose reports include a CEO letter (Table 1, Panel B). The final unbalanced sample (for some firms, the CSR report or/and the CEO letter was not available for each of the 5 years) comprises 1,046 firm-year observations, of which 296 (750) regard firms belonging (not belonging) to the DJSI. Table 1 (Panel C) presents the sample distribution across industries. The industrial sector is the most common (44% of the sample) and the smallest representation (with around 3%) is for the mining and construction industry. Both DJSI and Non-DJSI firms are found in almost all industries. In all industries, the number of Non-DJSI firms is greater than the number of DJSI firms.

For example, in the industrial sector 67% (309/461) of the firms do not belong to the DJSI, while the remaining firms (33% = 152/461) belong to such index.

We computed the readability measures based on the CEO letters collected from the CSR reports. The accounting and market data used to compute the other variables included in the empirical study were collected from the Thompson Reuters Eikon Database.

(insert Table 1 here)

4.2. Textual characteristics

For the empirical analysis we rely on two variables that aim to capture the firms' communication strategy: the variable FLESCH, which assesses the level of readability of the CEO letters presented in the CSR reports, measured by the Flesch Reading Ease index[2]; and the variable WORD, that assesses the length of disclosure of the CEO letters, measured by the Number of words of this document.

The Flesch Reading Ease index is "one of the oldest and still most widely used formula for computing readability (Smeuninx et al., 2020, p. 55). As emphasized by Bakar and Ameer (2011), because it is a widely used technique, it makes it easier to compare the findings of this study with those of existing studies. This index captures the syntactic complexity of narratives and defines the text's level of reading ease. The results of the Flesch Reading Ease index are interpreted as follows: 100-90 (very easy to

[2] The Flesch index is calculated according to the following equation: $FLESCH_i$ = *(206.835 – 1.015 x average sentence length) – (84.6 x average syllables per word).* There are other formulas to assess readability: the Flesch-Kincad Grade Level, the Coleman-Liau, the Automated Readability index, the Average, and the Simple Measure of Gobbledygook (SMOG). But all of them use a combination of textual variables to assess the readability of a text, such as English-based word and syllable count.

read); 90-80 (easy to read); 80-70 (fairly easy to read); 70-60 (plain English); 60-50 (fairly difficult to read); 50-30 (difficult to read); 30-0 (very difficult to read).

The Number of words in a document has also been used as a proxy for communication strategy (Ben-Amar and Belgacem, 2018; Clarkson et al., 2020; Mahmoudian et al., 2021; Nazari et al., 2017). The Number of words is interpreted here as an indicator of disclosure transparency and informativeness.

To increase the robustness of the results, we performed an additional analysis by using the Fog index to capture the level of readability of the CEO letters presented in the CSR reports. The Flesch index and the Fog index are the measures of readability that are common to most of the relevant studies we reviewed.

4.3. Models and variables

To analyze the association between the reputation for leadership in CSR and the length of disclosure and readability of the CEO letters in CSR reports (to test H1a and H1b), we estimated the following regression model:

$$TEXT_i = \beta_0 + \beta_1 DJSI_i + \beta_2 PROFIT_i + \beta_3 SIZE_i + \beta_4 LEV_i + \beta_5 GROWTH_i + \beta_6 PtoB_i + \beta_7 AGE_i + \beta_8 SEG_i + \beta_9 A_FOLLOW_i + \beta_{10} ENV_SENS_i + \varepsilon_I \quad (1)$$

To analyze the moderating role of financial performance in the association between the reputation for leadership in CSR and the readability and length of disclosure of the CEO letters (to test H2a and H2b), we estimated the following regression model:

$$TEXT_i = \beta 0 + \beta_1 DJSI_I + \beta_2 PROFITt_i + \beta_3 DJSI_i \, x \, PROFITt_i + \beta_4 SIZE_i + \beta_5 LEVi + \beta_6 GROWTH_i + \beta_7 PtoB_i + \beta_8 AGE_i + \beta_9 SEG_i + \beta_{10} A_FOLLOW_i + \beta_{11} ENV_SENS_i + e_i \quad (2)$$

The variables are defined in Appendix 1. The dependent variable used in both models, TEXT, represents each of the following CEO letters' textual characteristics:

FLESCH: Flesch Reading Ease index.

WORD: Number of words.

The main independent variables are as follows:

DJSI: a binary variable that assumes 1 if the firm is included in the DJSI every year during the five-year period 2014–2018, and 0 otherwise.

PROFIT: the financial performance assessed by two proxies: a continuous variable (PROFIT_C) measured as the net income divided by total assets (Lundholm et al., 2014), and a dummy variable (PROFIT_D) that assumes 1 if the firm's profitability (PROFIT_C) is higher than the median, and 0 otherwise.

The control variables are as follows:

SIZE: the natural logarithm of total assets. Larger firms present better information environments, potentially more complex operations, and greater investment counseling (Lehavy et al., 2011). Additionally, larger firms are more publicly visible and therefore more easily scrutinized by stakeholders such as financial analysts (Lehavy et al., 2011). Since size captures the complexity of a firm's operating and business environment, we expect larger firms to have longer and less readable disclosures (Li, 2008).

LEV: the ratio of total liabilities divided by total assets (Lundholm et al., 2014). Leverage reflects the firm's dependency on debtholders, which can influence firm information disclosure behavior. Consistent with Lim et al. (2018), we expect that leveraged firms present longer and less readable disclosures.

GROWTH: the mean of sales growth in the last five years. This variable was included because fast-growing firms might have more complicated issues that need to be discussed in their narrative disclosures (Wang et al., 2018; Lundholm et al., 2014). Thus, we expect that fast-growing firms present less readable and longer disclosures (Lim et al., 2018).

PtoB: the price to book ratio. Firms with higher levels of price to book ratio are different from those with lower levels in many aspects, including the investment horizons and potential growth. Growth firms may have more complex and uncertain business models, and consequently disclose more complex information. Price to book ratio is therefore a potential determinant of disclosure narratives' readability and disclosure length (Lundholm et al., 2014). Therefore, we expect that these firms present longer and less readable disclosures (Li, 2008).

AGE: the natural logarithm of the number of years the firm has been in operation since its inception. Older firms may exhibit different levels of narrative disclosure readability because there is less information asymmetry and less information uncertainty for these firms. If investors are more familiar with and have more precise information about the business models of older firms, then the narrative disclosures of older firms should be shorter, simpler and more readable (Lundholm et al., 2014).

SEG: the number of segments the firm has. It is used as a proxy for business operation complexity. Business complexity has been found to be positively associated with the

readability of CSR reports (Wang et al., 2018). Ben-Amar and Belgacem (2018) found the number of segments to be positively associated with disclosure length.

A_FOLLOW: the number of analysts providing earnings per share estimates for the next financial year (Muslu et al., 2019). Analysts likely follow successful firms (Schipper, 1991) and less readable reports are associated with greater dispersion, lower accuracy, and uncertainty in analyst earnings estimates (Lehavy et al., 2011). Additionally, Boone et al. (2022) found evidence that firms with lengthier disclosures are associated with greater analyst following. Consequently, we expect that analyst following to be positively associated with readability and disclosure length.

ENV_SENS: an indicator that assumes 1 if the firm belongs to an industry with higher risk regarding environmental impact (mining, oil and gas, chemicals, construction and building materials, forestry and paper, steel and other metals, electricity, gas distribution, or water), and 0 otherwise (Mahmoudian et al., 2021).[3] Although Mahmoudian et al. (2021) have not presented any expectation regarding the signal of the relationship between their control variable and the readability and volume of CSR disclosure, we expect a positive association between this variable and disclosure length, in view of the need for the disclosure of more detailed information concerning the risk mentioned above and the policies in place to mitigate it.

Our econometric models consider that independent variables are contemporaneous in relation to the dependent variable. Consistent with Barkemeyer et al. (2014), we support our view on the fact that since CSR reports function as a firm-stakeholder interface crucial to assess firm's sustainability performance, the current levels of firm's sustainability performance will determine the content and the rhetoric used in the CEO

[3] Brammer and Millington (2005) suggest the control of social sensitive industry as those operating in an industry with significant social externalities (such as alcoholic, beverage, tobacco, defense, and pharmaceutical). However, since in our sample has a very low number of observations in these industries, we decided not to include this control variable in our analysis.

letters to communicate with stakeholders. Models (1) and (2) were estimated for the entire sample and with industry (consistent with SIC codes classification) and year-fixed effects.

We expect that, in models (1) and (2), the coefficient of the variable DJSI is positive and statistically significant considering both WORD and FLESCH as dependent variables, which means that reputation for leadership in CSR is positively associated with both length and readability of the CEO letters in CSR reports.

Additionally, we expect that, in model (2), the coefficient of the interaction term of DJSI and PROFIT is statistically significant and negative (positive), when considering the variable WORD (FLESCH) as dependent variable, which means that the positive association between reputation for leadership in CSR and the disclosure length (readability) of the CEO letters in CSR reports is lower (higher) for firms with higher financial performance.

5. Findings

5.1. Descriptive statistics

Table 2 reports the descriptive statistics for the entire sample as well as for the two sub-samples of 296 DJSI firms and 750 Non-DJSI firms. The readability levels provided by FLESCH – Table 2 (All firms) – shows that readability varies from "plain English"/ "acceptable" (FLESCH maximum value = 72.260) to "very difficult to read"/ "unreadable" (FLESCH minimum value = 1.004). The mean value of FLESCH is 33.962, which indicates that CEO letters in CSR reports are "difficult to read". Table 2

(All firms) also shows that the number of words of the CEO letters (WORD) varies between 19 and 1,827, with a mean of 536 words per CEO letter.

(Insert Table 2 here)

When comparing the two sub-groups of firms, the results for the equality of means parametric t-test show that the mean values of the textual variables FLESCH and WORD are significantly higher in the group of DJSI firms, which provides preliminary support for hypotheses H1a and H1b. The mean value of the moderating variable – PROFIT – is also significantly higher in the group of DJSI firms. Regarding the control variables, the results for the equality of means parametric t-test show that the mean values of the variables SIZE, AGE, and SEG (GROWTH and PtoB) are significantly higher (lower) in the group of DJSI firms.

5.2. Correlations

Table 3 shows Pearson and Spearman correlations for the continuous and categorical variables included in the regression model.

(Insert Table 3 here)

FLESCH and WORD are significantly related to most of the independent continuous variables. It seems that firms that are larger, more profitable, and more leveraged are more likely to communicate in a shorter (lower WORD) but more readable

way (higher FLESCH). Older firms and firms with a higher number of segments are also associated with a higher level of readability. Regarding the control variables, correlations are low, which indicates that multicollinearity problems are minimal. The variance inflation factors were also checked confirming previous findings (VIF < 10).

5.3. Regression results

Table 4 presents summary statistics resulting from the Ordinary Least Squares (OLS) estimation of Model 1 and Model 2 (Model 2a with PROFIT as a continuous variable and Model 2b with PROFIT as a binary variable) considering the entire sample. The models were run for the variables FLESCH and WORD[4, 5].

(Insert Table 4 here)

The findings regarding Model 1 show that the variable DJSI is positively and statistically associated with the variable WORD, which means that reputation for leadership in CSR (through inclusion in the DJSI) is positively associated with the length of disclosure of CEO letters in CSR reports and supports H1a.

The findings regarding Model 2 show that the variable DJSI (DJSI x PROFIT) is positively (negatively) associated with the variable WORD, which means that financial performance negatively moderates the relationship between reputation for leadership in CSR and the length of disclosure of CEO letters in CSR reports, also supporting H2a.

[4] As confirmed by histogram analysis and the Kolmogorov-Smirnov test (K-S=0.023; p-value>0.05), the variable FLESCH follows a normal distribution. However, based on similar analyses, the variable WORD does not (K-S=0.000; p-value<0.05). In this case, following Cooke (1998), we transformed the variable WORD to its normal score using the Bloom's transformation. We rerun our model with this new variable and findings remain unchanged.

[5] In the multivariate analysis standard errors are heteroskedasticity-adjusted and clustered at firm level.

The findings regarding Model 1 and Model 2 also show that the variable DJSI is not statistically associated, but the interaction term DJSI x PROFIT is positively and statistically associated, with the variable FLESCH, which means that only the combination of reputation for leadership in CSR (through inclusion in the DJSI) with higher financial performance is statistically, and positively, associated with the readability of CEO letters in CSR reports. Findings thus partially support H2a and H2b.

Additionally, to mitigate the effects of influential observations, we re-estimate the regression models of Table 4 excluding the observations having a value higher than four standard deviations from the mean.[6] The untabulated findings without the effects of outliers remained unchanged. We also re-estimate the regression models of Table 4 without industry fixed-effects. The untabulated findings remained unchanged. Finally, regarding issues of simultaneity, we believe that reverse causality is unlikely due to the following arguments: a) reputation for leadership in CSR is built over a long period of time and is a cumulative result of long-term strategic actions, rather than being influenced by short-term communication characteristics (Fombrun and Shanley, 1990); b) leadership reputation drives, rather than reacts to communication strategies. More specifically, companies with strong CSR leadership use communication strategies to reinforce their social responsibility agenda, shaping the style and substance of reports (Porter and Kramer, 2006); c) finally, CSR communication is proactive, not reactive, because companies known for leadership in CSR tend to engage in proactive communication to shape stakeholder perceptions (Clarkson et al., 2008).

[6] Both trimming and winsorization are used in econometrics to deal with the effect of outliers on statistical analysis. We choose to use trimming over winsorization for the following reasons: a) trimming is robust to outliers because it simply removes them without changing the values of the remaining observations (Wilcox, 2021); b) trimming retains the original values of non-outlying observations, providing a clear picture of the underlying distribution (Hampel, 1974); c) trimming may lead to more efficient parameter estimation in the presence of outliers compared to winsorization (Yohai, 1987).

To increase the robustness of our results, we split the sample into two sub-samples (firms with a high and firms with a low level of financial performance (PROF-IT), based in the median) and we then estimate Model 1 separately for each of these sub-samples. The results, presented in Table 5, are like those found with the entire sample.

(Insert Table 5 here)

Overall, our findings suggest that firms with institutionally endorsed reputation for leadership in CSR should be viewed as using the textual characteristics of CSR narratives differently from firms that do not enjoy such a reputation, and that financial performance plays a relevant role in how they use such characteristics. We show empirically that firms with institutionally endorsed reputation for leadership in CSR offer longer CEO letters in CSR reports, compared with firms lacking such reputation, but within the group of firms viewed as CSR leaders those with lower financial performance stand out for presenting even lengthier narratives. We also show that firms with institutionally endorsed reputation for leadership in CSR enjoying higher financial performance (and not those enjoying lower financial performance) offer more readable CEO letters in CSR reports, compared with firms lacking such reputation.

5.4. Additional analysis

To overcome the possibility of Flesch index overestimating the readability of CEO letters, we used another commonly used readability measure: the FOG index. Table 6 presents the results of Model 1 and Model 2 using the FOG index.

(insert table 6 here)

Prior research indicates that Fog index and the Flesch Reading Ease index are strong and significantly correlated (Nazari et al., 2017). Besides they are inversely related, because due to their scale of measure a high Flesch index means a high level of readability whereas as a high Fog index means a low level of readability. Consequently, to get comparable results with those in Table 4 we multiplied the Fog index by minus one. Table 6 shows that findings remain unchanged for an alternative measure of readability and are consistent with those presented in Table 4.

5.5. Overall discussion of the findings

The findings presented above are largely consistent with our expectations and with the lens of analysis proposed. The way in which CSR narratives are construed by firms is arguably influenced by the existence of other signals of CSR and financial performance. CSR reporting strategies should be examined considering the existence of these signals, particularly those that, as the institutional endorsement of the reputation for CSR leadership, are credible and costly. A firm that simultaneously enjoys two strong signals (CSR reputation and financial performance) does not need to provide its stakeholders information that is as contextualized and complex regarding its CSR and its interaction with financial performance as firms that do not enjoy said signals. Such a

firm is likely to have more to account for and offer more transparent and informative narratives (with greater disclosure length). It also does not have to offer the causal inferences and related explanations that a less profitable firm will feel the need to offer, which would lead to less readable narratives.

In terms of legitimacy theory, one could argue that the institutional endorsement of its reputation acts as a deterrent to any information distortion intentions. Inferior financial performance, for its part, seems to lead firms to obscure their underperformance with less readable narratives.

The findings reported in this paper and the multi-signal lens of analysis proposed may be useful to make sense of the mixed results reported in existing studies on the associations between textual characteristics of CSR narratives and CSR performance and financial performance. Whereas Clarkson et al. (2020) and Ben-Amar and Belgacem (2018) imply that good CSR performers offer less readable narratives, the findings of Nazari et al. (2017) and Wang et al. (2018) suggest the contrary. The findings of Clarkson et al. (2020) and Mahmoudian et al. (2021) also indicate that good CSR performers offer narratives with greater disclosure length. Bakar and Ameer's (2011) and Mahmoudian et al.'s (2020) findings suggest that financial performance is positively associated with readability, and Ben-Amar and Belgacem's (2018) results indicate that financial performance is positively associated with disclosure length. Our lens of analysis and findings suggest that to make some sense of the relationships between the textual characteristics under examination and CSR performance and financial performance, one should also consider the interconnection between other signals of CSR performance and CSR narratives as well as of the interconnection between CSR and financial performance.

6. Conclusion

This study suggests that looking only at financial performance or the reputation for leadership in CSR performance individually to examine corporate narrative disclosure strategies (in particular those involving CSR narratives' readability and length) is insufficient. One must also examine how the interactions between the two factors influence such characteristics of CSR narratives.

We adopted a lens of analysis based on signaling theory suggesting that CSR reporting strategies should be examined considering the existence or absence of other CSR-related signals, such as the institutional endorsement of the reputation for CSR leadership, and also considering the moderating role of financial performance. We consider this lens of analysis to be a novel and innovative application of signaling theory to the study of CSR reporting. Acknowledging that the same findings can also be interpreted through the lens of legitimacy theory, we point out that such an interpretation should also be conducted considering institutional endorsements of CSR reputation and CSR narratives as legitimacy building instruments that must be analyzed together. We consider this to be a novel insight regarding legitimacy theory.

Findings suggest that managers of firms with a strong signal of reputation for CSR leadership that simultaneously present a signal of relatively stronger financial performance have an incentive to offer CSR narratives without such detailed causal inferences and related explanations regarding the interconnection between CSR and financial performance when compared to their less profitable counterparts. They will offer CEO letters in CSR reports with lower disclosure length and higher level of readability. Good performers that possess institutional endorsement of their performance do seem to offer better-quality information, while their counterparts prefer low-quality information.

The study adds to the emerging literature on the textual characteristics of CSR information by investigating the conditions that motivate an organization to use such information as a way to signal its CSR performance and its financial performance, as well as the interconnection between them. In view of the inextricable connection between CSR and financial performance, CSR narratives can be examined as signaling devices or legitimacy-building instruments. However, the examination of how they are used in these manners must consider the existence of other probably stronger signals, such as institutional endorsements of CSR performance and indicators of financial performance.

Our study has some theoretical implications for both signaling theory and legitimacy theory. Concerning signaling theory, findings suggest that the existence of different signals for similar characteristics unobserved by third parties implies that their use for signaling purposes must be theorized and empirically studied considering in an articulated manner their simultaneous existence as well as the differences in their efficacy. They have similar implication for legitimacy theory by implying that the usage of CSR reporting for legitimacy purposes is likely to be influenced by the existence of independent third-party information intermediaries which can act as deterrents to managers intentions to distort information presented in CSR reports.

In terms of practical implications, this study can help managers and organizations become aware of the various forces that could drive the need for CSR communication and help them to be responsive to stakeholder audiences by communicating information about the organization's socially responsible strategies and activities. The study implies that it may be important for managers to consider the different signaling instruments at their hands and to use them in an articulated manner. In addition, the implication that CEO letters in CSR reports should not be considered in vacuum but in con-

junction with the overall CSR strategy of the company (including CSR listings such as the DJSI one) and financial performance may be of interest to policymakers. They would be well advised to consider such implication in their reporting standardization efforts.

This study presents several limitations. First, it focuses on a sample of firms from the US, being limited to English language reports. Further research could include the examination of the readability of CEO letters written in different languages and from diverse socio-cultural contexts. Second, it examines only the readability and disclosure length of CEO letters in CSR reports. Other textual characteristics of such narratives could be examined.

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Table 1 - Sample selection

Panel A: Firms selected for the analysis of the CEO letters	N. firms
US Firms included in the North America (NA) DJSI Eligible Universe in 2018	567
Firms excluded (firms not constantly included (or not included) in the DJSI during the five-year period 2014-2018 and firms not constantly included in the NA DJSI Eligible Universe during the five-year period 2014 and 2018)	-109
Firms selected:	458
DJSI firms: firms included in the DJSI in an ongoing basis between 2014 and 2018	*76*
Non-DJSI firms: firms excluded from the DJSI in an ongoing basis between 2014 and 2018	*382*

Panel B: Firm-year observations	2014	2015	2016	2017	2018	Total
Initial sample	458	458	458	458	458	2,290
Firm-year observations excluded (without a CSR report or a CEO letter)	-285	-268	-248	-235	-208	-1,244
Firm-year observations selected:	173	190	210	223	250	1,046
DJSI firms	*52*	*60*	*63*	*61*	*60*	*296*
Non-DJSI firms	*121*	*130*	*147*	*162*	*190*	*750*

Panel C: Sample distribution by industry	SIC code	DJSI firms		Non-DJSI firms		All firms	
		N	%	N	%	N	%
Mining and construction	SIC 1	0	0	27	4	27	3
Industrial	SIC 2 and 3	152	51	309	41	461	44
Utilities	SIC 4	47	16	126	17	173	17
Commercial	SIC 5	26	9	59	8	85	8
Financial	SIC 6	41	14	170	23	211	20
Services	SIC 7 and 8	30	10	59	8	89	9
	All	296	100	750	100	1,046	100

Table 2 – Descriptive statistics

Variable	Mean	Median	Std. Dev.	Min	Max
All firms (n = 1,046)					
FLESCH	33.962*	33.945	9.831	1.004	72.260
WORD	536.010*	468.000	294.933	19.000	1,827.0000
PROFIT	0.061*	0.051	0.066	-0.490	0.380
SIZE	16.956*	16.766	1.293	14.216	21.582
LEV	0.645	0.633	0.185	0.038	1.302
GROWTH	0.041*	0.038	0.085	-0.391	0.425
PtoB	3.626*	2.750	46.955	-1,100.000	540.010
AGE	3.450*	3.401	0.777	0.000	5.170
SEG	4.500*	4.000	2.320	1.000	10.000
A_FOLLOW	21.109*	20.000	7.593	2.000	50.000
ENV_SENS	0.254	0.000	0.436	0.000	1.000
DJSI firms (n =296)					
FLESCH	35.256	34.990	9.430	10.350	64.070
WORD	593.310	511.000	279.819	110.000	1,724.0000
PROFIT	0.071	0.061	0.069	-0.220	0.330
SIZE	17.234	17.173	1.220	14.512	21.444
LEV	0.654	0.629	0.181	0.245	1.151
GROWTH	0.022	0.024	0.090	-0.363	0.361
PtoB	-1.262	2.850	75.262	-1,100.000	245.700
AGE	3.550	3.466	0.886	0.000	5.112
SEG	5.050	5.000	2.315	1.000	10.000
A_FOLLOW	22.436	22.000	7.071	8.000	46.000
ENV_SENS	0.253	0.000	0.436	0.000	1.000
Non-DJSI firms (n = 750)					
FLESCH	33.451	33.540	9.945	1.004	72.260
WORD	513.390	447.500	297.848	19.000	1,827.0000
PROFIT	0.057	0.047	0.064	-0.490	0.380
SIZE	16.846	16.665	1.306	14.216	21.582
LEV	0.642	0.633	0.187	0.038	1.302
GROWTH	0.049	0.042	0.082	-0.391	0.425
PtoB	5.555	2.710	28.844	-136.970	540.010
AGE	3.410	3.367	0.726	0.000	5.170
SEG	4.280	4.000	2.287	1.000	10.000

A_FOLLOW	20.585	20.000	7.731	2.000	50.000
ENV_SENS	0.255	0.000	0.436	0.000	1.000

* The mean values of these variables are significantly different in the sub-group of DJSI firms, as compared to the sub-group of Non-DJSI firms (*FLESCH*: t-test = -2.682; *WORD*: t-test = -3.975; *ROA*: t-test = -2.986; *SIZE*: t-test = -4.413; *GROWTH*: t-test = 4.734; *PtoB*: t-test = 2.119; *AGE*: t-test = -2.640; *SEG*: t-test = -4.871).

Table 3 – Correlation matrix

	FLESCH	WORD	PROFIT	SIZE	LEV	GROWTH	PtoB	AGE	SEG	A_FOLLOW	DJSI
Panel A: Pearson correlations for continuous variables											
WORD	0.005	-		-	-	-	-	-			
PROFIT	0.113***	-0.087***	-	-	-	-	-	-			
SIZE	0.072**	-0.069**	-0.302***	-	-	-	-	-			
LEV	0.068**	-0.052*	-0.217***	0.428***	-	-	-	-			
GROWTH	0.005	-0.017	0.199***	-0.131***	-0.156***	-	-	-			
PtoB	-0.097***	-0.014	-0.033	0.026	-0.007	0.032	-	-			
AGE	0.074**	0.023	0.022	0.106***	0.080***	-0.109***	-0.030	-			
SEG	0.097***	0.022	-0.090***	0.251***	0.098***	-0.171***	0.028	0.096***			
A_FOLLOW	0.123***	0.022	0.194***	0.343***	-0.010	-0.016	0.013	0.053	0.039		
Panel B: Spearman correlations for categorical variables											
DJSI	0.083***	0.170***	0.080***	0.154***	0.021	-0.133***	0.044	0.080***	0.142***	0.119***	
ENV_SENS	-0.135***	0.149***	-0.175***	0.095***	-0.028	-0.203***	0.197***	0.007	0.203***	-0.063**	-0.001

Correlation significant at ***0.01 level (2-tailed); **0.05 level (2-tailed); *0.1 level (2-tailed).

Table 4 – Regression results (all firms)

		FLESCH			WORD		
	Pred. Sign	Model 1	Model 2a	Model 2b	Model 1	Model 2a	Model 2b
Intercept		23.494***	23.794***	25.301***	454.383***	447.192***	367.829**
DJSI	H1b+/H1a+	0.661	-1.065	-0.948	87.437***	128.760***	137.655***
PROFIT_C	+/-	13.210**	5.604	-	-434.606**	-252.574	-
DJSI x PROFIT_C	H2b+/H2a-	-	25.714***	-	-	-615.459**	-
PROFIT_D	+/-	-	-	0.193	-	-	5.480
DJSI x PROFIT_D	H2b+/H2a-	-	-	3.084**	-	-	-98.181**
SIZE	-/+	0.052	0.081	-0.010	7.531	6.809	10.927
LEV	-/+	1.795	1.691	1.750	-127.962**	-125.473**	-125.042**
GROWTH	-/+	-0.964	-1.607	0.449	156.722	172.112	106.237
PtoB	-/+	-0.022**	-0.020**	-0.022**	0.003	-0.040	-0.002
AGE	+/-	0.558	0.551	0.518	8.488	8,658	9.532
SEG	+/+	0.610***	0.596***	0.617***	-6.042	-5.697	-6.167
A_FOLLOW	+/+	0.103*	0.093*	0.111**	1.980	2.218	1.489
ENV_SENS	?/+	-2.192***	-2.141***	-2.201***	68.803**	67.581**	71.360**
SIC 1 - MINING & CONSTRUCTION	?/?	-1.771	-2.219	-2.697	-113.466**	-102.742*	-78.539
SIC 4 - UTILITIES	?/?	1.171	1.160	1.071	62.295*	62.568*	68.451**
SIC 5- COMMERCIAL	?/?	6.155***	6.180***	6.025***	-93.387***	-93.988***	-88.461***
SIC 6 - FINANCIAL	?/?	1.144	1.646	1.526	-23.670	-22.601	-12.828
SIC 7/8 - SERVICES	?/?	2.004*	1.982*	1.790	-93.539***	-93.034***	-84.878***

YEAR-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	9.85%	10.45%	9.97%	7.96%	8,35%	7.94%
F value	5.37***	5.57***	5.19***	5.53***	5.31***	5.17***
No observations	1,046	1,046	1,046	1,046	1,046	1,046

Significance levels: *** 0.01 (2-tailed); **0.05 (2-tailed); *0.1 (2-tailed). Standard errors are heteroskedasticity-adjusted and clustered at firm level. Predicted sign correspond to Flesch/Word, respectively.

Table 5 – Regression results (High *versus* Low profitability firms)

Panel A - Group comparison	Mean values		T test	
	High profitability firms (N=523)	Low profitability firms (N=523)		
FLESCH	34.684	33.240	2.381	**
WORD	523.591	548.428	-1.362	
PROFIT	0.106	0.016	30.258	***
SIZE	16.510	17.402	-11.880	***
LEV	0.601	0.690	-8.009	***
GROWTH	0.047	0.036	2.140	**
PtoB	4.517	2.736	.613	
AGE	3.487	3.413	1.544	
SEG	4.289	4.706	-2.916	***
A_FOLLOW	22.859	19.359	7.655	***

Panel B – Regression test	Pred. Sign	High profitability firms		Low profitability firms	
		FLESCH	WORD	FLESCH	WORD
Intercept		27.597***	439.189**	17.994**	518.733**
DJSI	H1b+/H1a+	2.016**	35.459***	-1.270	141.444***
PROFIT	+/-	9.178*	-322.318*	15.270**	-579.963
SIZE	-/+	-0.484	2.444	0.734	8.599
LEV	-/+	4.352*	-77.620	-2.377	-186.379*
GROWTH	-/+	-10.611*	68.223	5.155	252.351*
PtoB	-/+	-0.020**	-0.001	-0.196	-4.383**
AGE	+/-	0.867	8.197	0.185	6.884
SEG	+/+	0.404**	4.293	0.841***	-12.123**
A_FOLLOW	+/+	0.219***	1.851	0.034	1.728
ENV_SENS	?/+	-1.733*	125.957***	-1.835	64.890
SIC 1 - MINING/CONSTR	?/?	-3.445	-9.924	-2.540	-154.494**
SIC 4 - UTILITIES	?/?	2.095	194.064***	-0.383	29.832
SIC 5 - COMMERCIAL	?/?	6.047***	-44.007	4.921	-155.517**
SIC 6 - FINANCIAL	?/?	4.885**	-58.155	0.221	-24.298
SIC 7/8 - SERVICES	?/?	0.551	-68.362**	4.635***	-79.851*
YEAR-fixed effects		Yes	Yes	Yes	Yes
R^2		15.25%	11.79%	8.95%	9.92%
F value		4.24***	4.01***	3.05***	3.45***
No observations		523	523	523	523

Significance levels: *** 0.01 (2-tailed); **0.05 (2-tailed); *0.1 (2-tailed). Standard errors are heteroskedasticity-adjusted and clustered at firm level. Predicted sign correspond to Flesch/Word, respectively.

Table 6 – Regression results using FOG index (all firms)

	Pred. Sign	Model 1	Model 2	Model 3
Intercept		-17.697***	-17.639***	-17.490***
DJSI	H1b+	0.085	-0.247	-0.214
PROFIT_C	+	1.886**	0.423	-
DJSI x PROFIT_C	H2b+	-	4.947**	-
PROFIT_D	+	-	-	0.026
DJSI x PROFIT_D	H2b+	-	-	0.563**
SIZE	-	-0.076	-0.070	-0.080
LEV	-	0.595	0.575	0.594
GROWTH	-	-0.186	-0.310	-0.001
PtoB	-	-0.005**	-0.005**	-0.005**
AGE	+	0.110	0.108	0.102
SEG	+	0.117***	0.114***	0.118***
A_FOLLOW	+	0.031***	0.030**	0.032***
ENV_SENS	?	-0.387**	-0.377**	-0.382***
SIC 1 - MINING & CONSTRUCTION	?	-0.468	-0.555	-.598
SIC 4 - UTILITIES	?	0.033	0.031	0.025
SIC 5 - COMMERCIAL	?	0.728**	0.732**	0.704**
SIC 6 - FINANCIAL	?	0.160	0.152	0.143
SIC 7/8 - SERVICES	?	0.196	0.192	0.162
YEAR-fixed effects		Yes	Yes	Yes
R^2		6.56%	7.02%	6.77%
F value		3.78***	3.79***	3.60***
No observations		1,046	1,046	1,046

Significance levels: *** 0.01 (2-tailed); **0.05 (2-tailed); *0.1 (2-tailed). Standard errors are heteroskedasticity-adjusted and clustered at firm level. Predicted sign correspond to Flesch/Word, respectively.

Appendix 1 – Definition of variables

Dependent variables:
- $TEXT_i$:
  - Flesch:
  - WORD:
	
	Flesch Reading Ease Index
	Number of words

Independent variables:
- DJSI:
 	
- PROFIT:
  - PROFIT_C:
 	
  - PROFIT_D:
	
	Dummy variable that equals "1" if the firm is included in the DJSI every year during the five-year period 2014-2018, and "0" otherwise.
	
	Financial performance assessed by a continuous variable measured as the net income divided by total assets
	Financial performance assessed by a dummy variable that assumes "1" if the firm's profitability (PROFIT_C) is higher that the median, and "0" otherwise.

Control variables: - SIZE: - LEV: - GROWTH: - PtoB: - AGE: - SEG: - A_FOLLOW: - ENV_SENS:	 Natural logarithm of total assets. Ratio of total liabilities divided by total assets. The mean of sales growth in the last five years. Price-to-book ratio. Natural logarithm of the number of years the firm has been in operation since its inception. Number of segments the firm has. Number of analysts providing earnings-per-share estimates for the next financial year. Dummy variable that assumes "1" if the firm belongs to an industry with higher risk regarding environmental impact (mining, oil and gas, chemicals, construction and buiding materials, forestry, electricity, gas distribution or water) and "0" otherwise.