Ingunn Margrete Holden Helland
Tone Overvik

Sustainability Disclosure Unmasked: The Relationship Between ESG Performance and Disclosure Quality

An Empirical Study of Swedish Listed Firms

Master's thesis

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Norwegian University of
Science and Technology

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Abstract

This study investigates the relationship between ESG performance and sustainability disclosure quality in Swedish listed firms. Drawing on signaling theory and legitimacy theory; we employ a textual analysis approach to measure sustainability disclosure quality in annual reports. We calculate different textual features (transparency, complexity, readability, and balance) across 773 annual reports issued between 2013 and 2021. The association between the disclosure measures and ESG performance are then examined using 25 ordinary least square regression models. Our findings demonstrate a positive relationship between the extent of information disclosed and ESG performance, indicating that better performers aim for transparency in accordance with signaling theory. However, we also find a trade-off, as higher disclosure levels are associated with increased complexity and readability in sustainability disclosures. This highlights the need for firms to balance transparency and simplicity in their sustainability reporting. Our research contributes to the literature by providing a more comprehensive analysis of disclosure quality, incorporating textual features, and expanding the number of observations and industries studied. These findings provide valuable insights for investors, regulators, and standard setters in sustainability reporting, emphasizing the importance of accurate and transparent non-financial disclosures in assessing ESG performance.

Sammendrag

Denne studien undersøker forholdet mellom ESG-ytelse og kvaliteten på ikke-finansiell informasjon (bærekraftsrapportering) hos svenske børsnoterte selskaper. Ved å ta utgangspunkt i signalteori og legitimitetsteori, benytter vi tekstanalyse for å måle kvaliteten på ikke-finansiell informasjon (bærekraftsrapportering) i årsrapporter. Vi beregner ulike tekstlige egenskaper (transparens, kompleksitet, lesbarhet og balanse) for 773 årsrapporter utstedt mellom 2013 og 2021. Deretter undersøkes sammenhengen mellom rapporteringskvalitet og ESG-ytelse ved hjelp av 25 ordinære minste kvadraters regresjonsmodeller. Våre funn viser en positiv sammenheng mellom omfanget av informasjon som blir rapportert og ESG-ytelse, noe som tyder på at selskaper med bedre ytelse streber etter åpenhet i samsvar med signalteori. Imidlertid finner vi også en avveining, da høyere nivåer av rapportering er assosiert med økt kompleksitet og lav leservennlighet i bærekraftrapportene. Dette understreker behovet for at selskaper balanserer åpenhet og enkelhet i sin bærekraftsrapportering. Vår forskning bidrar til litteraturen ved å gi en mer omfattende analyse av kvaliteten på rapporteringen, ved å inkludere tekstlige egenskaper, utvide antallet observasjoner og antallet bransjer som inngår i studien. Disse funnene gir verdifull innsikt for investorer, reguleringsmyndigheter og standardsettere innen bærekraftsrapportering, og understreker viktigheten av nøyaktig og transparent ikke-finansiell rapportering i vurderingen av ESG-ytelse.

Preface

This master's thesis concludes our master's study in Accounting and Auditing (MRR) at NTNU School of Economics. The thesis is written in joint effort during the spring semester 2023 and amounts to 30 credit points. We thank our supervisors, Associate Professors Anders Berg Olsen and Seyed Mahmoud Hosseinniakani, for their valuable guidance and constructive feedback throughout the thesis. We would also like to thank former MRR student Ole Kristian Reum for taking the time to answer our questions regarding textual analysis and Associate Professor Ranik Raaen Wahlstrøm for aiding in preprocessing our data for the textual analysis.

The content of this thesis reflects the author's personal views and is not necessarily endorsed by NTNU. The content in this thesis is at the expense of the authors.

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Ingunn Margrete Holden Helland

Tone Overvik

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1.0 Introduction

There has been a massive development in sustainability reporting[1] over the last decades, for instance, per 2022, Sweden has a reporting rate of 98% (KPMG, 2022). This is an increase of 19% compared to Sweden's reporting rate in 2013 (KPMG, 2013). Simultaneously and consequently, several research papers have been issued regarding the quality of sustainability reports, especially regarding greenwashing[2] (Boiral, 2013; Cho & Patten, 2007; Christensen et al., 2021; Clarkson et al., 2008; Delmas & Burbano, 2011; Hummel & Schlick, 2016; Khan et al., 2021; Mahoney et al., 2013; Patten, 2002). Boiral (2013) finds that sustainability disclosure can be seen as a simulacrum used to project an idealized view of the firm's situation. Khan et al. (2021) investigated the development of sustainability disclosure for Banks in Bangladesh to see if there were any improvements in quality. They found improvement, though they also found that sustainability disclosure has yet to become fully substantive.

According to the global investor survey conducted by PWC (2022), 87% of the respondents believe corporate reporting contains at least some greenwashing. In addition, every other investor uses ESG ratings as a source of information in investment decisions. Investor spending on ESG rating agencies increased by $300 million from 2014 to 2018 (Gilbert, 2019). This illustrates the mistrust in non-financial reporting. Arvidsson and Dumay (2022) also illustrate how a leading country within sustainability reporting is neither without faults:

While Sweden has a long history of and reputation for being at the forefront of ESG reporting, the country is not without its corporate scandals (Rimmel & Jonall, 2011). These include fraud and bonuses scandals (e.g., ABB and Skandia: Foley, 2002; Sachs et al., 2009; The

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[1] ESG embraces the three topics environmental, social, and governance aspects of a firm. Christensen et al. (2021) define CSR and ESG as *"corporate activities and policies that assess, manage, and govern a firm's responsibilities for and its impacts on society and the environment."* The term sustainability derives from sustainable development, which Brundtland (1987) defined as *"a development that meets the needs of the present without compromising the ability of future generations to meet their own needs."* All mentions of CSR, ESG, sustainability, and non-financial reporting are related to sustainability due to their resemblance and interchangeable use.

[2] Lyon and Maxwell (2011) define greenwashing as the *"selective disclosure of positive information about a company's environmental or social performance, without full disclosure of negative information on these dimensions, to create an overly positive corporate image."* However, the term can be broad and vague; see further explanation of greenwashing and sustainability disclosure quality in chapter 3.0.

New York Times, 2005), violation of labour rights (e.g., H&M: Adamsson, 2020; Butler, 2016) and corruption (e.g., Telia Company: Dye, 2017; Pollack & Allern, 2018). Such scandals have also accelerated a focus on ESG in corporate reporting, particularly as scandals may reduce public trust in Swedish companies. Rebuilding trust in companies was one of the reasons the EU introduced the Directive (EU, 2014). However, Ries et al. (2018, p. 43) report that the Swedish people have a general mistrust of Swedish companies, which has barely shifted over the last decade. Thus, despite the increased pressure on Swedish companies to become more accountable, disclosures by those companies about their performance—financial and otherwise—have not shifted the needle on public trust. (Arvidsson & Dumay, 2022, p. 1094).

Consequently, this study aims to uncover the relationship between ESG performance and sustainability disclosure quality for Swedish listed firms. Following, we present our research question: "*Do Swedish firms engage in greenwashing"?*

We investigate the relationship between ESG performance and sustainability disclosure quality. To understand the relationship, we base our discussion on two theories that may help explain whether firms engage in greenwashing: signaling theory and legitimacy theory. Legitimacy theory may help explain why firms engage in greenwashing, while signaling theory may explain why firms do not engage in greenwashing but rather disclose sustainability information to reduce information asymmetry (Hummel & Schlick, 2016; Mahoney et al., 2013). Similar theories have been applied in studies related to this matter; however, the literature finds conflicting results[3] (Cho & Patten, 2007; Clarkson et al., 2008; Hummel & Schlick, 2016; Khan et al., 2021; Mahoney et al., 2013). Sustainability disclosure quality is considered high when the non-financial report is transparent, balanced, and easy to understand and read, in accordance with IIRC (2013) and GRI (2016). Contrary to this, the quality is considered low when the information provided is less transparent, imbalanced, containing high complexity and poor readability[4]. Low quality sustainability disclosure can be considered greenwashing when information provided differs from reality. Delmas and Burbano (2011) addressed how firms engaging in greenwashing participate in two behaviors simultaneously: poor environmental performance and positive communication

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[3] See Chapter 3.0 for further explanation of the literature and related theories.
[4] See section 3.2 for further explanation on sustainability disclosure quality.

about environmental performance. Consequently, we hypothesize that if firms engage in greenwashing, the relationship between ESG performance and sustainability disclosure quality will be negative, in accordance with legitimacy theory, meaning that less balance, less transparency, and more complex sustainability disclosure are associated with lower ESG performance. This also means less complex, more balanced, and transparent disclosure is associated with higher ESG performance, in accordance with signaling theory.

The study draws on textual analysis, and we measure the non-financial disclosure quality in firms' annual reports by calculating five different textual features[5] of 773 annual reports issued by Swedish listed firms between 2013 and 2021. To understand how the disclosure measures are associated with ESG performance, we conducted 25 OLS regression models. The dependent variables are the ESG performance score, the ESG controversies score, and each distinct pillar. We supplemented our analysis with the ESG controversies score to see if there are any abnormal tone or textual features for firms with controversies.

We find that the relationship between our disclosure measures and ESG performance is positive, similar to Clarkson et al. (2008). This means better performers provide more extensive disclosure, I.e., positivity, uncertainty, and transparency. This contradicts Cho et al. (2010) and Lyon & Maxwell (2011), who found that an overly positive tone is associated with poor ESG performance. Our finding is consistent with signaling theory, where good performers aim to distinguish themselves from inferior performers by adopting ESG practices that may be difficult or too costly to mimic. Our findings are inconsistent with greenwashing and legitimacy theory due to positive associations between our disclosure measures and ESG performance. Our study reveals higher levels of disclosure among better ESG performers, indicating increased transparency. However, in firms' pursuit to be transparent, we find that they add more complexity and advanced language to their sustainability disclosure, potentially obscuring the quality. While higher disclosure levels do not guarantee improved sustainability disclosure quality (Michelon et al., 2015; Cho & Patten, 2007), good ESG performers may utilize complex terminology as a

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[5] See section 4.4 for further explanation on textual analysis and disclosure measures.

signaling mechanism, making their disclosures less understandable and comprehensible. For firms with controversies, we find no association between our disclosure measures and controversies, leaving us to believe firms with controversy report in a more neutral language.

We uncover variations in sustainability disclosure quality across the distinct aspects of ESG performance. Specifically, governance disclosure, being less influenced by discretionary choices, aligns with previous research (Fatemi et al. (2017). Moreover, companies issuing standalone sustainability reports perform better in the environmental and social pillars. Our analysis highlights that the environmental pillar exhibits a more positive tone, increased transparency, and added complexity compared to the social and governance pillars. This suggests that companies actively focus on enhancing transparency in their environmental commitments. However, this increased transparency comes with a trade-off, as it introduces more complexity to the disclosure. These findings emphasize the need to balance transparency and simplicity in firms' sustainability disclosure.

This study contributes to the literature on ESG performance and sustainability disclosure practices by offering a more extensive analysis of the disclosure quality and its association with ESG performance. Unlike prior studies (Boiral, 2013; Cho et al., 2010; Cho & Patten, 2007; Patten, 2002), we find a positive relationship between sustainability disclosure quality and ESG performance, challenging the notion of greenwashing and supporting the findings of Clarkson et al. (2008), Hummel & Schlick (2016), and Mahoney et al. (2013). Our research extends the understanding of signaling theory by demonstrating that a positive tone in non-financial disclosures does not necessarily indicate misinformation or imbalance. In contrast to Lyon & Maxwell (2011), who associated an excessively positive tone with greenwashing, our findings can provide more confidence in firms' non-financial reports. Moreover, our study expands the literature by exploring textual features, significantly increasing the number of observations, and covering a wide range of industries over nine years. Additionally, our examination of different aspects of the ESG score highlights variations in sustainability disclosure quality. Our contributions distinguish our research and provide a strong basis for future studies in the field.

In the next chapter (Chapter 2.0), we explain the research setting of our study. Further on, in chapter 3.0, we review the existing literature and present our hypothesis. Chapter 4.0 explains the methodology and how our research is conducted. Chapter 5.0 contains results, and in chapter 6.0, we discuss our findings in the context of presented theories and literature. Finally, in chapter 7.0, we conclude and present possible implications and contributions of our research.

2.0 Research Setting: Sustainability Reporting in the EU and Sweden

This study investigates the relationship between ESG performance and sustainability disclosure quality for listed companies in Sweden. Sweden has been regarded as a leading country in integrated reporting (Eccels & Serafeim, 2011; as mentioned in Arvidsson & Dumay, 2022). We focus on the potential occurrence of greenwashing within sustainability reporting. Thus, we present the statutory reporting requirements present in Sweden:

The EU Directive for mandatory non-financial reporting requires organizations to report on ESG performance in their annual reports (European Commission, 2014). The Directive attempts to harmonize and enhance economic, social, and environmental reporting in the European States by establishing minimal legal requirements for non-financial reporting and making it mandatory (La Torre et al., 2020). EU member states were obliged to put the Directive into force as national legislation by December 2016 (European Commission, 2014). Starting from the 2017 fiscal year, the NFR Directive mandates reporting for companies with more than 500 employees, total assets exceeding EUR 20 million, or sales exceeding EUR 40 million (European Commission, 2014; European Commission, 2017). EU member states can extend the requirements beyond the mandates of the Directive (Fiechter et al., 2022.)

Since 2007, state-owned enterprises in Sweden have reported on sustainability matters according to GRI guidelines (SI, 2021). With the implementation of the NFR Directive as a part of the Swedish Annual Accounts Act in 2017 (Lag om ändring i Årsredovisningslagen (2016); Årsredovisningslagen (1995)), legislators extended the Swedish law to go beyond the minimum disclosure requirements of the NFR Directive by implementing a lower threshold for CSR reporting. Companies that meet two of the following three thresholds have to report in accordance with the NFR Directive: More than 250 employees, total assets exceeding SEK 175 million and, sales exceeding SEK 350 million.

According to KPMGs survey of sustainability reporting 2022, Sweden is one of the leading countries[6] within sustainability reporting, with a reporting rate of 98% (KPMG, 2022). After the implementation of NFRD in the EU, disclosure has increased (Samani et al., 2022). However, the quality still varies between companies and countries due to the flexible legislative approach and a lack of coherent guidance and quality assessment (Arvidsson & Dumay, 2022; Johansen, 2016). The Corporate Sustainability Directive (CSRD) is an NFR Directive advancement created to address the lack of coherent guidance and quality assessment (European Commission, 2022). CSRD is expected to come into force for listed companies in the fiscal year 2024 for the reports published in 2025 (European Commission, 2022). As a part of the European Green Deal, CSRD includes the mandate to report non-financial information under the European Sustainability Reporting Standards (ESRS) framework. The EU Commission encouraged the European Financial Reporting Advisory Group (EFRAG) to develop the framework to bring "*sustainability reporting on a par with financial reporting*" (EFRAG, 2021). CSRD can be seen as a result of the NFRD not being sufficient and the reports not being comparable (European Commission, 2021). Our study does not review how legislation impacts the sustainability reporting quality; however, we acknowledge that there is an impact, but it does not necessarily sufficiently prohibit firms from engaging in greenwashing (Christensen et al., 2021).

While many Swedish companies comply with the NFR Directive, there is still a risk of greenwashing. The Swedish corporation H&M was recently exposed by the news website Quartz (Shendruk, A., 2022) and accused of misleading their consumers on the sustainability of their products, i.e., greenwashing. In 2020, Earthsight exposed the Swedish company IKEA for using illegally felled wood in their products, failing to inspect the certifications of the companies selling them the wood (Earthsight, 2020). This demonstrates that greenwashing still is a topical issue, despite the increase in sustainability reporting. According to Arvidsson & Dumay (2022), Sweden is an excellent lens through which to examine corporate ESG disclosure, being among the countries with the highest reporting rate when it comes to providing ESG information to their stakeholders (KPMG, 2022) and for this reason, we select Sweden as a basis for our research.

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[6] KPMGs survey is based on a worldwide sample of the top 100 companies by revenue in 58 countries, territories, and jurisdictions (KPMG, 2022)

3.0 Literature Review and Hypothesis Development

3.1 Literature Review

Previous literature on the relationship between ESG performance and sustainability disclosure is conflicting, and it often includes viewing the relationship through either signaling theory or legitimacy theory. Scholars have found the relationship to be either positive or negative (Al-Tuwaijri et al., 2004; Cho et al., 2012; Cho & Patten, 2007; Clarkson et al., 2008, 2011; De Villiers & van Staden, 2006; Patten, 2002; As mentioned in Hummel & Schlick, 2016). A positive relationship means higher performance is associated with more disclosure, and a negative relationship means poor performers disclose more. For instance, Cho & Patten (2007) uncover that companies do appear to use environmental disclosures as a legitimizing tool, meaning that poor environmental performers have higher levels of disclosure. However, Clarkson et al. (2008) find a positive association between environmental performance and the level of discretionary environmental disclosures, meaning that better ESG performers are disclosing more to inform investors and stakeholders of their superior performance. Hummel & Schlick (2016) assert both theories and find that it can be two sides of the same story. When shifting from focusing on the quantity of sustainability disclosure to the quality, they find that superior sustainability performers choose high-quality sustainability disclosure to signal their superior performance, and poor sustainability performers prefer low-quality sustainability disclosure to disguise their actual performance and protect their legitimacy.

Khan et al. (2021) find that sustainability disclosure is still more symbolic than substantive, which in the context of Suchman (1995) means that firms try to maintain and repair organizational legitimacy through adopting externally demanded programs such as sustainability reporting, while the actual practices in the firm remain unchanged. Delmas and Burbano (2011) addressed that greenwashing is used by companies who try to legitimize their behavior, and they illustrate that companies engaging in greenwashing take part in two behaviors simultaneously: poor environmental performance and positive communication about environmental performance. Our thesis draws on the perception that greenwashing entails poor ESG performance in

combination with low sustainability reporting quality to obtain legitimacy; hence legitimacy theory can provide insight into why companies engage in greenwashing (Mahoney et al., 2013).

Signaling theory belongs to a voluntary disclosure perspective and is based on reducing information asymmetry between two parties (Spence, 2002; as found in Connelly et al., 2011). Contrary, legitimacy theory belongs to a socio-political perspective. The theories overlap in many ways (Deegan, 2002), but they can also provide different explanations for a firm's reporting behavior (Clarkson et al., 2008). Both theories acknowledge that there is a cost associated with disclosure, and they also assume that "good" corporate citizens will gain benefits and "bad" corporate citizens will be penalized (Mahoney et al., 2013). Both theoretical perspectives agree that firms will engage in sustainability disclosure when the advantages exceed the related costs (Li et al., 1997; as found in Mahoney et al., 2013). A key difference between these theoretical perspectives lies in the relative costs and benefits for those that do not report honestly. Signaling theory suggests that the "costs" of not being honest will make "bad" firms less likely to signal compared to "good" firms (Connelly et al., 2011). In contrast, legitimacy theory posits that "bad" firms gain more benefits than "good" firms. Consequently, signaling theory insinuates that "good" firms will be more inclined to engage in sustainability disclosures; conversely, legitimacy theory suggests that "bad" firms will be more likely to engage in sustainability disclosures (Clarkson et al., 2008; Mahoney et al., 2013).

3.2 Hypothesis Development

Corporate ESG disclosure has been a subject of criticism and skepticism by investors for many years. The lack of qualitative aspects such as comparability, credibility, and value relevance are shared challenges in providing a good foundation for decision-making and risk evaluation (Abhayawansa et al., 2019; Arvidsson, 2014; Cho et al., 2015; as mentioned in Arvidsson & Dumay, 2021). The term "quality" is used in many settings and therefore has a variety of definitions. As for disclosure quality within sustainability reporting, The Global Reporting Initiative defined report quality through the reporting principles of Accuracy, Balance, Clarity, Comparability, Reliability, and Timeliness (GRI, 2016). The Global Reporting Initiative designed reporting standards to enhance global comparability and quality of information about ESG

matters provided by companies to enable greater transparency and accountability of organizations (GRI, 2016). The Guiding Principles proposed by the International Integrated Reporting Council also include fundamental principles of quality such as conciseness, completeness, and balance. They claim that to improve disclosure quality, "*an integrated report should express concepts clearly and in as few words as possible and favor plain language over the use of jargon or highly technical terminology*" (IIRC, 2013). Based on the GRI reporting principles and the guiding principles proposed by IIRC, we reason that high sustainability disclosure quality contains transparent and balanced information, less complexity, and it should be easy to understand and read.

Arvidsson & Dumay (2021) found that the NFR has led to increased reporting quality, but the ESG performance plateaued around 2015. As the NFR requires more companies to disclose information, one would expect an increase in sustainability disclosure; however, regardless of the directive, Michelon et al. (2015) found that more information disclosed does not necessarily imply better quality. This is in line with Patten (2002) & Cho & Patten (2007), who investigated the relationship between environmental performance and environmental disclosure and found that companies with worse environmental performance provide extensive environmental disclosure. With regards to the NFR Directive, Fiechter et al. (2022) said that firms may attempt to meet the CSR reporting requirements by using greenwashing disclosures "*because enforcement of the directive is, if anything, in its infancy*" (Fiechter et al., 2022). This also illustrates how sustainability reporting is still mainly subject to voluntary disclosure and opens the possibility of engaging in greenwashing.

Drawing on Hummel & Schlick's (2016) findings, we reason that signaling theory can explain incentives for "good" firms to provide high disclosure quality, while legitimacy theory explains the incentives for "bad" firms to greenwash or provide poor disclosure quality. We further hypothesize that:

H1: A higher (lower) ESG performer has higher (lower) sustainability disclosure quality

We also investigate the relationship between the pillars of ESG (Environment, Social, and Governance) and disclosure quality. Due to the voluntary nature of sustainability disclosure, firms disclose differently and choose to what extent they disclose information, which can lead to less comprehensible information. Gerwing et al. (2022) argue that corporate governance enhances the quality of sustainability reporting. Disclosure regarding corporate governance is often mandated and regulated by the government, contrary to social and environmental disclosure, which is primarily voluntary and more difficult to verify (Fatemi et al., 2017). We thus expect less tone management and higher quality disclosure within the governance pillar. On the other hand, Melloni et al. (2017) find that companies with worse social performance provide reports that are foggier (I.e., less concise) and with less information on their ESG performance; thus, we expect that there is more room for greenwashing and tone management within the social pillar. In accordance with Delmas & Burbano (2011), who finds that limited and imperfect environmental information are among the factors that contribute to greenwashing, we also expect there to be more greenwashing within the environmental pillar.

We hypothesize that:

H2: The disclosure quality varies among the individual aspects of the total ESG score (Environment, Social & Governance)

4.0 Research Design

4.1 Sample Selection and Descriptive Statistics

Our sample consists of Swedish firms listed on the Nasdaq OMX Stockholm Exchange from 2013 – 2021. This is presented in Table 1, panel A. We downloaded annual reports[7] from companies' websites and converted the pdf to text files. We manually removed financial statements, including financial notes, from the reports. The non-financial information in the annual reports was preprocessed using Python, including steps such as tokenization, stop word removal, and punctuation removal. Subsequently, we applied Natural Language Processing (NLP) techniques to analyze the processed annual reports. We dropped observations where we were not able to retrieve English annual reports. This results in our independent variables. Data regarding the control variables and SIC codes were collected from Capital IQ. The SIC codes were converted into 2-digit SIC codes. Data for the dependent variables, The ESG data, is collected from the Refinitv Eikon database.

Table 1. Sample composition

Panel A: Sample selection	Firm-year observations
Swedish firms listed on the Nasdaq OMX Stockholm Exchange during 2013 – 2021 with available annual reports in English.	2,013
Less firm-year observations due to the lack of non-financial information in annual reports.	(3)
Less firm-year observations due to removing industry groups with SIC codes 60-67 (Banking and finance).	(280)
Less firm-year observations due to the lack of Refinitiv Eikon ESG-score or missing data for control variables collected from Capital IQ.	(957)
Final sample	**773**
Unique number of firms in the sample	**182**

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[7] We analyze annual reports, not standalone sustainability reports, due to there being no substantial differences in the content or quality of the disclosures (Samani et al., 2022; Khan et al., 2021)

Panel B: Sample breakdown by year			
	Frequency	%	Cumulative
2013	35	4.53	4.53
2014	36	4.66	9.18
2015	44	5.69	14.88
2016	48	6.21	21.09
2017	53	6.86	27.94
2018	93	12.03	39.97
2019	117	15.14	55.11
2020	175	22.64	77.75
2021	172	22.25	100.00
Unique number of companies	**773**	**100.00**	

Notes: This panel summarizes the sample breakdown by year. Data from 2019 to 2021 accounts for approximately 60% of our observations.

4.2 Models

To test our hypothesis, we employ ordinary least squares (OLS) regressions explained as follows.

Model 1 (Hypothesis 1):

$$ESGScore = \beta0 + \beta1(Disclosure) + \sum \beta2(Control) + \varepsilon$$

$$ESG\ Controversy = \beta0 + \beta1(Disclosure) + \sum \beta2(Control) + \varepsilon$$

Model 2 (Hypothesis 2):

$$Environment\ Pillar = \beta0 + \beta1(Disclosure) + \sum \beta2(Control) + \varepsilon$$

$$Social\ Pillar = \beta0 + \beta1(Disclosure) + \sum \beta2(Control) + \varepsilon$$

$$Governance\ Pillar = \beta0 + \beta1(Disclosure) + \sum \beta2(Control) + \varepsilon$$

4.3 Dependent Variables

Khan et al. (2021) list different proxies for ESG performance, e.g., whether the company reported a standalone sustainability report, whether the GRI framework was used, or whether the sustainability report was assured. For this study, we use ESG-rating (*ESG Score_w)* as a proxy for ESG performance due to it evolving into being a quality reference for companies' sustainability reporting and ESG performance (Escrig-Olmedo et al., 2019). Refinitiv (2022) states they "*offer one of the most comprehensive ESG databases in the industry, covering 85% of the global market cap, across more than 630 different ESG metrics, with history dating back to 2002"*. The company-level ESG measures are analyzed and processed manually by Refinitiv analysts. Annual reports, company websites, NGO websites, stock exchange filings, CSR reports, and news sources are used in the analysis (Refinitiv, 2022). The measures are grouped into ten categories that reformulate the three pillar scores (Environment, Social, and Governance), with environmental weighting 43% on the total ESG score, social weighting 31%, and governance weighting 26 % (Refinitiv, 2022). The scores range from 0 to 100 and are designed to transparently and objectively measure a company's relative ESG performance, commitment, and effectiveness based on publicly reported data (Refinitiv, 2022).

Boiral (2013) presented how sustainability reporting could be seen as a simulacrum used to camouflage actual sustainable-development problems and project an idealized view of the firm's situation. He found that for firms who received an A or A+ application from the Global Reporting Initiative (GRI), 90% of significant negative news events were not reported. Refinitiv offers an ESG controversies score, where the main objective of the score is to discount the ESG performance score based on scandals regarding the company[8]. We use the controversy score (*ESG Controversies Score)* as a proxy for poor ESG performance, given the findings from Boiral (2013). The impact of an event or scandal may still affect the ESG controversy score in the following years, for example, due to lawsuits or ongoing legislative disputes. According to Refinitiv, the ESG controversy score is calculated based on 23 ESG controversy topics. It addresses the market cap bias more prominent companies suffer from due to them attracting more media attention. ESG scores and ESG controversy scores are updated every week, and scores will

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[8] The discounted ESG score is a new measure, and we do not use this score in our study.

be updated up to five years back in time. The score will be corrected if a controversy or added information regarding 2020 arises today (Refinitiv, 2022). This score also ranges from 0 to 100, but a score below 100, in this case, means there are controversies.

4.4 Disclosure Variables

To measure the quality of sustainability reporting, we draw on the literature on textual analysis of both financial and non-financial disclosure. Levin et al. (1998) state that tone can alter stakeholders' perceptions of the information in disclosures, regardless of the content. We measure the quality of a company's disclosure through the tone in the non-financial part of the annual reports. Using Loughran & McDonald (2011) dictionary, the tone is measured through different sentiment categories using the textual analysis "Bag of Words" method[9]. The dictionary is widely used in research on disclosure quality (Lang & Stice-Lawrence, 2015; Samani et al., 2022). We are interested in the following sentiment categories from the dictionary: positivity (Ln *Positivity_w)* and uncertainty *(Ln Uncertainty_w)*. Positivity is measured by positively charged words (e.g., achieve, attain, profitable, and upturn), and uncertainty is measured by words based on uncertainty (e.g., approximate, depend, indefinite, and uncertain) (Loughran & McDonald, 2011). Cho et al. (2010) find that worse environmental performers exhibit significantly more optimism and less certainty than their better-performing peers. However, Delmas & Burbano (2011) addressed that firms with high ESG performance also can be positive and vocal about their performance. From this, we reason that more positivity (optimism) and uncertainty, in combination with poor performance, indicate imbalanced information and can be seen as low sustainability disclosure quality.

Readability (*Readability_w)* is measured by the Flesch-Kinkaid score. The Flesch-Kinkaid score is a popular measure of readability (Li, F., 2008) and measures the readability in a U.S school grade level required to understand a text (Flesch, R., 1948). A score of 8.0 suggests that an

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[9] The dictionary is an extended version of the 2of23inf dictionary and includes words appearing in 10-K documents and earnings calls (SRAF, 2022); and is therefore explicitly developed for annual reports and financial statements. Words that use abbreviations, acronyms, British English, hyphenated words, names, or phrases were not included (SRAF, 2022). The classification method counts the words in a text, ignores all neutral words, and categorizes the words into sentiments.

average eighth grader should be able to comprehend the content of the text[10]. We use the Flesch-Kinkaid score as a proxy for readability in sustainability reporting (Christensen et al., 2021), and a higher score indicates the more advanced language (poor readability). We use vocabulary (*Vocabulary_w)* as a proxy for complexity (Christensen et al., 2021), indicating that a higher score on vocabulary leads to more complexity (e.g., higher technical terminology) because an extensive vocabulary can make a text less comprehensible (Loughran & McDonald, 2014). The number of words (*Ln Number of Words_w)* is a proxy for the length of the non-financial disclosure (Li, 2011). Depending on the relation between the ESG performance and the measure, we believe that a positive relationship between the length of disclosure and ESG performance equals higher transparency (consistent with signaling theory), and a negative association indicates low transparency (consistent with legitimacy theory). We use the natural logarithm of the total number of words in each year's disclosure to address the potential outlier problem.

4.5 Control Variables

Prior research shows that several firm-specific factors seem to influence the variation of ESG performance and disclosure (Cho et Al., 2010). Standard measures like size, leverage, industry, age, and financial performance are factors that are found to influence CSR (Graves & Waddock, 1994; Mahoney et al., 2013; Mahoney & Roberts, 2007; Roberts, R.W., 1992; Ullmann, 1985). Christensen et al. (2021) noted that several studies found differences in the extent of environmental disclosure due to controversies in various industries. Prior studies found significant relationships between the age of a corporation, industry classification, and social responsibility activities (Roberts, R.W., 1992). In addition, Huang et al. (2014) found a positive relationship between tone management and age, and we, therefore, control for age *(Ln AGE)* and industry effects *(Industry effects).* We take the natural logarithm of age to address the potential outlier problem. Cho et al. (2010) claim that more resourceful companies tend to disclose more extensive environmental information, while another explanation for extensive disclosure may be that it is less costly for larger companies (Wickert et al., 2016; as found in Su et al., 2016). We consider company size (*Size)* by using the natural logarithm of total assets at the end of the year. We calculate the natural logarithm of total assets because log transforming can help address non-

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[10] The formula is calculated as (11.8 * syllables per word) + (0,39 * words per sentence) - 15,59 (Li, F., 2008).

normality, outliers, and heteroskedasticity issues. In line with Margolis & Walsh (2003) and Eccles et al. (2014), who found that there is a positive association between financial performance and sustainability reporting, we calculate return on assets (*RoA_w*) by dividing net income by total assets.

Mahoney et al. (2013) find that firms that issue standalone reports are better CSR performers. Therefore, we manually controlled whether companies issued standalone sustainability reports (*Dummy SR)*. Companies issuing an integrated sustainability report were regarded as not issuing a standalone sustainability report. We created a dummy where 0 means no standalone report, and 1 means having a standalone report. A proxy for growth is market-to-book ratio (*MB_w)*. The market to book ratio is calculated by dividing market capitalization by total book value. Some companies may have limited resources, and according to Waddock & Graves (1997), companies with limited resources are less likely to invest a lot in ESG performance. To control these effects, we add leverage (*Leverage_w)* as a control variable: total debt divided by total assets. We also created a second dummy variable that presents whether the company has ESG score controversies in the topical fiscal year (*Dummy Controversy*), where 0 equals a score of 100, and 1 if the score is less than 100 (1 = companies that have controversies). This way, we can investigate the ESG score before considering the controversies. See Appendix A for a table of the variables with associated explanations and calculations.

5.0 Empirical Results

5.1 Descriptive Statistics

Table 2. Descriptive statistics

Descriptive statistics Variables	N	Mean	Median	Std.	Min.	Max.
Dependent:						
ESG Score_w	773	54.113	55.277	18.400	14.656	88.071
ESG Controversies Score	773	95.068	100	16.357	2.272	100
Environment Pillar_w	773	46.106	46.650	26.831	0	93.360
Social Pillar_w	773	58.320	61.008	21.655	8.832	92.955
Governance Pillar_w	773	54.517	56.094	21.351	9.478	93.473
Disclosure:						
Ln Positivity_w	773	6.025	6.079	0.475	4.615	6.978
Ln Uncertainty_w	773	5.448	5.480	0.464	4.262	6.492
Ln Number of words_w	773	10.216	10.249	0.359	9.307	11.008
Vocabulary_w	773	2908.926	2916	526.572	1710	4245
Readability_w	773	12.922	12.900	0.992	10.7	15.8
Control:						
Size	773	9.318	9.404	1.777	4.076	13.170
Leverage_w	773	0.638	0.522	0.810	-2.493	4.525
RoA_w	773	4.406	5.120	8.820	-39.6	26.51
MB_w	773	3.917	2.894	4.694	-13.064	29.096
Ln AGE	773	4.050	4.234	0.863	0.693	6.021
Dummy SR	773	0.243	0	0.429	0	1
Additional analysis:						
Dummy Controversy	773	0.112	0	0.316	0	1

Notes: ***, **, and * behind the coefficients show 1%, 5%, and 10% levels of statistical significance. Variables with _w have been winsorized, where outliers below the 1st and above the 99th percentile have been adapted to nearby observations. A list of variables is available in Appendix A.

Table 2 presents the means, median, standard deviations, minimal value, and maximal value for our dependent, independent, and control variables for our entire sample. The mean ESG score (*ESG Score*_w) is 54.1 points, where scores range from 14.656 to 88.071. Our ESG controversies score (*ESG Controversies Score)* has a mean of 95.068. In line with how this variable is interpreted, the min score 2.272 indicates a very controversial incident. The max score of 100 means there are no controversies. The means for the E, S, and G pillars, are 46.106, 58.320, and 54.517. The mean score is highest within the social pillar, indicating that the companies in our

sample disclose more in the workforce, human rights, community, and product responsibility categories. The degree of uncertainty, measured through the natural logarithm of uncertain words (*Ln uncertainty_w*), has a min value of 4.262, and the max value is 6.492. For the degree of positivity, measured through the natural logarithm of positive words (*Ln positivity_w)*, the min value is 4.615, and the max value is 6.978. The variable measuring length of disclosure (*Ln Number of words_w*) is presented in the natural logarithm, and a high score can indicate transparency when positively associated with performance. Vocabulary (*Vocabulary_w*), measuring complexity, has a mean of 2 908.926 words, and the amount ranges between 1 710 and 4 245, which indicates a wide range of different words used in the non-financial reports. A high maximum indicates less informative text due to more complexity. The readability has a mean of 12.922 and indicates that a U.S student with 13 years of school should be able to comprehend the content of the non-financial report. The maximum value of readability *(Readability_w),* 15.8, indicates an advanced language where higher education is needed to comprehend the content.

The mean for size *(Size_w),* leverage(*leverage_w*), and RoA (*RoA_w*) for our sample are 9.318, 0.638, and 4.406, respectively. Over 24% of our sample provides a standalone sustainability report (*Dummy SR*) in addition to the integrated sustainability report in the annual report. 11.2% of our sample has had controversial incidents (*Dummy Controversy*). Age (*Ln AGE*) presents the natural logarithm of age, and the mean value is 4.050. The mean of growth (*MB_w*) for our sample is 3.917, where min and max values are –13.064 and 29.096.

To manage outlier influence, we analyzed histograms and boxplots and then winsorized the data using STATA to reduce the outliers' impact on the variables in our analysis. We conducted White tests on our regression models, which indicated some heteroskedasticity. To account for this, we then performed VCE robustness tests and obtained robust standard errors that are consistent and less sensitive to heteroskedasticity. We also used natural log transformation on the variables total assets, age, number of words, positivity, and uncertainty, to reduce the impact of heteroskedasticity. To assess the presence of multicollinearity in our models, we ran a correlation matrix analysis in STATA. Furthermore, we performed a Variance Inflation Factor test (VIF test)

for our regression models and following the VIF index we found no compelling evidence of multicollinearity.

5.2 Model 1

Table 3. Model 1. ESG Score_w

	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Ln Positivity_w					**8.835*** (6.39)
Ln Uncertainty_w				**8.936*** (7.40)	
Vocabulary_w			**0.010*** (8.60)		
Readability_w		**2.301*** (4.37)			
Ln Number of words_w	**15.084*** (8.92)				
Size	4.519*** (11.01)	6.345*** (17.12)	4.602*** (11.36)	5.084*** (12.32)	5.221*** (12.57)
Leverage_w	-1.808*** (-2.85)	-2.295*** (-3.41)	-1.826*** (-2.87)	-2.043*** (-3.18)	-1.961*** (-3.03)
RoA_w	0.148*** (2.91)	0.108** (2.01)	0.141*** (2.78)	0.172*** (3.23)	0.068 (1.35)
MB_w	0.108 (1.01)	0.206* (1.91)	0.115 (1.07)	0.181* (1.71)	0.141 (1.35)
Ln AGE	0.948 (1.50)	0.898 (1.30)	1.045* (1.65)	0.674 (1.03)	0.907 (1.42)
Dummy SR	5.992*** (5.72)	3.428*** (3.11)	5.777*** (5.45)	4.986*** (4.56)	4.889*** (4.71)
Intercept	-153.590*** (-9.77)	-45.210*** (-5.94)	-27.150*** (-6.56)	-53.979*** (-8.73)	-54.292*** (-8.03)
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
R²	0.718	0.691	0.716	0.706	0.704
N	773	773	773	773	773

Notes: ***, **, and * behind the coefficients show 1%, 5%, and 10% levels of statistical significance. Variables with _w have been winsorized, where outliers below the 1st and above the 99th percentile have been adapted to nearby observations. A list of variables is available in Appendix A. Numbers in parentheses present the t-statistic values for each coefficient.

Table 3 represents the results from hypothesis 1, where we hypothesize that a higher (lower) ESG performer has higher (lower) disclosure quality. The table presents a regression with each of our dependent variables. The results show a significant positive relationship between the ESG score and positivity (*Ln Positivity_w, coef. = 8.835, at 1% level*). The positive relationship indicates

that companies with higher ESG score are disclosing more positive words. There is a positive relationship between uncertainty and the ESG score (*Ln Uncertainty_w, coef. = 8.936, at 1% level)*, meaning that companies with a higher degree of uncertainty in their non-financial reporting have higher ESG scores. Complexity (*Vocabulary_w, coef. = 0.010, at 1% level)* is positively associated with the ESG score, indicating that companies who disclose more complex language have higher ESG scores. Readability has a positive relationship to the ESG score (*Readability_w, coef. = 2.301, at 1 % level)*, and the relationships show that companies that report in a more advanced language overall have higher ESG scores. The final disclosure variable, the length (*Ln Number of Words_w, coef. = 15.084, at 1% level)*, is positively associated with the ESG score, indicating that better ESG performers aim for more transparency.

Regarding our control variables, several of the variables are significant at the 1%, 5%, and 10% levels (*size, leverage_w, RoA_w, MB, Ln AGE_w, and Dummy SR*). With R2 exceeding 69%, model 1 accounts for a substantial proportion of the variance in the ESG score (dependent variable). The association between ESG score and leverage (*leverage, at 1% level)* is negative, and the coefficient in the regressions ranges between –1.808 to –2.295 among our disclosure variables, which indicates that companies with less resources available have lower ESG scores. As for RoA (*RoA_w, at 1% level*), the association is positive, and the coefficients are relatively stable among all the disclosure variables, except for one (*Ln Positivity_w*), ranging between 0.141 to 0.172. This indicates that companies with higher profitability have higher ESG scores. The dummy variable for standalone sustainability reports (*Dummy SR, at 1% level*) shows a positive association with the ESG score in all five regressions, indicating that companies that issue standalone sustainability reports have higher ESG scores.

Table 4. Model 1. ESG Controversies Score

	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Ln Positivity_w					-1.413
					(-0.99)
Ln Uncertainty_w				-0.683	
				(-0.51)	
Vocabulary_w			-0.001		
			(-0.87)		
Readability_w		-0.613			
		(-0.90)			
Ln Number of words_w	-1.996				
	(-1.00)				
Size	-2.897***	-3.084***	-2.930***	-3.065***	-2.948***
	(-4.96)	(-5.90)	(-5.28)	(-5.34)	(-5.19)
Leverage_w	2.371**	2.413**	2.380**	2.426**	2.378**
	(2.32)	(2.40)	(2.34)	(2.40)	(2.35)
RoA_w	0.155***	0.157***	0.157***	0.157***	0.166***
	(3.24)	(3.27)	(3.30)	(3.13)	(3.47)
MB_w	-0.029	-0.039	-0.031	-0.042	-0.031
	(-0.32)	(-0.43)	(-0.35)	(-0.46)	(-0.33)
Ln AGE	-0.474	-0.483	-0.484	-0.444	-0.472
	(-0.63)	(-0.64)	(-0.65)	(-0.59)	(-0.63)
Dummy SR	0.319	0.633	0.373	0.550	0.419
	(0.22)	(0.45)	(0.27)	(0.39)	(0.29)
Intercept	132.423***	121.699***	115.594***	117.236***	12.277***
	(6.61)	(10.44)	(12.62)	(11.77)	(11.40)
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
R²	0.256	0.256	0.256	0.255	0.256
N	773	773	773	773	773

Notes: ***, **, and * behind the coefficients show 1%, 5%, and 10% levels of statistical significance. Variables with _w have been winsorized, where outliers below the 1st and above the 99th percentile have been adapted to nearby observations. A list of variables is available in Appendix A. Numbers in parentheses present the t-statistic values for each coefficient.

Table 4 presents the results of part two of our model 1. The results of the disclosure variables show that all variables have a negative association with the ESG controversies score[11] (*ESG Controversies Score*). The association is the same for all remaining disclosure variables. However, the associations are not significant. The results imply that companies with controversies overall have a more neutral non-financial reporting.

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[11] This interpretation aligns with how the ESG Controversy score is presented: A score of 100 means no controversies, and a score of less than 100 means there have been controversies regarding the company. For example, an increase in positivity is associated with more controversy.

5.3 Model 2

Table 5. Model 2. Environment Pillar_w

	(1)	(2)	(3)	(4)	(5)
Ln Positivity _w					10.471***
					(6.09)
Ln Uncertainty_w				7.199***	
				(4.37)	
Vocabulary_w			0.011***		
			(7.23)		
Readability_w		0.544			
		(0.81)			
Ln Number of words_w	17.645***				
	(7.41)				
Size	5.373***	7.887***	5.419***	6.640***	6.170***
	(8.96)	(15.44)	(9.08)	(11.50)	(10.62)
Leverage_w	-0.037	-0.766	-0.043	-0.467	-0.209
	(-0.04)	(-0.92)	(-0.05)	(-0.56)	(-0.25)
RoA_w	0.257***	0.184***	0.251***	0.252***	0.163***
	(4.09)	(2.87)	(4.00)	(3.88)	(2.71)
MB_w	-0.061	0.077	-0.055	0.043	-0.023
	(-0.45)	(0.58)	(-0.41)	(0.33)	(-0.18)
Ln AGE	1.952**	1.789*	2.071**	1.673*	1.906**
	(2.09)	(1.87)	(2.23)	(1.78)	(2.02)
Dummy SR	6.230***	3.056**	6.039***	4.418***	4.965***
	(4.19)	(2.12)	(4.00)	(2.99)	(3.42)
Intercept	-215.087***	-63.055***	-67.392***	--85.516***	-99.488***
	(-9.73)	(-6.67)	(-12.78)	(-10.05)	(-11.51)
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
R^2	0.736	0.712	0.735	0.719	0.727
N	773	773	773	773	773

Notes: ***, **, and * behind the coefficients show 1%, 5%, and 10% levels of statistical significance. Variables with _w have been winsorized, where outliers below the 1st and above the 99th percentile have been adapted to nearby observations. A list of variables is available in Appendix A. Numbers in parentheses present the t-statistic values for each coefficient.

Tables 5, 6, and 7 represent the results from hypothesis 2, where we hypothesize that the disclosure quality varies among the individual aspects of the total ESG score. In Table 5, we look closer at the environmental part of the ESG scores. The results show a significant positive relationship between the environmental pillar *(Environment Pillar_w)* and positivity (*Ln Positivity_w, coef. = 10.471, at 1% level)*. The positive relationship indicates that companies with a higher environmental score are disclosing in a more positive tone. There is a positive relationship between uncertainty and the environmental score (*Ln Uncertainty_w, coef. = 7.199, at 1% level)*, which means that companies with a higher degree of uncertainty in their non-

financial reporting also have higher environmental scores. Complexity (*Vocabulary_w, coef. = 0.011, at 1% level)* is positively associated with the environmental score, indicating that companies with more complex language have better environmental performance. The final significant disclosure variable, length of disclosures (*Ln Number of Words_w, coef. = 19.738, at 1% level),* is positively associated with the environmental score, indicating that higher environmental performers aim for more transparency.

In addition to the above, several of our control variables are significant. *Size and RoA_w* are significant on the 1% level, positively associated with the environmental pillar *(Environmental Pillar_w).* This means that an increase in size and profitability increases the environmental score. The dummy variable for sustainability reporting (*Dummy SR, at 1% level)* has a positive association with the environmental score, indicating a 3.056 to 6.230 increase in the environmental score if the company issues a standalone sustainability report.

Table 6. Model 2. Social Pillar_w

Ln Positivity_w					**7.320***
					(4.56)
Ln Uncertainty_w				**8.231***	
				(5.76)	
Vocabulary_w			**0.008***		
			(6.44)		
Readability_w		**1.595**			
		(2.49)			
Ln Number of words_w	**12.279***				
	(6.18)				
Size	5.188***	6.724***	5.088***	5.469***	5.737***
	(10.89)	(15.73)	(10.64)	(11.71)	(12.52)
Leverage_w	-2.840***	-3.257***	-2.805***	-2.987***	-2.957***
	(-3.36)	(-3.73)	(-3.32)	(-3.53)	(-.348)
RoA_w	0.239***	0.203***	0.238***	0.268***	0.173***
	(3.66)	(3.13)	(3.72)	(3.99)	(2.74)
MB_w	0.148	0.231*	0.144	0.202	0.173
	(1.13)	(1.79)	(1.09)	(1.56)	(1.36)
Ln AGE	3.597***	3.542***	3.695***	3.361***	3.565***
	(4.27)	(3.94)	(4.41)	(3.92)	(6.048)
Dummy SR	6.921***	4.812***	6.945***	6.289***	6.048***
	(5.60)	(3.88)	(5.58)	(5.12)	(5.03)
Intercept	-142.135***	-50.633***	-39.909***	-64.884***	-61.827***
	(-7.79)	(-5.65)	(-8.92)	(-9.14)	(-7.90)
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
R²	0.691	0.676	0.693	0.688	0.684
N	773	773	773	773	773

Notes: ***, **, and * behind the coefficients show 1%, 5%, and 10% levels of statistical significance. Variables with _w have been winsorized, where outliers below the 1st and above the 99th percentile have been adapted to nearby observations. A list of variables is available in Appendix A. Numbers in parentheses present the t-statistic values for each coefficient.

In Table 6, we look closer at the social pillar (*Social Pillar_w*) of the ESG score. The results show a significant relationship between the social pillar and positivity (*Ln Positivity_w, coef. = 7.320, at 1% level)*. The positive relationship indicates that companies with higher social scores disclose in a positive tone. There is a positive relationship between uncertainty and the social pillar (*Ln Uncertainty_w, coef. = 8.231, at 1% level)*, which means that companies with a higher degree of uncertainty in their non-financial reporting have higher social scores. Complexity (*Vocabulary_w, coef. = 0.008, at 1% level),* is positively associated with the social pillar, indicating that companies that disclose in a more complex language have higher social scores. Readability is also positively associated with the social pillar (*Readability_w, coef. = 1.595, at*

5% level), meaning that companies that report in a more advanced language overall have higher social scores. The length of disclosure (*Ln Number of Words_w, coef. = 12.279, at 1% level),* is positively associated with the social pillar, indicating that higher social performers aim for more transparency.

Size, RoA_w, Ln AGE, and *Dummy SR* are positively associated with the social pillar (*at a 1% significance level*), indicating that more prominent companies, stronger financial performers, older companies, and companies that disclose a standalone sustainability report all have higher social scores. The association between the social pillar and leverage (*leverage_w, at a 1% level)* is negative, indicating that firms with less resources have a lower social score.

Table 7. Model 2. Governance Pillar_w

	(1)	(2)	(3)	(4)	(5)
Ln Positivity_w					7.566***
					(3.49)
Ln Uncertainty_w				11.200***	
				(6.00)	
Vocabulary_w			0.008***		
			(4.93)		
Readability_w		4.635***			
		(5.78)			
Ln Number of words_w	15.197***				
	(5.64)				
Size	3.130***	4.561***	3.505***	3.289***	4.067***
	(4.47)	(7.90)	(5.06)	(4.90)	(5.86)
Leverage_w	-1.477	-1.796*	-1.582	-1.611	-1.707*
	(-1.45)	(-1.76)	(-1.54)	(-1.61)	(-1.65)
RoA_w	-0.004	-0.016	-0.019	0.042	-0.083
	(-0.05)	(-0.19)	(-0.23)	(0.47)	(-0.97)
MB_w	0.039	0.112	0.063	0.102	0.087
	(0.22)	(0.62)	(0.35)	(0.58)	(0.49)
Ln AGE	-2.979***	-2.917***	-2.917***	-3.283***	-3.039***
	(-3.02)	(-2.94)	(-2.93)	(-3.34)	(-3.05)
Dummy SR	2.761	0.367	2.201	2.177	1.401
	(1.60)	(0.21)	(1.28)	(1.24)	(0.82)
Intercept	-92.512***	-10.544	36.093***	-0.967	12.985
	(-3.57)	(-0.78)	(3.83)	(-0.08)	(0.99)
Industry effect	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes
R^2	0.432	0.436	0.424	0.433	0.417
N	773	773	773	773	773

Notes: ***, **, and * behind the coefficients show 1%, 5%, and 10% levels of statistical significance. Variables with _w have been winsorized, where outliers below the 1st and above the 99th percentile have been adapted to nearby observations. A list of variables is available in Appendix A. A. Numbers in parentheses present the t-statistic values for each coefficient.

Table 7 presents the results of part three of our model 2, the governance pillar *(Governance Pillar_w)*. The significant association with positivity (*Ln Positivity_w, coef. = 7.566, at 1% level)* indicates that companies with higher governance scores disclose more positive words in their non-financial reporting. The positive relationship between uncertainty (*Ln Uncertainty_w, coef. = 11.200, at 1% level)* and the governance pillar means that companies with a higher degree of uncertainty in their non-financial reporting have higher governance scores. The disclosure variable complexity (*Vocabulary_w, coef. = 0.008, at 1% level)* is positively associated with the governance pillar, meaning that companies that disclose a greater proportion of complex language have higher governance scores. Readability is also positively related to the governance

pillar (*Readability_w, coef. = 4.635, at 1% level),* indicating that companies that report in a more advanced language have higher governance scores. The length of disclosure (*Ln Number of Words_w, coef. = 15.197, at 1% level)* is positively associated with the governance pillar, indicating that higher governance performers aim for more transparency.

Two of our control variables are also significant, Size (*Size, at 1% level)* and *Age (Ln AGE, at 1% level).* Both are positively associated with the governance pillar through all five disclosure variables. These results indicate that larger and older companies perform better within the governance pillar.

5.4 Additional Analysis

Table 8. Two-sample T-test with equal variances.

ESG Score by Controversy Groups.

GROUP	OBS	MEAN	STD. ERR.	STD. DEV.	95% CONF.
0	**686**	52.038	0.685	17.965	50.69 - 53.38
1	**87**	70.479	1.368	12.767	67.75 - 73.20
COMBINED	**773**	54.113	0.661	18.400	52.81 - 55.41
DIFF		**-18.441**	1.987		

Notes: A list of variables is available in Appendix A. Group 1 = companies with controversies. Group 0 = companies with no controversies.

The p-value (0.000) is less than the significance level of 0.05, and we conclude that there is a significant difference in the means of the ESG score between the groups with controversy and those without controversy. We have 87 observations for firms with controversy. The difference in the mean is 18.441 between the two groups. This means that companies with controversies initially receive higher ESG scores before the controversies are considered.

Table 9. Two-sample T-test with equal variances.

ESG Pillars by Controversy Groups.

GROUP		ENVIRONMENT		SOCIAL		GOVERNANCE	
	OBS	MEAN	STD. ERR	MEAN	STD. ERR	MEAN	STD. ERR
0	**686**	43.270	1.003	56.011	0.816	53.254	0.809
1	**87**	68.467	2.113	76.528	1.457	64.474	2.148
COMBINED	**773**	46.106	0.965	58.320	0.778	54.517	0.767
DIFF		**-25.197**	2.917	**-20.517**	2.352	**-11.220**	2.397

Notes: A list of variables is available in Appendix A. Group 1 = companies with controversies. Group 0 = companies with no controversies.

The p-value (0.000) falls below the significance threshold of 0.05 for all separate pillar scores, revealing a significant difference between companies with and without controversies. The mean score is generally more significant for the controversy group, but the difference between the two groups is more pronounced in the environmental score mean. The environmental score mean differs by 25.197 points, suggesting that companies with controversy typically have a higher environmental pillar score than those without controversy. The social pillar score differs by

20.517 points between the two groups, suggesting that companies with controversy have a higher social score. This trend is also evident in the governance pillar, but the difference is particularly significant in the environmental and social pillars. This indicates that controversies are more related to companies with high environmental and social performance.

6.0 Discussion

We investigate if companies with strong ESG performance attempt to signal their superior performance to their stakeholders in accordance with signaling theory. Additionally, we investigate if firms with poor ESG performance attempt to gain legitimacy from stakeholders through greenwashing in accordance with legitimacy theory. Signaling theory is based on reducing the information asymmetry between two parties (Spence, 2002; as found in Connelly et al., 2011), and it can explain incentives for firms with good ESG performance to report their good performance and increase transparency (Clarkson et al., 2008; Hummel & Schlick, 2016). The alternative explanation, legitimacy theory, suggests that non-financial disclosure is used to influence stakeholders' perceptions by disguising their actual performance (Cho & Patten, 2007; Hummel & Schlick, 2016; Patten, 2002;).

Our results contradict Cho et al. (2010), who found that an overly positive and uncertain tone is associated with poor ESG performance. The associations are also contrary to Patten (2002) and Cho & Patten (2007), who found that firms use sustainability disclosure as a legitimizing tool to obfuscate poor performance. We find a positive relationship between sustainability disclosure quality and ESG performance, implying that poor performers do not give false signals due to the costs exceeding the benefits (Connelly et al., 2011). Our study demonstrates that a prominently positive tone in non-financial disclosures does not inherently signal an imbalance or misinformation. It aligns with Delmas & Burbano's (2011) observation: high-performing companies can also be vocal and effective communicators. This perspective differs from Lyon & Maxwell's (2011) interpretation, which linked an excessively positive tone and a misleadingly positive corporate image to greenwashing practices. As a result, our research endorses confidence in companies' non-financial reports, as they tend to reflect the company's actual performance. The result is in accordance with the findings of Clarkson et al. (2008), Hummel & Schlick (2016), and Mahoney et al. (2013). Our research reinforces these studies by adding the dimension of sustainability disclosure quality by exploring textual features and significantly expanding the number of observations. Moreover, our observations cover nine years and encompass a more comprehensive range of industries.

Our findings reveal higher levels of disclosure among better ESG performers, indicating increased transparency. This finding is consistent with the implementation of the NFR Directive, which, according to Samani et al. (2022), has led to enhanced disclosure and greater uncertainty. Previous research, such as Cho et al. (2010) and Melloni et al. (2017), have indicated that greater uncertainty typically signifies lower disclosure quality or greenwashing. Our results deviate from these findings, suggesting that firms with more uncertainty demonstrate stronger ESG performance. The increased uncertainty can be related to the NFR Directive's focus on risk-related reporting requirements (Samani et al., 2022). Fiechter et al. (2022) illustrated that the enforcement of the directive is still in its infancy, and firms may try to meet the reporting requirements by using greenwashing disclosures. While our findings do not suggest greenwashing, we find that in firms' pursuit to be transparent, they add more complex language to their sustainability disclosures, potentially obscuring the sustainability disclosure quality. It is worth noting that while higher disclosure levels do not guarantee improved sustainability disclosure quality (Cho & Patten, 2007; Michelon et al., 2015), good ESG performers may utilize complex terminology as a signaling mechanism, making their disclosures less understandable and comprehensible.

Hypothesis 2 suggested variation in sustainability disclosure quality across different aspects of the ESG score. We found that the governance performance is less associated with the disclosure measures, indicating less influence of discretionary choices. This aligns with Fatemi et al.'s (2017) argument and reflects Gerwing et al.'s (2022) claim that corporate governance enhances the quality of sustainability reporting. Also, companies presenting standalone sustainability reports show better performance in the environmental- and social pillars, partially resonating with Mahoney et al. (2013). Our analysis discloses a more positive tone, increased transparency, and added complexity in the environmental pillar compared to the social- and governance pillar. This highlights that companies may be making a concerted effort to enhance transparency in their environmental commitments. However, this increased transparency also introduces more complexity to the disclosure, suggesting a trade-off between transparency and simplicity in communication. The findings support our hypothesis as our model more effectively accounts for

variation in the environmental- and social pillars than in the governance pillar. This suggests that the dynamics of disclosure vary substantially between different ESG aspects.

7.0 Conclusion

In conclusion, our study provides valuable insights into the relationship between ESG performance and sustainability disclosure quality, challenging previous findings (Boiral, 2013; Cho et al., 2010; Cho & Patten, 2007; Patten, 2002) and contributing to the existing literature. In line with signaling theory, we find a positive association between sustainability disclosure quality and ESG performance. We do not find evidence of greenwashing; contrary, our results suggest that firms with good ESG performance aim for transparency. Our research supports the notion that a positive tone in non-financial disclosures does not necessarily indicate misinformation and imbalance; rather, it can be seen as effective communication by high-performing companies. However, this increased transparency may come at the cost of added complexity in disclosure, suggesting a trade-off between transparency and simplicity. Due to this trade-off, we neither keep nor reject our hypothesis one. Additionally, our findings highlight variations in sustainability disclosure quality across different aspects of ESG performance, emphasizing the importance of transparency in environmental commitments; hence, we keep our hypothesis two. These insights contribute to understanding disclosure dynamics in different ESG aspects and provide a basis for further research in the field.

Our findings are subject to limitations. Firstly, the study is limited to Swedish companies on the Nasdaq OMX Stockholm Exchange between 2013 and 2021. The applicability of our findings may not extend to alternative research contexts or geographical settings. However, our study has a significantly larger sample than other renowned studies, such as Mahoney et al. (2021), Boiral (2013), and Melloni et al. (2017), and covers a timespan of nine years. Second, the non-significant relationship between the ESG controversies score and our disclosure variables may be due to too few controversies, where a larger sample of controversies could improve the model's explanatory power. Third, the bag of words method used in our analysis might not be as accurate

as more complex models (e.g., machine learning models). There is also a risk that the dictionary by Loughran & McDonald (2011) does not capture the sustainability reporting point of view in the annual reports because the dictionary is initially constructed around the financial report. Regardless, the dictionary is widely used in research (Lang & Stice-Lawrence, 2015; Samani et al., 2022) and is known to serve the purpose of textual analysis effectively.

In addition, Boiral (2013) found that 98% of significant negative ESG news events were not reported by firms with A or A+ ratings from GRI (Global Reporting Initiative). Our additional analysis shows that firms with controversies have a significantly higher ESG performance average. This is evident throughout the individual aspects of ESG, especially in the environmental- and social pillars. Christensen & Serafeim (2022) finds that greater ESG disclosure leads to greater ESG disagreement among rating agencies, as disclosure expands the opportunities for different interpretations of the information disclosed. These findings can raise concerns about the reliability and accuracy of ESG performance measures. However, to respond to new global challenges, ESG rating agencies have expanded the criteria in their assessment models to measure performance more robustly (Escrig-Olmedo et al., 2019).

Our findings supplement studies looking into the relationship between ESG performance and sustainability disclosure quality (Arvidsson & Dumay, 2022; Cho et al., 2010; Christensen et al., 2021; Delmas & Burbano, 2011; Hummel & Schlick, 2016; Mahoney et al., 2013; Melloni et al., 2017; Samani et al., 2022) by providing additional evidence that higher performers report more, but do not necessarily have higher sustainability disclosure quality. Arvidsson & Dumay (2022) finds an increase in sustainability reporting quality after the implementation of NFRD. Khan et al. (2021) also finds similar evolvement for banks in Bangladesh. We provide further insight by extending the number of years since the implementation of NFRD and analyzing textual features of non-financial information. We show that firms must use caution when disclosing more extensive reports due to the possibility of enhancing the complexity of their non-financial disclosures. Standard setters need to be aware of these mechanisms when developing future regulation. These insights are also important for investors when analyzing information in decision-making processes. Further research might consider including more countries to uncover

institutional impacts. Increasing the number of observations can also enhance the number of controversies, further contributing to understanding the relation between disclosure quality and performance.

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Appendix A: List of variables

VARIABLE	DEFINITION	DATA SOURCE
DEPENDENT: **ESG SCORE** • **ENVIRONMENT PILLAR** • **SOCIAL PILLAR** • **GOVERNANCE PILLAR**	Refinitiv Eikons ESG Score is based on a company's ESG performance. The score is calculated by the company performance in the different pillars: environment, social, and governance.	Refinitiv Eikon*
ESG CONTROVERSIES SCORE	Refinitiv Eikons ESG Controversies Score is based on whether a company has had controversies.	Refinitiv Eikon*
DISCLOSURE:		
LN POSITIVITY	The natural logarithm of the number of words categorized as positive in each observation.	Parser in Python
LN UNCERTAINTY	The natural logarithm of the number of words categorized as uncertain in each observation.	Parser in Python
LN NUMBER OF WORDS	The natural logarithm of the total number of words for each observation.	Parser in Python
VOCABULARY	The number of different words in each observation.	Parser in Python
READABILITY	The Flesch-Kinkaid readability score. The formula is calculated as (11.8 * syllables per word) + (0,39 * words per sentence) - 15,59.	Parser in Python
CONTROL:		
SIZE	The natural logarithm of total assets.	Calculated by authors**
ROA	Net income divided by total assets.	Calculated by authors**
MB	Market capitalization, divided by total book value.	Calculated by authors**
LN AGE	The natural logarithm of number of years since the company was founded for each observation.	Calculated by authors**

LEVERAGE	Total debt divided by total assets.	Calculated by authors**
INDUSTRY EFFECT	Two-digit SIC code for industry groups.	Calculated in STATA
YEAR EFFECT	Dummy variable controlling for fiscal year effect.	Calculated in STATA
DUMMY SR	The dummy variable equals one if the company has issued a standalone sustainability report; otherwise, zero.	Generated by authors.
ADDITIONAL ANALYSIS:		
DUMMY CONTROVERSY	The dummy variable equals one if the company has had controversies; otherwise, zero.	Generated by authors

Notes:

* Thomson Reuters Eikon

** Calculated with data from Capital IQ