ENVIRONMENTAL, SOCIAL, AND GOVERNANCE CONTROVERSIES AND EARNINGS QUALITY

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Abstract

The paper examines the association between environmental, social, and governance (ESG) controversies and earnings quality. Prior studies have adduced evidence that ESG controversies significantly influence the cost of equity, audit pricing, firm value, and analyst following. However, the mechanism by which these relationships result has remained an open question. Using publicly available data from multiple sources, the paper constructs a sample of 2,629 firm-year observations. Then the author tests three hypotheses, contending that firms with high ESG controversies are more likely to be associated with low earnings quality. The fourth hypothesis is that these effects are more likely to be elevated in firms operating in environmentally sensitive industries. The author uses abnormal discretionary accruals, and measures of real activities, earnings management, and restatements as proxies of earnings quality. It was found that decreasing ESG controversies score (more controversies) is significantly associated with decreasing earnings quality. Moreover, this effect is more significant in firms operating in environmentally sensitive industries. These results are replicated in additional analyses. Hence, the underlying earnings quality associated with ESG controversies may be one of the links between ESG performance and the factors identified in the research. The author argues that the findings associated with higher ESG performance are better explained by the opportunistic reporting hypothesis rather than the transparent hypothesis. The findings provide a significant addition to the existing literature as they explain the mechanism in support of results documented in prior studies that ESG controversies affect firm value (Aouadi & Marsat, 2018), relate to more gender diversity on the board (Issa & Hanaysha, 2023) and affect firm cost of equity (La Rosa & Bernini, 2022). Moreover, these findings extend prior research to show that the components of ESG performance (rather than the combined score) can provide a better understanding of how firm executives behave considering emerging controversies as argued by Kolsi et al. (2023). The paper argues on the significance of the findings, and the accompanying limitations, and suggest future research.

Keywords: ESG Performance, ESG Controversies, Earnings Quality, Transparent Reporting Hypothesis, Opportunistic Reporting Hypothesis

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1. INTRODUCTION

Extant literature emphasizes the nascent state of knowledge about how environmental, social, and governance (ESG) issues affect businesses. For example, Christensen et al. (2022) indicate that it is imperative to understand ESG data better and how it relates to crucial firm and market effects. Additionally, Galletta and Mazzù (2023) assert a need to enhance the integration of climate-related risks in firm risk management frameworks. Overall, there has been interest in how non-financial information on ESG issues relates to such measures as firm performance, firm value, auditor response, audit pricing, value relevance, and earnings quality.

Contemporaneous research depicts a developing curiosity to understand the relevance of ESG issues in critical firm measures. Some of these include firm performance (Serafeim & Yoon 2022) and firm market value (Zhou et al., 2022). This is in cognizance of the heightened concern by investors to know how firms manage environmental issues that are now understood as business risks (Serafeim & Yoon, 2022). This is important because most companies are not yet aware of how climate-related risks affect their businesses (Whieldon et al., 2023). Therefore, the author intends to contribute to this stream of research by investigating how ESG controversies, one of the ESG issues, relate to earnings quality, a fundamental firm measure important to investors.

This study makes a significant contribution to the literature in several ways. First, findings from this study provide an understanding of the mechanism through wich ESG controversies may affect such factors as analyst following, cost of equity, bank risk, and board composition, documented in prior research. Second, the author directs investors', regulators' and other users' attention to the details of ESG performance in line with the adage, "*the devil is in the details.*" Third, although contemporaneous research has documented a significant association between ESG performance and earnings quality (Kolsi et al., 2023; Tohang et al., 2024), no research has examined the association between ESG controversies and earnings quality. In addition, while Kolsi et al. (2023) focus on banking firms and separate ESG performance into its three pillars, they find no significant association between the environmental pillar and earnings management. This result may be due to the sample firm characteristics (banks are less likely to have operations that involve the environment directly). The study focuses on ESG controversies which is a component of the environmental pillar. This is a crucial addition to this research stream because, as La Rosa and Bernini (2022) advise, separating ESG data into its components provides an accurate approach to measuring the associated effects. Additionally, recent research (Cheng et al., 2015; Ho et al., 2022) documents that investors recognize ESG scores as important indicators of business strategic success. Hence, a better understanding of the components that make up the scores would go a long way in improving business strategic decisions. Therefore, the study has both research and economic implications.

These findings are significant in several ways. First, they indicate the aptness of the ESG controversies scores as a proxy for environmental issues in firm operations. They provide empirical evidence of the nexus between the effects of climate change and firm operations to the extent that the effects of ESG controversies' score on earnings quality are more prevalent in firms operating in environmentally sensitive industries.

Second, these findings provide the mechanism of explaining findings in prior studies that ESG controversies can affect firm value (Aouadi & Marsat, 2018), relate to more gender diversity on the board (Issa & Hanaysha, 2023) and affect firm cost of equity (La Rosa & Bernini, 2022). Third, these findings extend prior research to show that the components of ESG performance (rather than the combined score) can provide a better understanding of how firm executives engage in ESG and respond to emerging controversies as argued by Kolsi et al. (2023).

In this study, the author addresses the research question of whether executives protect themselves against the effects of ESG controversies by changing their financial reporting behavior. The author answers the following questions:

RQ1: Does the quality of earnings for firms varies with the level of ESG controversies?

RQ2: Is earnings quality in such firms driven by the nature of their business environment or by earnings management?

By answering these questions, the author is able to contribute to the debate of the opposing hypotheses that explain ESG performance and also understand the executives' reporting behavior in light of ESG controversies.

The paper is organized as follows. In the next Section 2, reviews the related literature and develop the hypotheses. Section 3, presents the data sources, sample construction, and the research design. Then Section 4 provides results and Section 5 discusses them. Section 6, concludes the paper and mentions the limitations of the study.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

There is a multiplicity of constructs in the literature that refer to ESG issues. Some of these include corporate social responsibility (Gaio et al., 2022; Kim et al., 2012), integrated reporting (Bose & Hossain, 2024; Gerwanski, 2020), sustainability reporting (Dechow, 2023), ESG performance (Kolsi et al., 2023; Moffitt et al., 2024; Nurrahman et al., 2019; Tohang et al., 2024), environmental performance (Hardeck et al., 2024), ESG disclosure (Garsaa & Paulet, 2022; Liu et al., 2023), corporate sustainability (Khan et al., 2016), sustainability disclosures (Rezaee & Tuo, 2019) and climate risks (Jiang & Luo, 2024; Truong et al., 2020).

ESG performance continues to receive more attention in the literature compared to other issues. ESG performance is measured by the ESG combined scores or ESG ratings (Kolsi et al., 2023; Moffitt et al., 2024; Nurrahman et al., 2019). These ESG scores, however, suffer from measurement diffculties (Moffit et al., 2024). Moreover, the ESG ratings have been documented to differ in several other ways with the attending undesired consequences

(Christensen et al., 2022) that include higher return volatility, larger price changes, and diminished likelihood of issuing external financing.

Extant literature has documented alternative hypotheses to understand how ESG performance may relate to the quality of financial reporting. On the one hand, there is the transparent reporting hypothesis (Kim et al., 2012) which contends that high ESG performance is associated with high-quality financial reporting. This view is in line with the signaling theory. On the other hand, the opportunistic reporting hypothesis argues that executives may invest in improving the firm's ESG performance to serve their opportunistic interests.

Opportunistic actions by executives are always associated with a declining internal control environment with the attendant reduction in earnings quality. The relationship between ESG performance and the internal control environment has been examined in the literature (Moffitt et al., 2024). Moffitt et al. (2024) find that ESG performance is significantly associated with internal control environment consistent with the transparent reporting hypothesis. This finding supports Rezaee and Tuo (2019) who find that the quality of sustainability disclosures, like the ESG performance, is negatively correlated with discretionary earnings quality which mitigates executive opportunistic reporting behavior.

Another ESG issue that has attracted research interest in the recent past is ESG controversies. ESG controversies have been related to nomination committee characteristics (Iannuzzi et al., 2023), firm value (Aouadi & Marsat, 2018), auditor response (Burke et al., 2019), corporate performance (Elamer & Boulhaga, 2024), bank risk-taking (Galletta & Mazzù, 2023), women on corporate boards (Issa & Hanaysha, 2023), audit pricing (Koh & Tong, 2013), cost of equity capital (La Rosa & Bernini, 2022), and analyst following (Mburu & Bonaparte, 2024).

ESG controversies differ uniquely from the other forementioned issues. This is because, while it measures a company's exposure to negative events reflected in global media, all the other issues relate to what the executive does and reports. Hence, the ESG controversies score is an external measure while the others, like ESG performance scores, are internal measures. It is, therefore, possible to classify constructs like ESG performance, corporate social responsibility, sustainability reporting, and integrated reporting, as firm endogenous constructs. In that sense, ESG controversies is an exogenous construct. This classification then affords an opportunity to examine ESG controversies as an exogenous shock within the ESG performance measure. This classification, which is also supported by Galletta and Mazzù (2023, p. 275), is important because it provides an additional lense through wich ESG performance can be better understood. To the extent that ESG controversies is an exogenous construct then it can be argued that it is not subject to executive manipulation as anticipated by the opportunistic reporting hypothesis. This study contributes to this stream of research and examines how ESG controversies relate to earnings quality. The author considers this an important question for several reasons.

To start with, there is evidence from accounting research to support the argument that,

the use of combined measures has the potential to shroud some important insights regarding the underlying constructs. One example is by Richardson et al. (2006) who find additional insights by decomposing total accruals into separate components to avoid distortion. Another example is by Landsman et al. (2011) who examine the question of whether investors understand the difference between the two components of surplus; dirty and really dirty surplus. There are other similar examples in the literature. In addition, the combined ESG scores that measure ESG performance are explained by opposing hypotheses that provide tension between transparent and opportunistic reporting as explained above. The ability to examine the separate components of the combined ESG scores has the potential to discriminate between these opposing hypotheses.

These considerations are the key motivations for this study. Furthermore, although prior studies have documented significant relationships between ESG controversies and 1) bank risk (Galletta & Mazzù, 2023), 2) cost of equity capital (La Rosa & Bernini, 2022), 3) firm value (Aouadi & Marsat, 2018), 4) firm performance (Elamer & Boulhaga, 2024), and 5) board composition, (Iannuzzi et al., 2023), no study has provided an explanation of what mechanism drives these relationships. This is the focus of the study. Moreover, while some studies have separated the ESG combined score into its ESG pillars (Moffitt et al., 2024), none has gone to the level of ESG controversies which is a component of the environmental pillar. This separation is important as it has been documented that the combined scores have huge measurement errors (Serafeim & Yoon, 2022) and result in multifaceted issues (Christensen et al., 2022). The author contends that delving into the ESG controversies as an exogenous component of the combined ESG score can provide an understanding of the mechanism that drives factors so important to investors.

Firm executives are known to sacrifice economic benefits to meet earnings targets (Graham et al., 2005). This is because the market ascribes great value to meeting earnings targets and brutally penalizes firms that miss them. In addition, executives make every effort to provide voluntary disclosures to reduce information asymmetry. This is to be expected according to the agency theory. Furthermore, behavioral agency theory predicts varying risk appetites among executives depending on the expected benefits accruing from risk-taking behavior. Executives can also create unrealistic expectations for market users by manipulating earnings to smoothen earnings. This is driven by the fact that investors and financial analysts prefer predictable earnings (Dechow & Schrand, 2004, p. 2). All these are risk-taking behaviors that distort the earnings quality. Nevertheless, as Dechow and Schrand (2004) cautioned, firms operating in volatile business environments may have low-quality earnings even with no manipulation.

Earnings quality is an important firm characteristic. Investors and financial analysts are keen on earnings quality because it is deemed sustainable and can be replicated (Dichev et al., 2013). Furthermore, earnings quality coheres with the economic reality and is, therefore, important for use in firm valuation, debt covenants, and executive

compensation, among others. There are both internal and external measures of earnings quality.

External indicators of earnings quality include restatements, accounting and auditing enforcement releases (AAERs), and internal control weaknesses under Sarbanes-Oxley Act (SOX) sections 404 and 304. Internal indicators are categorized as 1) properties of earnings (persistence, accruals, smoothness) and 2) investor responsiveness (using earnings response coefficient (ERC) or the R^2 from the earnings-returns model). Hence, it is possible to investigate earnings quality based on external and internal indicators related to the firm status of ESG controversies.

ESG information has been adopted as a key component of investment decisions (Christensen et al., 2022) in financial markets. This is because it is now agreed that ignoring ESG-related factors, which are a source of firm risk, is imprudent on the part of corporate boards and investment decision-makers. Firms that ignore the use of ESG information risk losing competitive advantage and preference by investors (Garsaa & Paulet, 2022). ESG information has been used in research using ESG disclosures, ESG scores, and ESG pillars (environment, social, and governance).

ESG information has been measured in different ways in the literature. Some of these are ESG performance, ESG disclosures, sustainability reporting, corporate social responsibility, and integrated reporting. What is common to all these measures is the non-financial nature of the underlying firm information that they provide. Often when reference is made to ESG performance, the measure is the ESG score. This score usually combines information from the three pillars — ESG pillars. Each of these pillars is made up of different components. For example, ESG controversies are a component of the environmental pillar. These measures have been examined from different viewpoints, one of which is financial reporting.

Prior research has focused on whether financial reporting quality is significantly associated with ESG performance. Some of these studies have examined whether ESG performance affects financial reporting quality from the point of view of abnormal loss provisions in banks (Kolsi et al., 2023); real activities earnings management (Liu et al., 2023); internal control environment (Moffitt et al., 2024); discretionary accruals (Nurrahman et al., 2019); earnings quality (Tohang et al., 2024). Others have looked at whether ESG performance is related to other variables related to financial reporting quality such as value relevance (Serafeim & Yoon, 2022) and market value (Zhou et al., 2022).

Overall, these studies find that increasing ESG performance is significantly associated with decreasing the likelihood of engaging in earnings management. Hence ESG performance is positively associated with increasing earnings quality. However, all these studies suffer from two major limitations. The first limitation is that they all rely on combined ESG scores to measure ESG performance which has been identified to have measurement errors (Serafeim & Yoon, 2022) and can cause distortions in result interpretation as argued by (Christensen et al., 2022). In some studies, the components of the score have been separated as in the case of Kolsi et al. (2023). Kolsi et al. (2023)

identify the need to split the ESG scores into their components to better understand their influence on the dependent variables of interest. Furthermore, such combined measures have been found to be open to criticism, and separating them into components provides a better lens to examine the positive and negative effects (La Rosa & Bernini, 2022).

The second limitation of the contemporaneous studies relating ESG performance and earnings quality is that none have been able to explain the tension between the transparent reporting hypothesis and the opportunistic reporting hypothesis. Such a distinction would be telling to investors and the complicated users of firm disclosures. Furthermore, the distinction can potentially determine whether ESG performance relates to earnings quality in and of itself or is due to underlying factors.

Alternative non-financial measures related to ESG have been used in extant literature. Examples of these are Rezaee and Tuo, (2019) where sustainability disclosures and discretionary earnings quality are examined. Another example is (Kim et al., 2012) where earings quality is related to corporate social responsibility. Again, in these studies just like in the earlier ones, the general finding is that better sustainability disclosures and higher corporate social responsibility are associated with increasing earnings quality.

A component of ESG performance (score) that has become of interest to researchers is the ESG controversies (score). Research on this component is quite nascent (La Rosa & Bernini, 2022, p. 645). ESG controversies are defined as corporate ESG news that provide a bad reputation and picture of the firm (Aouadi & Marsat, 2018). The ESG controversies score measures a company's exposure to environmental, social and governance controversies and negative events reflected in global media. While this score combines non-environment-related news, it has been documented to be an apt proxy for climate-related news (Mburu & Bonaparte, 2024). Hence, it is reasonable to use ESG controversies to tease environmentally related exposures from adverse events.

Such events capture investors' attention, making them cast doubts about the firm's future performance and probably reducing the firm's value. Decreasing ESG controversies is significantly related to decreasing bank risk-taking (Galletta & Mazzù, 2023). Research has also established that ESG controversies are associated with increased audit risk, higher audit fees, and a higher likelihood of auditor resignation (Burke et al., 2019) because of the potential increase in material misstatement and declining business conditions. Furthermore, ESG controversies may indicate poor management effectiveness, which might incentivize executives to manage earnings. Burke et al. (2019) argue that the ESG controversies score is a novel proxy for audit risk that has not been used in accounting research. Similarly, Truong et al. (2020) find that firms exposed to climate risks related to drought pay significantly higher audit fees and environmental risks increase audit fees (Eierle et al., 2022), while firms with ESG controversies are perceived to have a higher risk of mismanagement, unethical behavior, and diminishing financial

performance (Koh & Tong, 2013) and, therefore, pay higher audit fees.

Together, these findings add credence to the use of ESG controversies to capture the underlying components within the environmental pillar of ESG score. Moreover, as an exogenous variable, ESG controversies potentially provide room to release the tension between the competing hypotheses — opportunistic and transparent reporting hypotheses. From an environmental (and climate change) perspective, executives would want to mitigate the negative effects of their operations on the environment. These, more often than not, result in controversies. Consistent with Graham et al. (2005) and based on the behavioral agency theory, one can argue that executives would be willing to do anything to reduce their risks and improve their earnings figures. ESG controversies can potentially provide the potential for such behavior as it can have significant adverse effects on firm performance (Issa & Hanaysha, 2023, p. 624). These arguments together with the above research findings suggest that firms with ESG controversies scores would be deemed to have lower earnings quality. Therefore, we hypothesize:

H1: Firms with high ESG controversies scores are likelier to be associated with accruals earnings management.

H2: Firms with high ESG controversies scores are likelier to be associated with real activities earnings management.

The ESG controversies score is an exogenous indicator of firm characteristics to the extent that it cannot be directly influenced by the firm (Galletta & Mazzù, 2023, p. 275). Companies exposed to ESG controversies are more likely to have declining future prospects, reputation, profits, and market value. Alternatively, such controversies create impetus for improved climate change mitigation behavior by the affected companies. The effects of ESG controversies can be attenuated by the composition of the board and nomination committee (Iannuzzi et al., 2023) and by having more women on the boards (Issa & Hanaysha, 2023). These findings suggest that ESG controversies have something to do with the quality of corporate governance in line with diversity theory and gender socialization theory.

Corporate governance factors that are known to influence the ESG controversies score, as outlined by Issa and Hanaysha (2023), are board size, proportion of independent directors, chief executive officer (CEO) duality, and directors' tenure on the board. There are also firm fundamentals that can influence ESG performance, including firm size, profitability, growth opportunities, and leverage. Industry and year-fixed effects are also important, as the ESG controversies vary by industry and across time. Hence, in a model that seeks to understand the effects of ESG controversies, these factors would need to be controlled.

Using the transparent reporting hypothesis, Moffit et al. (2024) find that firms with high ESG performance are less likely to have internal control material weaknesses because of their improved internal control environment, as they have a better tone at the top. This finding suggests high ESG firms are more likely to be associated with high-quality earnings. In addition, firms with poor ESG performance pay higher capital costs than those with better performance (La Rosa & Bernini, 2022). Specifically, La Rosa and Bernini (2022) find that ESG controversies further increase the cost of capital in strongly regulated markets. They argue that ESG controversies could clarify contrasting findings in the extant literature on the association between ESG and the cost of capital because this separation provides an accurate approach to measuring the associated effects. Using legitimacy theory, La Rosa and Bernini (2022) find that firms with high ESG controversies suffer higher capital costs. This is because such companies are exposed to declining survival prospects, which disapprove of the firm's legitimacy. And given that executives would work hard to counter these negative effects, the author hypothesizes:

H3: Firms with high ESG controversies scores are more likely to be associated with financial statement restatements.

ESG controversies arise because of many factors, including environmental issues arising from climate change effects. These effects are not the same across industries. This is because climate change effects disrupt nature and resource availability in the economy. Furthermore, these effects are on the increase because of the overuse of key resources such as water, wood, agricultural produce, and energy (Corvellec et al., 2021). Some of the nature-related issues that influence the availability of these resources are pollution, carbon emissions, soil erosion, and flooding, among others, all of which aggravate controversies. Relatedly, firms would be exposed to ESG controversies depending on the industries in which they operate. Gerwanski (2020) classifies environmentally sensitive industries as those identified by the 2-digit Standard Industrial Classification (SIC) codes 08, 10–14, 26, 28, 33–34 and 49. This leads to the fourth hypothesis.

H4: Effects of ESG controversies on earning quality are more pronounced in environmentally sensitive industries.

3. RESEARCH METHODOLOGY

3.1. Data sources

The author obtained data from multiple public sources. Firm fundamentals data from Compustat, restatements, internal control weakness, and auditor data from audit analytics, analyst following data from I/B/E/S, corporate governance data from ISS, and ESG data from LSEG Refinitiv. The author used data for US firms for the period 2011–2023.

3.2. Research design

In this section, the author presents the variables including how they are constructed, the models estimated, the methods of analysis, the sample construction, and the sample distribution.

3.2.1. Variable construction

The author uses multiple variables to measure earnings quality (*EQ*) which is the dependent variable. The first variable is the abnormal discretionary accruals (*ADA*) as per the modified

Jones model (Dechow et al., 1995). The author then computes the three real activities earnings management variables. These are abnormal cash flows (*ACFO*), abnormal production costs (*APROD*), and abnormal discretionary expenses (*ADISX*) as per Roychowdhury (2006) and the two comprehensive measures as per Cohen and Zarowin (2010), *CZ1* and *CZ2* defined as follows.

$$CZ1 = (-1) \times ADISX + APROD \qquad (1)$$

$$CZ2 = (-1) \times ACFO + ADISX \qquad (2)$$

ESG controversies is the independent variable of interest. The author uses the ESG controversies score in two variations. One, is the absolute ESG controversies score (*CONTROV*). The author multiplies the ESG controversies score by -1 for ease of interpretation to make the variable *CONTROVERSY*. This is because the highest value of the ESG controversies score is 100, which indicates excellent relative ESG performance and no ESG controversies. Hence, the lower the *CONTROVERSY* variable, the lower the ESG controversies.

The ESG combined score (*COMBSCORE*) is a score that overlays the ESG score with ESG controversies to provide a comprehensive evaluation of the company's sustainability impact and conduct over time, and it is a comprehensive measure of a firm's ESG performance. The other variation of the ESG controversies measure is *CONTROLEVEL*. *CONTROLEVEL* is a dummy variable equal to 1 if the firm has an ESG controversies score less than the sample 25th percentile and zero otherwise. The discretion to use the 25th percentile is informed by the score distributions in the sample firms[1]. The author uses this variable to partition the sample firms into those with high and low levels of ESG controversies. To test *H4*, the author constructs variable *ENVIRONSENSE* which is a dummy variable equal to 1 for firms that operate in environmentally sensitive industries and zero otherwise. To classify industries as environmentally sensitive or not, the author adopts Gerwanski's (2020) classification of environmentally sensitive industries as those identified by the 2-digit SIC codes 08, 10–14, 26, 28, 33–34 and 49.

3.2.2. Dataset calibration

To start with, the author tests whether the data set is properly constructed; the author refers to this as calibration. The author estimates Model 1 was used in contemporaneous research by Issa and Hanaysha (2023). If the dataset is appropriately constructed, the author expects to find similar results to those of Issa and Hanaysha (2023).

Model 1

$$COMBSCORE = \alpha + \beta_1 BGDIVERSITY + \beta_2 BDSIZE + \beta_3 BIND + \beta_4 CEODUALITY + \beta_5 BTENURE + \beta_6 SIZE + \beta_7 ROA + \beta_8 GROWTH + \beta_9 LEV + YEAR + INDUSTRY + \varepsilon \qquad (3)$$

The dependent variable, *COMBSCORE* is the ESG combined score. *BGDIVERSITY*, *BDSIZE*, *BIND*, *CEODUALITY*, and *BTENURE* are corporate governance variables. *SIZE*, *ROA*, *GROWTH*, and *LEV* are firm-level variables measuring size, performance, growth opportunities, and leverage, respectively. All variables are as defined in Appendix (Table 1).

3.2.3. Hypotheses testing models

To test *H1*, *H2*, and *H3*, the author estimates a modified La Rosa and Bernini (2022) cross-sectional linear regression (Model 2) below. Consistent with La Rossa and Bernini (2022), the author lags the independent variables for a one-year from the dependent variable to abate endogeneity issues. The dependent variable *EQ* consists of five different measures of earnings management as explained above. The independent variable of interest *CONTROV* takes two forms: the ESG controversies score (*CONTROVERSY*) and the level of ESG controversies (*CONTROLEVEL*) which can be high (1) or low (0). A significant coefficient for variable *CONTROV* would provide support for *H1* and *H2*. The author expects positive and significant coefficients for the dependent variables *ADA*, *APROD*, *CZ1*, and *CZ2* and a negative and significant coefficient for the dependent variable *ADISX*. We do not predict the sign for chief financial officer (CFO) as it can move in both ways depending on the approach to earnings management.

Model 2

$$EQ_{i,t} = \alpha + \beta_1 CONTROVERSY_i + \beta_2 LEV + \beta_3 ANFOL + \beta_4 ADA + \beta_5 BTENURE + \beta_6 BGDIVERSITY + \beta_7 BIND + \beta_8 RD + \beta_9 AD + \beta_{10} INCENTIVE + YEAR + INDUSTRY + \varepsilon \qquad (4)$$

The author includes in the model variables likely to influence earnings quality as documented in extant literature. These are leverage (*LEV*), analyst following (*ANFOL*), corporate governance variables including director tenure (*BTENURE*), board gender diversity (*BGDIVERSITY*), and proportion of independent directors (*BIND*). Besides controlling for year and industry fixed effects, the author also controls for research and development input (*RD*), intensity of advertising expenses (*AD*), and incentive to engage in earnings management (*INCENTIVE*) as argued by Roychowdhury (2006). Because prior literature has documented substitution between accruals earnings management and real activities earnings management, the author controls for discretionary accruals (*ADA*) when the measure of the dependent variable relates to real activities earnings management and vice versa. All variables are defined in Appendix (Table 1).

To test *H3*, the author estimates a logistic regression Model 3 below. The dependent variable is a dummy variable, *RESTATEMENT*. The author codes *RESTATEMENT* equal to 1 if the firm has had a restatement in the last five years and zero otherwise. The independent variable of interest in this model is *CONTROV* which as in Model 2 takes two forms, the negative ESG controversies score (*CONTROVERSY*), and the level of ESG controversies (*CONTROLEVEL*) which can be high (1) or low (0). To support this hypothesis, the author expects

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[1] The 25th percentile score was more than 78 compared to a maximum of 100.

a negative and significant coefficient for variable *CONTROVERSY* and a positive and significant coefficient for *CONTROLEVEL.*

Model 3

$$RESTATEMENT_{i,t} = \alpha + \beta_1 CONTROVERSY_i + \beta_2 ADA + \beta_3 GROWTH + \beta_4 ROA + \beta_5 LEV + \beta_6 RISK + \beta_7 ANFOL + \beta_8 BTENURE + \beta_9 BGDIVERSITY + \beta_{10} BIND + \beta_{11} RD + \beta_{12} AD + \beta_{13} ICMW + \beta_{14} AUDITOR + \beta_{15} PANDEMIC + YEAR + INDUSTRY + \varepsilon \quad (5)$$

The author includes control variables for factors that are likely to influence the financial statement restatement. These include variable abnormal discretionary accruals (*ADA*), growth (*GROWTH*), performance (*ROA*), leverage (*LEV*), and liquidity risk (*RISK*). Analyst following (*ANFOL*), board tenure (*BTENURE*), board gender diversity (*BGDIVERSITY*), proportion of independent directors (*BIND*), internal control material weaknesses (*ICMW*), the auditor size (*AUDITOR*). The author also controls for year (*YEAR*) and industry (*INDUSTRY*) fixed effects and the COVID-19 effects (*PANDEMIC*). All the variables are defined in Appendix (Table 1).

3.2.4. Environmentally sensitive industries

Consistent with Gerwanski (2020), the author defines environmentally sensitive industries as those in the 2-digit SIC codes 08, 10–14, 26, 28, 33, 34, and 49. To test *H4* which focuses on firms in these industries and contends that the effect of ESG controversies on earnings quality is elevated in these industries compared to other industries, the author estimates Model 4.

Model 4

$$EQ_{i,t} = \alpha + \beta_1 ENVIRONSENSE \times CONTROVERSY + \beta_2 LEV + \beta_3 ANFOL + \beta_4 ADA + \beta_5 BTENURE + \beta_6 BGDIVERSITY + \beta_7 BIND + \beta_8 RD + \beta_9 AD + \beta_{10} ROA + \beta_{11} AUDITOR + \beta_{12} EM + YEAR + INDUSTRY + \varepsilon \quad (6)$$

The dependent variable remains the measures of earnings quality (*EQ*). The author proxies for earnings quality using the same variables as in Model 2. However, the independent variable of interest is *ENVIRONSENSE* × *CONTROVERSY*. The variable *EM* represents a proxy for earnings management to control for the substitution between accruals and real activities earnings management as per Zang (2012). To find support for *H4*, coefficient β_1 should be significant indicating a change in ESG controversies conditional on environmentally sensitive industry. Specifically, coefficient β_1 should be negative for *APROD*, *CZ1*, and *CZ2* but negative for *ADISX* to support *H4*.

3.3. Sample construction

The author selects the sample firms starting with the Compustat universe for 2000–2023. The author constructs earnings management variables and drop firms with missing earnings management variables, financial (SIC 6000–69999) and utility firms (SIC 4400–4999). The author argues that financial and utility firms are not likely to have environmentally sensitive operations that attract controversies. This argument is consistent with Galletta and Mazzù (2023) who indicate that stakeholder reactions are stronger when controversies are related to the environment. The author then merges with data from Audit Analytics, ISS, LSEG, and I/B/E/S. The author loses observations due to the required variables from I/B/E/S. The author ends up with a dataset with 2629 observations, as shown in Table 2 (see Appendix). The final sample comprises 418 unique firms for the periods 2010–2023 and 2,629 firm-year observations.

3.4. Analysis

The author does the analysis using the SAS software. For univariate analysis, the author conducts correlation analysis and t-test for differences in means. The author then conducts a cross-sectional linear regression analysis to test *H1*, *H2*, and *H4*. The author estimates a logistic regression model to test *H3*. The author requests variance inflation factor (VIF) statistics to check for multicollinearity in all the regressions.

Results from Model 1 estimation show an F-statistic of 36.5 (p-value < 0.0001), and the adjusted R^2 is 0.2199. These results closely compare with those documented by Issa and Hanaysha (2023) (R^2 between 0.208 and 0.221). All independent variables have the same direction as those documented by the authors. This adds credence to the data and the author concludes that it is reasonably constructed to proceed to data analysis.

3.5. Sample distribution

The author shows the sample distribution in Table 3 (see Appendix). Panel A shows the distribution across industries, and Panel B shows the distribution by years, S&P Index, and auditor size.

The entire sample consists of firms from 37 industries (by 2-digit SIC code). As Table 3 Panel A (see Appendix) shows, 80% of the observations in the sample are from 14 industries. Of the industries not listed, 25 have observations below 3% and 13 of them comprise less than 1% of the observations. The distribution is similar according to the Fama and French's (1997) 48-industry classifications (see F&F code in Table 3, see Appendix). The author has listed specific industries that have at least 2.4% of the observations and summed up the rest as "others". In the category "others" the highest % is 2.2 with 28 of the industries having less than 1%. Therefore, the sample is well distributed across industries and does not suggest clustering.

As for the distribution by year, about 37% of the observations are in 2020–2023. Furthermore, the year distribution shows a gradual increase in the observations from 2011 to 2021, with a sharp decline from 2022. Half of the observations are from S&P 500 (large cap) firms, while the other half are equally divided into small and medium cap firms. Consequently, the author observes that about 60% of the firms are audited by one of the Big 6 auditors. Again, the distribution does not suggest any clustering, although most firms are large.

4. RESULTS

The author now presents the results starting with the descriptive statistics of the variables, univariate analysis, multivariate analysis, and then additional robustness analysis.

4.1. Descriptive statistics

The author shows the descriptive statistics of all the variables, including control variables, in Table 4 (see Appendix). The statistics do not show any indication of outliers. However, the standard deviation for the earnings management variables is higher than the mean, suggesting that these variables may have outliers. To allay this concern, the author repeats the multivariate analysis using winsorized variables at the 5% and 95% levels in the additional analysis.

4.2. Univariate analysis

In the univariate analysis, the author conducts a correlation analysis and test of difference in means. The author uses correlation analysis to find preliminary support for the hypotheses and assess any evidence of multicollinearity. Regarding the correlation analysis, the author examines three aspects related to the ESG controversies score. First, the author divided the sample into firms with high controversies (coded 1) and those with low controversies (coded 0). The author classifies firms with ESG controversies score less than the 25th percentile as having a high controversies level. The author uses the variable *CONTROLEVEL* for this partition.

4.2.1. Correlation analysis

The author presents the correlation analysis results for the dependent and independent variables of interest in Table 5 (see Appendix). The dependent variables, *RESTATEMENT*, *ADISX*, *CZ1*, and *CZ2*, significantly correlate to *CONTROLEVEL* at the 5% level (1% for *RESTATEMENT*).

Second, the author examines the correlation between the negative ESG controversies score (*CONTROVERSY*) with the dependent variables. Results show that *RESTATEMENT* and *ADISX* are negatively and significantly correlated to *CONTROVERSY*. This means firms with controversies are likelier to have more restatements and lower abnormal discretionary expenses. In addition, *CONTROVERSY* is positively and significantly correlated to the likelihood of real activities earnings management.

Third, the author divides the sample by the variable *ENVIRONSENSE*, a dummy variable coded 1 if the firm is in an industry classified as environmentally sensitive[2] and zero otherwise.

Correlation results for the independent variables (not tabulated) do not suggest any likelihood of multicollinearity. The significant correlation coefficients above 0.8 are between the liquidity risk of operational cash flows for the last five years (*CRISK*) and internal control

material weaknesses (*ICMW*), analyst following (*ANFOL*) and the auditor size (*AUDITOR*), and *ICMW* and *AUDITOR*. These variables are not entered into the models together.

4.2.2. Test of differences in means

The author conducts tests of differences in means of the dependent variables by partitioning the sample in two different ways. In the first one, the author uses *ENVIRONSENSE* which compares the sample firms in environmentally sensitive industries to those which are not. In the second test, the author partitions the sample firms using the variable *CONTROLEVEL*. *CONTROLEVEL* compares firms with high ESG controversies to those with low ESG controversies. The author shows the results in Table 6 (see Appendix).

4.3. Multivariate analysis

4.3.1. Linear regression analysis

To test the hypotheses and adduce more credible support for the univariate results, we proceed to multivariate analysis and estimate Model 2. The author shows the results in Table 7 (see Appendix).

Coefficients for the independent variable of interest take the expected signs. Except for abnormal discretionary accruals, all the other measures of real activities earnings management are significant.

4.3.2. Logistic regression analysis

The author estimates the logistic regression model, Model 3, to test *H3*. The dependent variable in this model is the probability of a restatement (*RESTATEMENT* = 1). The independent variable of interest remains the ESG controversies score (*CONTROVERSY*). The author estimates the model in three variations: the prior-year controversies score, the current-year controversies score, and the controversy level. The author presents the results in Table 8 (see Appendix).

To test *H4*, we estimate the linear regression Model 4 using the earnings management variables as dependent variables and the logistic regression using restatement as the dependent variable. The author presents the results for this estimation in Table 9 (see Appendix). Results for the restatement logistic regression model are not significant.

4.4. Additional analysis

The author compares the effect size of the model estimates for the full sample and for the environmentally sensitive industries sample. The author finds that the effect in all instances (except for abnormal production costs) is larger for firms in environmentally sensitive industries (2-digit SIC codes 08, 10–14, 26, 28, 33–34 and 49) compared to firms in other industries. This finding adds to the previous results that the effect of ESG controversies on earnings quality is higher for such firms.

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[2] Gerwanski (2020) classifies environmentally sensitive industries as those identified by the 2-digit SIC codes 08, 10–14, 26, 28, 33–34 and 49.

Figure 1. Comparison between full sample and environmentally sensitive industries sample
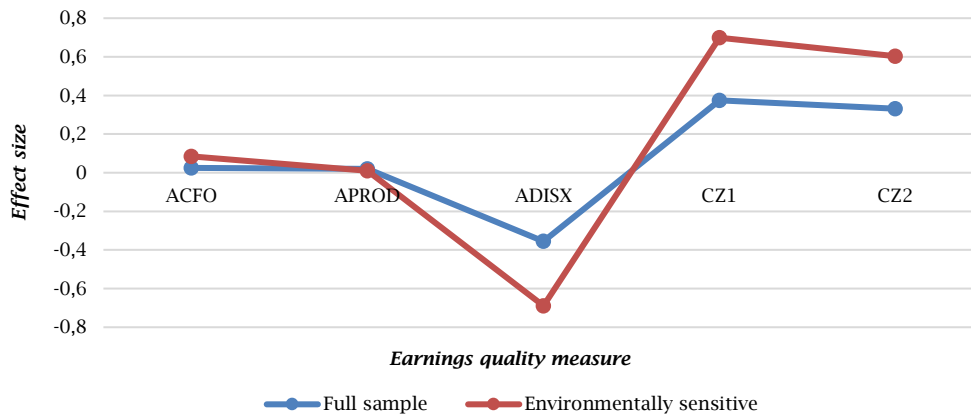
To allay the concerns over outliers in the dependent variables as suggested by the descriptive statistics, the author winsorized the dependent variables, *ADA, ACFO, APROD, ADISX, CZ1*, and *CZ2* at the 5% and 95% percentiles and repeated the estimates for the main tests. All the results (not tabulated) are similar in the direction and significance of the independent variables of interest. However, the author found attenuated effect sizes and increased adjusted R^2.

The author constructs two additional proxies for earnings quality: 1) persistence and 2) quality of earnings ratio. To calculate persistence, the author estimates for each firm in the sample the regression:

$$Earnings_{t-1} = \alpha + \beta Earnings_t + \varepsilon \qquad (7)$$

The coefficient β is the measure of persistence. The higher the value, the higher the persistence and the higher the earnings quality. The quality of earnings ratio is net operating cash flows scaled by the net income before extraordinary items. These proxies are negatively and significantly correlated to the *CONTROLEVEL* and *CONTROVERSY* variables at the 1% level. Results for the difference in means show that firms in highly environmentally sensitive industries have significantly lower persistence at the 1% level (t-value = 4.15). Similarly, firms with high controversies have significantly lower persistence than firms with low controversies at the 1% level (t-value = 5.92). The regression results show that *CONTROLEVEL* negatively and significantly influences persistence at the 5% level ($\beta = -0.1404$, p-value = 0.0262). Taken together, these results add credence to those in the main analyses.

The author estimated an alternative regression model to test *H4*. In this model, the dependent variables are interaction terms between earnings quality proxies and the dummy variable for environmentally sensitive industries. The interaction terms are of the form *ENVIRONSENSE × REM*, where *REM* is the measure of earnings management, abnormal discretionary accruals (*ADA*), abnormal operational cash flows (*ACFO*), abnormal production costs (*APROD*), abnormal discretionary expenses (*ADISX*), and the two comprehensive measures for real activities earnings management per Cohen and Zarowin (2010), *CZ1* and *CZ2*. The independent variable of interest in these estimations is *CONTROVERSY*. The author shows these results in Table 10 (see Appendix).

These results are quantitatively like those in the main analysis providing further support for *H4*.

5. DISCUSSION OF RESULTS

The author starts the discussion of the results with the correlation analysis. The correlation results indicate that firms with higher levels of controversies are associated with a higher likelihood of restatement, abnormally low discretionary expenses, and higher measures of real activities earnings management. These results provide preliminary support for *H2* and *H3*. A negative and significant correlation between *CONTROLEVEL* and *RESTATEMENT* is consistent with no significant correlation with abnormal discretionary accruals. This is true to the extent that executives avoid engaging in accrual earnings management for fear of detection by auditors. Moreover, restatements are more likely to be triggered by accrual earnings management.

Results also show that firms in environmentally sensitive industries are associated with significantly higher controversies, higher restatements, higher abnormal discretionary accruals, higher abnormal cash flows from operations, lower abnormal production costs, lower abnormal discretionary expenses, and an overall higher likelihood of real activities earnings management. All these correlations are significant at the 1% level except for *RESTATEMENT*, which is significant at 7%. These findings provide preliminary support for *H4*.

Taken together, findings from correlation analysis suggest there is preliminary support for *H2*, *H3*, and *H4* and that firms with high ESG controversies are more likely to be associated with low earnings quality.

Results from the test of difference in means show that firms in environmentally sensitive industries have significantly higher measures of earnings quality. These firms have on average significantly higher abnormal discretionary accruals and a higher likelihood of engaging in real activities earnings management at the 1% level. Focusing on the level of controversies, firms with high controversies have on average significantly higher number of restatements and a higher likelihood of real activities earnings management.

The univariate results are consistent. Together, they provide preliminary support for all the hypotheses and suggest that firms with high ESG controversies are likely to be associated with low earnings quality.

Multivariate results in Table 7 (Panel A) (see Appendix) show that firms with high levels of controversies are associated with significantly higher (lower) levels of abnormal production costs (discretionary expenses) and have significantly higher comprehensive measures of real earnings management (see Panel A) at the 5% and 1% levels. These results suggest that firms with higher levels of controversies are significantly associated with both accruals and real activities earnings management. In addition, results in Table 7 (Panel B) (see Appendix) are based on the absolute ESG controversies scores and suggest that increasing controversies are associated with an increasing likelihood of engagement in real activities earning management, specifically with decreasing discretionary expenses. The author interprets these findings collectively with those of real activities earnings management and in line with prior research (Cohen & Zarowin, 2010, Zang, 2012) that executives shift from accruals earnings management to real activities earnings management. These findings support *H2* that firms with high controversy scores are more likely to be associated with real activities earnings management. This means firms with high controversies have significantly low earnings quality compared with those with low controversies.

Results from logistic regression show that the probability of a restatement increases with increasing controversies at the 5% significance level. The controversies score for the current year increases the probability of restatement by 31.6%. Firms with high levels of controversies are more likely to have a restatement by 66.8% compared to those with low levels. The Hosmer and Lemeshow test result shows a good model fit for these two estimates (Hosmer et al., 2013). The model for prior-year controversies is not well specified, as the Hosmer and Lemeshow p-value is less than 0.05. The logistic regression results support *H3* that firms with high ESG controversy scores are more likely to have restatements.

Test results for *H4* are to be interpreted by looking at the coefficient β_1. The interaction term is negative. Hence the results show that conditional on firms being in environmentally sensitive industries, the ESG controversies score is significantly associated with increasing likelihood of real activities earnings management. These findings provide adequate support for *H4* that declining earnings quality is more prevalent in environmentally sensitive industries. Furthermore, these results show that the quality of earnings decreases further by a minimum of 10% to a maximum of 32% when the firm has controversies in an environmentally sensitive industry. These changes are economically significant and suggest that the results of the initial analysis explain how controversies and environmentally sensitive industries interact to influence earnings quality.

These results are robust to a different proxy for earnings quality and a different model. The author considers them to be appropriate to make conclusions based on the findings.

6. CONCLUSION

In this paper, the author asks whether ESG controversies affect earnings quality. The author contends that increasing ESG controversies would erode earnings quality. The author hypothesizes and find that firms with high ESG controversies scores would more likely engage in earnings management and be associated with more restatements. Furthermore, the effect on earnings quality is significantly higher in firms operating in environmentally sensitive industries. Firms with higher ESG controversies scores (meaning values close to zero) are more likely to engage in earnings management and have more restatements, and these effects are higher in environmentally sensitive industries. Therefore, the author concludes that the ESG controversies score is significantly associated with declining earnings quality.

These findings shed more light on the opposing hypotheses for prior research findings that increasing ESG performance is associated with improved firm performance measures. To the extent that high ESG controversies is significantly associated with low earnings quality, the author argues that the previous results are not due to ESG performance in and of itself but to other underlying factors in action. To this extent, the author concludes that previous results that ESG performance being associated with improved firm measures are more consistent with the opportunistic reporting hypothesis rather than the transparent reporting hypothesis.

This argument is consistent with prior findings that ESG controversies are associated with declining analyst following (Mburu & Bonaparte, 2024), no direct effect on firm value (Aouadi & Marsat, 2018), higher risks in banks (Galletta & Mazzù, 2023), presence of women on corporate boards. Although there may be alternative explanations to these findings which surprisingly rhyme, the author dares conclude that they are all driven by the underlying decline in earnings quality when ESG controversies increase. Stated differently, increasing ESG controversies are associated with higher financial reporting risk-taking behavior. This is the explanatory factor for to decline in analyst coverage, higher risk in banks, and requiring more women on the board as reported in prior research. For this reason, investors, users of firm disclosures, and regulators may well look beyond ESG performance rest they miss important insights about the firm financial reporting regime.

Future research could focus on separating the sources of ESG controversies to better understand whether all controversies are the same.

The author recognizes the limitation in the use of ESG controversies to speak to earnings quality. This is because the ESG controversies score incorporates many factors some of which might not relate to financial reporting incentives. However, the exogenous nature of this proxy diminishes this reality. Despite this assurance, the use of ESG controversies that relate more to environmental issues would more likely provide better results. The author is also cognizant of the sample size which is rather small; the use of a large sample size may provide better insights into this matter.

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APPENDIX

Table 1. Variable definitions

Variable	Definition
COMBSCORE	The ESG combined score from LSEG Refinitiv.
CONTROLEVEL	The dummy variable is equal to 1 if the firm has an ESG controversies score less than the sample 25th percentile (high level of controversies) and zero otherwise.
CONTROVERSY	The controversies score measured by negative LSEG ESG controversies score.
ENVIRONSENSE	The dummy variable equal to 1 if a firm is in an environmentally sensitive industry and zero otherwise.
RESTATEMENT	The dummy variable equal to 1 if the firm has had a restatement in the last five years and zero otherwise.
ADA	The Jones model of abnormal discretionary accruals.
CZ1	The first comprehensive measure of real activities management as per Cohen and Zarowin (2010) measured by -ADISX + APROD.
CZ2	The second comprehensive measure of real activities management as per Cohen and Zarowin (2010) measured by -ACFO + -ADISX.
APROD	The abnormal production costs as per Roychowdhury (2006).
ACFO	The abnormal cash flows as per Roychowdhury (2006).
ADISX	The abnormal discretionary expenses as per Roychowdhury (2006).
LEV	The leverage is measured by the ratio of total debt scaled by total equity.
ROA	The ratio of net income before extraordinary items is scaled by total assets.
CRISK	The measure of liquidity risk is measured by the standard deviation of the operational cash flows in the last five years.
ANFOL	The analyst following is measured by the natural logarithm of the number of financial analysts following the firm.
BTENURE	The tenure of the directors on the board is calculated as the natural logarithm of the average years of tenure of all the directors on the board.
BGDIVERSITY	The gender diversity of the board is measured by the proportion of female directors on a company's board of directors.
BIND	The board independence is measured by the proportion of independent directors to the total number of directors.
BSIZE	The size of the board is measured as the natural logarithm of the number of directors.
CEODUALITY	The dummy variable coded 1 if the CEO also serves as board chair, and 0 otherwise.
RD	The measure of research and development input is measured by research and development (R&D) expenditure scaled by sales.
AD	The measure of advertising intensity is measured by advertising expenditure scaled by sales.
ICMW	The measure of internal control material weakness is coded as 1 if the firm has had internal control weaknesses during the year per SOX 404 (b).
AUDITOR	The dummy variable measuring the audit quality coded 1 if the auditor is one of the Big 6 and zero otherwise.
SIZE	The firm size is measured by the natural logarithm of market value (closing price × outstanding shares).
GROWTH	The sales growth is measured by the current year's sales scaled by year t - 1 sales.
INDUSTRY.	The dummy variable representing the Fama and French's (1997)48-industry classifications industry fixed effects.
YEAR	The dummy variable representing the fixed-year effects.

Table 2. Sample selection

Description	Total observations
Compustat universe 2000–2023	277,324
Drop firms in financial and utility industries and with missing variables	183,112
Firms with earnings management variables	94,212
Drop duplicates and firms with missing ISS, I/B/E/S, and LSEG data	91,583
Final sample (2010–2023)	2,629

Table 3. Sample distribution

Panel A: Industry distribution								
#	2-digit SIC code	Obs.	% of total	Cumulative %	F&F code	Obs.	% of total	Cumulative %
1	73	340	12.9	12.9	FF42	512	19.5	19.5
2	36	268	10.2	23.1	FF34	338	12.9	32.3
3	28	241	9.2	32.3	FF36	239	9.1	41.4
4	35	196	7.5	39.7	FF21	159	6.0	47.5
5	56	164	6.2	46.0	FF41	116	4.4	51.9
6	38	134	5.1	51.1	FF13	111	4.2	56.1
7	37	115	4.4	55.5	FF30	104	4.0	60.1
8	53	111	4.2	59.7	FF9	101	3.8	63.9
9	20	107	4.1	63.8	FF10	85	3.2	67.1
10	59	97	3.7	67.4	FF11	74	2.8	70.0
11	23	85	3.2	70.7	FF23	73	2.8	72.7
12	50	83	3.2	73.8	FF2	70	2.7	75.4
13	55	80	3.0	76.9	FF14	64	2.4	77.8
14	80	74	2.8	79.7	FF12	62	2.4	80.2
15	Others	534	20.3	100.0.	Others	521	19.8	100.0
	Total	2,629	100.0		Total	2,629	100.0	

Panel B: Distribution by year, S&P index, and auditor size							
Year	Obs.	% of total	Cumulative %	S&P Index		Obs.	%
2011	136	5.2	5.2	400		674	25.6
2012	141	5.4	10.5	500		1,308	49.8
2013	140	5.3	15.9	600		647	24.6
2014	145	5.5	21.4	Total		2,629	100.0
2015	152	5.8	27.2				
2016	188	7.2	34.3				
2017	230	8.7	43.1	Auditor size		Obs.	%
2018	258	9.8	52.9	Big 6		1,498	57.0
2019	275	10.5	63.3	Non-Big 6		1,131	43.0
2020	294	11.2	74.5	Total		2,629	100.0
2021	317	12.1	86.6				
2022	236	9.0	95.5				
2023	117	4.5	100.0				
	2,629	100.0					

Table 4. Descriptive statistics

Variable	N	Minimum	P5	Mean	Median	Std. dev.	P95	Maximum
COMBSCORE	2,629	0.019	0.215	0.491	0.485	0.171	0.779	0.925
CONTROLEVEL	2,629	0.000	0.000	0.251	0.000	0.433	1.000	1.000
CONTROVERSY	2,629	-1.000	-1.000	-0.828	-1.000	0.302	-0.100	-0.003
RESTATEMENT	2,629	0.000	0.000	0.035	0.000	0.184	0.000	1.000
ADA	2,629	-22.628	-0.700	0.096	-0.002	2.017	1.061	58.312
CZ1	2,629	-22.314	-0.875	0.267	0.089	1.800	2.312	12.628
CZ2	2,629	-22.668	-1.165	0.117	0.033	1.625	1.513	11.483
APROD	2,629	-2.1423	-0.299	-0.028	-0.025	0.180	0.242	1.835
ACFO	2,629	-3.9719	-0.130	0.178	0.083	0.460	0.829	6.825
ADISX	2,629	-12.715	-2.353	-0.295	-0.092	1.777	0.790	22.381
LEV	2,629	0.000	0.001	0.254	0.235	0.184	0.576	1.074
ROA	2,629	-1.572	-0.057	0.062	0.062	0.084	0.184	0.368
CRISK	2,629	0.000	0.000	3.054	3.742	2.743	7.236	9.557
ANFOL	2,629	0.000	0.000	2.076	2.565	1.331	3.611	4.220
BTENURE	2,629	2.000	5.222	9.941	9.545	3.588	16.222	31.125
BGDIVERSITY	2,629	0.000	0.100	0.250	0.250	0.111	0.455	0.667
BIND	2,629	0.000	0.000	0.433	0.625	0.412	0.909	1.111
RD	2,629	0.000	0.000	0.058	0.006	0.434	0.224	21.670
AD	2,629	0.000	0.000	0.020	0.005	0.036	0.093	0.285
ICMW	2,629	0.000	0.000	0.403	0.000	0.491	1.000	1.000
AUDITOR	2,629	0.000	0.000	0.570	1.000	0.495	1.000	1.000
SG	2,629	0.000	0.816	1.070	1.054	0.254	1.365	9.839

Note: COMBSCORE is the LSEG ESG combined score, CONTROLEVEL is a dummy variable equal to 1 if the firm has LSEG ESG controversies score less than the sample 25th percentile and zero otherwise, ENVIRONSENSE is a dummy variable equal to 1 if the firm is in environmentally sensitive industry and zero otherwise, CONTROVERSY is the negative ESG controversies score, RESTATEMENT is a dummy variable equal to 1 if the firm has had a restatement in the last five years and zero otherwise, ADA is the Jones model abnormal discretionary accruals, ACFO is the abnormal cash flows, APROD is the abnormal production costs, ADISX is the abnormal discretionary expenses, CZ1 and CZ2 refer to the first and second comprehensive measures of real activities management as per Cohen and Zarowin (2010) respectively. All other variables are as defined in Table 1.

Table 5. Pearson's correlations for the main variables

Variable	1	2	3	4	5	6	7	8	9	10
CONTROLEVEL (1)	1	0.015 (0.451)	**0.909***** (< 0.0001)	**-0.053***** (0.0067)	-0.015 (0.4292)	0.014 (0.4762)	0.008 (0.6897)	**-0.048**** (0.0143)	**0.048*** (0.014)	**0.048**** (0.0133)
ENVIRONSENSE (2)		1	0.019 (0.3361)	**0.036*** (0.0666)	**0.230***** (< 0.0001)	**0.300***** (< 0.0001)	**-0.073***** (0.0002)	**-0.298***** (< 0.0001)	**0.287***** (< 0.0001)	**0.241***** (< 0.0001)
CONTROVERSY (3)			1	**-0.050**** (0.0107)	-0.022 (0.2548)	0.014 (0.4608)	0.000 (0.9813)	**-0.047**** (0.0154)	**0.047**** (0.0166)	**0.048**** (0.0146)
RESTATEMENT (4)				1	-0.005 (0.812)	0.027 (0.1643)	0.008 (0.684)	-0.007 (0.7047)	0.008 (0.6782)	0.000 (0.9836)
ADA (5)					1	**0.077***** (< 0.0001)	**-0.077***** (< 0.0001)	**-0.165***** (< 0.0001)	**0.155***** (< 0.0001)	**0.158***** (< 0.0001)
ACFO (6)						1	**-0.056***** (0.0042)	**-0.445***** (< 0.0001)	**0.434***** (< 0.0001)	**0.204***** (< 0.0001)
APROD (7)							1	**-0.077***** (< 0.0001)	**0.177***** (< 0.0001)	**0.100***** (< 0.0001)
ADISX (8)								1	**-0.995***** (< 0.0001)	**-0.967***** (< 0.0001)
CZ1 (9)									1	**0.965***** (< 0.0001)
CZ2 (10)										1

Note: CONTROLEVEL is a dummy variable equal to 1 if the firm has ESG controversies score less than the sample 25th percentile and zero otherwise, ENVIRONSENSE is a dummy variable equal to 1 if firm is in environmentally sensitive industry and zero otherwise, CONTROVERSY is the negative ESG controversies score, RESTATEMENT is a dummy variable equal to 1 if the firm has had a restatement in the last five years and zero otherwise, ADA is the Jones model abnormal discretionary accruals, ACFO is the abnormal cash flows, APROD is the abnormal production costs, ADISX is the abnormal discretionary expenses, CZ1 and CZ2 refer to the first and second comprehensive measures of real activities management as per Cohen and Zarowin (2010) respectively. Bolded figures are significant at 1%, 5%, or 10% and are marked as ***, **, * respectively.

Table 6. Test of differences in means of the dependent variables

Variable	ENVIRONSENSE		CONTROLEVEL		ENVIRONSENSE t-statistic	CONTROLEVEL t-statistic
	High (1) N = 395	Low (0) N = 2,234	High (1) N = 659	Low (0) N = 1,970	High-low	High-low
RESTATEMENT	0.051	0.0322	0.0182	0.0406	1.58	**−3.27*****
ADA	1.200	-0.0995	0.042	0.1138	**5.81*****	-0.83
ACFO	0.506	0.1199	0.189	0.1742	**13.18*****	0.65
APROD	-0.060	-0.0226	-0.0257	-0.0290	**-3.75*****	-0.4
ADISX	-1.554	-0.0726	-0.4419	-0.2462	**-7.58*****	**-2.36****
CZ1	1.495	0.0500	0.4161	0.2172	**7.37*****	**2.38***
CZ2	1.048	-0.0472	0.2529	0.0719	**6.09*****	**2.48****

Note: CONTROLEVEL is a dummy variable equal to 1 if the firm has ESG controversies score less than the sample 25th percentile (high level of controversies) and zero otherwise, ENVIRONSENSE is a dummy variable equal to 1 if the firm is in an environmentally sensitive industry and zero otherwise, RESTATEMENT is a dummy variable equal to 1 if the firm has had a restatement in the last five years and zero otherwise, ADA is the Jones model abnormal discretionary accruals, ACFO is the abnormal cash flows, APROD is the abnormal production costs, ADISX is the abnormal discretionary expenses, CZ1 and CZ2 refer to the first and second comprehensive measures of real activities management as per Cohen and Zarowin (2010) respectively. Bolded figures are significant at 1%, 5%, or 10% and are marked as ***, **, * respectively.

Table 7. Results from regression analysis (Model 2)

Panel A: Independent variable of interest = ESG controversies level (CONTROLEVEL)						
Dependent variable	**ADA**	**APROD**	**ACFO**	**ADISX**	**CZ1**	**CZ2**
Constant	-0.104***	0.080***	0.107	-0.343***	0.416***	**0.214*****
Coefficient, β_1 (p-value)	-0.006 (0.702)	**0.014**** **(0.012)**	0.010 (0.288)	**-0.083*** (0.004)**	**0.108*** (0.0005)**	**0.231*** (0.0019)**
LEV	0.078*	-0.002	-0.067***	0.043	-0.068	0.100
ROA	0.266***	-0.601***	0.600***	-0.141	-0.494***	-0.503***
ANFOL	0.001	-0.004**	0.004	-0.001	-0.004	-0.004
BTENURE	-0.001	0.000	-0.001	0.001	-0.001	-0.001***
BGDIVERSITY	0.128*	-0.011	0.073*	-0.158	0.174	0.003
BIND	0.167***	0.019**	-0.011	0.088**	-0.068	-0.053
RD	0.032	-0.352***	0.522***	-0.381***	0.045	-0.070
AD	1.021***	-0.779***	0.575***	-0.383	-0.215	-0.389
ICMW	-0.059	-0.043***	-0.082	0.248***	-0.308***	-0.123
ADA		0.003	0.186***	-0.572***	0.572***	0.330***
CZ2	0.128***					
F-value (p-value)	16.78 (< 0.0001)	39.39 (< 0.0001)	51.68 (< 0.0001)	22.78 (< 0.0001)	20.21 (< 0.0001)	10.83 (< 0.0001)
Adjusted R²	0.1167	0.2596	0.3164	0.1659	0.1493	0.0824
Max VIF	1.984	2.046	2.046	2.046	2.046	2.046
N	2,629	2,629	2,629	2,629	2,629	2,629
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: Independent variable of interest = ESG controversies score (CONTROVERSY)						
Dependent variable	**ADA**	**APROD**	**ACFO**	**ADISX**	**CZ1**	**CZ2**
Constant	-0.716***	0.073***	-0.011	-0.466*	0.539**	0.477**
Coefficient, β_1 (p-value)	-0.074 (0.5818)	**0.0194*** **(0.0709)**	0.024 (0.4077)	**-0.355*** (0.0022)**	**0.375*** (0.0015)**	**0.3311*** (0.002)**
LEV	-0.073	-0.025	-0.115**	0.014	-0.039	0.102
ROA	0.030	-0.702***	0.780***	-0.387	-0.315	-0.393
ANFOL	0.168*	-0.008***	0.007	0.014	-0.022	-0.021
BTENURE	0.055**	0.000	-0.002***	0.015	-0.015	-0.013
BGDIVERSITY	0.026	-0.011	0.159*	0.165	-0.176	-0.324
BIND	0.319	0.025**	0.066**	-0.365***	0.390***	0.299***
RD	0.497***	-0.406***	0.601***	-1.165***	0.759***	0.565**
AUDITOR	-0.321*	0.061***	0.123***	-0.295***	0.356***	0.172**
AD	0.166	-0.972***	1.130***	-1.509	0.537	0.379
CZ2	0.529***					
ADA		-0.006***	0.012***	-0.125***	0.119***	0.114***
F-value (p-value)	6.27 (< 0.0001)	33.27 (< 0.0001)	14.98 (< 0.0001)	8.97 (< 0.0001)	8.15 (< 0.0001)	7.09 (< 0.0001)
Adjusted R²	0.0422	0.2276	0.1132	0.0678	0.0613	0.0526
Max VIF	1.993	2.018	2.018	2.018	2.018	2.018
N	2,629	2,629	2,629	2,629	2,629	2,629
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Note: ADA is the Jones model of abnormal discretionary accruals, ACFO is the abnormal cash flows, APROD is the abnormal production costs, ADISX is the abnormal discretionary expenses, CZ2 refers to the second comprehensive measure of real activities management as per Cohen and Zarowin (2010). All other variables are as defined in Table 1 (see Appendix). ***, **, * indicate significant values at the 1%, 5%, or 10% level, respectively.

Table 8. Results from logistic regression

Dependent variable = RESTATEMENT			
Independent variable	*Prior-year controversies score*	*Controversies score*	*Controversies level*
Constant	-6.757***	-6.529***	-5.771***
Coefficient, β_1 (p-value) [Expb]	**-1.276**** **(0.0187) [0.279]**	**-1.151**** **(0.0323) [0.316]**	**-0.404**** **(0.019) [0.668]**
ADA	-0.170	-0.167	-0.167
LEV	-0.411	-0.380	-0.361
ROA	-0.110	-0.096	-0.089
ANFOL	-0.041	-0.049	-0.047
BTENURE	0.082**	0.082	0.082
BGDIVERSITY	1.041	0.997	0.973
CRISK	0.111	0.099	0.095
BIND	2.731***	2.705***	2.709***
RD	-4.366**	-4.432**	-4.513**
AD	1.261	1.190	1.180
GROWTH	0.137	0.141	0.152
AUDITOR	-0.358	-0.354	-0.3625
ICMW	-1.687***	-1.727***	-1.759***
Likelihood ratio (p-value)	130.344 (< 0.0001)	129.215 (< 0.0001)	130.148 (< 0.0001)
Pseudo R²	0.1848	0.1833	0.1846
Hosmer and Lemeshow p-value	0.0364	0.0663	0.1196
N	2,629	2,629	2,629
Year and industry fixed effects	Yes	Yes	Yes

Note: ***, **, * indicate significant values at the 1%, 5%, or 10% level, respectively.

Table 9. Regression results for *H4*

Dependent variable	ADA	APROD	ACFO	ADISX	CZ1	CZ2
Constant	-0.203***	0.039***	0.004	-0.039	0.063	0.056
ENVIRONSENSE × CONTROVERSY	**-0.252*****	**-0.029*****	**-0.225*****	**0.660*****	**-0.671*****	**-0.425*****
LEV	0.039	-0.010	-0.102***	0.147**	-0.180**	0.035
ROA	0.227***	-0.603***	0.587***	-0.092	-0.543***	-0.544***
ANFOL	-0.001	-0.005**	0.004	-0.001	-0.004	-0.004
BTENURE	0.000	0.000	0.001	-0.001	0.002	0.000
BGDIVERSITY	0.139**	-0.008	0.079*	-0.189	0.204	0.032
BIND	0.163***	0.023***	-0.004	0.065	-0.044	-0.038
RD	-0.011	-0.355***	0.486***	-0.280***	-0.054	-0.135
AUDITOR	0.052***	0.041***	0.047***	-0.160***	0.216***	0.071***
AD	0.850***	-0.780***	0.443***	-0.086	-0.498	-0.529*
CZ2	0.093***					
ADA		-0.004	0.140***	-0.434***	0.432***	0.242***
F-value	23.2	41.78	65.61	33.47	28.98	16.15
(p-value)	(< 0.0001)	(< 0.0001)	(< 0.0001)	(0.0001)	(< 00001)	(< 0.0001)
Adjusted R²	0.1567	0.263	0.3711	0.2287	0.2035	0.1215
Max VIF	1.982	1.714	2.046	2.046	2.046	2.046
N	2,629	2,629	2,629	2,629	2,629	2,629
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Note: ***, **, * indicate significant values at the 1%, 5%, or 10% level, respectively.

Table 10. Results for the interaction of environmentally sensitive industry and dependent variables

Dependent variable	Coefficient, β_1 (p-value)	F-value (p-value)	Adjusted R²
Environsense × ADA	0.03369 (0.7737)	5.59(< 0.0001)	0.037
Environsense × APROD	**-0.0088* (0.0621)**	14.11(< 0.0001)	0.1029
Environsense × ACFO	**0.06113*** (0.0004)**	24.58(< 0.0001)	0.1772
Environsense × ADISX	**-0.3336*** (0.0013)**	10.92(< 0.0001)	0.083
Environsense × CZ1	**0.3242*** (0.0017)**	10.15(< 0.0001)	0.0771
Environsense × CZ2	**0.2724*** (0.0035)**	8.68(< 0.0001)	0.0655

Note: ***, **, * indicate significant values at the 1%, 5%, or 10% level, respectively.