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## Article

# Sustainability performance and earnings management: institutional and regulatory perspectives

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# Sustainability performance and earnings management: institutional and regulatory perspectives

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## ABSTRACT

This study investigates the effect of companies' sustainability performance on their future earnings management. Applying moral licensing theory, we predict that sustainability performance decreases accruals, while increases real earnings management. We analyse a dataset comprising of 47,186 firm-year observations from 44 countries during 2002–2021. We use a two-stage Heckman approach to address potential endogeneity and conduct supplementary fixed-effects regression tests for separate periods of before-after crisis and regulatory effectiveness, quality and enforcement. Our findings suggest that firms with superior sustainability performance have an impact on decreased (increased) accrual-based (real) earnings management. We also found a greater impact of sustainability initiatives by companies in countries with lower regulatory effectiveness, lower regulatory quality standards, and mandatory government regulation. This study is the first in encompassing SDGs practices through advanced testing, analysis and offering insights into the implications of government regulation on management decisions on earnings. Our research provides practical contributions for policymakers to evaluate ongoing efforts and development of corporate ESG-related policies as well as investors in using earnings information.

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## 1. Introduction

This research examines the effect of companies' sustainability performance on their future earnings management under the moral licensing theory. This theory represents the concept of individuals behaving less responsibly in the future, as a result of their ethical actions in the past (Kouchaki, 2011). One real-life example is the Volkswagen diesel emissions scandal, involving emissions test cheating, which led to financial and environmental losses. Initially, the violation began with sustainability reporting highlighting efforts to green its fleet and gain stakeholder approval (Allam et al., 2020; Kuo et al., 2021; Zhang et al., 2021). In earnings management context, corporate managers may manipulate earnings to achieve profit targets by attributing their past ethical actions, namely sustainable performance. Thus, we argue that sustainable performance might be part of a strategic move by managers to bolster their reputation, credibility, and conceal their involvement in future earnings manipulation.

Mutuc et al. (2020) explains that sustainable activities increase earnings management due to stakeholders' pressure for high performance. Companies with high sustainability performance tend to make large investments (Goss & Roberts, 2011), which result in lower earnings and the inability to reach profit

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targets (Zalata, Ntim, Aboud, et al., 2022). Furthermore, investments in sustainable performance take longer to yield returns (Brooks & Oikonomou, 2018; Qiu et al., 2016) which affect the stakeholders' assessment of the companies' performance. In such circumstances, stakeholders' demand for performance and possibility of missed profit targets increase the incentives for managers to act opportunistically and to engage in earnings and accruals management (Abdelfattah & Elfeky, 2021; Buerter et al., 2020; Prior et al., 2008).

On the other hand, Shi et al. (2022) argue that with sustainable activities, companies become more conservative or decrease earnings, because managers adopt a pro-social and transparent approach in their financial report disclosures. The managers hold a commitment to gaining long-term profits (Gaio et al., 2022), maintaining the credibility of information, and avoiding policies that could negatively impact their finances (Ahmad, Hayat, et al., 2023; Ehsan et al., 2022). Researchers believe that companies practicing corporate social responsibility (CSR) may be less inclined to engage in earnings manipulation because they prioritize the long-term needs of stakeholders (Ahmad, Subhan, et al., 2023). Therefore, despite uncertainties surrounding the direct effects of CSR practices on financial performance, managers seem to prioritize maintaining the company's reputation and stability over the long term by ensuring transparency and integrity in their financial reporting, particularly in the context of earnings management.

Similar dynamics are also reflected in the manipulation of real earnings, where managers have an incentive to manipulate real activities throughout the year to meet specific profit targets, before eventually resorting to accrual manipulation. Graham et al. (2005) indicate that managers have a greater incentive to engage in real-based earnings than accrual-based manipulation because accrual-based manipulation is more likely to attract the attention of auditors and regulators, compared to real-based manipulation. Alternatively, the company is more likely to be interested in applying both approaches of manipulation to control the high risk, rather than solely implementing accrual-earnings.

This study utilizes ESG (Environmental, Social and Governance) scores to represent sustainability performance from Thomson Reuters and two measures of earnings management (accrual-based from Jones [1991] and Dechow et al. [1995]; and real-based from Roychowdhury [2006] and Kim et al. [2012]). The study analyzes a long-event period from 2002 to 2021, to capture earnings management trends in 44 selected countries. We employ a two-stage least squares (2SLS) Heckman test to address endogeneity issues, involving country-specific and firm-level factors, and document any crashes throughout the period. We verify the robustness of our main results using industry-year fixed effects regression in the same observation period, while also testing the relationship between accrual and real earnings management. For additional testing, we used three separate sustainability pillars against earnings management, as well as industry and year-based tests.

This study is motivated by Ehsan et al. (2020) and Lokuwaduge and Heenetigala (2017), who underline the importance of institutions inherent in each country such as government regulations and policies that affect corporate decisions. Specifically, this research analyzes whether government regulations and policies with regard to sustainability motivates managers to do earnings management, filling the gap in the literature of sustainability and earnings management. This research contributes empirically to the literature in several ways. First, this study acknowledges that the moral licensing theory has not been studied in the context of sustainability and earnings management, compared to the agency, legitimacy, or stakeholder theories. Nevertheless, we find compelling arguments to explain managerial behavior in ethical strategic decisions concerning sustainability performance and earnings management. Therefore, this research borrows from the psychological theory to elucidate the relationship between sustainability reporting practices and earnings management. Second, recent studies have recommended future research that focusses on the practices of SDG adopters (Sofian et al., 2022) and regulatory roles (Santos-Jaén et al., 2021). More specifically, this study capitalizes on the research gap to gain insights into variations in regulatory levels, the effectiveness of their implementation, and the existence of mandatory government disclosure policies for ESG. Thus, this research provides a new perspective through cross-country, long-period studies for shaping future research endeavours.

Third, this study aims to contribute by providing empirical evidence through an appropriate approach and established statistical sophistication, following Ehsan et al. (2022) recommendation concerning endogeneity issues arising from reverse causality and potential selection bias. Fourth, this study provides robustness tests and model sensitivity, as well as the separate utilization of ESG measurement

components that offer a more detailed explanation of the relationships. Finally, this study provides practical contributions by recommending government regulatory involvement to standardize companies' reporting activities. While this involvement may be well-intentioned, it is limiting and its reliance on generally accepted practices makes sustainability activities costly and difficult to internalize. Ultimately, this situation incentivizes companies to engage in misleading earnings manipulation practices, due to information opacity.

The remainder of this article is structured as follows: the second part reviews the relevant literature regarding the development of the sustainability performance concept. The third part presents explanations about the perspectives of moral licensing as well as how earnings management is interpreted in this research. Fourth, it contains the development of hypotheses, followed by the research design, and then continues with empirical results and discussion. In the final section, we conclude with the conclusion, limitations, and recommendations from this study.

## 2. Sustainability performance reform

The term 'sustainability' originates from the concept of sustainable development as defined in the 1987 United Nations report 'Our Common Future'. 'Sustainable' refers to how current needs can be met without compromising the ability of future generations to meet their own needs. The United Nations identifies three main pillars of sustainability, namely, economic, environmental, and social, in the term 'triple bottom line'. In its evolution, companies can adopt the concept of sustainability that aligns with development goals (Chih et al., 2008). Initially, the concept of sustainability in business was primarily expressed through corporate social responsibility (CSR) as a form of social initiative, charity, and community project. However, a shift in strategy has led companies to integrate ESG as a commitment to consistent sustainable actions aligned with the values of SDGs. The goal is not only to fulfil the sustainable development responsibilities outlined, but also to meet the needs of the company, current stakeholders, and those of the future.

This study specifically uses 'ESG' measurements to represent sustainability performance in response to the popularly evolving term. We concur with Löw and Cordovez (2023), that there is a definitional difference between CSR, ESG, and sustainability, but they are communicated somewhat synonymously in some studies. For us, ESG represents how a company operates sustainably, based on the three main pillars, and is a broader measurement than CSR (Gillan et al., 2021). The Sustainability Accounting Standards Board (SASB) also states that sustainability relates to measuring environmental, social, and governance aspects to create long-term value. We also understand that the ESG framework is not a direct embodiment of the sustainability concept. Nevertheless, ESG facilitates measurement, risk and opportunity identification (Murata & Hamori, 2021), as well as improving transparency and reporting accountability (Sachs et al., 2022). Consequently, ESG also communicates non-financial information while maintaining good relationships and trust with stakeholders, investors, regulators, and the public (Friede et al., 2015).

The development of ESG is not just a trend but is also recognized by investors as a business concept that can become a common standard in investment (Chinn et al., 2021; Murata & Hamori, 2021). Therefore, the ESG topic is not only of interest to companies but also provides a space for researchers and academics to fill gaps and make advancements. This study is interested in examining the motives and behaviors of companies engaging in sustainability activities as a strategic management action within the realm of ethics.

## 3. Theoretical literature review

### 3.1. Moral licensing perspective

Hockerts (2015) simplifies the idea that the cognitive theory, when applied to corporate social responsibility, is related to the expectation of an increase in sustainability exposure that influences the mental framework of society. This theory apply social psychology to explain how individuals process information based on previous experiences (Fiske & Taylor, 2013; Reed, 2012). Bansal and Roth (2000) emphasize that cognitive structures in sustainable performance have a one-way relationship with their motivations.

Companies with higher sustainability performance should have strong intrinsic and extrinsic motives, that leads to both more competitive and more ethical. The cognitive theory's use to explain the effect of the sustainability issues with earnings management is viewed as the moral aspect of corporate management, otherwise known as the moral licensing behavior, as explained by moral licensing theory. In this context, we examine the effect of sustainability performance on earnings management in the future to support the moral licensing theory.

Moral licensing is behavior when individuals who initially behave morally may display immoral behavior in the future (Merritt et al., 2010). They argue that their good deeds provide a sense of moral security for themselves. In this context, companies increase their sustainability activities with the motive of obtaining a license, building a reputation, and sending positive signals to maintain stakeholder relationships, thereby concealing their manipulative behavior. For individuals who have behaved poorly, gaining a moral license before their wrongdoing can mitigate any damage to their personal reputations and promote forgiveness, thus limiting the potential harmful effects of their poor behavior and enhancing their attractiveness (Klotz & Bolino, 2013; Wang & Chan, 2019). Once the prerequisite for moral credit exists, some leaders are susceptible to the bias that this moral credit can be exchanged, or offset, against future transgressions. Ormiston and Wong, (2013) argue that leaders who consider themselves morally licensed may feel exempt from responsibility, thereby influencing an organization's social responsibility practices and substantially worsening its performance. These perspectives can complement the analysis of the motives behind management's behavior, involving how managers base strategic decisions on other decisions.

### **3.2. Earnings management: ethical or unethical?**

McKee (2005) questioned the line between ethical and unethical earnings management, assuming that there is no clear distinction between the two. Grasso et al. (2009) considered that a higher level of earnings management is unethical practices. However, earlier research, (for example, Bruns and Merchant [1990]) which surveyed 649 managers, found that no respondents truly saw earnings management as either ethical or unethical behavior.

Rosenzweig and Fischer (1994) adopted a questionnaire from Bruns and Merchant (1990) involving two manipulations: Accounting manipulations (such as recording expenses at the wrong time) and operational decision manipulations (such as delaying operational decisions or offering terms to pull sales from the upcoming year to the current year). The study revealed that accountants are more sensitive to accounting manipulations than operational manipulations. However, despite operational manipulations are not being governed by explicit standards, this does not make them more ethical than accounting manipulations. This strengthens the argument brought by Bruns and Merchant (1990) that essentially earnings management practices can obscure information, mislead users of financial reports, and undermine the credibility of the accounting data itself. These impacts can lead to inaccurate assessments of a company's financial health and influence the decisions made by its stakeholders. Due to its impact, earnings management contradicts significant ethical standards in the field of management accounting and cannot be overlooked.

From the stakeholders' perspective, earnings management is associated with a tendency toward unethical behavior (Barghathi et al., 2020). Their study's results also indicate that earnings management will only be approved, on average, by stakeholders if it is congruent with the interests of others and is intended for the benefit of the company. In their findings, stakeholders may view earnings management as an ethical practice, but it must still adhere to generally accepted accounting principles and applicable laws. In contrast to the stakeholders, non-stakeholder perspectives are not influenced by the intention to benefit the company, and therefore, earnings management is considered unethical behavior. The reason is that non-stakeholders receive a distorted financial information, which can mislead their decisions.

Based on the explanation above, the support for earnings management as unethical behavior, irrespective of its intentions, strengthens our argument in this case. Therefore, our study does not distinguish or identify specific conditions that could transform an unethical perspective into an ethical one. This study further interprets earnings management solely as unethical management behavior.



## 4. Hypotheses development

### 4.1. Sustainability performance and earnings management

This study examines the relationship between a company's sustainable performance and earnings management in the future, using the perspective of moral licensing. In the context of accrual earnings management, managers have discretion over accrual recognition, accounting policies, and changes to manipulate earnings (Adut et al., 2013; Dechow et al., 1995; Healy, 1985). Managers who incorporate sustainability activities into their operations will have higher moral values, reputations, and credibility in the eyes of stakeholders and the public. Therefore, managers prioritizing their personal interests will credit their current performance to secure an improved future reputation and credibility (Habbash & Haddad, 2019), by choosing to build sustainable performance.

Managers with positive sustainable performance typically face more demands to meet targets, due to the associated costs of ESG's implementation. Thus, managers have a greater incentive to report higher earnings to achieve performance targets (Abdelfattah & Elfeky, 2021; Buerthey et al., 2020; Mutuc et al., 2020) and secure their bonuses (Healy, 1985). Additionally, another consequence of past credibility is that companies can successfully mask earnings management practices and find it easier to gain understanding, forgiveness, and leniency from stakeholders.

Borralho et al. (2022) used data from companies listed on the French and Spanish stock exchanges from 2009 to 2019 to investigate whether companies strategically use ESG to compensate for earnings management practices. Their findings confirm this, and also indicate that ESG activities carried out by companies allow for the diversion of stakeholder attention from non-standard reporting procedures. This is in line with Jian et al. (2023) and Jordaan et al. (2018), who suggest that social responsibility practices ultimately become opportunistic when managers use them as reputation insurance to offset the negative impacts of specific mistakes, or divert attention from unethical actions. Therefore, companies tend to engage in earnings management to conceal their issues (Chih et al., 2008) and hide their dishonesty behind sustainable activities to achieve a form of licensing (Shi et al., 2022).

Conversely, Ehsan et al. (2022) examined the relationship between CSR and earnings management in the context of manufacturing companies in Pakistan, as a developing economy. They documented a negative relationship between the two, supporting the idea that committed companies benefit in the long term and avoid policies with distorting effects on their accounts. Furthermore, managers are highly motivated to avoid suspicion from stakeholders, because it carries the risk of losing reporting credibility in the published information. This compels companies to secure future performance targets by considering the economic conditions and external factors, to avoid excessive public scrutiny, and exercise caution in their accounting and audit practices (Choi et al., 2013; Kim et al., 2012). This study reinforces the opportunistic argument about the possibility of accrual earnings practices being motivated by sustainability activities. However, material accrual management may attract the attention of auditors and regulators (Graham et al., 2005), and result in greater risks for managers. Thus, managers tend to restrict their accrual-based earnings management.

On another perspective, Roychowdhury's research (2006) shows that managers may manipulate real earnings to avoid reporting losses using various activities such as implementing price discounts to temporarily boost sales, overproduction to report lower cost of goods sold, and reducing discretionary expenses to enhance reporting margins. Extending Roychowdhury (2006), this study examines the real (operational based) earnings management in the context of moral licensing phenomena, so that managers tend to manage earnings after getting the sustainability performance.

With two ways to do earnings management: accruals vs real earnings management, how management selects, or combines the approaches? Graham et al. (2005) explain that real-based activities are given more consideration than accrual-based activities, because accrual-based activities are more likely to attract the attention of auditors and regulators compared to real-based activities. Moreover, companies relying solely on accrual manipulation carry a disproportionately higher risk. This argument is further strengthened by Zalata, Ntim, Alsohagy, et al. (2022), who explains that real-based earnings management is less likely to be detected compared to accruals.

Zang (2012) explicates the conditions under which managers use less (more) accrual-based manipulation, if real manipulation activities during the year turn out to be unexpectedly high (low). He concludes that managers make trade-offs in profit manipulation, where the choice of using accrual becomes a strategic decision stemming from the adjustment process for the results of manipulating real activities during the year. Zang's findings lead to the assumption that, to some extents companies will resort to

real earnings management to avoid getting too involved in risky accrual activities. Elleuch Hamza and Kortas (2019) tested the relationship between accrual and real earnings management in the specific context of weak regulatory environments, finding that they not only fulfil a complementary but also exhibit a substitutive explanation between accrual vs real earnings management. This study adopts the complementary logic to explain the relationship between accrual and real earnings, as described by Graham et al. (2005), due to the generality that conform with this study. Building on the accrual hypothesis, real-based earnings should take the opposite side, being positively influenced by sustainability performance. Therefore, we propose the following hypothesis:

H1: Companies with higher sustainable performance tend to report upward (downward) real-based (accruals-based) earnings management.

## 5. Research design

### 5.1. Sample and data

This study focused on adopting the time frame from 2002 to 2021 to observe companies' sustainability performance regarding earnings management behavior in the future ( $t+1$ ). We utilized an extended period to capture managerial behavioral trends and past motivations, incorporating institutional effects and government regulatory forces. This study also controlled for the relevant effects of the adoption of IFRS (International Financial Reporting Standards) in enhancing corporate transparency and the impact of the global development strategy, the Sustainable Development Goals (SDGs). To achieve the objectives, we collected 47,186 firm-year observations (unbalanced data) from 44 countries as the final sample (see Table 1, Panel A for the sample selection process). We present a detailed distribution of the sample based on country (Panel B) and industry and year (Panel C).

**Table 1.** Sample selection and sample distributions.

Panel A: Sample selection process					
Selection criteria			Observations		
Initial observations—companies that have an ESG score on Thomson Reuters in period 2002–2021.			54,557		
Excluded:					
Companies with missing data or incomplete information about all the variables used.			(7,005)		
Companies from conflict countries and samples with less than 10 observations			(366)		
Final observations			47,186		
This table reports the sample selection for the period 2002–2021 and the industry breakdown of the sample firms. Panel A reports the selection of the firm-year observations to answer the hypotheses in this study.					
Panel B: Sample Distribution by Country					
No	Country of Exchange	Total	No	Country of Exchange	Total
1	Argentina	169	23	Malaysia	334
2	Australia	2530	24	Mexico	336
3	Austria	209	25	Morocco	13
4	Belgium	377	26	Netherlands	456
5	Brazil	77	27	New Zealand	287
6	Canada	2085	28	Norway	429
7	Chile	246	29	Oman	24
8	China	2277	30	Peru	125
9	Colombia	86	31	Philippines	87
10	Denmark	419	32	Poland	192
11	Finland	450	33	Portugal	96
12	France	1290	34	Qatar	90
13	Germany	1581	35	Russia	295
14	Greece	172	36	Singapore	163
15	Hong Kong	2094	37	South Africa	689
16	Hungary	41	38	Spain	505
17	India	637	39	Sweden	1283
18	Indonesia	105	40	Switzerland	961
19	Italy	487	41	Thailand	81
20	Japan	4243	42	Turkey	130
21	Korea; Republic (S. Korea)	1135	43	United Kingdom	3102
22	Kuwait	41	44	United States of America	16,757
				Total	47,186

Table 1 Panel B reports the distribution sample by country and year from 44 countries of 47,772 observation firm-year.

(Continued)



Table 1. Continued.

Panel C: Sample Distribution by Industry or Year			
Based on Industry Code and Name of Industry	Total	Based on Year of Observation	Total
[11] Agriculture, Forestry, Fishing, and Hunting	237	2002	402
[21] Mining, Quarrying, and Oil and Gas Extraction	3575	2003	421
[22] Utilities	671	2004	769
[23] Construction	2021	2005	908
[31-33] Manufacturing	19,981	2006	999
[42] Wholesale Trade	1520	2007	1130
[44 - 45] Retail Trade	3482	2008	1370
[48 - 49] Transportation and Warehousing	1562	2009	1574
[51] Information	3939	2010	1576
[52] Finance and Insurance	2411	2011	1728
[53] Real Estate and Rental and Leasing	1645	2012	1824
[54] Professional, Scientific, and Technical Services	2891	2013	1928
[55] Management of Companies and Enterprises	10	2014	2034
[56] Administrative and Support and Waste Management and Remediation Services	963	2015	2658
[61] Educational Services	217	2016	3171
[62] Health Care and Social Assistance	621	2017	3790
[71] Arts, Entertainment, and Recreation	307	2018	4439
[72] Accommodation and Food Services	931	2019	5266
[81] Other Services	202	2020	5867
		2021	5332
Total	47,186	Total	47,186

Table 1 Panel C reports distribution sample by two-digit code from The North American Industry Classification System (NAICS) on the left side and year period (2002–2021) on the right side.

The entirety of the company-level data utilized the Thomson Reuters database, while the national-level data made use of full access from the World Bank, the Sustainable Development Report, and the Principles for Responsible Investment Report.

## 5.2. Model for testing the hypotheses

To test the hypothesis, this study estimated cross-country equations using two-stage least squares (2SLS). This estimation was used to address endogeneity issues in the relationship between ESG and earnings management, as well as any unobservable heterogeneity that varied across companies but remained constant over time (Greene, 2003). Choi et al. (2018), Kyaw et al. (2017) and Pathak & Gupta (2022) highlight concerns about endogeneity issues stemming from the use of CSR as an exogenous variable. First, managerial policy considerations regarding the commitment to ESG could be influenced by overall policies or other internal factors, leading to non-random sample selection and creating sample selection bias. Second, issues of simultaneity are inevitable due to the possibility of simultaneous decision-making by managers regarding the selection of ESG and earnings management.

In other literature, endogeneity problems arise due to the presence of reverse causality, which adds complexity to determining the direction of the CSR-EM relationship (e.g. Abdelfattah and Elfeky [2021], Almahrog et al. [2018], Borralho et al. [2022], Ehsan et al. [2022], Ehsan et al. [2020], Faisal et al. [2018], Kim et al. [2019], Liu et al. [2017], and Palacios-Manzano et al. [2021]). Based on the licensing theory, there is a possibility that moral behavior in the present affects future occurrences, and it could also be that future occurrences influence present behavior. These are interrelated as long as managers can plan their strategies accordingly.

This study incorporated the use of instrumental variables in the Heckman 2SLS estimation, namely (1) lagged ESG ( $ESG_{it-1}$ ) and (2) probability of ESG (ProbESG) concerning the endogenous variable. In the first stage, this study conducted a probit regression for each instrumental variable with respect to the endogenous variable, with the following equation.

$$dESG_{it} = \beta_1 + \beta_2 Instrumental\ Variables_{it} + \beta_3 GOV_{it} + \beta_4 Reg\_Quality_{it} + \beta_5 GDP\ Growth_{it} + \beta_6 SDG_{it} + \beta_7 IFRS_{it} + \beta_8 FIRM\ SIZE_{it} + \beta_9 LEV_{it} + \beta_{10} ROA_{it} + \beta_{11} LOSS_{it} + \beta_{12} RD\_Intensity_{it} + \beta_{13} Industry\ Fixed\ Effect_{it} + \beta_{14} Year\ Fixed\ Effect_{it} + \varepsilon_{ijt} \quad (1)$$

In the second stage, this study examined whether ESGit affected future EM by including the inverse of the Mills ratio (MILLS) from the first stage. The following regression equation was used to test the hypothesis.

$$EM_{it+1} = \beta_1 + \beta_2 ESG_{it} + \beta_3 GOV_{it} + \beta_4 Reg\_Quality_{it} + \beta_5 GDP\ Growth_{it} + \beta_6 SDG_{it} + \beta_7 IFRS_{it} + \beta_8 FIRMSIZE_{it} + \beta_9 LEV_{it} + \beta_{10} ROA_{it} + \beta_{11} LOSS_{it} + \beta_{12} RD\_Intensity_{it} + \beta_{14} MILLS_{it} + \beta_{15} Industry\ Fixed\ Effect_{it} + \beta_{15} Year\ Fixed\ Effect_{it} + \varepsilon_{ijt} \quad (2)$$

Subscripts  $i, j$  and  $t$  denote firm, country and year, respectively.

The 2SLS model can generate consistent estimates for parameters, but in certain situations, these estimates might not be efficient due to its tendency to have a larger variance than other methods. So, we also conducted the industry and year fixed effect regression for panel data, which is presented in Equation (2). We applied current sustainability performance to the future earnings management model, including the country and the specific firm-level as control variables.

### 5.3. Measurement

#### 5.3.1. Accruals and real based earnings management

This study captured earnings management activities through two measurement bases: Accrual and real-based earnings management. Accrual earnings are subject to managerial discretion, which can enhance the informativeness of earnings by enabling the communication of private information (Healy & Palepu, 1993; Watts & Zimmerman, 1986). At the same time, they provide a means for managers to act opportunistically in their management (Subramanyam, 1996). This study employed the primary model proposed by Jones (1991) and modified by Dechow et al. (1995), with a focus on total accruals (both discretionary and non-discretionary) to accurately capture managerial manipulation activities. The Jones model bases the measurement of 'normal' total accruals on the DeAngelo (1986) model, which relies on the assumption that the average change in non-discretionary accruals will approach zero, thereby reflecting changes in discretionary accruals.

The Jones model (1991) was constructed based on Equation (3), with the control of changes in revenue and changes in gross property, plant, and equipment, each divided by lagged total assets. Parameters  $\alpha_1, \alpha_2$ , and  $\alpha_3$ , assume a relation existed between non-discretionary accruals and all the explanatory variables.

$$TA_{it} = \alpha_1 (1 / A_{it-1}) + \alpha_2 (\Delta REV_t / A_{it-1}) + \alpha_3 (PPE_t / A_{it-1}) + \varepsilon_{it} \quad (3)$$

To measure the prediction error as discretionary accruals, Equation (4) was defined as:

$$\varepsilon_{it} = NDA_{it} - \alpha_1 (1 / A_{it-1}) - \alpha_2 (\Delta REV_t / A_{it-1}) - \alpha_3 (PPE_t / A_{it-1}), \quad (4)$$

Dechow et al. (1995) modified Jones model and assumes that changes in credit sales in the event period are more easily observable, compared to discretionary adjustments to cash sales. As a result, the estimation of earnings management is no longer biased. The adjusted prediction error of the modified Jones model was quantified using Equation (5).

$$\mu_{it} = NDA_{it} - \alpha_1 (1 / A_{it-1}) - \alpha_2 (\Delta REV_t / A_{it-1} - \Delta REC_t / A_{it-1}) - \alpha_3 (PPE_t / A_{it-1}) \quad (5)$$

Roychowdhury (2006) defines manipulation activities as operational deviations motivated by managers' desire to mislead stakeholders, leading them to believe that financial reporting objectives have been met. In his explanation, these real activities differ from accruals, as real activities are based on operational shifts that are not reflected in the company's value, such as offering price

discounts to boost the sales volume and reducing discretionary expenses like research and development to enhance short-term earnings. This study adopted the model by Roychowdhury (2006), encompassing abnormal cash flows, overproduction, and discretionary expenses, as represented in Equations (6)–(8) respectively.

$$\frac{CFO_t}{A_{t-1}} = \alpha_0 + \alpha_1 (1/A_{t-1}) + \beta_1 (S_t/A_{t-1}) + \beta_2 (\Delta S_t/A_{t-1}) + \varepsilon_t \quad (6)$$

$$\frac{PROD_t}{A_{t-1}} = \alpha_0 + \alpha_1 (1/A_{t-1}) + \beta_1 (S_t/A_{t-1}) + \beta_2 (\Delta S_t/A_{t-1}) + \beta_3 (\Delta S_{t-1}/A_{t-1}) + \varepsilon_t \quad (7)$$

$$\frac{DISEXP_t}{A_{t-1}} = \alpha_0 + \alpha_1 (1/A_{t-1}) + \beta (S_{t-1}/A_{t-1}) + \varepsilon_t \quad (8)$$

From the Equations (3–8) above, the value of  $t+1$  was used to represent future earnings management in testing. In addition, we used the aggregate REM (real-based earnings management) measurement model following Kim et al. (2012) and Bozzolan et al. (2015), which was Equation (9).

$$REM_{it+1} = -CFO_{it+1} + PROD_{it+1} - DisEXP_{it+1} \quad (9)$$

### 5.3.2. Sustainability performance

Sustainability performance was measured using ESG, which reflected a business's concern regarding its environmental responsibility and commitment to society, as well as its processes and systems to ensure corporate officials act in the interest of its stakeholders (Duque-Grisales & Aguilera-Caracuel, 2021). ESG performance was the relative sum of the weight of each pillar's categories, which varied across industries for environmental and social categories, but remained the same for the governance pillar. This data was sourced from the Thomson Reuters database, with assessments based on annual reports, company websites, stock exchange filings, CSR reports, and news sources (Revinitiv, 2022). This study converted ESG scores (ranging from 0 to 100) into decimals by dividing by 100, to achieve a uniform scale for easier interpretation.

### 5.3.3. Control variables

We included macro and firm level as control variables to isolate the causal effects on the model in Equation (1). First, the roles of formal institutions, legal frameworks, and their strengths do not receive sufficient attention in the strategic decisions of the company. In this regard, the institutional perspective of the state is believed to have a systematic impact on the behavior of both the company and the individuals involved (Doh et al., 2017). We used government effectiveness (GOV) to provide perspectives on the quality of public services, employee quality, and the level of independence from political pressures, as well as the quality of policy formulation and implementation, and the government's commitment and credibility toward its policies. Regulation quality (Reg\_Quality) was used to indicate the government's ability to formulate and implement policies that promote private sector development. GDP annual growth (GDPGrowth) represented the value added generated by producers in a country, which we anticipated would support the country's activities in achieving SDGs, thus impacting management activities. Next, we included scores for the sustainable development goals (SDGs) from Sachs et al. (2022) to represent the country's progress in achieving SDG objectives, which indirectly influence sustainability activities. Finally, accounting regulation (IFRS) facilitates an explanation of the claim that the implementation standards for IFRS can enhance accounting quality, which in reality can also decrease information quality due to earnings management practices resulting from managerial policy flexibility (Kaya & Yazan, 2019).

Second, this study captured activities at the company level to observe how managers behave in the implementation of ESG-related corporate policies and earnings management. We utilized a company measure (FIRMSIZE) which was gauged by the natural logarithm of the company's total assets. The larger the company's size, the greater the pressure it faces in the capital market. Conversely, companies might also become subjects of further regulation oversight by external parties, leading to a tendency for earnings management to decrease (Ben Amar & Chakroun, 2018; Watts & Zimmerman, 1990). This happens because larger and more profitable companies tend to have little incentive for earnings management upwards (Dimitropoulos, 2022). Leverage (LEV) was calculated by dividing total liabilities by total assets, where higher leverage levels could increase earnings management upward under the debt-equity hypothesis. Conversely, it could result in reporting earnings management downward for companies experiencing financial difficulties, given contract renegotiations (van Tendeloo & Vanstraelen, 2005; Watts & Zimmerman, 1990).

The return on assets (ROA) was measured based on net income after tax divided by total assets. Companies with a high ROA tend to engage in earnings management downward because they have fewer incentives to manipulate earnings (Dimitropoulos, 2022; Li et al., 2019). Results from Dechow et al. (1995) and Palacios-Manzano et al. (2021) document the opposite, that companies with high profits tend to engage in upward earnings management (accruals). 'Loss' (LOSS) was a binary variable, equal to one if a company has net income before extraordinary items less than zero, and zero otherwise. Research and development intensity (RD\_Intensity) represented research and development expenditure scaled by total revenue. Kim et al. (2012) found that companies with higher research and development intensity are more likely to manipulate accounting figures to maintain their presence in the capital market, thereby gaining access to financing. On the other hand, managers tend to reduce research and development expenses to meet earnings benchmarks (Baber et al., 1991). The findings of Subramanyam (1996) support this argument in scenarios of real-based earnings management.

We also present the details of variable measurements in [Appendix A](#).

## 6. Empirical results and discussion

This study presents descriptive statistics for all the variables of the total sample ( $N=47,186$ ) from 44 countries ([Table 2](#)). We display all the future earnings management variables and all the independent variables at their current value. Accruals and real-based earnings management were calculated sequentially following [Equations \(3\)–\(9\)](#), using raw scores, without being absolute; this was intended to capture the trend (downward and upward) of the managers' activities. In accrual-based earnings, sample companies tended to report downward earnings (mean =  $-0.074$  and  $-0.062$ ) while at the same time, their real-based earnings tended to be reported upwards (mean =  $0.048$ ,  $0.084$ ,  $0.049$  and  $0.085$ ). This indicated that management decisions tended to shift toward policies that contained less risk and did not attract the attention of auditors or regulators (Graham et al., 2005; Roychowdhury, 2006; Subramanyam, 1996). Meanwhile, the sustainability performance ( $ESG_{it}$ ) of companies was relatively good (mean =  $0.441$ ), compared to the entire range of values.

**Table 2.** Statistics descriptive.

	N	Minimum	p25	Median	Mean	p75	Std. Dev	Maximum
$JONES_{it+1}$	47,186	-0.869	-0.147	-0.043	-0.074	0.022	0.241	0.529
Mdf. $JONES_{it+1}$	47,186	-0.902	-0.091	-0.014	-0.062	0.026	0.341	0.934
$CFO_{it+1}$	47,186	0.014	0.015	0.017	0.048	0.028	0.106	0.642
$PROD_{it+1}$	47,186	0.026	0.031	0.036	0.084	0.058	0.146	0.773
$DisEXP_{it+1}$	47,186	0.023	0.025	0.026	0.049	0.028	0.097	0.625
$REM_{it+1}$	47,186	0.036	0.042	0.045	0.085	0.058	0.132	0.757
$ESG_{it}$	47,186	0.004	0.273	0.428	0.441	0.601	0.208	0.986
$GOV_{jt}$	47,186	-0.602	1.336	1.514	1.388	1.633	0.479	2.426
$Reg\_Quality_{jt}$	47,186	-1.066	1.248	1.452	1.310	1.641	0.584	2.255
$GDPGrowth_{jt}$	47,186	-0.113	0.011	0.022	0.018	0.029	0.032	0.145
$SDG_{jt}$	47,186	0.000	0.000	1.000	0.562	1.000	0.496	1.000
$IFRS_{jt}$	47,186	0.000	0.000	1.000	0.557	1.000	0.497	1.000
$FIRMSIZE_{it}$	47,186	18.531	20.627	21.808	21.526	22.912	1.369	22.962
$LEV_{its}$	47,186	0.052	0.395	0.595	0.577	0.652	0.295	1.478
$ROA_{it}$	47,186	-1.491	0.017	0.031	0.052	0.066	0.126	0.540
$LOSS_{it}$	47,186	0.000	0.000	0.000	0.183	0.000	0.386	1.000
$RD\_Intensity_{it}$	47,186	0.000	0.000	0.001	0.134	0.050	0.524	4.222

Appendix B presents Pearson correlation coefficients among the variables with  $p$ -values of  $*p < 0.1$ ,  $**p < 0.05$ , and  $***p < 0.01$ . From the overall results, the univariate correlation analysis showed that  $ESG_t$  negatively correlates with all earnings management measurements, except for  $DisEXP_{it+1}$ .

### 6.1. The effects of sustainability performance on earnings management

This study examined the effect of companies' ESG performance on earnings management over a long period, from 2002 to 2021. To provide this causal effect, we used 2SLS Heckman to mitigate the risk of endogeneity problems due to sample selection bias. We argue that there might be a potential selection bias due to the limited availability of ESG scores from the provider (Reuters) and access to public information. In the first stage, we used the instrument variables ( $ESG_{it-1}$  and  $ProbESG_{it}$ ) in Equation (1) to obtain coefficient estimates that would be used in the second stage, which was realized in the inverse Mills ratio (MILLS). Table 3 panels A and B show the testing of both instrumental variables on the left side, and the main hypothesis testing on the right side. The results of the first stage (probit) showed that companies with higher sustainability performance (Panel A) or probability of performance in the same industry (Panel B) at present, would have stronger incentives to improve their performance in the future.

**Table 3.** 2SLS Heckman.

Panel A. 2SLS Heckman using $ProbESG_t$ as Instrument Variable							
	First stage	Second stage					
		Accrual-based earnings management		Real-based earnings management			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	$dESG_{it}$	$JONES_{it+1}$	Mdf. $JONES_{it+1}$	$CFO_{it+1}$	$PROD_{it+1}$	$DisEXP_{it+1}$	$REM_{it+1}$
<i>Instrumental Variable: <math>ESG_{it-1}</math></i>	0.131*** (4.38)						
$ESG_{it}$		-0.105*** (-17.38)	-0.042*** (-4.80)	0.034*** (15.50)	0.042*** (14.21)	0.040*** (19.49)	0.045*** (17.07)
$GOV_{it}$	-0.493*** (-13.19)	0.077*** (9.58)	-0.056*** (-4.85)	-0.085*** (-28.68)	-0.128*** (-32.70)	-0.068*** (-24.99)	-0.112*** (-31.64)
$Reg\_Quality_{it}$	0.546*** (18.35)	-0.082*** (-9.95)	0.057*** (4.77)	0.089*** (29.28)	0.135*** (33.36)	0.071*** (25.10)	0.116*** (32.01)
$GDPGrowth_{it}$	-6.263*** (-16.03)	1.524*** (15.55)	2.048*** (14.53)	-1.089*** (-30.15)	-1.577*** (-32.92)	-0.943*** (-28.26)	-1.420*** (-32.88)
$SDG_{it}$	0.109** (2.44)	-0.041*** (-5.67)	-0.040*** (-3.82)	0.011*** (4.16)	0.018*** (5.12)	0.007*** (2.81)	0.015*** (4.60)
$IFRS_{it}$	0.235*** (11.88)	-0.031*** (-8.01)	-0.104*** (-18.58)	0.050*** (34.57)	0.073*** (38.35)	0.043*** (32.64)	0.066*** (38.46)
$FIRMSIZE_{it}$	0.444*** (43.78)	-0.101*** (-16.13)	-0.082*** (-9.08)	0.048*** (20.80)	0.070*** (22.96)	0.040*** (18.98)	0.063*** (22.89)
$LEV_{it}$	0.757*** (18.95)	-0.292*** (-27.47)	-0.129*** (-8.41)	0.240*** (61.15)	0.341*** (65.61)	0.221*** (61.13)	0.317*** (67.78)
$ROA_{it}$	1.548*** (8.86)	-0.448*** (-16.69)	-0.424*** (-11.00)	0.369*** (37.32)	0.557*** (42.47)	0.337*** (36.94)	0.514*** (43.50)
$LOSS_{it}$	-0.100*** (-3.71)	0.031*** (8.97)	0.024*** (4.91)	-0.017*** (-13.14)	-0.019*** (-11.20)	-0.014*** (-11.49)	-0.016*** (-10.72)
$RD\_Intensity_{it}$	0.138*** (8.32)	-0.026*** (-9.88)	-0.054*** (-14.05)	0.037*** (37.59)	0.054*** (41.15)	0.031*** (34.51)	0.048*** (40.68)
MILLS		-0.328*** (-16.22)	-0.230*** (-7.92)	0.279*** (37.37)	0.410*** (41.41)	0.233*** (33.78)	0.362*** (40.45)
<i>Industry Fixed Effect</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year Fixed Effect</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\_cons$	-10.536*** (-44.00)	2.622*** (15.98)	2.069*** (8.77)	-1.459*** (-24.13)	-2.120*** (-26.43)	-1.230*** (-22.02)	-1.894*** (-26.21)
F		71.942	43.556	482.437	589.126	468.819	599.290
r2		0.075	0.047	0.352	0.398	0.345	0.403
r2_a		0.074	0.046	0.351	0.398	0.344	0.402
r2_p	0.155						
N	47,186	47,186	47,186	47,186	47,186	47,186	47,186

**Notes:**

The first-stage probit regression models test the instrument variable ( $ESG_{it-1}$ ) against the dummy variable values suspected to be endogenous, which are then documented in MILLS. The second-stage hypothesis testing includes MILLS to capture potential bias and overcome any endogeneity problem. The testing includes industry and year fixed effects, spanning the period 2002–2021. Z-statistics are in parentheses. Significance at \*10%, \*\*5%, and \*\*\*1%, denoted as \* $z > 1.645$ , \*\* $z > 1.960$ , \*\*\* $z > 2.326$ .

(Continued)

**Table 3.** Continued.

Panel B. 2SLS Heckman using ProbESG <sub>it</sub> as instrument variable							
	Second stage						
	First stage	Accrual-based earnings management		Real-based earnings management			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	dESG <sub>it</sub>	JONES <sub>it+1</sub>	Mdf. JONES <sub>it+1</sub>	CFO <sub>it+1</sub>	PROD <sub>it+1</sub>	DisEXP <sub>it+1</sub>	REM <sub>it+1</sub>
Instrumental Variables: ProbESG <sub>it</sub>	5.205*** (15.75)						
ESG <sub>it</sub>		−0.102*** (−16.81)	−0.039*** (−4.44)	0.033*** (14.73)	0.039*** (13.32)	0.039*** (18.83)	0.043*** (16.21)
GOV <sub>it</sub>	−0.528*** (−14.02)	0.090*** (10.73)	−0.041*** (−3.38)	−0.086*** (−28.02)	−0.132*** (−32.24)	−0.069*** (−24.10)	−0.114*** (−31.04)
Reg_Quality <sub>it</sub>	0.588*** (19.54)	−0.097*** (−11.16)	0.039*** (3.14)	0.091*** (28.46)	0.139*** (32.74)	0.071*** (24.07)	0.119*** (31.25)
GDPGrowth <sub>it</sub>	−6.132*** (−15.67)	1.561*** (16.19)	2.148*** (15.49)	−1.016*** (−28.52)	−1.484*** (−31.42)	−0.871*** (−26.49)	−1.330*** (−31.25)
SDG <sub>it</sub>	0.135*** (2.98)	−0.048*** (−6.55)	−0.047*** (−4.46)	0.014*** (5.08)	0.022*** (6.26)	0.009*** (3.52)	0.018*** (5.66)
IFRS <sub>it</sub>	0.235*** (11.85)	−0.033*** (−8.61)	−0.109*** (−19.53)	0.047*** (33.12)	0.070*** (37.06)	0.041*** (31.03)	0.063*** (37.02)
FIRMSIZE <sub>it</sub>	0.442*** (43.63)	−0.106*** (−17.04)	−0.091*** (−10.21)	0.043*** (18.99)	0.065*** (21.34)	0.036*** (16.94)	0.058*** (21.09)
LEV <sub>it</sub>	0.772*** (19.32)	−0.304*** (−28.19)	−0.147*** (−9.47)	0.236*** (59.22)	0.337*** (63.87)	0.217*** (58.92)	0.313*** (65.81)
ROA <sub>it</sub>	1.539*** (8.83)	−0.465*** (−17.53)	−0.460*** (−12.07)	0.349*** (35.71)	0.533*** (41.05)	0.318*** (35.13)	0.490*** (41.93)
LOSS <sub>it</sub>	−0.087*** (−3.20)	0.029*** (8.54)	0.024*** (4.88)	−0.014*** (−11.05)	−0.015*** (−8.95)	−0.011*** (−9.49)	−0.013*** (−8.45)
RD_Intensity <sub>it</sub>	0.129*** (7.60)	−0.025*** (−9.70)	−0.055*** (−14.65)	0.034*** (35.62)	0.050*** (39.17)	0.029*** (32.53)	0.044*** (38.63)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MILLS		−0.346*** (−17.15)	−0.263*** (−9.06)	0.266*** (35.65)	0.394*** (39.91)	0.219*** (31.83)	0.347*** (38.94)
_cons	−12.775*** (−45.21)	2.872*** (16.90)	2.409*** (9.87)	−1.438*** (−22.93)	−2.121*** (−25.50)	−1.189*** (−20.53)	−1.879*** (−25.08)
F		72.566	43.937	478.899	585.419	465.207	595.177
r <sup>2</sup>		0.075	0.047	0.350	0.397	0.343	0.401
r <sup>2</sup> <sub>a</sub>		0.074	0.046	0.349	0.396	0.343	0.400
r <sup>2</sup> <sub>p</sub>	0.162						
N	47,186	47,186	47,186	47,186	47,186	47,186	47,186

Note:

The first-stage probit regression models test the instrument variable (ProbESG<sub>it</sub>) against the dummy variable values suspected to be endogenous, which are then documented in MILLS. The second-stage hypothesis testing includes MILLS to capture potential bias and overcome any endogeneity problem. The testing includes industry and year fixed effects, spanning the period 2002–2021. Z-statistics are in parentheses. Significance at \*10%, \*\*5%, and \*\*\*1%, denoted as \* $z > 1.645$ , \*\* $z > 1.960$ , \*\*\* $z > 2.326$ .

In the second stage, the Mills ratio showed significance at  $p < 0.01$ , indicating that the model in the first stage was able to capture potential bias and overcome any endogeneity problems. Table 3 Panel A and B shows consistent results to explain the strategic decision preferences of managers reporting accrual and real-based earnings. The sustainability performance of companies had a negative effect on accruals (coef = −0.105 and −0.042) and a positive effect on real activities, both separately and with an aggregate proxy (coef = 0.034, 0.042, 0.040 and 0.045), which were significant at  $p < 0.01$ . This result thereby provides support for Hypotheses 1. This meant that companies with good sustainability performance at present would tend to report downward accrual earnings and upward real-based earnings in the future.

We have two main explanations for the findings obtained, based on the moral licensing theory. First, Zang's (2012) argument explains the conditions where managers use less (more) accrual-based earnings, if real manipulation activities during the year turn out to be unexpectedly high (low). In his explanation, he concludes that managers trade-off profit manipulation, where accrual becomes a strategic decision as a result of the adjustment process for manipulating real activities in the same year. As we know, real activities require planning throughout the running period and are realized at the end of the fiscal year. So, what remains is that managers could adjust earnings through accrual activities



as a final strategy. The other explanation is that managers will reduce accrual-based earnings because of the costs incurred between one and the other. Therefore, it is a reasonable strategy if the findings show a different sign for the accruals and real earnings, motivated by ESG's performance. This explanation is also in line with the findings by Cohen et al. (2008) that post-Sarbanes-Oxley, accrual-based earnings decreased, while real activities increased, as a result of the increased supervision of accounting practices. The supporting argument explains that even real is considered as a complementary item, because accrual is more likely to attract auditors' and regulators' attention, and there is a greater risk (Graham et al., 2005).

Based on the explanation provided, we narrowed down our ideas to arrive at the conclusion that companies engaging in downward accruals and upward real earnings, after a history of sustained performance, indicate behavioral motivation driven by moral licensing. This occurs because companies with sustained performance are more likely to obtain a moral license, enhancing their reputation and credibility in the capital market, since good news sends positive signals to stakeholders. They use their past reputation to conceal their involvement in earnings manipulation. The acquisition of this moral license fosters the idea of individual morality, to justify unethical behavior in the future, thereby allowing better control of reputation risks and encouraging forgiveness while enhancing its appeal. Furthermore, companies can also conceal their manipulation activities as a result of their past good deeds.

Secondly, in a separate argument, companies with high sustainability performance encourage managers to engage in downward accrual manipulation. This suggests that managers tend to be cautious, especially because accruals attract more attention and entail greater risks. Managers are more inclined to align with their past behavior, to maintain long-term value and positive relationships with stakeholders. Conversely, the positive relationship between sustainability performance and real-based earnings more accurately reflects managers' aggressive pursuit of, or exceeding, earnings targets while also meeting stakeholders' demands. Additionally, this strategy works more effectively when both accruals and real earnings are applied together (as complementary items), spreading, and minimizing risks.

We also used country and company variables to control the risk of unobserved variables in the model we observed. All of our control variables varied against future earnings management. In accrual earnings management, the control variables had a predominantly negative effect (for example,  $Reg\_Quality_{jt}$ ,  $SDG_{jt}$ ,  $IFRS_{jt}$ ,  $FIRMSIZE_{it}$ ,  $LEV_{it}$ ,  $ROA_{it}$ , and  $RD\_Intensity_{it}$ ). Conversely, the same variables showed a positive effect on real-based earnings. The remaining variables, such as  $Gov_{jt}$ ,  $GDPGrowth_{jt}$ , and  $LOSS_{it}$  had a positive effect on increasing accrual-based earnings management, and a negative effect on real earnings management. Even though accounting standards do not explicitly lead to social and environmental disclosures, Van Der Laan (2009) and van der Laan Smith et al. (2014) reveal that the implementation of IFRS provides pressure from stakeholders, as well as opportunities for managers, to provide more social information. Akisik and Gal (2011) provide evidence that sustainable development in business is closely related to CSR and accounting standards.

## 6.2. Robustness and sensitivity

2SLS has the advantage of producing consistent parameter estimates, but in some situations, it may allow for inefficient estimates. This study conducted additional robustness tests to address the possibility of inefficient estimates in the previous model. Table 4, Panel A, reports the results of robust model testing for industry-year fixed effect regression (excluding country) of ESG on future earnings management. Our results were consistent with the 2SLS testing, confirming that there was no difference in outcomes regarding the possibility of greater variance in the previous model. In general, we found higher impact estimate and magnitudes (significance and t-value), but the ability of the independent variables to explain the dependent variable had decreased. Nevertheless, our results did ensure consistency and robustness.

**Table 4.** Fixed effect regression.

Panel A. Fixed Effect Regression ESG <sub>t</sub> on Earnings Management <sub>t+1</sub>						
	Earnings management					
	Accrual-based earnings management			Real-based earnings management		
	(1)	(2)	(3)	(4)	(5)	(6)
	JONES <sub>it+1</sub>	Mdf. JONES <sub>it+1</sub>	CFO <sub>it+1</sub>	PROD <sub>it+1</sub>	DisEXP <sub>it+1</sub>	REM <sub>it+1</sub>
ESG <sub>it</sub>	-0.116*** (-17.24)	-0.049*** (-5.18)	0.044*** (17.89)	0.055*** (17.80)	0.048*** (20.26)	0.057*** (19.74)
GOV <sub>it</sub>	-0.025*** (-4.59)	-0.127*** (-15.58)	0.002 (0.85)	-0.001 (-0.49)	0.004** (2.23)	0.000 (0.22)
Reg_Quality <sub>it</sub>	0.032*** (7.05)	0.137*** (20.12)	-0.008*** (-4.90)	-0.008*** (-3.74)	-0.010*** (-7.08)	-0.009*** (-5.06)
GDPGrowth <sub>it</sub>	0.267*** (4.09)	1.165*** (12.18)	-0.022 (-0.90)	-0.008 (-0.26)	-0.052** (-2.37)	-0.033 (-1.13)
SDG <sub>it</sub>	-0.008 (-1.61)	-0.016*** (-2.66)	-0.017*** (-7.16)	-0.023*** (-7.02)	-0.017*** (-7.78)	-0.022*** (-7.40)
IFRS <sub>it</sub>	0.018*** (8.10)	-0.070*** (-23.40)	0.008*** (8.94)	0.012*** (9.73)	0.008*** (10.57)	0.012*** (11.02)
FIRMSIZE <sub>it</sub>	-0.001 (-0.55)	-0.011*** (-6.70)	-0.037*** (-52.34)	-0.055*** (-62.73)	-0.031*** (-44.03)	-0.047*** (-57.22)
LEV <sub>it</sub>	-0.132*** (-22.27)	-0.016** (-2.18)	0.104*** (37.37)	0.141*** (41.21)	0.108*** (39.05)	0.141*** (42.90)
ROA <sub>it</sub>	-0.047** (-2.04)	-0.142*** (-5.24)	0.028** (2.10)	0.056*** (3.58)	0.053*** (3.82)	0.071*** (4.56)
LOSS <sub>it</sub>	0.014*** (4.28)	0.012*** (2.79)	-0.002 (-1.38)	0.002 (1.19)	-0.001 (-0.89)	0.003 (1.33)
RD_Intensity <sub>it</sub>	-0.002 (-0.56)	-0.037*** (-8.57)	0.016*** (10.72)	0.023*** (11.72)	0.014*** (10.08)	0.020*** (11.67)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
_cons	0.050* (1.82)	0.245*** (6.90)	0.778*** (51.57)	1.170*** (62.11)	0.634*** (43.25)	1.011*** (57.04)
F	139.277	120.028	451.039	660.329	356.147	594.061
r <sup>2</sup>	0.070	0.045	0.332	0.377	0.329	0.382
r <sup>2</sup> <sub>a</sub>	0.069	0.044	0.332	0.376	0.329	0.381
N	47,186	47,186	47,186	47,186	47,186	47,186

The table displays t-test results, denoted as.

\* $t > 1.645$ .

\*\* $t > 1.960$ .

\*\*\* $t > 2.326$ , indicating significance at 10%, 5%, and 1% levels, respectively.

Panel B. Fixed Effect Regression ESG <sub>t</sub> on Earnings Management <sub>t+1</sub> Without High Regulated Industry						
	Earnings management					
	Accrual-based earnings management			Real-based earnings management		
	(1)	(2)	(3)	(4)	(5)	(6)
	JONES <sub>it+1</sub>	Mdf. JONES <sub>it+1</sub>	CFO <sub>it+1</sub>	PROD <sub>it+1</sub>	DisEXP <sub>it+1</sub>	REM <sub>it+1</sub>
ESG <sub>it</sub>	-0.114*** (-16.29)	-0.034*** (-3.46)	0.046*** (18.14)	0.057*** (17.90)	0.050*** (20.46)	0.059*** (19.83)
Control Variable Included	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
_cons	0.062** (2.15)	0.272*** (7.32)	0.787*** (50.71)	1.184*** (61.06)	0.644*** (42.60)	1.024*** (56.18)
F	131.269	112.350	428.004	626.160	340.038	565.972
r <sup>2</sup>	0.069	0.047	0.335	0.378	0.335	0.385
r <sup>2</sup> <sub>a</sub>	0.068	0.046	0.334	0.378	0.334	0.384
N	44,104	44,104	44,104	44,104	44,104	44,104

The table displays t-test results, denoted as.

\* $t > 1.645$ .

\*\* $t > 1.960$ .

\*\*\* $t > 2.326$ , indicating significance at 10%, 5%, and 1% levels, respectively.

Panel C. Fixed Effect Regression—Relational of Real-based on Accrual-based Earnings Management							
	Accrual-based Earnings Management						
	JONES <sub>it</sub> + 1				Mdf. JONES <sub>it</sub> + 1		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CFO <sub>it</sub> + 1	-0.393*** (-17.23)				-0.084*** (-2.95)		
PROD <sub>it</sub> + 1		-0.276***				-0.071***	

(Continued)

Table 4. Continued.

Panel C. Fixed Effect Regression—Relational of Real-based on Accrual-based Earnings Management								
	Accrual-based Earnings Management							
	JONESit + 1				Mdf. JONES it + 1			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
DisEXPit + 1		(−17.52)	−0.462*** (−17.75)			(−3.76)	−0.121*** (−3.67)	
REMit + 1				−0.329*** (−18.00)				−0.090*** (−4.02)
GOVjt	−0.015*** (−2.81)	−0.016*** (−2.95)	−0.014*** (−2.68)	−0.016*** (−2.93)	−0.123*** (−15.06)	−0.123*** (−15.08)	−0.123*** (−15.05)	−0.123*** (−15.08)
Reg_Qualityjt	0.018*** (4.02)	0.019*** (4.17)	0.017*** (3.76)	0.018*** (4.05)	0.131*** (19.37)	0.131*** (19.38)	0.131*** (19.33)	0.131*** (19.36)
GDPGrowthjt	0.336*** (5.25)	0.344*** (5.35)	0.317*** (4.97)	0.333*** (5.19)	1.199*** (12.68)	1.200*** (12.68)	1.193*** (12.62)	1.196*** (12.65)
SDGjt	−0.019*** (−3.96)	−0.019*** (−3.92)	−0.020*** (−4.11)	−0.020*** (−4.05)	−0.020*** (−3.27)	−0.020*** (−3.30)	−0.021*** (−3.34)	−0.021*** (−3.34)
IFRSjt	0.018*** (8.25)	0.018*** (8.27)	0.019*** (8.69)	0.019*** (8.63)	−0.070*** (−23.83)	−0.070*** (−23.79)	−0.070*** (−23.72)	−0.070*** (−23.72)
FIRMSIZEit	−0.022*** (−20.51)	−0.023*** (−21.18)	−0.022*** (−20.50)	−0.023*** (−21.76)	−0.018*** (−12.83)	−0.018*** (−13.47)	−0.018*** (−13.56)	−0.019*** (−13.84)
LEVit	−0.105*** (−18.31)	−0.107*** (−18.85)	−0.095*** (−16.82)	−0.099*** (−17.66)	−0.014* (−1.94)	−0.012* (−1.75)	−0.009 (−1.29)	−0.009 (−1.37)
ROAit	−0.056*** (−2.58)	−0.052** (−2.38)	−0.042* (−1.95)	−0.043** (−2.00)	−0.150*** (−5.55)	−0.148*** (−5.49)	−0.145*** (−5.40)	−0.145*** (−5.40)
LOSSit	0.015*** (4.60)	0.016*** (5.06)	0.015*** (4.69)	0.016*** (5.13)	0.013*** (2.91)	0.013*** (2.99)	0.013*** (2.91)	0.013*** (3.00)
RD_Intensityit	0.002 (0.67)	0.002 (0.65)	0.002 (0.76)	0.002 (0.87)	−0.037*** (−8.53)	−0.036*** (−8.46)	−0.036*** (−8.43)	−0.036*** (−8.39)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
_cons	0.478*** (19.53)	0.497*** (20.22)	0.459*** (19.39)	0.503*** (20.73)	0.367*** (11.62)	0.384*** (12.18)	0.376*** (12.22)	0.391*** (12.49)
F	157.350	158.871	156.889	159.008	116.029	116.414	116.299	116.540
r <sup>2</sup>	0.083	0.080	0.086	0.083	0.045	0.045	0.046	0.046
r <sup>2</sup> _a	0.082	0.079	0.085	0.082	0.044	0.044	0.045	0.044
N	47,186	47,186	47,186	47,186	47,186	47,186	47,186	47,186

The table displays *t*-test results, denoted as.

\**t* > 1.645.

\*\**t* > 1.960.

\*\*\**t* > 2.326, indicating significance at 10%, 5%, and 1% levels, respectively.

Table 4, Panel B, reports the results of testing by excluding samples from highly regulated industries (e.g., the finance and insurance industries, and utilities). Companies in strictly regulated sectors tend to have limited flexibility in managing earnings. Therefore, this research addressed concerns about potential bias in results influenced by sample characteristics. Surprisingly, by excluding highly regulated industries that are expected to face higher institutional pressures, our results remained consistent. Hence, the findings with our main sample provided confidence and robustness.

In empirical terms, we conducted separate tests to prove whether real-based earnings and accrual-based earnings were indeed complementary, thereby offering a linear explanation consistent with our main test. The results in Table 4, Panel C confirm that real-based earnings had a negative effect on accruals, indicating contrasting management strategies.

### 6.3. Additional analysis

#### 6.3.1. 3 Pillars of ESG

We conducted separate tests based on the three main pillars of ESG, to determine whether the sustainability performance components contributed equally to building the combined score. Borralho et al. (2022) and Block & Wagner (2014) provided evidence from their findings that the three ESG pillars make different contributions, and therefore, it is worthwhile to conduct separate testing. In this section, we maintained the 2SLS Heckman approach to mitigate the risk of inherent endogeneity in each model, with the performance probabilities of each as instrumental variables. The results using lagged ESG were similar, so we have not presented them here.

Table 5, panels A, B, and C present the results of the testing of the environmental, social, and governance pillars on earnings management. The impact coefficients varied among pillars, with the environmental aspect exerting significant influence, consistent with the emphasis on ‘environmental justice’ in ESG, driving earnings activities (Abdul-Rashid et al., 2017). Conversely, governance showed minimal impact, aligning with findings except for Mdf. Jones. Notably, the environmental pillar strongly influences earnings management, thus emphasizing its significance (Revinitiv, 2022). The social dimension, bridging environmental and governance influences, notably involved stakeholders, fostering sustainable corporate governance and collaboration (Rajesh, 2020). Overall, the study highlighted how all pillars motivate firms towards earnings manipulation within sustainability contexts, emphasizing their independent roles.

### 6.3.2. Phenomena based on the year of the crisis occurrence and industry

Over an extended period, we have been pondering whether managers formulated different strategies when operating in the periods before the global economic crisis (2002–2007), during the crisis (2008 and

**Table 5.** 2SLS Heckman for 3 pillar of ESG.

	First stage	Second stage					
		Accrual-based earnings management			real-based earnings management		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>N</i> = 47,186	dEnv <sub>it</sub>	JONES <sub>it+1</sub>	Mdf. JONES <sub>it+1</sub>	CFO <sub>it+1</sub>	PROD <sub>it+1</sub>	DisEXP <sub>it+1</sub>	REM <sub>it+1</sub>
<b>Panel A. Environment Pillar</b>							
<i>Instrumental Variable:</i>	3.630***						
ProbEnv	(23.33)						
EnvPillarScore <sub>it</sub>		−0.090*** (−18.60)	−0.055*** (−7.98)	0.041*** (22.84)	0.052*** (21.94)	0.045*** (27.26)	0.054*** (25.29)
MILLS		−0.183*** (−11.80)	−0.203*** (−9.14)	0.129*** (22.43)	0.199*** (26.14)	0.098*** (18.60)	0.171*** (24.90)
_cons	−12.708*** (−48.88)	1.543*** (11.22)	1.927*** (9.76)	−0.315*** (−6.18)	−0.529*** (−7.82)	−0.190*** (−4.05)	−0.438*** (−7.19)
r <sup>2</sup>		0.073	0.048	0.344	0.390	0.339	0.395
r <sup>2</sup> <sub>a</sub>		0.072	0.047	0.343	0.389	0.339	0.394
r <sup>2</sup> <sub>p</sub>	0.202						
<b>Panel B. Social Pillar</b>							
<i>Instrumental Variable:</i>	4.759***						
ProbSocial	(16.69)						
SocialPillarScore <sub>it</sub>		−0.085*** (−16.74)	−0.034*** (−4.64)	0.033*** (17.37)	0.040*** (16.19)	0.036*** (20.95)	0.042*** (18.88)
MILLS		−0.155*** (−8.27)	−0.143*** (−5.32)	0.133*** (19.09)	0.203*** (21.95)	0.105*** (16.33)	0.175*** (21.02)
_cons	−11.558*** (−46.78)	1.144*** (8.18)	1.278*** (6.37)	−0.205*** (−3.95)	−0.334*** (−4.83)	−0.139*** (−2.89)	−0.284*** (−4.56)
r <sup>2</sup>		0.070	0.046	0.383	0.333	0.070	0.387
r <sup>2</sup> <sub>a</sub>		0.069	0.045	0.382	0.332	0.069	0.386
r <sup>2</sup> <sub>p</sub>	0.154						
<b>Panel C. Governance Pillar</b>							
<i>Instrumental Variable:</i>	4.603***						
ProbGovernance	(11.65)						
GovernancePillarScore <sub>it</sub>		−0.054*** (−10.63)	−0.057*** (−7.83)	0.011*** (5.79)	0.011*** (4.61)	0.013*** (7.62)	0.013*** (5.73)
MILLS		−0.806*** (−13.09)	−0.748*** (−8.48)	0.958*** (42.41)	1.371*** (45.77)	0.830*** (39.75)	1.225*** (45.33)
_cons	−7.702*** (−29.83)	3.730*** (13.43)	3.607*** (9.07)	−3.582*** (−35.13)	−5.067*** (−37.48)	−3.150*** (−33.42)	−4.564*** (−37.43)
r <sup>2</sup>		0.068	0.048	0.353	0.399	0.345	0.403
r <sup>2</sup> <sub>a</sub>		0.067	0.047	0.352	0.399	0.344	0.402
r <sup>2</sup> <sub>p</sub>	0.054						

#### Notes.

The first-stage probit regression models test the instrument variable (ProbEnv, ProbSocial, ProbGovernance) against the dummy variable of each pillar values suspected to be endogenous, which are then documented in MILLS. The second-stage hypothesis testing includes MILLS to capture potential bias and overcome any endogeneity problem. The testing includes industry and year fixed effects, spanning the period 2002–2021. Z-statistics are in parentheses. Significance at \*10%, \*\*5%, and \*\*\*1%, denoted as \**z* > 1.645, \*\**z* > 1.960, \*\*\**z* > 2.326.

2009), after the crisis (2010–2019), and during the pandemic (2020 and 2021). Would the relationship between ESG and earnings management differ? Table 6, Panel A–D presents the results of robust industry-fixed effect regressions for these periods. The managerial strategies displayed consistency throughout the observation period, maintaining a balance between sustainability efforts and unavoidable earnings manipulation. However, the most pronounced impact of ESG on earnings management emerged post-2008 global crisis, marked by severe economic downturns, currency devaluation, and stock index collapses. This period witnessed firms leveraging regulatory and investor backing, using enhanced ESG transparency as a communication tactic to signify meeting profit targets amidst recovery efforts.

We present fixed effect regression, based on industry, for all measurements in Appendix C.

### 6.3.3. Different perspectives based on regulation and the role of government in ESG

This study takes into account the institutional characteristics inherent to each country, in response to a research call by Ehsan et al. (2020). Lokuwaduge & Heenetigala (2017) emphasize the significance of regulations in influencing corporate decisions to implement ESG. Hence, it becomes intriguing to analyze whether there are differences for those operating in settings above or below the average regulatory environment. To be more specific, Jordaan et al. (2018) found that national-level institutional factors, such as the legal environment in which companies operate, play a crucial role in explaining the relationship between CSR and earnings management. Therefore, this study conducts a differentiated analysis at the country level, to gain insights into the role of regulations and government involvement in promoting ESG activities that stimulate earnings management.

Table 7, panels A and B concentrate on evaluating the role of government effectiveness, policy credibility, and regulatory quality in influencing management reactions within ESG and earnings management contexts. The study establishes a connection between the government's policy formulation and implementation effectiveness, the credibility of its commitments, and the quality of regulations, illustrating their impact on companies engaged in ESG and earnings management practices. The results reveal

**Table 6.** Fixed effect regression based on crash period by year.

Panel A. Before Global Economics Crisis (2002–2007)						
N=4625	JONES <sub>it+1</sub>	Mdf. JONES <sub>it+1</sub>	CFO <sub>it+1</sub>	PROD <sub>it+1</sub>	DISEXP <sub>it+1</sub>	REM <sub>it+1</sub>
ESG <sub>it</sub>	−0.096*** (−4.67)	−0.065** (−2.16)	0.028*** (5.68)	0.030*** (5.25)	0.035*** (7.29)	0.036*** (6.55)
_cons	0.375** (2.04)	0.233 (1.05)	0.827*** (8.94)	1.152*** (10.14)	0.681*** (7.28)	0.996*** (8.91)
r2	0.101	0.187	0.623	0.688	0.617	0.689
r2_a	0.090	0.177	0.619	0.684	0.612	0.685
Panel B. During Global Economics Crisis (2008–09)						
N=2944	JONES <sub>it+1</sub>	Mdf. JONES <sub>it+1</sub>	CFO <sub>it+1</sub>	PROD <sub>it+1</sub>	DISEXP <sub>it+1</sub>	REM <sub>it+1</sub>
ESG <sub>it</sub>	−0.116*** (−4.39)	−0.076** (−1.97)	0.026*** (4.16)	0.032*** (4.38)	0.029*** (4.80)	0.034*** (4.78)
_cons	−0.034 (−0.15)	0.079 (0.29)	0.662*** (7.29)	1.007*** (9.36)	0.555*** (6.26)	0.881*** (8.57)
r2	0.101	0.068	0.657	0.716	0.660	0.720
r2_a	0.078	0.045	0.648	0.709	0.652	0.713
Panel C. After Economics Crisis (2010–2019)						
N=28,414	JONES <sub>it+1</sub>	Mdf. JONES <sub>it+1</sub>	CFO <sub>it+1</sub>	PROD <sub>it+1</sub>	DISEXP <sub>it+1</sub>	REM <sub>it+1</sub>
ESG <sub>it</sub>	−0.136*** (−15.64)	−0.094*** (−7.44)	0.044*** (15.71)	0.054*** (15.64)	0.048*** (17.45)	0.056*** (17.30)
_cons	−0.050 (−1.21)	0.105* (1.92)	0.819*** (46.20)	1.225*** (55.47)	0.654*** (37.71)	1.046*** (50.52)
r2	0.087	0.106	0.483	0.542	0.480	0.549
r2_a	0.085	0.104	0.482	0.541	0.479	0.548
Panel D. During Global Pandemic Covid-19 (2020–2021)						
N=11,199	JONES <sub>it+1</sub>	Mdf. JONES <sub>it+1</sub>	CFO <sub>it+1</sub>	PROD <sub>it+1</sub>	DISEXP <sub>it+1</sub>	REM <sub>it+1</sub>
ESG <sub>it</sub>	−0.104*** (−6.88)	−0.093*** (−4.71)	0.031*** (4.13)	0.042*** (4.21)	0.033*** (4.87)	0.042*** (4.68)
_cons	0.326*** (3.84)	0.575*** (4.86)	0.384*** (9.88)	0.623*** (11.67)	0.305*** (9.00)	0.534*** (11.44)
r2	0.067	0.084	0.117	0.134	0.116	0.137
r2_a	0.061	0.078	0.111	0.128	0.110	0.132

Each model in panel includes control variable, industry and year fixed effect.

The table displays *t*-test results, denoted as \**t*>1.645, \*\**t*>1.960, \*\*\**t*>2.326, indicating significance at 10%, 5%, and 1% levels, respectively.

**Table 7.** Different perspective based on regulation and the role of government in ESG.

	Earnings management					
	Accrual-based earnings management		Real-based earnings management			
	(1)	(2)	(3)	(4)	(5)	(6)
	JONES <sub>it+1</sub>	Mdf. JONES <sub>it+1</sub>	CFO <sub>it+1</sub>	PROD <sub>it+1</sub>	DisEXP <sub>it+1</sub>	REM <sub>it+1</sub>
Panel A.						
High Government Effectiveness						
N = 23,400						
ESG <sub>it</sub>	−0.075*** (−10.23)	−0.040*** (−4.77)	0.018*** (6.81)	0.022*** (6.24)	0.020*** (8.02)	0.023*** (7.17)
_cons	0.026 (0.62)	0.039 (0.82)	0.690*** (32.26)	1.060*** (38.94)	0.518*** (25.30)	0.882*** (34.90)
r2	0.093	0.051	0.282	0.318	0.224	0.296
r2_a	0.091	0.049	0.281	0.316	0.223	0.294
Low Government Effectiveness						
N = 23,786						
ESG <sub>it</sub>	−0.131*** (−12.40)	−0.092*** (−5.78)	0.051*** (13.07)	0.064*** (13.16)	0.055*** (14.63)	0.066*** (14.45)
_cons	0.011 (0.27)	0.316*** (5.51)	0.801*** (35.17)	1.184*** (41.55)	0.683*** (31.05)	1.044*** (39.02)
r2	0.076	0.071	0.398	0.444	0.416	0.461
r2_a	0.074	0.069	0.397	0.443	0.415	0.460
Panel B.						
High Regulation Quality						
N = 23,264						
ESG <sub>it</sub>	−0.067*** (−9.75)	−0.053*** (−7.72)	0.005** (2.00)	0.005 (1.54)	0.005*** (2.58)	0.005* (1.92)
_cons	0.151*** (4.67)	0.146*** (4.35)	0.512*** (32.08)	0.835*** (37.86)	0.342*** (24.84)	0.664*** (34.94)
r2	0.099	0.034	0.288	0.308	0.245	0.295
r2_a	0.097	0.032	0.286	0.307	0.244	0.293
Low Regulation Quality						
N = 23,921						
ESG <sub>it</sub>	−0.130*** (−12.45)	−0.079*** (−4.99)	0.047*** (12.80)	0.060*** (12.90)	0.052*** (14.46)	0.062*** (14.26)
_cons	−0.029 (−0.68)	0.266*** (4.71)	0.831*** (36.16)	1.221*** (42.83)	0.713*** (31.91)	1.080*** (40.11)
r2	0.076	0.072	0.429	0.478	0.445	0.494
r2_a	0.074	0.071	0.428	0.477	0.444	0.493
Panel C						
Government Imposed Corporate ESG Disclosure (Mandatory)						
N = 39,197						
ESG <sub>it</sub>	−0.113*** (−15.26)	−0.011 (−1.02)	0.043*** (16.84)	0.056*** (17.15)	0.047*** (19.11)	0.058*** (19.00)
_cons	0.083*** (2.88)	0.308*** (8.17)	0.742*** (48.96)	1.130*** (59.05)	0.596*** (40.64)	0.970*** (54.27)
r2	0.061	0.058	0.288	0.329	0.272	0.326
r2_a	0.060	0.056	0.287	0.328	0.271	0.325
Government Imposed Corporate ESG Disclosure (Voluntary/Others)						
N = 7,989						
ESG <sub>it</sub>	−0.098*** (−5.92)	−0.117*** (−5.55)	0.040*** (5.77)	0.045*** (5.30)	0.045*** (6.80)	0.048*** (6.08)
_cons	−0.021 (−0.26)	0.095 (1.03)	0.885*** (16.69)	1.269*** (20.08)	0.769*** (14.71)	1.127*** (18.51)
r2	0.172	0.097	0.503	0.565	0.522	0.583
r2_a	0.167	0.091	0.500	0.562	0.519	0.581
Control Variable	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes

Each model in panel includes control variable, industry and year fixed effect.

The table displays *t*-test results, denoted as \**t* > 1.645, \*\**t* > 1.960, \*\*\**t* > 2.326, indicating significance at 10%, 5%, and 1% levels, respectively.

that companies implementing ESG are involved in both accrual reduction and real earnings increase under varying regulatory settings (high and low). Notably, the study underscores that the magnitude and strength of the coefficients, as well as the influence level (significance and *t*-value) between ESG and earnings, are more substantial in countries with lower government effectiveness and regulatory quality, while a diminished influence is observed in countries with higher effectiveness and regulatory quality. This contributes to a more comprehensive understanding of the intricate relationship between government policies, ESG practices, and earnings management across diverse regulatory environments.

The examination unveils insights into how companies respond to regulations in implementing ESG, indicating an indirect correlation between high regulatory quality, rule of law (Naz & Sheikh, 2023),



political stability (Gu et al., 2022), and reduced CSR investment. This reduction aligns with efforts to align interests between companies and governments, using CSR as a tool for information transfer, political risk mitigation, and conflict reduction amidst imperfect legal oversight. This elucidates the link between high ESG implementation under low regulatory settings and subsequent earnings management. Additionally, our analysis echoes Doh et al.'s (2017) explanation that lower regulations lead to difficulty internalizing values, resulting in higher transaction costs. In contexts of low effectiveness and quality, high ESG incurs elevated costs, possibly incentivizing profit manipulation or seeking stakeholder recognition. This aligns with the rationale of our primary testing and the perspective on licensing.

Contrasting results in Table 7, Panel C highlight government involvement in regulating ESG reporting, documented in the Principles for Responsible Investment (2016) report. The report identifies that 38 of the world's 50 largest economies have or are developing government guidelines for ESG disclosure. Under both high and low government involvement, the study demonstrates how ESG affects earnings management, particularly under mandatory regulation, where higher ESG performance leads to significant impact coefficients for earnings manipulation, except for Mdf. Jones. This exploitation of better ESG performance in justifying earnings manipulation resonates with the correlation observed between responsible investment regulations, enhanced ESG risk management, and subsequent economic gains for companies as highlighted by the UN PRI (2016).

## 7. Conclusion, limitations and recommendation

This study examines whether companies' sustainable performance affects future accrual and real-based earnings management. We used a sample of 47,186 firm-years from 44 countries that met the criteria for the extended periods from 2002 to 2021.

The study found evidence that companies with high sustainable performance tend to decrease (increase) accrual-based (real-based) future earnings management, in line with the perspective of moral licensing theory. Separate moral explanations for accrual earnings (as opposed to real earnings) indicate that managers tend to be more conservative, but this does not imply that managers are committed to ethical behavior. Conversely, companies may exhibit aggressiveness in real earnings, reflecting managers' attempts to surpass targets, responding to pressure, and meeting stakeholder demands. The accruals vs. real earnings explanations indicate that management compensates for excessively high real-based by reducing their accrual-based earnings management.

We conducted robust tests to address inefficient estimates with industry-year fixed-effect regression and excluded highly regulated industries. We also test the three pillars of ESG separately; split the sample based on crisis phenomena; industry; and natures of regulation (government effectiveness, regulatory quality standards, and regulatory enforcement). This study concludes that while all pillars of environmental, social, and governance (ESG) have varying impacts on earnings management, the environmental aspect significantly exerts a significant influence, emphasizing its crucial role in driving earnings activities within sustainability contexts. Our analysis also reveals that managerial strategies remain consistent over various economic periods, with companies balancing sustainability efforts and earnings manipulation, although the most significant impact of ESG on earnings management occurred after the 2008 global crisis, characterized by companies using enhanced ESG transparency as a communication tactic amidst recovery efforts. The impact coefficient of ESG's influence on earnings management is greater and stronger under lower government effectiveness, and lower regulatory quality standards. Conversely, a greater and stronger impact of ESG on earnings manipulation is evident in countries where the government mandates the regulation of ESG. Our overall findings lead to the conclusion that ESG and earnings management are inseparable, and deduced from moral licensing theory, are viewed as unethical behavior in the implementation of sustainability strategies.

In this study, we are limited to using ESG scores compiled by Thomson Reuters as the primary database, thus neglecting other measurements of ESG. Another limitation is that this study does not capture the relationship between ESG and earnings with country-fixed effect when testing (due to variable prioritization in the model), which may offer insights into different cultures and characteristics. Future research should consider other measurements of ESG and evaluate the impact and consequences in each country to provide more comprehensive explanations about the ESG and earnings management phenomena.

This study empirically contributes to literature in the several ways. First, this study applies moral licensing theory adding to predominant theories such as agency, legitimacy, or stakeholder theories to explain managerial behavior in ethical strategic decisions concerning sustainability performance and earnings management. We present compelling arguments that shed light on this aspect, filling the gap by incorporating insights from psychological behavior theory to elucidate the effect of sustainability reporting practices on earnings management. Second, recent studies have recommended the expansion of future research, including a focus on the practices of SDG adopters (Sofian et al., 2022), and institutional characteristics and regulatory roles (Santos-Jaén et al., 2021). Building upon these recommendations, this study capitalizes on the research gap to gain insights into the variations in regulatory effectiveness, quality as well as the extent government mandate companies' ESG practices. By design this research provides a new perspective through cross-country and long-periods data to analyze the effect regulatory issues on the effect of sustainability performance and earnings management.

Third, this study conducts statistical testing to respond Ehsan et al. (2022) recommendations concerning endogeneity issues arising from reverse causality and potential selection bias in the sample that have been overlooked. In addition, robustness tests and model sensitivity, as well as the separate utilization of ESG measurement components, offer a more detailed explanation to sustainability performance and earnings management issues. These methodological approaches enhance the reliability and validity of our findings, thereby strengthening the overall contribution of this research to the literature on sustainability reporting and earnings management practices.

Finally, our findings have crucial practical implications. We underscore the role of the government as a provider of ESG-related policies that may be challenging to internalize due to regulatory uniformity. Our recommendations differ from those of Bermejo Climent et al. (2021), who emphasize the importance of homogeneous ESG standards in portfolio performance contexts. However, we agree with Tran, Beddewela, and Ntim (2021), who question the effectiveness of legislative approaches in corporate reporting engagement. We express concerns that standardized regulations could lead to resource damage, decreased industry competitiveness, and reduced stakeholders' information capacity. Moreover, the high implementation costs may burden companies in developing countries. We advocate for policymakers to adopt a gradual and tailored approach before moving toward standardization.

Researchers believe that companies practicing corporate social responsibility (CSR) may be less inclined to engage in earnings manipulation because they prioritize the long-term needs of stakeholders (Ahmad, Subhan, et al. 2023). This study provides different explanation that managers inclined to manage earnings. This difference may occur due to regulatory environment and stakeholder pressure on management to achieve profit targets, compensation, and efforts to maintain company reputation are done by relying on excessive disclosure of environmental, social, and governance. Our findings also highlight a similar issue regarding the importance of holistic management strategies in facing regulatory and policy challenges, as discussed in Ahmad et al. (2024).

These findings also hold practical implications for company management strategies. Managers must conduct thorough assessments of the financial implications of adhering to such regulations and plan their financial resources accordingly. Moreover, they may need to explore alternative, cost-effective implementation methods while ensuring adherence to regulatory standards. Our findings also highlight a similar issue regarding the importance of holistic management strategies in facing regulatory and policy challenges, as discussed in Ahmad et al. (2024). The results of the study may also provide information for investors in resource allocation decisions based on earnings information. Since earnings are managed, in this case as part of companies' sustainability strategy, investors need to consider the quality of (managed) earnings information in determining the value of the firms for investment decisions.

## Author contributions

Conceptualization and idea, RRWNS and AN; Methodology, RRWNS, IKW, FR, AN; running and analysis data, RRWNS and FR; Writing and original Draft Preparation, RRWNS; Writing – review and editing, AN, IKW, FR; Supervisor, AN. All authors have read and agreed to the published version of the manuscript.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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## Data availability statement

The data supporting this study's findings are available on request from the first author [RRWNS] or Correspondance author [AN].

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## Appendix:

### Appendix A. Variable definitions

Variable name	Variable	Measurement	Sources
<b>Dependent Variables</b>			
Accrual-based Earnings Management	JONESit + 1 Mdf. JONES it + 1	Is accrual-based earnings management following the measurement by Jones model (1991) and modified Jones by Dechow et al. (1995) at year $t + 1$	Thomson Reuters
Real-based Earnings Management	CFOit + 1 PRODit + 1 DisEXPit + 1 REM it + 1	Is real based earnings management following the measurement by Roychowdhury (2006) at year $t + 1$  Is aggregate real based earnings following the measurement by Kim et al. (2012) at year $t + 1$	
<b>Independent Variables</b>			
Sustainability Performance	ESGit	Is the aggregate score of the three pillars (environmental, social, and governance (ESG), ranging from 0 to 100 divided by 100	Thomson Reuters
Control Variable			
Government Effectiveness	GOVjt	Is the score of the perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies in the range from approximately -2.5 to 2.5	World Bank
Regulation Quality	Reg_Qualityjt	Is the score of the perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development in the range from approximately -2.5 to 2.5	
GDP Growth	GDPGrowthjt	Is the annual percentage growth rate of GDP at market prices based on constant local currency, divided by 100	
SDGs	SDGjt	Are the binary variables 1 if the country has an index score based on overall performance on the 17 SDGs in period, and 0 otherwise	
Accounting Regulation	IFRSjt	Are the binary variables 1 if the country fully-adopts the principle based (IFRS) at the year observation, and 0 otherwise	IFRS Website and IAS Plus by Deloitte
Firm Size	FIRMSIZEit	Is this calculated as the natural logarithm of total assets	Thomson Reuters
Leverage	LEVit	Is this calculated as total liabilities divided by total assets	
Return on Asset	ROAit	Is this calculated as net income divided by total assets	
Loss	LOSSit	Are the binary variables 1 if company has net income before extraordinary item less than 0, and 0 otherwise?	
RD_Intensity	RD_Intensityit	Is research and development expenditure scaled by total assets	
Additional Government Imposed	Gov_imposed	Are the binary variables 1 if the company is located in a country where the government regulates ESG-related reporting (mandatory), and 0 otherwise.	

### Appendix B. Pearson correlation

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
[1] JONESit + 1	1.000							
[2] Mdf. JONES it + 1	0.021***	1.000						
[3] CFOit + 1	-0.155***	-0.013***	1.000					
[4] PRODit + 1	-0.140***	-0.011**	0.970***	1.000				
[5] DisEXPit + 1	-0.181***	-0.028***	0.962***	0.922***	1.000			
[6] REM it + 1	-0.158***	-0.019***	0.962***	0.985***	0.960***	1.000		
[7] ESGit	-0.125***	-0.056***	-0.031***	-0.051***	0.011**	-0.026***	1.000	
[8] GOVjt	0.013***	0.016***	-0.048***	-0.052***	-0.054***	-0.057***	0.006	1.000
[9] Reg_Qualityjt	0.025***	0.067***	-0.019***	-0.016***	-0.032***	-0.025***	0.034***	0.879***
[10] GDPGrowthjt	0.015***	0.018***	-0.003	-0.004	-0.005	-0.005	-0.068***	-0.129***
[11] SDGjt	0.058***	0.039***	0.060***	0.078***	0.029***	0.060***	0.005	-0.177***

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
[12] IFRSjt	0.041***	-0.079***	0.051***	0.056***	0.056***	0.060***	0.072***	-0.168***
[13] FIRMSIZEit	-0.052***	-0.063***	-0.459***	-0.505***	-0.407***	-0.481***	0.364***	-0.004
[14] LEVjt	-0.185***	-0.030***	0.341***	0.343***	0.389***	0.379***	0.173***	-0.090***
[15] ROAit	-0.083***	-0.064***	0.196***	0.209***	0.236***	0.235***	0.071***	-0.057***
[16] LOSSit	0.039***	0.065***	0.085***	0.104***	0.057***	0.089***	-0.118***	0.032***
[17] RD_Intensityit	0.021***	-0.032***	0.103***	0.109***	0.083***	0.099***	0.001	0.052***
	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]
[9] Reg_Qualityjt	1.000							
[10] GDPGrowthjt	-0.170***	1.000						
[11] SDGjt	-0.121***	-0.011**	1.000					
[12] IFRSjt	-0.153***	0.006	0.091***	1.000				
[13] FIRMSIZEit	-0.079***	0.032***	-0.229***	-0.042***	1.000			
[14] LEVjt	-0.090***	-0.014***	0.001	-0.025***	-0.063***	1.000		
[15] ROAit	-0.068***	0.040***	-0.064***	0.076***	-0.177***	0.264***	1.000	
[16] LOSSit	0.069***	-0.106***	0.126***	-0.081***	-0.220***	0.030***	-0.396***	1.000
[17] RD_Intensityit	0.040***	-0.012***	0.040***	-0.078***	-0.113***	-0.052***	-0.208***	0.211***

p-Values in parentheses.

\*p < 0.1.

\*\*p < 0.05.

\*\*\*p < 0.01.

## Appendix C. Regression for each industry with year fixed effect (robust)

Panel A. Independent Variable = ESG	Industry by One-digit NAICS Code							
	-1	-2	-3	-4	-5	-6	-7	-8
N	N = 237	N = 6267	N = 19,981	N = 6564	N = 11,859	N = 838	N = 1238	N = 202
_cons	-0.344 (-1.12)	-0.267*** (-3.40)	-0.021 (-0.47)	0.045 (0.91)	0.797*** (10.65)	0.737*** (4.66)	-3.292*** (-5.61)	0.384*** (3.24)
JONESit + 1	-0.411*** (-2.79)	-0.095*** (-5.68)	-0.151*** (-14.30)	-0.090*** (-7.06)	-0.092*** (-5.13)	-0.247*** (-5.37)	-0.180** (-2.14)	0.085** (2.24)
r2	0.291	0.038	0.092	0.052	0.099	0.204	0.344	0.054
r2_a	0.211	0.033	0.091	0.049	0.095	0.175	0.237	0.031
_cons	-0.292 (-0.71)	0.098 (1.06)	0.459*** (8.03)	0.015 (0.24)	0.201** (2.08)	0.355*** (3.17)	-3.433*** (-5.68)	0.201 (1.52)
Mdf. JONESit + 1	-0.161 (-0.95)	-0.060*** (-2.78)	-0.009 (-0.54)	-0.072*** (-3.97)	-0.059** (-2.42)	-0.052 (-1.16)	0.133 (1.62)	-0.054 (-1.16)
r2	0.240	0.046	0.057	0.039	0.043	0.233	0.390	0.054
r2_a	0.154	0.042	0.055	0.037	0.038	0.205	0.291	0.030
_cons	0.650*** (2.76)	0.873*** (25.31)	0.861*** (34.27)	0.475*** (9.60)	0.738*** (25.88)	0.326*** (3.75)	0.289*** (5.56)	0.037 (0.17)
CFOit + 1	0.123*** (2.82)	0.049*** (7.56)	0.055*** (14.15)	0.018*** (3.06)	0.036*** (7.30)	0.010 (0.51)	0.011 (1.08)	0.029 (0.74)
r2	0.383	0.349	0.381	0.312	0.318	0.311	0.204	0.270
r2_a	0.313	0.346	0.380	0.309	0.317	0.286	0.184	0.152
_cons	1.082*** (3.30)	1.321*** (30.58)	1.263*** (40.68)	0.814*** (13.36)	1.115*** (30.85)	0.531*** (4.53)	0.494*** (6.52)	0.136 (0.50)
PRODit + 1	0.176*** (2.87)	0.066*** (8.02)	0.064*** (13.23)	0.028*** (3.75)	0.048*** (7.36)	0.014 (0.57)	0.017 (1.22)	0.031 (0.65)
r2	0.377	0.399	0.422	0.362	0.357	0.307	0.262	0.294
r2_a	0.306	0.396	0.421	0.359	0.355	0.281	0.243	0.180
_cons	0.464** (2.30)	0.722*** (21.48)	0.715*** (29.40)	0.336*** (6.84)	0.596*** (21.45)	0.207*** (3.01)	0.151*** (3.41)	-0.007 (-0.03)
DISEXPit + 1	0.103*** (2.85)	0.058*** (9.04)	0.056*** (15.14)	0.022*** (3.88)	0.043*** (9.05)	0.005 (0.28)	0.006 (0.65)	0.026 (0.68)
r2	0.397	0.317	0.392	0.319	0.310	0.326	0.174	0.269
r2_a	0.328	0.313	0.391	0.316	0.308	0.301	0.154	0.150
_cons	0.896*** (3.13)	1.148*** (28.36)	1.102*** (37.68)	0.670*** (11.48)	0.955*** (28.14)	0.412*** (4.23)	0.356*** (5.41)	0.091 (0.35)
REMit + 1	0.157*** (3.01)	0.071*** (9.03)	0.064*** (14.28)	0.031*** (4.42)	0.051*** (8.53)	0.009 (0.40)	0.012 (1.01)	0.027 (0.60)
r2	0.393	0.387	0.436	0.375	0.356	0.327	0.263	0.297
r2_a	0.324	0.384	0.435	0.373	0.355	0.302	0.245	0.183

Included: All control variable in model, year fixed effect.

t Statistics in parentheses.

\*p < 0.1.

\*\*p < 0.05.

\*\*\*p < 0.01.