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The Impact of Environmental, Social, and Governance (ESG) Disclosures on Accounting Earnings Management: An Applied Study

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Abstract:

Purpose: The study aims to examine the relationship between Environmental, Social, and Governance (ESG) disclosures and accounting earnings management (AEM) practices within firms listed on the Saudi stock market.

Design/Methodology/Approach: The study is based on a sample of 51 Saudi companies, covering the period from 2020 to 2024. An index was developed to measure ESG disclosures at two levels: the first measures each dimension individually, while the second measures overall sustainability practices. The study used a set of control variables covering corporate governance, audit quality, and company characteristics. Descriptive analysis, Pearson correlation analysis, and multiple linear regression analysis were applied.

Findings: The results show a negative relationship between a company's ESG disclosures and AEM in companies listed on the Saudi market, whether at the level of each individual ESG dimension or overall performance. Our findings indicate that expanding ESG disclosure improves the quality of financial reporting, suggesting that companies' managers with greater ESG disclosures have an ethical commitment and are aware of the need to improve the company's long-term value.

Practical implications: Our results indicate that expanding ESG disclosures strengthens the ethical behavior of managers, which in turn improves the quality of financial reports and reduces manipulation and earnings management practices. Therefore, it is essential for policymakers and governments in Arab countries to emphasize the need to expand ESG disclosures. For investors, the results show that a company's increased commitment to ESG can boost its reputation and limit opportunistic behavior.

Originality/value: The findings of this study enhance the literature on ESG disclosures by illustrating that expanding ESG disclosures can significantly improve the quality and credibility of financial information published in stock markets.

Keywords: Accounting Earnings management; sustainability; environmental; social; governance.

1. Introduction

Earnings management represents a challenge to the integrity of financial reports (Benedetti et al., 2025). It refers to using accounting methods to prepare misleading financial reports or to present an exaggeratedly positive picture of a company's economic situation (Benedetti et al., 2025). Although AEM falls within the boundaries of accounting standards and regulations, it often includes manipulating the timing of expenses and revenues to stabilize profit fluctuations, portraying a business as consistently more profitable, or increasing profits to meet financial analysts' expectations (Dechow et al., 2003). While AEM is a legal process, it is considered unethical because it can mislead investors and other stakeholders. In extreme cases, it may cross the line to become a fraudulent activity, as seen in the Enron and WorldCom scandals (Benedetti et al., 2025).

According to Belgasem (2020), earnings management has become a significant phenomenon that raises questions about the reliability of financial reports. Furthermore, Zulue (2023) states that earnings management erodes earnings quality and negatively affects the quality of financial reports. This fails to meet the objectives of international financial reporting, which aim to provide useful information to current and potential investors, creditors, and other users for making rational investment and credit decisions. According to Zulue (2023), although AEM is harmful, it is legal and within accounting standards.

Following the 2008/2009 financial crisis, there was a growing demand from stakeholders for more transparency. As a result, companies began voluntarily releasing independent reports on their corporate social responsibility (CSR) and related CSR performance figures for public interest entities (KPMG, 2022). ESG has emerged as a globally significant topic, putting pressure on company managers and shareholders (Ekawatie, 2025). Tohang et al. (2024) believe that the field of studies related to ESG disclosure has gained significant attention in recent years, driven primarily by increasing global concern about climate change and environmental challenges. According to Sofian et al. (2020), corporate social responsibility (CSR) has long been a core field in business research. The aspects of CSR that researchers have focused on have seen tremendous growth, with most research concentrating on the positive effects, including good behavioral changes, promising financial performance, social investment and development, and environmental safeguarding and protection.

Elkington (2018) argues that measuring business success should not be based solely on financial information but should also include the well-being of society and the good of the planet. Zulue (2023) believes there are several reasons for companies to be socially responsible, including the feel-good factor from contributing to the community, enhancing the company's reputation, and attracting talented employees who care about the planet, along with consumers and investors through sustainable investment strategies. Additionally, corporate social responsibility (CSR) activities can also be a source of revenue. Within the framework of the United Nations Development Programme's (UNDP) Sustainable Development Goals, ESG practice responsibilities are considered important for supporting corporate sustainability (United Nations Development Programme, 2023). Benedetti et al. (2025) add that integrating ESG disclosure into a company's operations and strategies is viewed as an indicator of sustainability and ethical governance. Several studies (Fuente et al., 2021; Abdi et al., 2022; Habib and Mourad, 2023) have also proven that ESG disclosure leads to an increase in a company's market value.

However, Velte (2024) argues that there are risks associated with ESG disclosure, including the risk of information overload resulting from a lack of connection between financial and ESG reports. Mahoney et al. (2013) believe that social responsibility reports suffer from low levels of objectivity, which can lead to greenwashing. Sial et al. (2019) add that companies may use ESG reports as an impression management tool to conceal their opportunistic behavior. This is consistent with several studies (e.g., Ben-Amar and McIlkenny, 2015; Garcia and Herrero, 2020) that have shown that with increasing stakeholder pressure to improve environmental performance, two outcomes can occur: greenwashing and information overload. Feghali et al. (2025) also add that greenwashing can negatively affect a company's performance, customer perceptions, and corporate reputation.

While corporate social responsibility (CSR) is known to improve a company's transparency, value, relationships, and reputation, the motivations behind these activities and ESG reporting remain a subject of debate (Gunawan et al., 2020). This is supported by evidence suggesting that CSR activities and reporting practices can be linked to the manipulation of information in corporate reports (Alsaadi et al., 2017).

Zulue (2023) believes that with the growing interest in corporate social responsibility (CSR), many questions have been raised about whether these practices can help mitigate earnings management. Some academics believe that companies use earnings management strategies to enhance their growth prospects regardless of their actual financial performance (Cai et al., 2012). Prior et al. (2008) argue that companies engaging in earnings management tend to view CSR activities and reporting as a strategy to intentionally shift the attention of stakeholders away from their performance and expectations.

Brahmana et al. (2018) argue that in emerging markets, a company's disclosure of environmental information can actually enhance its earnings management. Because these markets often lack robust regulatory systems, managers can use environmental disclosure as a corporate social responsibility (CSR) activity to divert investors' attention away from opportunistic behavior. Tohang et al. (2020) noted that earlier research on CSR and ESG initiatives identified these practices as vulnerable to opportunistic behavior by managers, which can be observed through earnings management. Sofian et al. (2020) also noted that many researchers have questioned the credibility of corporate social responsibility and its link to unethical financial behavior, particularly earnings management.

However, some studies present a different view. For example, Kim et al. (2012) showed that companies with higher ESG ratings tend to have lower levels of AEM, suggesting that ESG disclosure can be a reliable indicator of financial report quality. Similarly, Kolsi et al. (2023) found that socially responsible companies, particularly those focused on environmental issues, are less likely to manipulate earnings. Additionally, Shang and Chi (2023) discovered that in both emerging and developed markets, companies that are more transparent with their environmental information foster a corporate culture with strong ethical beliefs.

Given the previous debate on the relationship between ESG disclosure and AEM, the research question is, what is the effect of ESG disclosure on earnings management through discretionary accruals? Accordingly, this study aims to test the impact of ESG disclosure practices on AEM.

The importance of this study stems from the ongoing academic debate about the significance and motivations behind ESG disclosure specifically, whether they improve financial report quality or are used to conceal AEM and mislead financial report users. The study's

importance also lies in being one of the few to address all three sustainability dimensions (environmental, social, and governance) in a single study. It measures each dimension individually to determine its relationship with AEM and then measures the overall sustainability disclosures and their impact on AEM.

The rest of the study is divided into five subsequent sections. The next part traces the evolution of ESG disclosure. This is followed by a discussion of prior research and the development of the study's hypotheses. The research methodology and design are then presented, after which the results are interpreted. The paper concludes with a final section that outlines the study's findings, recommendations, and areas for future research.

2. Evolution of the Emphasis on Sustainability

The emphasis on environmental, social, and governance (ESG) disclosure may seem like a modern trend, but its origins span back many years, recognized under various terms such as environmental responsibility, social responsibility, and corporate responsibility. Recently, there has been a notable increase in focus on these practices. The concept of sustainability, as we understand it today, was first introduced in the Brundtland Report released by the United Nations Commission on Environment and Development in 1987 (Sener et al., 2016).

Starting with the new millennium and inspired by the principles of the United Nations Conference on Environment and Development, the UN Global Compact was established to assist companies in aligning their operations and strategies with sustainability goals (UN, 2000). In addition, the Global Reporting Initiative (GRI) released the first generation (G1) of its standards and guidelines for sustainability reporting. This was followed by several additional generations, culminating in the release of the fourth generation (G4) standards in 2013. The G4 standards consist of two sets of guidelines: one focuses on principles for defining report content, while the other addresses the quality of reports (GRI, 2013). These standards are recognized and adopted worldwide.

In light of the increasing interest in and risks associated with sustainability issues, the International Financial Reporting Standards (IFRS) Foundation announced the creation of the International Sustainability Standards Board (ISSB) during the twenty-sixth United Nations conference, COP26, on November 3, 2021. The board's

primary role is to focus on developing standards related to sustainability (IAF et al., 2022). The ISSB has released its first two international sustainability standards: IFRS S1, titled "General Requirements for Disclosure of Sustainability-related Financial Information," which establishes disclosure requirements to help companies communicate sustainability risks and opportunities to investors and outlines the essential content for comprehensive sustainability-related disclosures (IFRS S1, 2023); and IFRS S2, "Climate-related Disclosures," which details the necessary disclosures related to climate change and mandates the sharing of information about climate-related risks and opportunities. This second standard complements the first (IFRS S2, 2023). Both standards aim to create a globally recognized foundation that assists organizations in reporting on sustainability-related risks and opportunities, thereby enabling investors and capital markets to make more informed decisions (IIA Bulletin, 2022).

Concerning the Saudi environment, Saudi Arabia is giving noteworthy attention to sustainability, launching numerous initiatives. These include the King Salman Renewable Energy Initiative, the establishment of the Council of Royal Reserves, and the launch of the National Environment Strategy. The country has also joined the International Solar Alliance, launched the Green Riyadh project, and adopted the Circular Carbon Economy initiative. These efforts culminate in the Saudi Green and Middle East Green initiatives launched in 2021 (Capital Market Authority, 2024).

On October 28, 2021, the Saudi Tadawul Group issued the ESG Disclosure Guidance Manual. The manual's primary purpose is to help companies listed on the Saudi market understand and implement best practices for disclosing non-financial information. This initiative aligns with global trends and aims to enhance transparency and trust within the Saudi financial market. The guide explains the importance of ESG reports to investors and stakeholders, offering detailed instructions on how to collect and report relevant data in a standardized way. This includes environmental indicators (e.g., energy consumption and waste), social indicators (e.g., employee health and safety), and governance indicators (e.g., board independence and anti-corruption). By following these guidelines, companies can attract responsible investments and promote long-term sustainability (Tadawul, 2021).

In early 2024, the Saudi Capital Market Authority (CMA) established a sustainability management to lead its sustainability

efforts. The department's key goals include improving the relevant information environment by implementing sustainability and sustainable finance initiatives, raising awareness, and developing policies, standards, and classifications for sustainable finance related to the financial market and its products. The CMA is also making concerted efforts to develop corporate sustainability disclosure standards and has created the first draft of a sustainability classification (Capital Market Authority, 2024).

Sustainability disclosures by companies listed on the Saudi financial market have seen a remarkable development. In 2019, 24 companies, or 13.19% of those listed, disclosed sustainability information. This number grew significantly to 93 companies by 2023, representing 43.66% of the total listed companies. For the year 2023, 20 companies released independent sustainability reports, while 70 integrated the information into their board of directors' reports. Companies on the Saudi market used 11 types of standards to prepare these reports, including the GRI standards (Capital Market Authority, 2024).

3. Literature Review and Hypothesis

The relationship between ESG disclosure and AEM has been a subject of significant interest in previous studies. While researchers have attempted to clarify this relationship, the findings from studies conducted in various environments have not been consistent in terms of the type and direction of the relationship. Even within the same environments, studies have not reached a consensus.

The results of previous studies are divided into two main groups. However, some studies also found no relationship between sustainability disclosures and AEM, such as, the study by Moratis and Egmond (2018) examined the relationship between corporate social responsibility (CSR) disclosure and AEM in a sample of 5,494 observations of companies listed on the U.S. financial market from 2003 to 2009.

Additionally, Deng et al. (2024) reviewed and compiled available literature to summarize whether the essence of Corporate Social Responsibility (CSR) truly stems from a genuine social commitment or if it is primarily used as a tactic to conceal earnings management practices. The study used a literature review methodology to carefully evaluate 75 selected articles from the Web of Science and Scopus databases, integrating bibliometric techniques and following PRISMA

guidelines. They found that with the evolving economic and social landscapes, research on the relationship between CSR and earnings management is increasing, particularly in Asian contexts. However, most research does not examine the effect of the three dimensions of CSR and earnings management. They concluded that there are four diverse relationships between CSR and earnings management in emerging markets: positive, negative, mixed (depending on the type of emerging market), and no relationship. It suggests that this should be determined by macro-level factors (such as the political and economic environment) and micro-level factors (such as industries and governance). Therefore, the relationship between CSR and earnings management cannot be simply generalized across all emerging markets. They also found that most research examines CSR as a whole, with some studies using CSR disclosure and performance as measures. However, the distinctions between CSR disclosure and performance, and specifically the separation of CSR, remain insufficiently explored.

3.1 A Negative Relationship between ESG Disclosure and AEM

The academic literature consistently demonstrates an inverse relationship between a company's commitment to environmental, social, and governance (ESG) disclosure and its tendency to engage in earnings management. This suggests that companies with a strong focus on sustainability and responsibility are more likely to exhibit transparency and integrity in their financial reporting.

A comprehensive analysis by Velte (2024), which synthesized findings from 107 prior studies across developed and developing nations, confirmed this inverse relationship. The study found that most of these studies confirmed an inverse relationship between earnings management and ESG disclosure. This inverse relationship held true regardless of the country's development status, legal system, or the strength of shareholder protection and law enforcement. However, the studies revealed clear evidence that corporate governance affects earnings management linked to sustainability disclosure, and this influence can be either positive or negative.

Complementing this, Gerged et al. (2020) examined the relationship between corporate environmental disclosure, a key ESG disclosure, and earnings management via accruals. The research, which used data from 60 companies on the Kuwait Stock Exchange between 2010 and 2014, found that more environmental disclosure led

to less AEM. The study concluded that managers with a strong commitment to environmental responsibility are less likely to engage in manipulating earnings.

Similarly, Mohmed et al. (2020) examined the relationship between corporate social responsibility (CSR) and the quality of accounting earnings using discretionary accruals. The research looked at a sample of 100 companies on the Egyptian Stock Exchange from 2007 to 2015. The findings showed that for the 30 companies included in the EGX ESG S&P index, improved CSR performance led to better earnings quality. In contrast, the 70 companies outside the index appeared to use CSR disclosures as a marketing tactic to conceal poor earnings. Additionally, a separate study by Velte (2020) also found an inverse relationship between a company's carbon performance and earnings management through accruals. This conclusion was based on an analysis of 1,509 observations from companies on the STOX Europe 600 index between 2014 and 2018.

In the same vein, Eleni (2022) investigated the impact of corporate sustainability practices on earnings management for companies listed in the Eurozone. The research utilized a sample of 32,214 annual observations from 3,090 firms that had been following IFRS for at least one year during the period from 2005 to 2020. The findings indicated a negative and statistically significant association between sustainability practices and AEM. The study concludes that a company's commitment to sustainable development is linked to enhanced transparency, greater accountability to stakeholders, and increased integrity in public financial reports.

Hashed and Ghaleb (2023) explored the relationship between corporate social responsibility (CSR) reports, earnings management, and the quality of financial reports. Using a sample of 840 observations from companies listed on the Saudi Arabian market between 2016 and 2021, the study found that CSR reporting mitigates real earnings management practices and increases the quality of financial reporting. Supporting this notion, Al Barrak and Kouaib (2024) used data from 37 companies listed on the Saudi market from 2018 to 2022. They found that sustainable corporate governance, achieved by expanding sustainability practices and forming sustainability committees and audit processes, limits both accounting and real earnings management. This means that companies focused on sustainable performance reduce their earnings management activities. They prioritize sustainable

management, focusing on long-term strategies and achieving transparency.

Moreover, based on an analysis of data from 66 non-financial companies listed on the Amman Stock Exchange from 2017 to 2020, Alodat et al. (2024) proved that companies' compliance with ESG disclosure improves their ethical behavior, curbs earnings management practices, and increases the reliability of their financial data. Additionally, Lei et al. (2024) observed the effect of corporate green transformation on AEM. Using a sample of companies listed on China's A-share market from 2015 to 2021, the results showed that green transformation helps in reducing AEM due to increased scrutiny from financial analysts and the easing of financing constraints.

Meyer and Dutzi (2024) surveyed research on the relationship between Corporate Social Responsibility (CSR) and earnings management. The survey focused on empirical analyses from research published in accredited business school databases, such as Chartered Association of Business Schools (CABS) and Australian Business Deans Council (ABDC). The overall conclusion was that CSR performance has a negative effect on accrual-based earnings management, meaning that companies with strong CSR practices are less likely to manipulate earnings through accounting methods. However, the findings were contradictory regarding the impact of CSR on real earnings management.

In addition to this, Mensah et al. (2024) explored the relationship between the quality of sustainability reports and AEM practices within the oil and gas industry. The research, which analyzed 100 companies listed on exchanges in 10 African countries from 2013 to 2022, found an inverse relationship between earnings management and the quality of ESG reports. The study highlighted that high-quality sustainability reports and thorough auditing efforts are crucial for mitigating earnings management and fostering greater transparency and accountability through effective sustainability practices and comprehensive auditing.

Furthermore, Ricapito (2024) examined the relationship between a company's overall ESG disclosure, its three dimensions (Environmental, Social, and Governance), and earnings management. The research, which included 618 annual observations from 103 Italian companies listed on the FTSE Italia All-Share index between 2014 and 2019, found that ESG disclosures have a negative effect on accrual-based earnings management but not on real earnings management.

The study further concluded that the governance dimension had the strongest effect in limiting earnings management compared to the environmental and social dimensions.

Finally, Benedetti et al. (2025) tested the relationship between green intensity and earnings management. Using a sample of 18,012 observations from 2,319 companies listed on the U.S. market from 2010 to 2022, the research found an inverse relationship between these two variables, indicating that companies with greater green intensity are less likely to engage in earnings management. The study also investigated whether geographical regions, cultural, and social standards affected this relationship but concluded that the link was not influenced by these factors.

Based on the preceding discussion about an inverse relationship between ESG disclosure and AEM, we formulate the following hypotheses:

$H0_1$: ***ESG disclosure is negatively associated with AEM.***

3.2 A Positive Relationship between ESG Disclosure and AEM

The academic literature presents a counterargument to the view that ESG disclosure enhances transparency, suggesting instead a positive relationship between a company's commitment to sustainability and its engagement in earnings management. This perspective argues that some managers may use ESG activities to conceal opportunistic behavior.

Habbash and Haddad (2020) conducted a comprehensive survey of data from all companies listed on the Saudi Stock Exchange for the years 2015 and 2016. They found that corporate social responsibility (CSR) disclosure is directly and positively related to AEM practices. This suggests that companies that take more CSR actions are more likely to manipulate their earnings.

Building on this theme, a study by Garfatta (2021) examined the relationship between corporate social responsibility (CSR) disclosure and AEM. Using a sample of 277 observations from companies listed on the Saudi Stock Exchange from 2017 to 2019, the study found a positive relationship between CSR disclosure and discretionary accruals. This suggests that managers engage in CSR activities to conceal their mistakes and persuade stakeholders of the company's transparency. It is likely that managers use ethical codes of conduct as

a tool to achieve their own personal goals rather than the company's objectives.

Additionally, Zulu (2023) examined the relationship between corporate social responsibility (CSR) and AEM, using a sample of 230 companies from the FTSE-350 on the London Stock Exchange from 2010 to 2019. He found a direct, positive relationship, meaning that as CSR practices increased, so did AEM. Zulu argues that company managers use CSR as a facade to hide their earnings management practices, which could negatively impact the company's long-term performance. The study suggests that stakeholders need to distinguish between genuine and non-genuine CSR practices, often referred to as greenwashing, to make a truly informed assessment of a company's CSR efforts.

In line with these findings, Almubarak et al. (2023) suggest that earnings management is an ethical issue that companies face. They propose that management teams who manipulate earnings may adopt ESG activities as a way to protect themselves from stakeholders. Therefore, the expansion of ESG disclosure could sometimes be viewed as a type of managerial misconduct used to cover up these manipulative practices. This view is based on the researchers' findings from a sample of 304 annual observations of companies listed on the Saudi Stock Exchange between 2014 and 2021. They found a positive relationship between ESG disclosures and earnings management, and this link was significantly stronger for financially distressed companies, which tended to increase both their ESG disclosures and their engagement in earnings management.

In a related context, Tohang et al. (2024) found a positive relationship between discretionary accruals and ESG disclosure but an inverse relationship between earnings quality and ESG disclosure. Using data from 316 observations of 79 telecommunications service companies in 17 Asian countries, the research suggests that over time, the use of ESG disclosure that involves greenwashing will harmfully affect the quality of a company's operating earnings and increase organizational uncertainty.

Lastly, Ekawati (2025) explored the motivations of companies listed on the Indonesian Stock Exchange to engage in ESG disclosure. Using a sample of manufacturing firms from 2015 to 2019, the study found that companies with a greater commitment to ESG standards are more inclined to engage in earnings management. This suggests

that these companies use the expansion of their ESG disclosure to cover up their opportunistic activities.

Expanding on the earlier discussion of the positive correlation between ESG disclosure and AEM, we propose the following hypothesis:

$H0_2$: ***ESG disclosure is positively associated with AEM.***

4. Research Design and Methodology

4.1 Sample Selection and Data Sources

The study population consisted of 256 companies listed on the Saudi Stock Exchange, based on the statistical report for the first quarter of 2025 (Tadawul, 2025). After excluding companies from the banking, financial services, insurance, and real estate investment trust sectors, the study population was reduced to 190 non-financial companies. Following the exclusion of companies with incomplete financial data and using a random selection process, a sample of 51 non-financial companies was chosen. Given that the modified Jones model requires five years of data, the companies' financial statements for the period from 2020 to 2024 were used, representing 255 annual observations. Data for four years of sustainability and board of directors' reports, from 2021 to 2024, were utilized, providing 204 four-year observations. This period was selected because it aligns with the Saudi Stock Exchange's initiative to issue ESG (Environmental, Social, and Governance) disclosure guidelines for listed companies. The data were collected from the companies' official websites, the Saudi Stock Exchange website, and the Argaam website. Table (1) shows how the study sample is distributed among the different sectors.

Table (1) Study Sectors

Industry	No. of firms	Percentage
Materials	17	33.3
Food & Beverages	5	9.8
Energy	4	7.8
Consumer Discretionary Distribution & Retail	4	7.8
Capital Goods	3	5.9
Transportation	3	5.9
Consumer Durables & Apparel	3	5.9
Consumer Services	2	3.9
Health Care Equipment & Svc	2	3.9
Telecommunication Services	2	3.9
Commercial & Professional Svc	2	3.9
Consumer Staples Distribution & Retail	1	2.0
Media and Entertainment	1	2.0
Pharma, Biotech & Life Science	1	2.0
Utilities	1	2.0
Total	51	%100

4.2 Definition of Variables

4.2.1 Dependent Variable

AEM is the dependent variable and can be measured through discretionary accruals. We will rely on the Jones (1991) model, as modified by Dechow et al. (1995), to measure discretionary accruals for the following reasons:

- **The model has a high capacity to explain changes in a company's total accruals.**
- **The majority of studies that have measured discretionary accruals in annual financial reports have used this model, as it is considered one of the most important measures for evaluating accruals.**

Discretionary accruals can be measured for each company in the sample using the modified Jones model by following these steps:

First Step: Measuring Total Accruals:

This is done by calculating the difference between net income before extraordinary items and cash flows from operating activities, according to the following equation:

$$TAcc_{it} = E_{it} - OCF_{it}$$

Where:

$TAcc_{it}$: Total accruals for the company (i) in period (t).
E_{it} : Net income before extraordinary items for the company (i) in period (t).
OCF_{it} : Cash flows from operating activities for the company (i) in period (t).

Second Step: Measuring Non-Discretionary Accruals:

Non-discretionary accruals are measured in two steps:

A- Estimating the coefficients of the modified Jones model for each sector of the study sample separately. This is because companies belonging to the same industry tend to have similar behavior regarding accruals. The coefficients are estimated using the following regression model:

$$\frac{TAcc_{it}}{A_{it-1}} = \beta_0\left(\frac{1}{A_{it-1}}\right) + \beta_1\left(\frac{\triangle REV_{it}}{A_{it-1}}\right) + \beta_2\left(\frac{PPE_{it}}{A_{it-1}}\right) + \varepsilon_{it}$$

Where:

A_{it}: Total assets for the company (i) in period (t−1).

ΔRev_{it}: Change in revenues for the company (i) between period (t) and period (t−1).

PPE_{it}: Fixed assets for the company (i) in period (t).

B_0, β_1 and β_2: The estimated values of the model's coefficients.

ϵ_{it}: The residuals of the regression model

B- Estimating Non-Discretionary Accruals

Nondiscretionary accruals are estimated according to the following equation:

$$NDA_{it} = \beta_0\left(\frac{1}{A_{it-1}}\right) + \beta_1\left(\frac{\triangle REV - \triangle AR_{it}}{A_{it-1}}\right) + \beta_2\left(\frac{PPE}{A_{it-1}}\right)$$

Where:

NDA_{it}: Non-discretionary accruals for the company (i) in period (t).

ΔAR_{it}: Change in accounts receivable for the company (i) between period (t) and period (t−1).

B_0, β_1 and β_2: The estimated values of the model's coefficients obtained from the previous regression equation.

The justification for dividing by total assets is to mitigate the impact of company size on the variation in accrual amounts from one company to another.

Third Step: Measuring Discretionary Accruals:

This represents the difference between total accruals and non-discretionary accruals, as follows:

$$DACC_{it} = \frac{TAcc_{it}}{A_{it-1}} - NDA_{it}$$

It should be noted that the value of discretionary accruals can be either positive (leading to an increase in reported profits) or negative (leading to a reduction in reported profits). Our primary concern is the extent to which management engages in discretionary accruals, as this indicates the level of earnings management being practiced.

4.2.2 Independent variable

ESG is an independent variable in this study, and its value was determined using a custom-designed index. This index measures the overall ESG disclosure as well as the three individual dimensions: environmental, social, and governance. The index is made up of 25 equally weighted items, totaling 25 points. These points are distributed among the three dimensions as follows: 8 points for the environmental dimension, 10 points for the social dimension, and 7 points for the governance dimension. The total points for each company reflect its overall ESG disclosure, while the points for each individual dimension provide a separate measure of its performance in that area. We based the construction of this index on the fundamental disclosure principles found in internationally recognized frameworks, including the Global Reporting Initiative (GRI) and the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). Each item within the

index is assessed on a binary scale, where a company receives 1 point if the information is clearly disclosed in a report (such as a sustainability, board of directors', or annual report) and 0 points if the information is not disclosed, is unclear, or is ambiguous. The specific items included in the proposed index are as follows:

Environmental Dimension: Has the company disclosed:

- **An approved environmental policy?**
- **The responsibility of the board of directors or a specific committee for environmental issues?**
- **Total energy consumption (in units/measurements)?**
- **Greenhouse gas emissions (Scope 1 and 2)?**
- **Targets for reducing emissions or improving energy efficiency?**
- **Total water consumption?**
- **The amount of waste generated and how it's managed (recycling/landfilling/ burning).**
- **The impact of the company's operations on biodiversity and protected areas?**

Social Dimension: Has the company disclosed:

- **The total number of employees (full-time and part-time)?**
- **Policies on diversity, inclusion, and equality in the workplace?**
- **Employee turnover rates (hiring and termination)?**
- **Occupational health and safety policies?**
- **Employee training and development programs?**
- **A clear human rights policy?**
- **An assessment of human rights risks in its supply chain?**
- **Policies and programs for community engagement and social investment?**
- **Charitable or community contributions?**
- **Product quality and safety policies?**

Governance Dimension: Has the company disclosed:

- **The number of board members and their qualifications?**

- The independence of the board (number of independent members)?

- The formation of a governance committee?

- Policies for senior management compensation?

- Policies for anti-corruption and anti-bribery?

- A description of risks and opportunities related to sustainability?

- A mechanism for reporting violations?

4.2.3 Control Variables

Previous studies have shown that AEM is not only influenced by ESG disclosure but also by several other variables, such as firm characteristics, corporate governance, and audit quality. For instance, Tohang et al. (2024), Mohmed et al. (2020), Lie et al. (2024), and Mensah et al. (2024) have all demonstrated that AEM is affected by firm size. Similarly, Velte (2020), Alodat et al. (2024), and Hashed & Ghaleb (2023) established a relationship between AEM and return on assets. Furthermore, Al Barrak and Kouaib (2024), Hashed and Ghaleb (2023), and Garfatta (2021) confirmed a link between board independence, audit committee independence, and earnings management. Finally, Almubarak et al. (2023), Alodat et al. (2024), and Al Barrak and Kouaib (2024) found a relationship between audit quality and earnings management.

Table (2) provides the measurement methods for these control variables.

Table No. (2) Method of measuring control variables

Variables	Code	Measurements
Board Independence	BIND	Equal to the ratio of independent board members to the total number of board members.
Audit Committee Meeting	ACM	Equal to the total number of committee meetings conducted during the fiscal year.
Audit Committee Independence	ACIND	Equal to the ratio of independent members on the audit committee to the total number of committee members.
Audit Firm Size	Big4	A dummy variable that equals 1 if the company receives auditing services from one of the Big Four firms, and 0 otherwise.
Audit Opinion	OPI	A dummy variable that equals 1 if the audit opinion is unqualified (clean) and 0 otherwise.
Firm Size	FSIZE	Equal to the natural logarithm of total assets.
Liquidity	LIQ	Equal to the total value of current assets divided by the total value of current liabilities.
Return on Assets	ROA	Equal to net income divided by total assets.

4.3 Empirical model

Based on the study's hypotheses, we constructed the following models to investigate the impact of ESG disclosure on AEM. Four models were built to measure the impact of each individual ESG dimension separately, in addition to the impact of overall ESG disclosure.

(1) $AEM= B_0 + B_1\ ENV + B_2\ BIND + B_3\ ACM + B_4\ ACIN + B_5\ BIG4 + B_6\ OPI + B_7\ FSIZE + B_8\ LIQ + B_9\ ROA + \varepsilon$

(2) $AEM= B_0 + B_1\ SOC + B_2\ BIND + B_3\ ACM + B_4\ ACIN + B_5\ BIG4 + B_6\ OPI + B_7\ FSIZE + B_8\ LIQ + B_9\ ROA + \varepsilon$

(3) $AEM= B_0 + B_1\ GOV + B_2\ BIND + B_3\ ACM + B_4\ ACIN + B_5\ BIG4 + B_6\ OPI + B_7\ FSIZE + B_8\ LIQ + B_9\ ROA + \varepsilon$

(4) $AEM= B_0 + B_1\ ESG + B_2\ BIND + B_3\ ACM + B_4\ ACIN + B_5\ BIG4 + B_6\ OPI + B_7\ FSIZE + B_8\ LIQ + B_9\ ROA + \varepsilon$

5. Results and Discussions

5.1 Analysis of Descriptive Statistics for ESG disclosure

The Environmental Dimension: The following table shows the development of disclosures regarding environmental disclosure of companies listed on the Saudi Stock Exchange from 2021 to 2024. It indicates that the mean for the four years demonstrates an increase in the level of disclosure about environmental information, with mean values for the environmental dimension according to the measurement index being 1.833, 2.28, 2.804, and 3.1412 for the years 2021, 2022, 2023, and 2024, respectively. The overall mean for all observations over the four years was 2.595. However, comparing the mean values to the total points of the environmental dimension (8 points) shows a decline in the level of environmental disclosures among companies listed on the Saudi Stock Exchange. Despite some companies achieving 100% of the points on the used index, there are still some companies that have not disclosed their environmental responsibilities throughout the four years (with a minimum value of 0).

Table No. (3) Environmental Dimension

	N	Environmental			
		Mean	STD	MIN.	MAX.
2021	51	1.833	2.095	0	8
2022	51	2.28	2.069	0	8
2023	51	2.804	2.232	0	8
2024	51	3.412	2.386	0	8
TOTAL	204	2.595	2.284	0	8

Social Dimension: The following table shows the development of disclosures regarding the social responsibility disclosure of companies listed on the Saudi Stock Exchange from 2021 to 2024. It indicates that the mean for the four years demonstrates an increase in the level of disclosure about social responsibility information, with mean values for the social dimension according to the measurement index being 3.188, 3.58, 4.098, and 4.725 for the years 2021, 2022, 2023, and 2024, respectively. The overall mean for all observations over the four years was 3.91. Comparing the mean values shows a gradual increase in the level of social disclosures over the four years, with a significant rise between 2023 and 2024. Some companies achieved a score of 10 points on the measurement index; however, reports from certain companies did not disclose any social responsibility

information throughout the four years, as reflected by the minimum recorded value of 0. Overall, the disclosure of social responsibility receives greater attention compared to environmental disclosure, based on the comparison of the mean values recorded over the four years.

Table No. (4) Social Dimension

	N	Social			
		Mean	STD	MIN.	MAX.
2021	51	3.188	2.128	0	10
2022	51	3.58	2.307	0	10
2023	51	4.098	2.243	0	10
2024	51	4.725	2.344	0	10
TOTAL	204	3.91	2.336	0	10

Governance Dimension: Table No. (5) shows the development of disclosure regarding governance disclosure among companies listed on the Saudi stock exchange from 2021 to 2024. The arithmetic mean over the four years indicates an improvement in the level of disclosure regarding governance disclosure, with the mean values for the years 2021, 2022, 2023, and 2024 being 3.784, 4.059, 4.196, and 4.373, respectively. The overall mean for all observations across the four years is 4.103. Comparing these mean values reveals a rising trend in the level of disclosure about governance disclosure over the four years; some companies achieved 7 points on the measurement index, while others recorded only 3 points. Generally, disclosure regarding governance disclosure is receiving greater attention compared to other sustainability disclosures, as evidenced by the increase in the mean over the four years and the absence of any value below 3 on the measurement index.

Table No. (5) Governance Dimension

	N	Governance			
		Mean	STD	MIN.	MAX.
2021	51	3.784	0.996	3	7
2022	51	4.059	1.037	3	7
2023	51	4.196	1.048	3	7
2024	51	4.373	1.066	3	7
TOTAL	204	4.103	1.062	3	7

Overall ESG Disclosure: When describing the overall performance of sustainability disclosure according to Table (6), it is evident that companies listed on the Saudi stock exchange have

significantly improved this type of disclosure during the study period. This is reflected in the notable improvement in the mean values recorded over the four years. We observed that companies issuing separate sustainability reports achieved higher scores on the measurement index used, while companies that integrate sustainability disclosure into their board of directors' and annual reports have shown variability and a decrease in their commitment to disclosing overall sustainability disclosure, compared to companies that issue independent sustainability reports.

Table No. (6) Overall ESG

	N	Overall ESG			
		Mean	STD	MIN.	MAX.
2021	51	8.51	0.629	3	25
2022	51	9.804	4.699	4	25
2023	51	11.098	4.876	4	25
2024	51	12.51	5.271	4	25
TOTAL	204	10.48	5.109	3	25

A general observation on the sustainability disclosure of companies listed on the Saudi stock market is that these companies are gradually expanding their disclosure of ESG practices. It is expected that these disclosures will improve in the near future, as we have observed some company boards of directors forming sustainability committees, or social and environmental responsibility committees, in addition to safety and security committees and governance committees. We also noted that some companies have started to disclose sustainability risks and safety and security risks, along with making data available on diversity, employee incentive programs, and the treatment of water, waste, and pollution.

However, we observed that many companies provide disclosures on environmental responsibilities that are characterized by generality and a lack of clarity, and they do not have clear and publicly announced environmental plans and policies. Therefore, the commitment to the environmental dimension of sustainability disclosure was the lowest compared to the social responsibility and governance dimensions.

5.2 Analysis of Descriptive Statistics for AEM and Control Variables:

Table No. (7) shows the descriptive statistics for the AEM indicator and the control variables used in the study.

The mean of the earnings management through discretionary accruals was 6.422, with a standard deviation of 8.997. The maximum value was 29.10, and the minimum value was 0.01. This indicates that all companies in the sample engage in AEM to varying degrees. Furthermore, we observed that some companies manage earnings upwards, while others manage earnings downwards.

Regarding the control variables related to corporate governance, the mean of the board independence ratio was 0.476 with a standard deviation of 0.135. The maximum value reached 0.88, and the minimum value was 0.11. This indicates a strong representation of independent members on the boards of directors of companies listed on the Saudi Stock Exchange.

The audit committees showed a high level of activity, with the mean number of meetings being 6.686, a standard deviation of 2.779, a minimum of 4 meetings, and a maximum of 16, which reflects a high degree of committee activity. Additionally, the mean of the audit committee independence ratio was 0.476, with a standard deviation of 0.221, a minimum value of 0.20, and a maximum of 1.00. We also observed that most companies comply with the requirement that the head of the audit committee be an independent member. The recorded mean values indicate a high level of company commitment to the mandatory and advisory instructions of the Saudi Capital Market Authority regarding the implementation of governance systems.

The companies maintained a high degree of audit quality. The mean for obtaining services from Big Audit firms was 0.569 with a standard deviation of 0.496. This suggests that many companies prefer to engage the services of Big Four audit firms, which are renowned for delivering high-quality audit services. The mean for the type of audit report was 0.922 with a standard deviation of 0.269. This demonstrates that the majority of companies received an unqualified audit report, indicating a higher level of audit quality.

As for the characteristics of the sample companies, the mean of the firm size was 8.571, with a standard deviation of 1.086, a maximum value of 11.06, and a minimum value of 6.56. The mean of firm

liquidity was 2.662, with a standard deviation of 3.051, a maximum value of 20.19, and a minimum value of 0.30. This highlights a significant variation in the liquidity levels of companies listed on the Saudi Stock Exchange. The return on assets (ROA) recorded a mean of 0.042, with a standard deviation of 0.111, a maximum value of 0.46, and a minimum value of -0.70. This also reveals a considerable disparity in the return on assets (ROA) among companies listed on the Saudi Stock Exchange.

Table No. (7) Descriptive Statistics for EAM and Control Variables

	N	Min.	Max.	Mean	STD
AEM	255	.01	29.10	6.422	8.997
BIND	204	.11	.88	.476	.135
ACM	204	4.00	16.00	6.686	2.779
ACIND	204	.20	1.00	.476	.221
Big4	255	.00	1.00	.569	.496
OPI	255	.00	1.00	.922	.269
FSIZE	255	6.56	11.06	8.571	1.086
LIQ	253	.30	20.19	2.662	3.051
ROA	254	-.70	.46	.042	.111

5.3 Correlation Matrix

The correlation matrix describes the relationship between the independent and control variables using Pearson's linear correlation coefficient. Table No. (8) presents the recorded correlation coefficients and their statistical significance.

The correlation coefficients recorded in Table No. (8) indicate the existence of very strong and significant correlation relationships between the overall sustainability disclosure variable and the social dimension (0.945) as well as the environmental dimension (0.941). The correlation between the environmental performance and social performance variables also recorded a strong relationship (0.838), which may cause a multicollinearity problem when building the regression model. All other coefficients for the relationship between the remaining variables indicated weak or moderate relationships that do not affect the construction of the regression model. The VIF values will be used to confirm the possibility of combining the sustainability variables or building separate models.

Table No. (8)Correlation Matrix

		ENV	SOC	GOV	ESG	BIND	ACM	ACIND	FSIZE	LIQ	ROA	Big4	OPI
ENV	P. Corr.	1											
SOC	P. Corr.	.838**	1										
GOV	P. Corr.	.490**	.498**	1									
ESG	P. Corr.	.941**	.945**	.662**	1								
BIND	P. Corr.	-.166**	-.147*	-.089	-.157*	1							
ACM	P. Corr.	-.022	.078	-.005	.029	.129*	1						
ACIND	P. Corr.	.041	-.082	-.060	-.037	.137*	-.053	1					
FSIZE	P. Corr.	-.115	-.113	-.063	-.128*	-.162*	.162*	.151*	1				
LIQ	P. Corr.	-.180**	-.297**	-.086	-.237**	.182**	-.085	.253**	.010	1			
ROA	P. Corr.	.283**	.199**	.095	.227**	-.221**	-.081	-.108	-.013	-.074	1		
Big4	P. Corr.	.211**	.105	.075	.146*	-.122*	-.255**	-.267**	-.247**	-.172**	.313**	1	
OPI	P. Corr.	.158*	-.027	.166**	.085	-.117*	-.285**	.085	-.092	.044	.165**	.224**	1

**. Correlation is significant at the 0.01 level (1-tailed).

*. Correlation is significant at the 0.05 level (1-tailed).

Variance Inflation Factor

The Variance Inflation Factor (VIF) is one of the most important methods for detecting multicollinearity. It evaluates the multicollinearity issue among the variables included in a regression model by estimating the VIF value and the tolerance value. If the VIF value is greater than or equal to 10 and the tolerance value is less than 0.1, This suggests the presence of multicollinearity among the independent variables in the study. Therefore, the presence of the ESG variable in the regression model could cause complications, prompting the development of several regression models to address this problem.

Table No. (9) Collinearity Statistics

	Tolerance	VIF
ENV	.689	1.451
SOC	.109	9.178
GOV	.951	1.052
ESG	.099	10.104
BIND	.842	1.188
ACM	.828	1.207
ACIND	.837	1.195
FSIZE	.841	1.189
LIQ	.824	1.214
ROA	.837	1.194
Big4	.724	1.382
OPI	.860	1.163

5.4 Regression Analysis

The table No. (10) illustrates the relationship between AEM and ESG disclosure at both the overall level and for each of the three dimensions of sustainability. The four models explain 0.666, 0.663, 0.646, and 0.668, respectively, of the changes occurring in AEM that result from variations in sustainability disclosure and control variables, according to the recorded Adj. R Square values for the four models. The F values for the models were 45.173, 44.535, 41.557, and 45.670, respectively, all of which are significant at 0.01, indicating that all models are statistically significant. The Durbin-Watson test values for all models were 1.736, 1.657, 1.581, and 1.694, respectively, all of which fall within the acceptable range of 1.5 to 2.5, indicating that there is no issue of Auto-collinearity in the study models.

Table No. (10) Regression Analysis

	Model 1		Model 2		Model 3		Model 4	
	B	T	B	T	B	T	B	T
Constant	82.795	12.977	86.793	13.083	84.742	12.368	86.389	13.259
ENV	-1.238	-4.611**						
SOC			-1.145	-4.385**				
GOV					-1.660	-3.009**		
ESG							-.556	-4.708**
BIND	6.588	1.463	6.898	1.526	8.431	1.834	6.844	1.529
ACM	.128	.582	.139	.627	.087	.383	.150	.682
ACIND	-4.106	-1.467	-5.619	-2.024*	-6.559	-2.313*	-5.180	-1.880
FSIZE	-9.214	-16.535**	-9.253	-16.474**	-8.955	-15.757**	-9.223	-16.618**
LIQ	-.553	-2.814**	-.638	-3.160**	-.442	-2.213*	-.590	-2.992**
ROA	16.974	3.069**	15.606	2.833**	12.363	2.224*	16.338	2.985**
Big4	3.206	1.409	2.560	1.925	2.615	1.928	2.954	1.245
OPI	3.443	1.547	2.068	.928	3.634	1.575	3.050	1.380
Adj. R Square	.666		.663		.646		.668	
F value	45.173**		44.535**		41.557**		45.670**	
Durbin-Watson	1.736		1.657		1.581		1.694	
** significant at the 0.01 level								
*significant at the 0.05 level								

At the variables level in the four models, the T values recorded for the dimensions individually were ENV (4.611), SOC (4.385), GOV (3.009), and for the overall sustainability disclosure indicator ESG (4.708). All T values are statistically significant at the 0.01 level. The B coefficients for the four models were recorded as 1.238, 1.145, 1.660, and 0.556, all with a negative sign. This means that the AEM is inversely related to sustainability disclosure. Therefore, we can argue that companies listed on the Saudi Stock Exchange, which tend to expand their performance in environmental, social, and governance (ESG) responsibilities, are less likely to manipulate accounting profits. This may be due to managers having an ethical commitment and an awareness of the need to enhance the company's long-term value, as well as a tendency to prioritize corporate interests over their personal interests. Based on the previous results, we can accept *hypothesis H1, which states, "ESG disclosure is negatively associated with AEM", and reject hypothesis H2, which states, "ESG disclosure is positively associated with AEM"*. Sustainability disclosure reduces AEM in companies listed on the Saudi Stock Exchange. Our findings align with several studies (e.g., Alodat et al., 2024; Ricapito, 2024) and also with the study by Al Barrak and Kouaib (2024) conducted in Saudi Arabia. However, the results of this study stand in contrast to the findings of the study by Almubarak et al. (2023), which demonstrated that the expansion of ESG disclosure is used to cover up manipulation in financial reporting.

Regarding the corporate governance-related control variables, in the four models, both BIND and ACM were not statistically significant. Meanwhile, ACIND was statistically significant in the second and third models, with a negative regression coefficient indicating an inverse relationship with AEM. ACIND was not statistically significant in the first and second models. All control variables related to company characteristics—FSIZE, LIQ, and ROA—were statistically significant at the 0.01 level in all four models. However, FSIZE and LIQ have an inverse relationship with AEM, as indicated by the negative B coefficient. This means that larger and more liquid companies tend to avoid earnings management practices. On the other hand, ROA has a positive relationship with AEM, indicating that companies with higher profits are more likely to engage in accruals and earnings management practices. As for the audit quality variables, BIG4 and OPI did not show statistical significance in the four models.

6. Conclusions and Recommendations

This study aims to evaluate the impact of ESG disclosures on accounting earnings management in non-financial companies listed on the Saudi Stock Exchange. The study employed multiple linear regression analysis on financial data, board reports, and sustainability reports published by companies during the period from 2020 to 2024, focusing on data from 51 companies across various sectors in the Saudi market. The study used the modified Jones model to measure accounting earnings management and constructed an index to measure ESG disclosure consisting of 25 items covering environmental, social, and governance aspects. Additionally, the study utilized a variety of control variables that encompass corporate governance (board independence, audit committee independence, audit committee activity), audit quality (audit firm size, audit opinion), and company characteristics (company size, liquidity, return on assets). We found a relative increase in the level of ESG disclosure among Saudi companies, with this increase observed across all dimensions. However, the lowest level of disclosure was found in the environmental dimensions, which requires more effort from legislators, regulatory bodies, and the financial market to encourage companies to enhance their ESG disclosure levels. Additionally, we noted that some companies issue independent ESG reports, while others integrate ESG information into their board reports. We observed that companies issuing independent ESG reports provide more diverse, clearer, and detailed disclosures compared to those that incorporate this information into their board reports.

We proved that the disclosure of ESG information reduces the levels of accounting earnings management, as we found a negative relationship between ESG index scores and the accounting earnings management. This negative relationship was significant between accounting earnings management and sustainability disclosure at the level of each individual dimension and at the level of overall sustainability performance. We argued that managers of companies that are more transparent about ESG information have a commitment to ethical standards and are less inclined toward opportunistic behavior. These findings were consistent with many previous studies in this field.

Therefore, we recommend that legislators, regulators, and the Capital Market Authority make greater efforts to support and encourage companies operating in the Saudi market to expand their

disclosure of ESG information and to issue independent sustainability reports. We also recommend that researchers conduct further studies on the topic of ESG to shed light on the benefits of these disclosures and their role in increasing the credibility of published financial information and reducing the manipulation of financial statements.

A notable limitation of our study is that its application was confined to non-financial companies. This presents a promising avenue for future research to investigate the relationship within banks and other financial institutions. Furthermore, we did not examine the influence of ownership structures on the relationship between ESG disclosures and accounting earnings management, thereby creating a research opportunity to explore the moderating effect of ownership structures on this relationship. Lastly, our study did not test the link between ESG disclosure and real earnings management, which provides a fruitful direction for scholarly inquiry into the relationship between ESG disclosure and earnings management via real activities.

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