EARNINGS MANAGEMENT AND ESG PERFORMANCE: EMPIRICAL EVIDENCE FROM ITALIAN CONTEXT

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Abstract

The purpose of this paper is to investigate the relationship between environmental, social and governance (ESG) performance, both in its totality and its three pillars (environmental, social and governance), and earnings management. The sample includes companies listed on the Italian Stock Exchange market (FTSE Italia All-Share index) during business years 2014–2019. After excluding those firms belonging to the financial sector, along with those with missing values, the final sample consists of 103 firms for a total of 618 firm-year observations. Data have been collected from two databases, that are Refinitiv Eikon (for ESG and governance variables) and AIDA Bureau van Dijk (for economic and financial variables). Panel data regression analysis has been implemented to analyse the impact of ESG performance on accrual-based (AEM) and real based (REM) earnings management. It is found that ESG performance has a negative effect on AEM but not on REM, and the governance pillar has the strongest impact compared to those of environmental and social ones. In addition, this research suggests a bidirectional link between ESG performance and earnings management. This analysis contributes to prior research since it is the first study that has used accrual and real-based earnings management proxies with this topic in relation with ESG performance and its three components in the Italian traditional corporate governance system. Corporate practice, regulators and researchers should recognize that ESG performance and earnings management should be discussed together.

Keywords: ESG Performance, Discretionary Accruals, Real Earnings Management, Italian Stock Market, Stakeholder Theory

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1. INTRODUCTION

Stakeholder and sustainability management have rapidly become research topics of interest after financial crisis, which bursted in the European Union (EU) in 2008 (Cimini, 2015), with the purpose of increasing environmental, social and governance (ESG) performance. Wood (1991) defines ESG performance as the set of ESG principles firms have to follow in order to relate with the rest of society. Stakeholder management should complement financial accounting to improve ESG and financial performance (Murphy & McGrath, 2013). Although stakeholder demands have increased in recent years, the literature suggests that information overload and greenwashing reduce the effectiveness of ESG reporting (Mahoney et al., 2013). Managers can deliberately manipulate the information value of ESG disclosures to fulfil information policy obligations (Darus et al., 2014). After the financial crisis, politicians implemented several reforms to improve non-financial reporting, such as Directive

2014/95/EU (Pizzi et al., 2023; Venturelli et al., 2017; Antonicelli et al., 2021) and legislation on Italian non-financial reporting 254/2016 on Disclosure of Information (Muserra et al., 2019; Grimaldi et al., 2020). These corporate social responsibility (CSR) reporting requirements may impact financial reporting, particularly earnings management. Following the definition of Gaynor et al. (2016), earnings management can be defined as the use of financial reporting judgments to alter financial reporting with the purpose of misleading stakeholders about a company's economic performance and influencing results that rely on reported accounting data. In practice, there are many interactions between financial reporting and non-financial reporting. Because earnings management and ESG disclosure allow management some discretion in reporting information, both disclosure areas are included in a comprehensive stakeholder communications strategy (Borralho et al., 2022). Therefore, the degree of earnings manipulation is expected to be related to the quality of ESG disclosure as a crucial factor in management decisions. Previous studies have examined the connection between CSR and earnings management (Cheng & Kung, 2016; Cho & Chun, 2016) as well as the relationship between earnings management and CSR (Martinez-Ferrero & Garcia Sanchez, 2015; Martinez-Ferrero, Gallego-Alvarez, et al., 2015; Martinez-Ferrero, Garcia-Sanchez, et al., Cuadrado-Ballesteros, 2015). While most studies have found a negative correlation, some have reported conflicting results, including positive or insignificant findings and varying causal impacts (Velayutham, 2018). These diverse outcomes may be attributed to the use of different measures for ESG performance and earnings management, as well as concerns regarding endogeneity, bidirectional relationships, and differing theoretical foundations (Bozzolan et al., 2015; Velayutham, 2018). There are various indicators used to assess ESG performance, with many relying on ESG databases such as KLD, Bloomberg, or Thomson Reuters/Asset4 for rankings. Some researchers create an ESG performance score through analyzing ESG disclosure content. Additionally, ESG performance can be measured by inclusion in a sustainability index like the Dow Jones Sustainability Indices (DJSI) or by charitable contributions to social and environmental organizations. As for earnings management, different measures exist, including accrual-based methods, real management variables, and others like accounting conservatism or smoothing (Dechow et al., 2010; Onesti & Romano, 2012). Furthermore, the issue of reversed causality is relevant, as earnings management behaviour may also impact CSR performance (Adeneye & Kammoun, 2022; Adeneye et al., 2024; Habib, 2023; Sun et al., 2024). ESG performance is a composite measure derived from various CSR activities, and it is unclear which aspects have the most influence on the CSR-earnings management relationship. This study aims to explore the relationship between ESG performance, both overall and in its environmental, social, and governance dimensions, and different measures of earnings management within the Italian context. While there are international studies on this topic (Bozzolan et al., 2015; Garcia-Sanchez & Garcia-Meca, 2017; Gras-Gil et al., 2016; Gavana et al., 2022; Adeneye et al., 2024; Habib, 2023), there has been no analysis of reverse causality in the ESG performance-earnings management link specifically for the Italian capital market. Thus, this paper makes a clear contribution to the existing literature. First, the analysis not only investigates the effect of ESG performance on earnings management in total, but also on its three sub-pillars. In fact, a deeper analysis of how the three components (environmental, social and governance scores) will contribute to the ESG-earnings management relationship is conducted. Second, most of prior research focused on the US-American capital market and on developing countries (e.g., Bangladesh), which is not transferable to other regimes like the EU. In addition, Italian-listed companies are becoming very active in voluntary CSR reporting in line with the Guidelines of the Global Reporting Initiative (GRI). Furthermore, Italy has been chosen because of the following peculiarities: 1) civil law country, 2) few listed companies, 3) high ownership concentration by state and families, 4) the use of control enhancing mechanisms to amplify the divergence between ownership and control and 5) the use of shareholders' agreements (Grimaldi et al., 2020). In this sense, Italy is the main representative of the so-called "traditional" corporate governance model, which is not common in the international context. Therefore, different board effects are expected regarding the implementation of the ESG strategies in one-tier, two-tier and traditional model. In the past decade, the European Commission (EC) has implemented a rigorous sustainability strategy that sets it apart from other regimes, such as the USA. Since 2014, EU-listed companies have been required to incorporate CSR aspects into their management and reporting processes through various regulations. This includes implementing sustainable management compensation systems and including non-financial information in their management reports. The study analyzed 618 firm-year observations from 2014 to 2019, focusing on Italian-listed companies in the FTSE-Italia All share index. The analysis also considered firm-specific variables (such as size, market-to-book ratio, return on assets, leverage, and growth) and corporate governance factors (independence, financial expertise of supervisory boards, and selection of Big Four (Deloitte, Ernst & Young [EY], PricewaterhouseCoopers [PwC], and Klynveld Peat Marwick Goerdeler [KPMG]) auditors). The results showed that both overall ESG performance and individual pillars of ESG reduced accruals-based earnings management, but not real earnings management. The governance score, one of the three components of ESG performance, had the most significant negative impact on accruals-based earnings management. Robustness tests were conducted to check for reverse causality between earnings management and CSR. The findings were consistent with the link between CSR and earnings management. It is noted that earnings management can be legal or illegal, and in empirical research, it can be challenging to distinguish between accounting failures and fraud in management activities.

The rest of this paper is structured as follows. Section 2 is devoted to the literature review and the statement of research hypotheses. Section 3

includes sample selection, main variables and regression models. Section 4 focuses on descriptive statistics, correlation analysis, regression results and additional test. Section 5 displays the conclusions and the limitations of the study.

2. LITERATURE REVIEW AND RESEARCH HYPOTHESES

The connection between CSR performance and earnings management is elucidated by various theories such as stakeholder theory, agency theory, legitimacy theory, and signaling theory. Stakeholder theory is predominantly used by researchers, positing that meeting the needs of diverse stakeholders within the firm is crucial in addressing information disparities and conflicting interests (Freeman, 1984). Unlike principal-agent theory (Ross, 1973; Jensen & Meckling, 1976), which focuses on investors and creditors, stakeholder theory emphasizes the responsibility of the firm towards all stakeholder groups with non-financial interests. Consequently, managers must balance the interests of these parties, giving equal weight to financial and non-financial reporting (Freeman, 1984). Managers aligned with stakeholder theory are likely to disclose more decision-relevant financial and non-financial information, leading to improved financial and CSR performance (Velayutham, 2018; Velte, 2016, 2017, 2019; Adeneye & Kammoun, 2022; Gavana et al., 2022; Adeneye et al., 2024). Based on the negative link between CSR and earnings management, managers who prioritize social responsibility are inclined towards long-term relationships with stakeholders. Such managers, engaged in CSR reporting, are less inclined to engage in earnings management as it does not align with stakeholders' interests (Velayutham, 2018). Empirical studies examining the relationship between CSR performance and earnings management yield mixed and conflicting results (Velayutham, 2018). However, most studies indicate a negative impact of CSR on earnings management, consistent with stakeholder theory, or varying results based on the type of earnings management considered (Borralho et al., 2020; Bozzolan et al., 2015; Cho & Chun, 2016; Cheng & Kung, 2016; Choi & Pae, 2011; Dhaliwal et al., 2012; Gavana et al., 2017; Garcia-Sanchez & Garcia-Meca, 2017; Gras-Gil et al., 2016; Kim et al., 2012; Lee, 2017; Litt et al., 2014; Martinez-Ferrero, Gallego-Alvarez, et al., 2015; Scholtens & Kang, 2013; Martinez-Ferrero, Garcia-Sanchez, et al., 2015; Suteja et al., 2016; Grimaldi et al., 2020; Adeneye et al., 2024; Habib, 2023). In this context, CSR performance (Choi & Pae, 2011; Martinez-Ferrero, Gallego-Alvarez, et al., 2015, Martinez-Ferrero, Garcia-Sanchez, et al., 2015; Gras-Gil et al., 2016; Kim et al., 2012; Litt et al., 2014; Scholtens & Kang, 2013; Grimaldi et al., 2020; Adeneye & Kammoun, 2022; Bifulco et al., 2023) and CSR reporting (Bozzolan et al., 2015; Suteja et al., 2016; Velte, 2019, 2021; Borralho et al., 2022; Habib, 2023) are linked to reduced earnings management. Additionally, real earnings management (Cho & Chun, 2016; Kim et al., 2012), analysts, management forecast errors (Dhaliwal et al., 2012; Lee, 2017), accounting and auditing enforcement releases (Kim et al., 2012) decrease with increased CSR. Some studies have also explored the use of CSR disclosure for camouflage purposes, particularly among family firms (Gavana et al., 2017; Doluca et al., 2018; Lopez-Gonzales, 2019; Dayan et al., 2019) and in cases of managerial entrenchment, leading to a disconnect between CSR disclosure and performance (Garcia-Sanchez et al., 2020; Bifulco et al., 2023). On the other hand, Chih et al. (2008) examined the relationship between CSR and earnings management, finding that socially and environmentally responsible companies tend to engage less in earnings smoothing and manipulation. Research focusing on the impact of environmental performance on earnings management practices suggests that environmental performance reduces accrual earnings management while increasing real earnings management (Velte, 2021). Choi and Pae (2011) discovered that companies with strong ethical commitments exhibit higher financial reporting quality and engage in less earnings management. Recent research has shown that government-mandated CSR policies can lead to more conservative financial reporting (Cheng & Kung, 2016). Socially responsible firms are less likely to engage in earnings management practices and are less likely to face SEC investigations, indicating that CSR reporting and performance serve as positive signals for reputation and lower earnings management (Velayutham, 2018). Studies have also found that accounting conservatism, earnings and cash flow persistence, and predictability increase with better CSR practices (Choi & Pae, 2011; Cheng & Kung, 2016; Garcia-Sanchez & Garcia-Meca, 2017). The relationship between CSR activities and real earnings management practices has been consistently negative in various studies (Hong & Andersen, 2011; Ji et al., 2019; Yoon et al., 2019; Adeneye & Kammoun, 2022; Sun et al., 2024), with corporate governance characteristics playing a moderating role (Cho & Chun, 2016; Adeneye et al., 2024). Furthermore, research has shown that companies with a strong CSR orientation are less likely to engage in earnings management practices due to the negative impact on future performance (Bozzolan et al., 2015). The link between ESG (environmental, social, and governance) factors and earnings management practices, as well as financial reporting quality, aligns with stakeholder theory. ESG performance can increase stakeholder confidence and expectations, leading to pressure on management to adopt ethical business practices to maintain legitimacy (Chairani & Siregar, 2021; Pope & Wæraas, 2016; Borralho et al., 2022; Adeneye et al., 2024). Overall, stakeholder theory and empirical evidence suggest a negative relationship between ESG performance and earnings management. Therefore, the following research hypotheses are stated:

H1a: ESG performance is related with a lower degree of AEM.

H1b: ESG performance is related with a lower degree of REM.

ESG performance is split into three components: 1) environmental, 2) social and 3) governance. For what matters the environmental pillar, it makes reference to reports concerning initiatives related to the state and conservation of the natural environment, responsible use of energy and natural resources, reduction of pollutant emissions and research into sustainable design and innovation (Campopiano & de Massis, 2015; Sanches et al., 2017). There are mixed results on the effect of environmental performance on earnings management. Pursuing environmental-friendly

initiatives can be advantageous for companies since they are likely to improve corporate reputation, reduce the cost of capital and strengthen firms' negotiation power (Bae et al., 2018; Sarumpaet et al., 2017). Companies may use environmental disclosure as a tool to reach legitimisation (Chen et al., 2014; Lu & Abeysekera, 2017) or a greenwashing method to cover up earnings management practices (Gerged et al., 2020). While the first situation suggests a negative relationship between environmental disclosure and financial reporting quality, the latter is expected to go in the opposite direction (Kim et al., 2012). However, undertaking environmental investments and their disclosures leave out funds for other activities (Campopiano et al., 2019; Dyer & Whetten, 2006). This situation can result in earnings management, that is to worsen financial results to avoid green activism pressures that emphasise investing resources in environmental protection measures (Gargouri et al., 2010). Green investments may also be used to increase managers' reputation and remuneration without investors receiving any clear benefits (Abeysekera & Fernando, 2020). Therefore, the long-term returns on environmental investments foster investors to ask for short-term profitability, since they feel disadvantaged by green initiatives that may imply lower dividends (Abeysekera & Fernando, 2020; Fernando et al., 2017). This conflict of interest is likely to increase earnings management practices aimed at maintaining a stable dividend policy (Block & Wagner, 2014). Nonetheless, this paper follows the stakeholder theory and supposes a negative relationship between environmental score and earnings management. Hence the following hypotheses are stated:

H2a: Environmental performance is related with a lower degree of AEM.

H2b: Environmental performance is related with a lower degree of REM.

For what matters the social pillar, it makes reference to work quality, job satisfaction, human rights, community engagement and product responsibility. Working quality is associated to workers' rights and duties, equal opportunities and non-discrimination when companies build their workforce (Miralles-Quiros et al., 2018). Human rights are related to the principles of respect for human dignity in line with major conventions (e.g., the Universal Declaration of Human Rights [UDHR] and the International Labour Organization [ILO]). Community engagement refers to firms' commitment to good citizenship including protecting the public's health and respecting business ethics, as well as producing goods and services that protect individuals' health, safety, integrity and third-party data privacy (Ben Amar & Chakroun, 2018; Sanches et al., 2017). The majority of researchers finds a negative association between social performance and earnings management. According to Ben Amar and Chakroun (2018), firms' social engagement reduces earnings management, since being socially responsible allows them to create stable relationships with all their stakeholders (e.g., local communities, customers, suppliers and workers). Lodhia et al. (2020) show that firms concerned about their image reduce earnings management and promote social activities through social media with the purpose of disseminating information on social issues, which legitimise them in their stakeholders' eyes. These initiatives foster workers to achieve future objectives, let managers move away from financial goals and thus reduce earnings management practices (Campopiano & de Massis, 2015; Hassabelnaby et al., 2010). Following previous research, it is assumed a negative relationship between social performance and earnings management. Hence, the following hypotheses are stated:

H3a: Social performance is related with a lower degree of AEM.

H3b: Social performance is related with a lower degree of REM.

For what matters the governance pillar, it can be defined as the set of firm's systems and processes that aim to ensure that board members and executives act in the best interests of company's long-term shareholders (Sassen et al., 2016). In other words, this definition requires companies' commitment to an effective implementation of good governance principles. In particular, all shareholders must be treated equally, and companies need to communicate information on economic, financial, social and environmental aspects of relevance to their decision-making processes (Miralles-Quiros et al., 2018). Externally published reports on financial and non-financial information constitute governance tools and serve to align managers' and shareholders' interests (Ferramosca & Ghio, 2018). Prior research has focused on governance mechanisms' role in constraining earnings management (Ben Amar & Chakroun, 2018), producing support for the idea that good governance practices generally lead to higher quality financial and non-financial reporting (Campopiano et al., 2019; Chi et al., 2015; Liu et al., 2016). The disclosure of good governance practices mitigates conflicts of interest, reduces agency costs and thus improves financial reporting quality (Adeneye et al., 2024; Borralho et al., 2020; García-Sanchez & Martínez-Ferrero, 2019; Liu et al., 2016) and limits earnings management (Martinez-Ferrero et al., 2016). In this sense, an adequate board of directors' structure and clear compensation system facilitate the alignment of all stakeholders' interests with regard to agency relationships (Wang, 2006). In light of previous literature, it is assumed a negative relationship between governance performance and earnings management. Hence, the following hypotheses are stated:

H4a: Governance performance is related with a lower degree of AEM.

H4b: Governance performance is related with a lower degree of REM.

3. DATA AND RESEARCH METHODOLOGY

3.1. Sample selection

The research sample is the Italian stock market, in particular the FTSE Italia All-Share Index, which consists of the aggregation of all firms belonging to FTSE MIB, FTSE Italia Mid Cap and FTSE Italia Small Cap indexes. Data have been collected from two databases: Refinitiv Workspace (for ESG scores) and AIDA Bureau van Dijk (for what matters financial variables). The ESG scores offered by Refinitiv Workspace are intended to objectively and transparently assess a company's ESG performance in ten areas (emissions, environmental product innovation, human rights, shareholders, etc.) using

data reported by the company (e.g., annual reports, CSR reports, stock exchange filings, and company websites). AIDA Bureau van Dijk is a database that holds all information regarding economic-financial variables of Italian companies of different kinds (public, private, small, mid or large cap). The original sample consists of 220 companies that are continuously quoted in the Milan Stock Exchange during the period 2014–2019. This time span has been chosen both since this is the pre-pandemic period and since these are the years where the databases have the highest available data for the analysis. Italy has been selected due to its unique characteristics, including being a civil law country with a small number of listed companies, high ownership concentration by the state and families, the implementation of control-enhancing mechanisms to increase the separation between ownership and control, and the utilization of shareholders' agreements. All financial institutions, such as banks, insurance companies, and investment funds, have been excluded from the initial sample due to significant differences in asset structure, financial leverage, accounting standards, and practices, as well as sector-specific disclosure and corporate governance regulation and supervision. After excluding all firms with missing values, the final sample consists of 103 firms, hence a balanced panel data of 618 firm-year observations.

3.2. Earnings management proxies

Both accounting-based, through discretionary accruals (AEM) and real-based (REM) proxies have been used for earnings management as dependent variables. Following previous literature, two different regressions for the two types of earnings management, AEM and REM (Kim et al., 2012), have been run.

3.2.1. AEM proxy

Drawing on Beck (2018), Cohen et al. (2019), Cohen and Malkogianni (2021) and Ferreira et al. (2013, 2020), this paper calculates AEM through the modified Jones model (Dechow et al., 1995), since the classic Jones (1991) model implicitly assumes that revenues are non-discretionary, which could lead to biased estimates of discretionary accruals when earnings are, in fact, managed through revenues. First, total accruals ($TACC_{i,t}$) of firm *i* at time *t* are defined:

$$TACC_{i,t} = NE_{i,t} - CFO_{i,t} \tag{1}$$

where $NE_{i,t}$ and $CFO_{i,t}$ are the net earnings and operating cash flows of firm *i* at year *t*, respectively. Following Dechow et al. (1995), discretionary and non-discretionary accruals have been separated in two steps. Firstly, the coefficients α_1, α_2 and α_3 are estimated through the following equation:

$$\frac{TACC_{i,t}}{TA_{i,t-1}} = \alpha_0 + \alpha_1 \left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2 \left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{TA_{i,t-1}}\right) + \alpha_3 \left(\frac{PPE_{i,t}}{TA_{i,t-1}}\right) + \varepsilon_{i,t} \tag{2}$$

where:

- $TA_{i,t-1}$ = total assets of observation *i* at year *t-1*;
- $\Delta REV_{i,t}$ = revenues at year t minus revenues at year *t-1* for observation *i*;
- $PPE_{i,t}$ = gross property, plant and equipment in year *t* for observation *i*;
- $\Delta REC_{i,t}$ = receivables at year *t* minus receivables at year *t-1* for observation *i*;
- $\varepsilon_{i,t}$ = error term.

Equation (2) is estimated every year from 2014 to 2019 and by the two-digit Standard Industrial Classification (SIC) (e.g., DeFond & Jiambalvo, 1994; Peasnell et al., 2000) through ordinary least squares (OLS) regression. Secondly, non-discretionary accruals (NDA) have been estimated as follows:

$$NDA_{i,t} = \alpha_1 \left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2 \left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{TA_{i,t-1}}\right) + \alpha_3 \left(\frac{PPE_{i,t}}{TA_{i,t-1}}\right) \tag{3}$$

where all the variables on the right side of the equation are defined as above and α_1, α_2 and α_3 are the industry and year-specific parameters obtained through the OLS estimator of α_1, α_2 and α_3 in Eq. (2). The discretionary accruals are then obtained by subtracting Eq. (3) to Eq. (2), that is the difference between total accruals and non-discretionary accruals:

$$DA_{i,t} = \hat{\varepsilon}_{i,t} = \left(\frac{TACC_{i,t}}{TA_{i,t-1}}\right) - NDA_{i,t} \tag{4}$$

In other words, DA represents the residual of the Dechow et al. (1995) model and is the proxy of AEM that is going to be used as the dependent variable in the final regression model.

3.2.2. REM proxy

Real earnings management is measured following Cohen et al. (2008) and Roychowdhury (2006) through the computation of: 1) abnormal levels of operating cash flows (ABN_CFO); 2) abnormal production costs (ABN_PROD); 3) abnormal discretionary expenses (ABN_EXP). Like AEM, the abnormal levels of the three REM measures are the residuals of the relevant models estimated every year (from 2014 to 2019) and by the two-digit SIC. As a result, a combined measure of these three variables is computed.

Abnormal operating cash flows

Using Roychowdhury's (2006) model, the actual level of operating cash flows is firstly computed:

$$\left(\frac{CFO_{i,t}}{TA_{i,t-1}}\right) = \alpha_0 + \alpha_1 \left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2 \left(\frac{S_{i,t}}{TA_{i,t-1}}\right) + \alpha_3 \left(\frac{\Delta S_{i,t}}{TA_{i,t-1}}\right) + \varepsilon_{i,t} \tag{5}$$

where:

- $CFO_{i,t}$ = operating cash flows of firm *i* at year *t*;
- $TA_{i,t-1}$ = total assets of firm *i* at year *t-1*;
- $S_{i,t}$ = sales of firm *i* at year *t*;

• $\Delta S_{i,t}$ = sales at year *t* minus sales at year *t-1* of firm *i*;

• $\varepsilon_{i,t}$ = error term.

Using the estimated coefficients α_1, α_2 and α_3 from Eq. (5), the normal level of operating cash flows ($NCFO_{i,t}$) is computed:

$$\left(\frac{NCFO_{i,t}}{TA_{i,t-1}}\right) = \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t}}{TA_{i,t-1}}\right) + \alpha_3\left(\frac{\Delta S_{i,t}}{TA_{i,t-1}}\right) \quad (6)$$

Abnormal operating cash flows (ABN_CFO) are computed by subtracting Eq. (6) to Eq. (5):

$$ABN\_CFO_{i,t} = \hat{\varepsilon}_{i,t} = \frac{CFO_{i,t}}{TA_{i,t-1}} - \frac{NCFO_{i,t}}{TA_{i,t-1}} \quad (7)$$

Abnormal production cost

Roychowdhury (2006) defines production cost as the sum of cost of goods sold and the change in inventory ($PROD_{i,t} = COGS_{i,t} + \Delta INV_{i,t}$). Therefore, the actual level of $COGS_{i,t}$ and $\Delta INV_{i,t}$ are firstly computed as follows:

$$\left(\frac{COGS_{i,t}}{TA_{i,t-1}}\right) = \alpha_0 + \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t}}{TA_{i,t-1}}\right) + \varepsilon_{i,t} \quad (8)$$

$$\left(\frac{\Delta INV_{i,t}}{TA_{i,t-1}}\right) = \alpha_0 + \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{\Delta S_{i,t}}{TA_{i,t-1}}\right) + \alpha_3\left(\frac{\Delta S_{i,t-1}}{TA_{i,t-1}}\right) + \varepsilon_{i,t} \quad (9)$$

where:

• $COGS_{i,t}$ = cost of goods sold of firm *i* at year *t*;

• $\Delta S_{i,t-1}$ = sales at year *t-1* minus sales at year *t-2* of firm *i*.

Using the estimated coefficients α_1, α_2 and α_3 from Eq. (8) and (9), the normal level of cost of goods sold ($NCOGS_{i,t}$) and change in inventory ($\Delta NINV_{i,t}$) are computed:

$$\left(\frac{NCOGS_{i,t}}{TA_{i,t-1}}\right) = \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t}}{TA_{i,t-1}}\right) \quad (10)$$

$$\left(\frac{\Delta NINV_{i,t}}{TA_{i,t-1}}\right) = \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{\Delta S_{i,t}}{TA_{i,t-1}}\right) + \alpha_3\left(\frac{\Delta S_{i,t-1}}{TA_{i,t-1}}\right) \quad (11)$$

Actual production costs are estimated by summing Eq. (8) and (9):

$$\left(\frac{PROD_{i,t}}{TA_{i,t-1}}\right) = \alpha_0 + \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t}}{TA_{i,t-1}}\right) + \alpha_3\left(\frac{\Delta S_{i,t}}{TA_{i,t-1}}\right) + \alpha_4\left(\frac{\Delta S_{i,t-1}}{TA_{i,t-1}}\right) + \varepsilon_{i,t} \quad (12)$$

Using the estimated coefficients $\alpha_1, \alpha_2, \alpha_3$ and α_4 from Eq. (12), the normal level of production costs ($NPROD_{i,t}$) is computed:

$$\left(\frac{NPROD_{i,t}}{TA_{i,t-1}}\right) = \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t}}{TA_{i,t-1}}\right) + \alpha_3\left(\frac{\Delta S_{i,t}}{TA_{i,t-1}}\right) + \alpha_4\left(\frac{\Delta S_{i,t-1}}{TA_{i,t-1}}\right) \quad (13)$$

Abnormal production costs (ABN_PROD) are computed by subtracting Eq. (13) to Eq. (12):

$$ABN\_PROD_{i,t} = \hat{\varepsilon}_{i,t} = \frac{PROD_{i,t}}{TA_{i,t-1}} - \frac{NPROD_{i,t}}{TA_{i,t-1}} \quad (14)$$

Abnormal discretionary expense

It is the sum of a firm's R&D expenses, advertising expenses, and selling, general, and administrative (SG&A) expenses. As previous proxies, it is modelled as a linear function of sales. Therefore, the actual level of discretionary expense ($DISEXP$) is firstly computed as follows:

$$\left(\frac{DISEXP_{i,t}}{TA_{i,t-1}}\right) = \alpha_0 + \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t-1}}{TA_{i,t-1}}\right) + \varepsilon_{i,t} \quad (15)$$

where $S_{i,t-1}$ = level of sales of firm *i* at year *t-1*.

Using the estimated coefficients α_1 and α_2 from Eq. (15), the normal level of discretionary expenses ($NDISEXP_{i,t}$) is computed:

$$\left(\frac{NDISEXP_{i,t}}{TA_{i,t-1}}\right) = \alpha_1\left(\frac{1}{TA_{i,t-1}}\right) + \alpha_2\left(\frac{S_{i,t-1}}{TA_{i,t-1}}\right) \quad (16)$$

Abnormal discretionary expenses (ABN_DISEXP) are computed by subtracting Eq. (16) to Eq. (15):

$$ABN_{DISEXP\,i,t} = \hat{\varepsilon}_{i,t} = \frac{DISEXP_{i,t}}{TA_{i,t-1}} - \frac{NDISEXP_{i,t}}{TA_{i,t-1}} \quad (17)$$

Finally, the combined measure of REM is estimated by aggregating the three individual proxies, ABN_CFO, ABN_PROD and ABN_DISEXP. To measure the direction of each REM variable, the combined measure (REM), is calculated as:

$$REM_{i,t} = ABN_{CFO\,i,t} - ABN_{PROD\,i,t} + ABN\_DISEXP_{i,t} \quad (18)$$

3.3. Independent variables

The study focuses on the independent variable of ESG performance, which is measured using ESG scores obtained from the Refinitiv Workspace database. The ESG score encompasses environmental, social, and governance aspects, including CSR factors like employment quality, health and safety, training and development, human rights, and community impact. Each aspect is further broken down into key performance indicators. The overall ESG score is calculated by giving equal weight to all data points, z-scoring them, and comparing them to other companies to determine a relative performance measure on a scale of 0 to 100. Additionally, the study examines the impact of individual components of the ESG score — environmental ($Escore$), social ($Sscore$), and

governance ($Gscore$) — as separate independent variables. The study hypothesizes a negative correlation between ESG performance and earnings management.

3.4. Control variables

Following prior literature in this research field (Bozzolan et al., 2015; Kim et al., 2012), the analysis includes several control variables. The first one is the firm size ($SIZE$), computed as the natural logarithm of total assets. Prior studies found that firm size influences stakeholders' interests of financial and non-financial reporting (Kim et al., 2012; Vitolla et al., 2020). Therefore, it is assumed a positive relationship between firm size and earnings management. The second one is the market-to-book value of equity (MTB). In this case, always following previous literature (Bozzolan et al., 2015), a negative impact on earnings management is assumed. The third one is the return on assets (ROA), computed as the ratio between income before extraordinary items and lagged total assets. In this case, it is supposed a negative impact on earnings management (Kim et al., 2012; Cheng & Kung, 2016). The fourth one is leverage (LEV), proxied by the ratio of long-term debt and total assets. In this case, it is assumed a positive impact on earnings management (Gavana et al., 2017; Garcia-Sanchez et al., 2020). The fifth one is firm growth ($GROWTH$), proxied by the percentage change of sales with regard to previous year. A negative relationship with earnings management is assumed (Dhaliwal et al., 2012; Suteja et al., 2016). For what matters corporate governance variables, there are included: 1) IND, which is the percentage of independent members in the board; 2) EXP, that is the percentage of financial experts in the board; 3) $BIG4$, that is a dummy equal to 1 if the firm is audited by a Big4 audit firm and 0 otherwise. For these three variables, it is assumed a negative impact on earnings management (Velte, 2021; Adeneye & Kammoun, 2022; Gavana et al., 2022; Adeneye et al., 2024; Habib, 2023).

3.5. Research models

A multivariate panel data analysis to test the relationship between both AEM and REM with ESG performance is runned. Therefore, two separate models are tested, one for AEM and another one for REM.

$$AEM_{i,t} = \alpha_0 + \alpha_1 ESGscore_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 ROA_{i,t} + \alpha_5 LEV_{i,t} + \alpha_6 GROWTH_{i,t} + \alpha_7 IND_{i,t} + \alpha_8 EXP_{i,t} + \alpha_9 BIG4_{i,t} + \varepsilon_{i,t} \quad (19)$$

$$REM_{i,t} = \alpha_0 + \alpha_1 ESGscore_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 ROA_{i,t} + \alpha_5 LEV_{i,t} + \alpha_6 GROWTH_{i,t} + \alpha_7 IND_{i,t} + \alpha_8 EXP_{i,t} + \alpha_9 BIG4_{i,t} + \varepsilon_{i,t} \quad (20)$$

In addition, other six further regressions have been implemented (three for AEM and three for REM) in order to test the impact of each individual pillar (environmental, social and governance) of ESG on both AEM and REM.

$$AEM_{i,t} = \alpha_0 + \alpha_1 Escore_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 ROA_{i,t} + \alpha_5 LEV_{i,t} + \alpha_6 GROWTH_{i,t} + \alpha_7 IND_{i,t} + \alpha_8 EXP_{i,t} + \alpha_9 BIG4_{i,t} + \varepsilon_{i,t} \quad (21)$$

$$REM_{i,t} = \alpha_0 + \alpha_1 Escore_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 ROA_{i,t} + \alpha_5 LEV_{i,t} + \alpha_6 GROWTH_{i,t} + \alpha_7 IND_{i,t} + \alpha_8 EXP_{i,t} + \alpha_9 BIG4_{i,t} + \varepsilon_{i,t} \quad (22)$$

$$AEM_{i,t} = \alpha_0 + \alpha_1 Sscore_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 ROA_{i,t} + \alpha_5 LEV_{i,t} + \alpha_6 GROWTH_{i,t} + \alpha_7 IND_{i,t} + \alpha_8 EXP_{i,t} + \alpha_9 BIG4_{i,t} + \varepsilon_{i,t} \quad (23)$$

$$REM_{i,t} = \alpha_0 + \alpha_1 Sscore_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 ROA_{i,t} + \alpha_5 LEV_{i,t} + \alpha_6 GROWTH_{i,t} + \alpha_7 IND_{i,t} + \alpha_8 EXP_{i,t} + \alpha_9 BIG4_{i,t} + \varepsilon_{i,t} \quad (24)$$

$$AEM_{i,t} = \alpha_0 + \alpha_1 Gscore_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 ROA_{i,t} + \alpha_5 LEV_{i,t} + \alpha_6 GROWTH_{i,t} + \alpha_7 IND_{i,t} + \alpha_8 EXP_{i,t} + \alpha_9 BIG4_{i,t} + \varepsilon_{i,t} \quad (25)$$

$$REM_{i,t} = \alpha_0 + \alpha_1 Gscore_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 ROA_{i,t} + \alpha_5 LEV_{i,t} + \alpha_6 GROWTH_{i,t} + \alpha_7 IND_{i,t} + \alpha_8 EXP_{i,t} + \alpha_9 BIG4_{i,t} + \varepsilon_{i,t} \quad (26)$$

4. EMPIRICAL FINDINGS

4.1. Descriptive statistics and correlation analysis

Table 1 shows the descriptive statistics of all variables taken into account in the analysis. The ESG score ranges from 0 to 1. Its mean and median values are 0.514 and 0.543, respectively. The environmental pillar score has mean and median values of 0.504 and 0.521, respectively. The social pillar score has mean and median values of 0.528 and 0.525, respectively. The governance pillar score has mean and median values of 0.512 and 0.509, respectively. Hence, social pillar scores are higher with regard to those of environmental and governance pillars. In addition, firms in the sample report positive values of AEM (mean and median equal to 0.083 and 0.091, respectively), indicating how they are likely to implement an income-increasing accrual policy. Sample firms also report positive values for REM (mean and median values equal to 0.052 and 0.047, respectively), indicating how, on average, they may conduct a certain degree of REM manipulation.

Table 1. Descriptive statistics

Variables	*N*	*Mean*	*Median*	*SD*	*Q1*	*Q3*	*Min*	*Max*
$AEM_{i,t}$	618	0.083	0.091	0.366	-0.065	0.824	-0.211	1.485
$REM_{i,t}$	618	0.052	0.047	0.308	-0.096	0.652	-0.342	1.103
$ESGscore_{i,t}$	618	0.514	0.543	0.245	0.486	0.736	0.012	0.957
$Escore_{i,t}$	618	0.504	0.521	0.241	0.493	0.703	0.016	0.973
$Sscore_{i,t}$	618	0.528	0.525	0.283	0.511	0.765	0.021	0.984
$Gscore_{i,t}$	618	0.512	0.509	0.204	0.498	0.749	0.029	0.932
$SIZE_{i,t}$	618	14.163	14.028	4.968	13.622	14.741	12.433	15.152
$MTB_{i,t}$	618	0.795	0.758	0.348	0.382	0.539	0.293	1.016
$ROA_{i,t}$	618	0.078	0.084	0.476	0.046	0.089	-0.141	0.197
$LEV_{i,t}$	618	0.565	0.548	0.623	0.751	0.428	0.011	0.759
$GROWTH_{i,t}$	618	0.382	0.395	2.347	0.125	-0.253	-0.473	0.926
$IND_{i,t}$	618	0.307	0.325	0.553	0.324	0.471	0	1
$EXP_{i,t}$	618	0.354	0.392	0.318	0.285	0.573	0	1
$BIG4_{i,t}$	618	1	0.5	1	1	1	0	1

Table A.1 (in Appendix) shows the correlation matrix for the dependent, explanatory and control variables. Clearly, ESG score, environmental, social and corporate governance scores are positively significantly related to one another because the ESG score takes into account the effect of the three pillars together. In addition, there is a negative correlation between ESG score and the three individual pillars (environmental, social and governance) with both *AEM* and *REM*. As assumed, *SIZE* and *LEV* show a positive correlation with *AEM* and *REM*, whereas *MTB*, *ROA*, *GROWTH*, *IND*, *EXP* and *BIG4* are negatively correlated with *AEM* and *REM*. The highest correlation value is equal to 0.365 (the correlation between board independence and board diversity). Apart from this, all the correlation coefficients are below ±0.8 or ± 0.9, suggesting us that multicollinearity is not an issue when estimating our models so that the explanatory variables chosen for the analysis are likely to proxy for different underlying factors.

4.2. Results and discussion

Table A.2 (in Appendix) provides the results of the multivariate regressions' analysis. However, it is necessary to discuss few diagnostic tests implemented in all models separately. Firstly, it has been determined whether fixed effects (FE), random effects (RE) or pooled data specification has to be used to estimate the results. Table A.2 shows that pooling the data is not suitable (p-value of the Lagrange multiplier (LM) test < 0.01) and that using FE is preferred to RE (p-value of the Hausman test < 0.01) in all models. Furthermore, the Pesaran and the modified Wooldridge tests are both significant at better than 0.01, indicating that cross-sectional dependence and heteroskedasticity are an issue in the models. The LM test for serial correlation is not significant at 0.1, suggesting that there is no first-order correlation in the models. Given these results, *AEM* and *REM* are estimated using fixed effects, and the standard errors are corrected as per Driscoll and Kraay (1998). To check for potential multicollinearity issues, the variance inflation factor (VIF) test has been conducted in all models; in all cases, its value is below 2, indicating that multicollinearity is not an issue in the analysis (Farrar & Glauber, 1967). The next part of this section discusses the results. ESG score has a negative statistically significant relationship with AEM, consistently with prior literature (Borralho et al., 2022; Bozzolan et al., 2015; Choi & Pae, 2011; Gavana et al., 2017; Gras-Gil et al., 2016; Kim et al., 2012; Litt et al., 2014; Velte, 2019). In addition, each of the three pillars (environmental, social and governance) has a negative statistically significant link with *AEM*, where the impact of governance score is stronger than that of the other two components' ones because of its better significance level (*Gscore* is equal to -1.973**, statistically significant at 5%, while *Escore* and *Sscore* are equal to -2.554* and -2.425*, respectively, both statistically significant at 10%). It has been suggested that the effectiveness of governance, such as the audit committee, can significantly influence earnings manipulation. However, in all models, a non-significant negative relationship is found for *REM*. This means that ESG performance impacts on the balance sheet through the usage of accounting manipulations (i.e., the accruals) rather than through the implementation of corporate business strategies or, alternatively, in the moment of preparing and displaying the financial statements and not during the decision of which strategy is better for the mission's achievement. Therefore, the results support hypotheses *H1a*, *H2a*, *H3a*, and *H4a*, but not *H1b*, *H2b*, *H3b*, and *H4b*. Interestingly, both *IND* and *EXP* are negatively related to earnings management variables, suggesting that having independent members and financial experts on the supervisory board can impact managers' earnings management activities (Velte, 2019, 2021; Adeneye & Kammoun, 2022; Gavana et al., 2022; Adeneye et al., 2024; Habib, 2023). In addition, in line with prior studies (Alhadab & Clacher, 2018; Cheng & Kung, 2016), it has been found that larger firms (*SIZE*) are associated with a higher level of *REM* and *AEM* in all models. However, leverage (*LEV*) and *ROA* do not have a significant relationship with earnings management proxies, whereas *GROWTH* has a negative significant relationship with them, indicating that firms with more growth opportunities are more likely to have a better quality of financial reporting due to the higher level of monitoring from regulators and investors (Dhaliwal et al., 2012; Suteja et al., 2016).

4.3. Additional analysis: Reverse causality

Previous research suggests that CSR may not be the cause, but rather the outcome of earnings management. As a result, some scholars have examined the link between CSR and earnings

management, yielding mixed findings (Choi et al., 2013; Grougiou et al., 2014; Martinez-Ferrero & Garcia-Sanchez, 2015; Martinez-Ferrero et al., 2016; Martinez-Ferrero, Gallego-Alvarez, et al., 2015; Muttakin et al., 2015; Martinez-Ferrero, Garcia-Sanchez, et al., 2015; Prior et al., 2008; Sun et al., 2010; Velte, 2019). In order to address possible reversed causality problems in the research, regression analysis on the earnings management-CSR link has been conducted through the usage of the following models:

$$ESGscore_{i,t} = \alpha_0 + \alpha_1 AEM_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 ROA_{i,t} + \alpha_5 LEV_{i,t} + \alpha_6 GROWTH_{i,t} + \alpha_7 IND_{i,t} + \alpha_8 EXP_{i,t} + \alpha_9 BIG4_{i,t} + \varepsilon_{i,t} \quad (27)$$

$$Escore_{i,t} = \alpha_0 + \alpha_1 AEM_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 ROA_{i,t} + \alpha_5 LEV_{i,t} + \alpha_6 GROWTH_{i,t} + \alpha_7 IND_{i,t} + \alpha_8 EXP_{i,t} + \alpha_9 BIG4_{i,t} + \varepsilon_{i,t} \quad (28)$$

$$Sscore_{i,t} = \alpha_0 + \alpha_1 AEM_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 ROA_{i,t} + \alpha_5 LEV_{i,t} + \alpha_6 GROWTH_{i,t} + \alpha_7 IND_{i,t} + \alpha_8 EXP_{i,t} + \alpha_9 BIG4_{i,t} + \varepsilon_{i,t} \quad (29)$$

$$Gscore_{i,t} = \alpha_0 + \alpha_1 AEM_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 ROA_{i,t} + \alpha_5 LEV_{i,t} + \alpha_6 GROWTH_{i,t} + \alpha_7 IND_{i,t} + \alpha_8 EXP_{i,t} + \alpha_9 BIG4_{i,t} + \varepsilon_{i,t} \quad (30)$$

$$ESGscore_{i,t} = \alpha_0 + \alpha_1 REM_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 ROA_{i,t} + \alpha_5 LEV_{i,t} + \alpha_6 GROWTH_{i,t} + \alpha_7 IND_{i,t} + \alpha_8 EXP_{i,t} + \alpha_9 BIG4_{i,t} + \varepsilon_{i,t} \quad (31)$$

$$Escore_{i,t} = \alpha_0 + \alpha_1 REM_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 ROA_{i,t} + \alpha_5 LEV_{i,t} + \alpha_6 GROWTH_{i,t} + \alpha_7 IND_{i,t} + \alpha_8 EXP_{i,t} + \alpha_9 BIG4_{i,t} + \varepsilon_{i,t} \quad (32)$$

$$Sscore_{i,t} = \alpha_0 + \alpha_1 REM_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 ROA_{i,t} + \alpha_5 LEV_{i,t} + \alpha_6 GROWTH_{i,t} + \alpha_7 IND_{i,t} + \alpha_8 EXP_{i,t} + \alpha_9 BIG4_{i,t} + \varepsilon_{i,t} \quad (33)$$

$$Gscore_{i,t} = \alpha_0 + \alpha_1 REM_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 ROA_{i,t} + \alpha_5 LEV_{i,t} + \alpha_6 GROWTH_{i,t} + \alpha_7 IND_{i,t} + \alpha_8 EXP_{i,t} + \alpha_9 BIG4_{i,t} + \varepsilon_{i,t} \quad (34)$$

Essentially, what has been done is to switch the dependent and independent variables and keep the controls constant. Clearly, there are eight regressions again, four for each proxy of earnings management (*AEM* and *REM*) and one for each explanatory variable (*ESGscore*, *Escore*, *Sscore* and *Gscore*). Table A.3 (in Appendix) gives an overview of the results of the additional analysis. In line with the previous regressions' results on the CSR-earnings management relationship, the *AEM* measure is negatively and significantly related to ESG performance, but not to *REM*. Again, each of the three pillars has a negative statistically significant link with *AEM*. This means that managers are less prone to manipulate earnings when they implement the business strategies by taking into account the potential environmental impact, the potential effects on the society and the different proposals arising from the board of directors. For what matters *REM*, a non-significant negative relationship is found in all models again. Therefore, a bidirectional relationship can be observed between ESG performance (including its three individual pillars) and *AEM* in the study, consistent with previous research (Choi et al., 2013). Engaging in earnings management may lead to a decrease in stakeholder trust. To mitigate these risks, companies may implement CSR initiatives that cater to a diverse group of stakeholders (Adeneye et al., 2024). One possible explanation for these findings is that the relationship between ESG performance and *AEM* is particularly significant in relation to *REM*. In other words, managers use ESG performance as a useful mean to mask their negative influence on financial reporting. As *AEM* can be more easily detected by external stakeholders than *REM*, managers tend to opportunistically shift from *AEM* to REM, liking ignoring stakeholder interests.

5. CONCLUSION

This paper investigated how ESG performance, both in its combined score and in its three pillars (environmental, social and governance) affects earnings management practices on the Italian stock market (FTSE Italia All-Share). To the best of our knowledge, this is the first study that have used accrual and real-based earnings management proxies to measure a bidirectional relationship between ESG and earnings management in the Italian traditional corporate governance model. The analysis includes 618 firm-year observations covering the business years 2014–2019 and maintains that ESG performance, both in total and its three components separately, has a negative impact on AEM. However, ESG performance is not related to REM in the model. Further analysis indicates that governance performance has the strongest impact on accruals with respect to environmental and social aspects. In the additional analysis, it has been examined the earnings management-CSR link and stated a bidirectional relationship. However, no significant impact of ESG performance on REM has been identified. Therefore, ESG performance may only affect accruals management post-balance sheet date. These findings are important for researchers, regulators, and practitioners, highlighting the importance of incentives for ESG activities and reducing earnings management. The integration of financial and non-financial reporting, as proposed by the concept of integrated reporting (Velte & Stawinoga, 2017), becomes crucial in this context. With regulations post-financial crisis aiming to enhance CSR awareness among firms, there is an expected increase in research activity in the European capital market in the coming years.

Consequently, ESG disclosure is seen as a vital addition to traditional financial reporting and is likely to become more standardized, for example, through the Global Reporting Initiative Guidelines. It is also advised to researchers to connect ESG performance with corporate governance variables, e.g., sustainable management compensation or gender diversity. Finally, this study is subject to some limitations. The time period covered in this study is limited to 2014–2019, which may restrict the insights gained. Regulatory changes and increased stakeholder management incentives following the financial crisis may only become apparent in long-term studies. Another limitation is the fact that Italian companies started adopting Directive 2014/95/EU only in 2017 (that is after the approval of Legislative Decree No. 254/2016, which entered into force in 2017). In this sense, future studies could implement a panel data analysis in order to test this bidirectional relationship by comparing two subsamples: 1) the one from 2014 to 2016 (the period before the Decree of 2016 entered into force) and 2) that from 2017 to 2019 (the period from when the Decree of 2016 entered into force). Moreover, the research is focused solely on evaluating the ESG performance of Refinitiv Workspace, which may introduce subjective biases that undermine the credibility of the findings. This lack of transparency could also extend to other commonly used metrics, such as ESG disclosure scores obtained through content analysis of ESG reports. Additionally, the study does not consider other indicators of earnings quality, such as earnings smoothing, conservatism, or loss avoidance, as highlighted in previous studies (Onesti & Romano, 2012; Cheng & Kung, 2016). The reliability of AEM measures is limited by the various variables used in previous studies (Dechow & Dichev, 2002; Dechow et al., 1995, 1996), and the presence of endogeneity issues cannot be ignored. To address these issues, it is suggested to use two or three-stage least squares with instrumental variables or a generalized method of moments models. However, the use of these models in this research field is not common (Martinez-Ferrero, Gallego-Alvarez, et al., 2015; Martinez-Ferrero et al., 2016). Thus, ESG performance and earnings management leave many questions open for future empirical research, for example, the impact of the COVID-19 pandemic on earnings manipulation and the role of ESG or corporate governance performance in mitigating this relationship.

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APPENDIX

Table A.1. Correlation matrix

Variables	$AEM_{i,t}$	$REM_{i,t}$	$ESGscore_{i,t}$	$Escore_{i,t}$	$Sscore_{i,t}$	$Gscore_{i,t}$	$SIZE_{i,t}$	$MTB_{i,t}$	$ROA_{i,t}$	$LEV_{i,t}$	$GROWTH_{i,t}$	$IND_{i,t}$	$EXP_{i,t}$	$BIG4_{i,t}$
$AEM_{i,t}$	1													
$REM_{i,t}$	0.182	1												
$ESGscore_{i,t}$	-0.248**	-0.235*	1											
$Escore_{i,t}$	-0.241**	-0.274*	0.687***	1										
$Sscore_{i,t}$	-0.288**	-0.226*	0.562***	0.336**	1									
$Gscore_{i,t}$	-0.256**	-0.261*	0.593***	0.411**	0.392**	1								
$SIZE_{i,t}$	0.223	0.231	0.165	0.116	0.102	0.108	1							
$MTB_{i,t}$	-0.094	-0.103	0.129	0.088	0.087	0.107	0.115	1						
$ROA_{i,t}$	-0.139	-0.083	0.141	0.096	0.127	0.085	0.238*	0.226*	1					
$LEV_{i,t}$	0.152	0.166	-0.237**	-0.128	-0.205*	-0.206**	0.105	0.179	-0.233*	1				
$GROWTH_{i,t}$	-0.109	-0.128	0.054	0.025	0.037	0.041	0.227**	0.278*	0.236*	-0.142	1			
$IND_{i,t}$	-0.204**	-0.233*	0.248**	0.225***	0.188**	0.209**	0.071	0.018	0.086	0.032	0.046	1		
$EXP_{i,t}$	-0.233**	-0.196**	0.285**	0.216**	0.217**	0.248**	0.114	0.094	0.097	0.091	0.033	0.082	1	
$BIG4_{i,t}$	-0.228**	.0,236**	0.091	0.056	0.092	0.027	0.245*	0.147	0.123	0.105	0.081	0.103	0.024	1

*Note: *, **, *** significantly different from zero at the 0.10, 0.05, and 0.01 levels, respectively.*

Table A.2. Regression results

Independent variable	*AEM*				*REM*			
	ESG score	*ENV score*	*SOC score*	*GOV score*	*ESG score*	*ENV score*	*SOC score*	*GOV score*
ESG SCORE	-2.226* (0.068)				-0.035 (0.321)			
ESCORE		-2.554* (0.093)				-0.062 (0.251)		
SSCORE			-2.425* (0.078)				-0.072 (0.298)	
GSCORE				-1.973** (0.028)				-0,052 (0.235)
SIZE	2.031**(0.044)	2.149**(0.051)	1.772**(0.032)	1.891**(0.028)	2.128**(0.041)	2.015**(0.046)	1.798**(0.031)	1.916*** (0.035)
MTB	-0.094 (0.459)	0.111 (0.394)	0.088 (0.426)	-0.128 (0.415)	-0.105 (0.433)	0.118 (0.395)	0.096 (0.414)	-0.085 (0.424)
ROA	-1.428 (0.336)	-1.318 (0.382)	-1.022 (0.325)	-1.117 (0.429)	-1.395 (0.339)	-1.235 (0.391)	-1.132 (0.357)	-1.015 (0.418)
LEV	0.029 (0.554)	0.028 (0.509)	0.025 (0.447)	0.031 (0.434)	0.038 (0.521)	0.028 (0.446)	0.025 (0.428)	0.035 (0.490)
GROWTH	-1.786** (0.037)	-1.776***(0.024)	-1.788** (0.033)	-1.863** (0.032)	-1.542** (0.036)	-1.558** (0.041)	-1.422** (0.039)	-1.623***(0.041)
IND	-1.781** (0.045)	-1.972** (0.033)	-1.535***(0.038)	-1.798** (0.025)	-1.858** (0.040)	-1.536** (0.042)	-1.614** (0.035)	-1.655***(0.048)
EXP	-2.319** (0.072)	-2.248** (0.074)	-1.854** (0.084)	-2.243** (0.078)	-2.011** (0.065)	-1.983** (0.068)	-2.058** (0.076)	-2.074***(0.081)
BIG4	-0.131 (0.392)	-0.146 (0.372)	-0.129 (0.307)	-0.107 (0.329)	-0.121 (0.386)	-0.118 (0.383)	-0.141 (0.423)	-0.097 (0.244)
Constant	1.225 (0.102)	1.148 (0.113)	1.092 (0.121)	1.116 (0.125)	0.995 (0.144)	0.952 (0.152)	0.976 (0.164)	0.917 (0.147)
Mean VIF	1.65	1.58	1.63	1.44	1.61	1.53	1.48	1.39
LM-Poolability test	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hausman test	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pesaran Cross-Sectional dependence test	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Modified Wooldridge test	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Serial correlation test	0.21	0.25	0.19	0.24	0.26	0.20	0.16	0.23
F-test for overall significance	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
N	618	618	618	618	618	618	618	618
R^2	0.235	0.219	0.204	0.213	0.223	0.205	0.214	0.202

*Note: *, **, *** Significantly different from zero at the 0.10, 0.05, 0.01 level, respectively. Standard errors are presented in parentheses. LM-Poolability is the Breusch–Pagan Lagrange multiplier test's p-value. Hausman is the Hausman test's p-value. Pesaran is the Pesaran cross-sectional dependence test's p-value. Modified Wooldridge is the Modified Wald test's p-value. Serial correlation is the Lagrange multiplier test's p-value. F-test is the p-value for a test of overall significance. R^2 is the regression's coefficient of determination. N is the number of observations used to estimate the model, using fixed effects.*

Table A.3. Additional analysis: Reverse causality

Independent variable	*ESG score*	*ENV score*	*SOC score*	*GOV score*	*ESG score*	*ENV score*	*SOC score*	*GOV score*
AEM	-2.118**(0.091)	-2.225**(0.078)	-2.011**(0.089)	-1.722***(0.033)				
REM					-0.056 (0.301)	-0.047 (0.298)	-0.042 (0.306)	-0.044 (0.322)
SIZE	0.096 (0.454)	0.109 (0.443)	0.088 (0.415)	0.137 (0.461)	0.082 (0.405)	0.094 (0.411)	0.109 (0.402)	0.076 (0.331)
MTB	-0.128 (0.325)	-0.095 (0.301)	-0.126 (0.315)	-0.139 (0.315)	-0.048 (0.433)	-0.019 (0.492)	-0.037 (0.425)	-0.058 (0.465)
ROA	1.136**(0.037)	1.025**(0.029)	1.312**(0.044)	1.224*** (0.013)	1.045*(0.448)	1.437**(0.358)	1.223**(0.306)	1.537**(0.326)
LEV	0.051 (0.518)	0.056 (0.524)	0.038 (0.482)	0.057 (0.495)	0.102 (0.081)	0.097*(0.079)	0.115 (0.073)	0.108 (0.084)
GROWTH	-1.427 (0.256)	-1.206 (0.248)	-1.334 (0.229)	-1.236 (0.271)	-1.418 (0.214)	-1.008 (0.347)	-1.121 (0.429)	-1.617 (0.257)
IND	1.564**(0.075)	1.407**(0.073)	1.616**(0.068)	1.415*** (0.051)	1.016 (0.256)	0.978 (0.330)	1.331 (0.440)	1.146 (0.251)
EXP	1.226**(0.084)	1.315**(0.071)	1.438**(0.077)	1.116*** (0.045)	1.907*(0.056)	1.918*(0.063)	2.236*(0.075)	1.524*(0.073)
BIG4	1.517*(0.075)	1.249**(0.077)	1.346*(0.073)	1.418*(0.068)	1.117*(0.083)	1.139*(0.094)	1.018*(0.634)	1.344*(0.079)
Constant	1.206 (0.157)	1.138 (0.168)	1.095 (0.172)	1.166 (0.164)	1.107 (0.161)	1.072 (0.175)	1.004 (0.181)	1.084 (0.179)
Mean VIF	1.60	1.53	1.65	1.41	1.71	1.58	1.67	1.46
LM-Poolability test	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hausman test	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pesaran Cross-Sectional dependence test	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Modified Wooldridge test	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Serial correlation test	0.24	0.29	0.16	0.22	0.27	0.21	0.19	0.15
F-test for overall significance	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
N	618	618	618	618	618	618	618	618
R^2	0.239	0.211	0.218	0.203	0.205	0.219	0.207	0.217

*Note: *, **, *** Significantly different from zero at the 0.10, 0.05, 0.01 level, respectively. Standard errors are presented in parentheses. LM-Poolability is the Breusch–Pagan Lagrange multiplier test's p-value. Hausman is the Hausman test's p-value. Pesaran is the Pesaran cross-sectional dependence test's p-value. Modified Wooldridge is the Modified Wald test's p-value. Serial correlation is the Lagrange multiplier test's p-value. F-test is the p-value for a test of overall significance. R^2 is the regression's coefficient of determination. N is the number of observations used to estimate the model, using fixed effects.*