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Exploring ESG practices in relation to accrual earnings management: Corporate competitiveness in crisis period

Camelia Iuliana Lungu, Chirata Caraiani, Cornelia Dascalu, Florentin Caloian

Abstract

This research investigates the relationship between environmental, social, and governance (ESG) practices and accrual earnings management (AEM), with a focus on the moderating influence of the pandemic crisis, from a corporate competitiveness perspective. Aiming to address gaps in the existing literature, this study emphasizes the specifics of European setting, shaped by continuously evolving sustainability requirements. The analysis covers both pre-pandemic and pandemic periods, excluding the influence of the ongoing geopolitical conflicts. Two models for estimating discretionary accruals are applied to differentiate between companies oriented toward performance or growth. The study employs multiple econometric models tested on a sample of non-financial European companies over the 2015-2021 period. Fixed-effects panel regression is used, complemented by endogeneity tests to ensure the robustness of the results. Mixed impacts are revealed in terms of intensity and magnitude of ESG practices (overall and disaggregated) on absolute, income-increasing, and income-decreasing discretionary accruals. Findings indicate that ESG practices, particularly the three individual pillars, have a stronger influence on AEM during the pandemic period. Additional analysis on the institutional context showcases significant differences in both ESG practices and AEM, highlighting the importance of country-level institutional heterogeneity (common versus civil law systems) as a determinant factor to be considered in shaping corporate strategies aimed at competitiveness. The study emphasizes the contingent nature of ESG-AEM relationship, showing a positive association for performance-oriented companies and a negative one for growth-oriented companies. Moreover, ethical or opportunistic management behavior aimed at enhancing competitiveness, may be driven by varying sustainability-related incentives. The results offer practical implications for managers of European companies by illustrating diverse corporate behavior in relation to AEM, with details on the distinct effects of individual ESG pillars delineated before and during the pandemics. Furthermore, this research holds relevance for policymakers by contributing to the discourse on evolving European sustainability disclosure requirements. This responds to the objectives of both stakeholders and corporate leadership. Particular impact is emphasized by showcasing the exposure to vulnerabilities that companies face during challenging periods, such as the pandemic crisis.

Keywords: *ESG practices, accrual earnings management, competitiveness, crisis period, European companies*

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1 INTRODUCTION

With the increasing importance attributed by stakeholders to sustainable-oriented companies, managers' practices evolved toward greater engagement in environmental, social, and governance (ESG) practices, as a means to enhance the corporate competitiveness (Cho, 2020; Broadstock et al., 2021; Durana et al., 2021; Agnese et al., 2024). Meanwhile, researchers have raised critical questions about whether corporate commitment to sustainability is authentic or is used as an earnings management tactic (Deng et al., 2024). Moreover, the alignment of large listed companies' financial incentives with the sustainable development goals (UN, 2015), as globally recognized benchmarks, fits the recent initiatives for new standards' development meant to expand the scope of corporate financial reporting (ISSB, 2022). These developments are investigated by Istudor et al. (2022) within a competitiveness-sustainability approach, which connects the business environment to solutions for major sustainability challenges through ESG practices. In particular, Deng et al. (2024) underscore the importance of policymakers' contribution, supported by the role of political and economic conditions, industry characteristics, and governance mechanisms in shaping the relationship between sustainability practices and earnings management.

In this context, the European Union's objectives of strengthening the social market economy that foster stability, growth, and sustainable investment are designed to ensure that systems are restored, resilient, and adequately protected, by 2050. The requirements for European companies to disclose environmental and social information, first established by the Directive 2014/95/EU and later expanded with governance information included in the EU Directive 2022/2464 (also known as Corporate Sustainability Reporting Directive, or CSRD) have drawn increasing attention in scientific literature (Gaio et al., 2022; Ottenstein et al., 2022; Deng et al., 2024). By promoting greater transparency, the European institutional and regulatory context may reinforce the ESG-AEM relationship by making earnings management more detectable in the context of sustainability, thereby discouraging opportunistic management behavior. However, variations in the implementation of European requirements across member states may weaken this relationship. Furthermore, the CSRD (European Parliament, 2022) emphasizes that achieving the EU's sustainability goals is especially important in the light of the economic challenges caused by the COVID-19 pandemic, which accelerated stakeholders' demand for more comprehensive information. Adams et al. (2021) claim that stakeholders are increasingly engaged in supporting companies identify and understand material topics in today's complex corporate landscape. The pandemic also compelled companies to reconsider their sustainability initiatives (Carroll, 2021), reinforcing the need to integrate the sustainable development goals into business strategies. Moreover, the scientific gap concerning how managers may contribute to achieving sustainability objectives under unprecedented crisis circumstances (Guaita Martinez et al., 2024) remains a critical area to be addressed in academic research.

Scientific research has typically examined two types of earnings: real earnings management (REM) and accrual earnings management (AEM) (Ehsan et al., 2022). Durana et al. (2021) consider that financial managers may intentionally manipulate reported earnings to enhance corporate competitiveness. Specifically, the discretionary component of AEM is considered of a high reliability and informativeness for controlling managers' opportunistic behavior (Gras-Gil et al., 2016). Furthermore, the value relevance of earnings is significantly influenced by specific corporate governance mechanisms (Cimini, 2022).

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While earnings management is considered a managerial interference in financial reporting, ESG practices extend corporate social responsibility (CSR) toward sustainability by adding governance alongside environmental and social dimensions. Gillan et al. (2021) highlight that the ESG concept reflects the integration of environmental, social and governance policies into the business model, whereas CSR incorporates companies' actions demonstrating responsibility toward society and its citizens. Although the concepts are often used interchangeably in sustainability research, "ESG is a more comprehensive term compared to CSR" (Deng et al., 2024:9). In this study, the choice of using the ESG instead of CSR is supported by its alignment with European legislation, which addresses all three pillars of sustainability, allowing to examine not only the environmental and social practices, but also their interrelationships with corporate governance.

A substantial body of literature has explored various facets of the link between sustainability-oriented practices and earnings management (Kim et al., 2012; Bozzolan et al., 2015; Martinez-Ferrero et al., 2015; Martinez-Ferrero et al., 2016; Wang et al., 2018; Alipour et al., 2019; Velte, 2019; Rezaee et al., 2020; Velte, 2021; Velte, 2024). Most previous studies are conducted on the CSR - AEM relationship, as the ESG concept remains relatively new in both academic research and regulatory setting. However, even in studies that use CSR as a title word or a keyword, ESG scores are often employed to measure CSR-related practices (Deng et al., 2024). The majority of studies find a negative link between the two corporate sets of practices, indicating a sustainable managerial behavior (Ehsan et al., 2022). Nonetheless, some studies report no significant relationship (Deng et al., 2024), while others report positive associations, in line with the opportunistic behavior (Ehsan et al., 2022; Deng et al., 2024). To address these mixed results, some authors include the moderating effect of institutional factors, finding an inverse bidirectional relation between CSR and AEM (Martinez-Ferrero et al., 2015), with a higher frequency of earnings manipulation amongst companies more engaged in CSR activities (Kim et al., 2019), in line with the managerial opportunism perspective.

Studies conducted on international samples (Bozzolan et al., 2015; Martinez-Ferrero et al., 2015; Martinez-Ferrero et al., 2016) emphasize the influence of geographical setting and country-specific regulations on ESG-AEM relationship. Velte (2024) reviews 107 studies published during the 2003 - 2023 period on the link between CSR and earnings management and finds that Asian and Anglo-American contexts are the most addressed. A limited number of papers analyze the European capital market (Velte, 2021; Velte, 2024), often focusing on specific countries such as Germany (Velte, 2019), Italy (Gavana et al., 2017), and Spain (Gras-Gil et al., 2016), groups of European countries such as France, Denmark, Sweden, Spain, and Germany (Chouaibi & Zouari, 2024), or, more generally, on the European Union member states (Goncalves et al., 2021). Despite the extensive number of studies on this topic, most researchers adopt a broad approach to ESG practices and yield inconclusive or mixed results. Moreover, limited research addresses disaggregated ESG practices during crisis period, leaving a gap in understanding how specific ESG practices influence earnings management within challenging economic contexts.

Aiming to fill the previously identified research gap, this paper examines whether companies that integrate various aspects of environmental, social, and governance practices into their management strategies exhibit higher or lower incentives to manage their earnings through accruals. The contribution of this research resides in addressing the ESG-AEM relationship from two contrasting perspectives (ethical and opportunistic management behavior) and in discussing the mixed results previously stated in the literature. On one hand, stewardship theory,

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complemented by stakeholder theory, supports the view that socially responsible managers avoid earnings management practices based on believes that misleading the stakeholders by distorting the accounting information may harm both the company - stakeholders' relationships and corporate performance (Ehsan et al., 2022). On the other hand, agency theory which embodies information asymmetry and conflicts of interests between mangers and stakeholders is used to mirror the opportunistic behavior of manipulating earnings concealed under the increase of socially responsible activities, particularly for short-term gains (Ehsan et al., 2022; Thomas et al., 2022).

This study also investigates the particularities of disaggregated ESG practices under unique circumstances of pandemics. Although growing legal requirements for corporate responsibility and transparency are believed to support a shift toward REM (Ehsan et al., 2022), the practical implications of corporate sustainability behavior are found to be more substantial when AEM is used (Kim et al., 2019). Consequently, this research focuses on managing earnings through accruals, rather than real activity manipulation. The theoretical background of this study is built upon a trade-off between stewardship theory complemented by stakeholder theory and agency theory, underpinned to explore two perspectives of AEM (performance and growth) in relation to ESG practices. Given the expansion of sustainability reporting requirements, particularly after 2015, aiming to equally address environmental, social, and governance issues, European companies offer an interesting and unique setting for research, ensuring the homogeneity and relevance of data. Thus, this study is conducted on a sample of European listed companies over the 2015-2021 timeframe, covering both pre-pandemic and pandemic periods, deliberately excluding the influence of the ongoing war. To respond to the aim of this research, two main hypotheses are developed. The first hypothesis tests the contingent relationship between ESG practices and AEM in European listed companies, with two secondary hypotheses specifying the directional impact (positive and negative), depending on managers' behavior. The second hypothesis examines the specific conditions reflected by the moderating role of the pandemic period.

To quantify AEM, two models validated in the literature (Larcker & Richardson, 2004; Kothari et al., 2005) are applied. They differentiate between two types of management objectives: performance and growth. Data on ESG practices (both overall and for each individual pillar), components of AEM, and control variables are collected from Refinitiv Eikon database for non-financial European companies. The final sample comprises 7,314 company-year observations, covering 9 industries and 33 countries, over the 2015-2021 period. The analysis includes descriptive statistics, tests of differences in means and medians (accounting for both pandemic period and institutional heterogeneity), fixed-effects panel regression to test the research hypotheses, and additional robustness checks using the generalized method of moments (GMM) and two-stage least squares (2SLS) methodologies to address potential endogeneity issues. Multiple regression analyses are conducted for the full sample and for two sub-samples: companies with positive discretionary accruals and companies with negative discretionary accruals. This study contributes to the literature by examining the specific changes associated with the moderating effect of pandemic period. Thus, the regressions are first estimated over the full period and then re-estimated with an interaction variable meant to capture the moderating effect of the pandemic on the relationship between ESG practices (overall and disaggregated) and AEM. The findings partially support the two research hypotheses, suggesting that different management objectives lead to distinct relationships between ESG practices and AEM. Additionally, evidence suggests that the pandemic period has a significant

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marginal effect on these relationships, with environmental practices showing a positive impact on AEM, while social and governance practices demonstrate a negative association.

Furthermore, the decision of framing the geographical area to the European companies enhances the consistency and contextual relevance of this research. The paper provides an in-depth discussion of corporate engagement in AEM, considering both ethical and opportunistic management behavior in relation to ESG practices, analyzed through the overall score, but also through its disaggregated pillars (environmental, social, and governance). The theoretical background employed in this study supports its contributions by addressing the topic from two complementary perspectives: the stakeholder perspective which emphasizes growing awareness of corporate responsibility, and corporate perspective, which focuses on improving visibility, legitimacy, and reputation depending on company's orientation toward performance or growth. Consequently, this research offers empirical evidence valuable both for practitioners, particularly in decision-making related to corporate competitiveness, and for academic researchers, by integrating and discussing findings on multiple measures of earnings management.

The remainder of the paper is structured as follows. Section 2 reviews the literature on ESG practices and AEM, summarizes the theoretical background, and develops the research hypotheses. Section 3 describes the methodological approach and data. Section 4 presents the results of empirical analysis, while Section 5 discusses the findings and provides concluding remarks, including study's limitations and suggestions for future research.

2 THEORETICAL BACKGROUND AND RESEARCH HYPOTHESES

2.1. Environmental, social, and governance practices for corporate sustainability

According to previous research, academic environment has examined the corporate sustainability from multiple perspectives. The topic has gained increasing significance due to a series of corporate failures, the global multidimensional crisis, and the growing relevance of sustainable development goals (Carroll, 2021; Gillan et al., 2021; Thomas et al., 2022; Tsang et al., 2023; Saleh et al., 2023; Deng et al., 2024). International organizations, such as the United Nations Global Compact, report that managers are becoming increasingly "aware of ESG factors to anticipate future risks and as a long-term recovery strategy" (Saleh et al., 2023:1). At the European level, sustainability has been gradually incorporated into legislation, starting with the introduction of non-financial reporting requirements under Directive 2014/95/EU (European Parliament, 2014, October), further revised by the Corporate Sustainability Reporting Directive (CSRD - European Parliament, 2022, December). The revised directive broadens the scope of corporate reporting, mandates assurance for the disclosed information, and requires alignment with the sustainability reporting standards developed by the European Financial Reporting Advisory Group (EFRAG).

Corporate sustainability, as reflected in ESG practices, has previously been employed to assess companies' non-financial performance (Eccles et al., 2011), to investigate their impact on company's value (Fatemi et al., 2018), or to examine possible association between corporate financial profile and enhanced ESG performance (Garcia-Sanchez & Garcia-Meca, 2017). Additionally, ESG concept was related to the impact of environmental and climate policies on corporate activities (Clarkson et al., 2011; Qiu et al., 2016; Alipour et al., 2019; Velte, 2021), to the shift in focus toward stakeholder-oriented approaches (Freeman et al., 2004; Stolowy &

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Paugam, 2018; Daugaard, 2019; Huang, 2021), as well as to the concept of double materiality, particularly addressed by the standards after the most recent crisis triggered by COVID-19 pandemic (Broadstock et al., 2021; Adams & Abhayawansa, 2022).

In this context, companies are becoming active contributors to the further integration of ESG practices, with implications for strategic planning and decision-making process (Gunarathne & Senaratne, 2017). Consequently, the shift in focus from financial to non-financial information has an increasing influence on management decisions driven by competitiveness enhancement. A plethora of recent studies explore how ESG practices affect managers' behavior in relation to corporate finance. Young-Ferris and Roberts (2021) highlight both the challenges and potentials benefits of incorporating ESG practices into investment decisions, questioning their value relevance and contribution in fostering a sense of financial security. In contrast, Leins (2020) emphasizes the importance of ESG practices for financial analysts, contributing to profit creation from crisis constraints. While the growing awareness and interest in ESG have been associated with promoting ethical investments, enhancing performance, and mitigating risks (Broadstock et al., 2021), some scholars argue that the integration of ESG into decision-making process may be motivated more by financial reasons than ethical concerns (Amel-Zadeh & Serafeim, 2018; Huang, 2021).

With the adoption of the new CSRD (European Parliament, 2022, December), the corporate sustainability, previously concerned with environmental and social aspects, has been expanded to include corporate governance, transposing ESG into a critical concept for stakeholders and organizations. Under CSRD, all large and listed companies in the EU should implement substantial changes in their ESG practices, thereby enhancing the quality and relevance of information disclosed to stakeholders. In response, companies may adjust their business model to ensure a balance between divergent managers' interests and stakeholders' expectations. ESG practices and AEM are emerging as central themes in accounting and finance research, especially from the perspective of corporate competitiveness. Companies embrace these practices to legitimize their operations, but also to meet stakeholders' demands, increasingly oriented toward sustainability. As a result, companies align with the double materiality approach endorsed by the new European legislation, complementing the financial accounting practices used by managers to pursue targets based on profit maximization or growth, through earnings management. Consequently, the ESG-AEM relationship may showcase either positive or negative influence, depending on the specific regulatory interpretations and enforcement mechanisms adopted across different countries, as well as the diverse managerial strategic approaches employed by European companies (Deng et al., 2024).

2.2. Accrual earnings management

The influence of managers' decisions on earnings quality has been the subject of extensive academic studies (Jones et al., 2008; Kim et al., 2012; Zang, 2012; Filip & Raffournier, 2014; Rezaee et al., 2020). Earnings management practices explored in empirical research are complex and multifaceted, encompassing real earnings management, accrual earnings management, accruals quality, earnings smoothing, or earnings aggressiveness. Durana et al. (2021) highlight the growing relevance of earnings management, calling for further research to uncover mechanisms in decision-making process aimed at enhancing corporate competitiveness.

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Academic research generally distinguishes between two types of earnings management: real earnings management (REM) and accrual earnings management (AEM). Prior studies suggest that companies often employ a combination of these mechanisms to manipulate reported earnings (Kim et al., 2012; Kim et al., 2019). Nevertheless, they tend to select the less costly method on a trade-off between their relative costs (Zang, 2012).

REM is typically implemented throughout the financial year, thus, it is less detectable, albeit, more costly, while AEM is mainly employed around the announcement of financial statements release, making it less costly but more detectable (Kim et al., 2019). Specifically, REM denotes the use of creative accounting practices to prepare the financial statements, hence, manipulating earnings, often compromising the transparency of information. These practices may result in abnormal cash flow from operations, abnormal production costs, and abnormal discretionary expenses (Kim et al., 2012). AEM focuses on abnormal accruals caused by the difference between operating income and operational cash flow (Kim et al., 2012), primarily concerning the discretionary accruals, which are associated with increased earnings manipulation and reduced earnings quality (Dechow et al., 2010). While Zang (2012) associates AEM with higher political costs and legitimacy risks due to regulatory setting, Kim et al. (2019) observe that companies facing significant legitimacy risks tend to manage earnings through REM rather than AEM. Ehsan et al. (2022), examining the two types of earnings management practices, conclude that managers prefer AEM instead of REM, as it tends to have less negative long-term effects on companies' performance and competitiveness. Their findings are consistent with earlier studies (Cohen et al., 2010; Bozzolan et al., 2015) which argue that responsible companies are more committed to sustainability and stakeholders' prioritization, hence they tend to avoid involving in REM, however, they may still favor AEM practices.

AEM is commonly analyzed through non-discretionary and discretionary accruals breakdown (Gaio et al., 2022). While non-discretionary accruals reflect normal business operations, discretionary accruals are subject to managers' judgements (Dechow et al., 2010). Studies of AEM often utilize discretionary accruals measured with Jones (1991) model, or its extensions (e.g. Dechow et al., 1995; Larcker & Richardson, 2004; Kothari et al., 2005 etc.). Jones (1991) model explains total value of accruals based on the change in sales (used to measure the growth of the company in terms of working capital) and the levels of property, plant, and equipment (used to capture discretionary adjustments related to depreciation costs). Later on, Dechow et al. (1995) propose a modified Jones model by arguing that only credit sales may have an impact on earnings management. The authors contend that earnings are easier to be managed via credit sales than cash sales. Hence, they adjust the change in sales with the change in receivables to more accurately measure the growth of the company. The modified model is found to outperform the original Jones model in detecting earnings management.

The Jones (1991) and Dechow et al. (1995) models remain foundational in measuring AEM, particularly when analyzing financial indicators that managers may manipulate. However, these two models tend to be less and less used, especially in the studies that examine earnings management relationships with corporate sustainability. As a result, extended models have been developed and proposed to be applied in the research.

Using the Dechow et al. (1995) proposal, Kothari et al. (2005) underscore the disparity of previous models by incorporating the total change in receivables and the return on assets (ROA) as a performance metric. The authors examine the underlying models by including both current and one-year lagged performance measures. Moreover, they assess the effectiveness of their

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model under two scenarios: performance matching versus performance inclusion into the accruals' regression, concluding that ROA inclusion enhances both the original and the modified-Jones models.

Larcker and Richardson (2004) refine the Dechow et al. (1995) model, by adding two independent variables to mitigate possible errors in estimating discretionary accruals: the book-to-market ratio (BM) and the operating cash flows (CFO). BM controls for expected growth in company's operations, ensuring that the observed growth is not a consequence of discretionary management behavior. CFO is included to control for current operating performance on estimated discretionary accruals, which is particularly important in studies involving companies with extreme performance levels.

Evaluating the effectiveness of various accruals models in detecting corporate earnings management, Jones et al. (2008) report positive and significant associations for fraudulent companies, irrespective of the model used to measure earnings management. Building on the findings that all proxies have similar impact, Dechow et al. (2010) argue that the earnings management measures are not interchangeable. Instead, each provides unique insights into the determinants and consequences of different accounting practices.

2.3. ESG practices - AEM relation: theoretical channels and hypotheses development

The relationship between ESG practices and AEM may be examined through the lenses of ethical managers (the stewardship theory) or opportunistic managers (the agency theory).

Connecting economic theory and business ethics, Carroll (1979) model of multidimensional corporate responsibilities is extended to validate the theory that ethically-committed companies operate on principles of trust and cooperation (Carroll, 2021). This frames the views of *stewardship theory* and *stakeholder theory*, which posit that organizations will respond to sustainability requirements by adopting ESG practices that jointly reduce earnings management and respond to the stakeholders' expectations (Velte, 2024). Similarly, Ehsan et al. (2022) argue that managers, who are committed to social responsibility, align with organizational goals, avoid misleading their stakeholders, and promote responsible and ethical management, thereby involving less in earnings manipulation. The presumed negative ESG-AEM relationship assumes that socially responsible companies adopt a long-term orientation consistent with stakeholder theory. When managers take stakeholders' interests into account, increased ESG practices may result in reduced AEM. Most studies reviewed by Velte (2020) support the stewardship theory, indicating that non-financial reporting is related to ethical management behavior that tends to mitigate earnings management. Managers who are responsive to stakeholders' interests and committed to ESG practices, are less likely to engage in earnings management, using them as signals of a positive reputation. The cross-sectional modified Jones model that incorporates company's performance effects on discretionary accruals is employed by Kim et al. (2012) to show that companies with a stronger focus on sustainability disclosure are less inclined to constrain earnings management. This ensures a higher level of accuracy and transparency in the financial information provided to investors.

Alternatively, Jensen and Merckling (1976), developing the *agency theory*, include the idea that social practices (later extended with environmental and governance aspects) may potentially support managerial misconduct by concealing the opportunistic behavior, ultimately leading to increased earnings manipulation (Velte, 2024). In contrast to the stewardship theory, which is often complemented by stakeholder theory, the agency theory assumes a positive ESG - AEM

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relationship. From this perspective, managers may utilize non-financial reporting not as a genuine commitment to sustainability, but as a means to cover irresponsible actions under the goal of corporate competitiveness. Martinez-Ferrero et al. (2015) similarly argue that stakeholders' perception of long-term corporate risk may be reduced for companies promoting positive ESG practices. In such cases, the erosion of stakeholder trust due to managers' engagement in earnings manipulation may be mitigated by extensive corporate responsibility practices, paradoxically increasing the agency costs (Saleh et al., 2023). Huang (2021:21) draws on the agency and signaling theories to explain the ESG's potential contribution in reducing information asymmetry between management and shareholders, "as signals of quality to shareholders and other stakeholders". The author also mentions that the current complex corporate environment may be interpreted through the lenses of stakeholder and institutional theories as well. He highlights the practical and theoretical challenges of integrating ESG requirements into financial decisions related to capital allocation, operational costs, and cash flows forecasting. In this context, increased earnings management may reflect personal benefits of managers, with sustainability-related activities serving as a tool to respond to stakeholder expectations and to enhance corporate image (Ehsan et al., 2022).

The hypotheses of this study are grounded on growing academic and regulatory interest in the impact of ESG practices on earnings management (Velte, 2019; Garcia-Sanchez et al., 2020; Velte, 2021). This is further driven by constant evolution of European non-financial reporting legislation, which increasingly integrates environmental, social, and governance requirements, thereby shaping the decision-making process. Previous research (Gillan et al., 2021; Kazmierczak, 2022; Tsang et al., 2023; Deng et al., 2024) shows that ESG has been gradually become embedded within the theoretical frameworks used to study earnings management. Initially introduced as variables to measure the CSR disclosure and performance, ESG scores are now more comprehensively used to explain the broaden concept of sustainability. In a recent bibliometric literature review, Deng et al. (2024) document that while CSR is the keyword with the highest occurrence in relationship with earnings management, recent research reflects a growing shift toward the use of ESG as preferred terminology.

The scientific literature examining the relationship between ESG practices and AEM remains limited for the European context and presents inconsistent findings (Velte, 2020; Velte, 2024). Rezaee and Tuo (2019) expose that both the disclosure of ESG practices and earnings quality are of equal importance to investors, highlighting the negative correlation of ESG practices with discretionary accruals. They emphasize that ESG practices, when integrated into business models, strategy, and organizational culture, contribute to improved earnings management. In the European setting, Velte (2021) finds that the environmental performance causes a decrease in the AEM measured with Kothari et al. (2005) model. Gras-Gil et al. (2016) mention that more effective resource utilization may have a negative impact on earnings management practices. Negative impacts of ESG practices are also evidenced by Choi et al. (2013) and Martinez-Ferrero et al. (2015), using both Dechow et al. (1995) and Kothari et al. (2005) models to measure AEM. Contrary, Martinez-Ferrero and Garcia-Sanchez (2015) showcase positive impact of non-financial performance on earnings management, interpreted as indicative of opportunistic management behavior, for international data prior to the year 2010. Despite these contributions, most of the studies report mixed or only partially significant findings (Velte, 2024), highlighting contingent (negative and positive) impacts of ESG practices on AEM (Reis Cardillo & Cruz Basso, 2025), depending on managers' behavior. Specifically, ethical managers may reduce earnings manipulation (resulting in a negative impact) as they increase

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the engagement in ESG practices, whereas opportunistic managers may continue to manipulate earnings (resulting in a positive impact), while using ESG practices strategically, to satisfy stakeholders' expectations. In line with previous studies showing varied results (Deng et al., 2024), the first research hypothesis of this study is formulated under an enlarged setting, allowing discussion on both positive and negative impacts of ESG practices on AEM, by applying two distinct models for measuring discretionary accruals.

RH1. There is a contingent impact of ESG practices on AEM, for European listed companies, depending on management behavior.

RH1.1 ESG practices have a positive impact on AEM for performance-oriented companies.

RH1.2 ESG practices have a negative impact on AEM for growth-oriented companies.

Research exploring the diverse behavior of companies during pandemic period is encouraged, particularly given the growing evidence that the COVID-19 heightened awareness of systemic risks to financial system stability, mainly linked to sustainability concerns (Guaita Martinez et al., 2024). Bodhanwala and Bodhanwala (2023) highlight that the crisis period offers a unique setting for testing the core theoretical perspectives in the ESG literature. Goncalves et al. (2021) suggest that during period of crisis, the managers of European companies may opportunistically leverage their sustainability orientation as a tool for earnings management. The International Organization of Securities Commissions (IOSCO, 2020) reports that sustainable investment instruments experienced significant growth during the pandemic, calling for greater transparency, comparability, and consistency in ESG-related disclosure. This increased interest in ESG may prompt investors to prioritize quantifiable metrics (Adams & Abhayawansa, 2022) over comprehensive strategies, seeking simplified methods of assessing sustainable corporate development. Although research on the specific role of ESG practices during the crisis period remains limited, several insights have emerged. Companies with enhanced ESG practices have demonstrated resilience (Adams & Abhayawansa, 2022), superior financial performance (Lins et al., 2017; Broadstock et al., 2021), and lower exposure to systemic risk and volatility (Albuquerque et al., 2020). Accordingly, further analysis of the pandemic period may contribute to expanding the ESG-AEM literature, offering academics a deeper understanding of the contextual dynamics, and practitioners an evidence-based support for strengthening sustainability efforts in times of crisis (Adams & Abhayawansa, 2022). Consistent with this perspective, the following research hypothesis is proposed.

RH2. The pandemic period moderates the relationship between ESG practices and AEM for European listed companies, by decreasing managers' incentives of earnings manipulation.

3 RESEARCH OBJECTIVE, METHODOLOGY AND DATA

The primary objective of this study is to analyze whether managers of European companies, acting in their own interest, engage in earnings management and use ESG practices as a defense mechanism, aiming to enhance corporate competitiveness. Insights drawn from the pandemic period complement the research.

3.1. Data and sample selection

Table 1 summarizes the sampling and data collection process. The initial sample designed for this empirical study consists of 7,696 European listed companies included in the Refinitiv Eikon

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database. The Refinitiv Eikon platform was selected due to the comprehensive coverage of both financial corporate indicators and ESG-related data. The focus on European listed companies frames this research and captures the increased regulations placed on corporate sustainability requirements in recent years (Gavana et al., 2017; Velte, 2019; Goncalves et al., 2021; Velte, 2021). Additionally, it ensures a level of geographical homogeneity to the dataset. To avoid potential biases stemming from regulatory heterogeneity, companies operating in the financial and real estate sectors were excluded from the sample, as they might distort the results of the research. These sectors are subject to specific regulations (Hong & Andersen, 2011) and distinct financial reporting requirements (Saleh et al., 2023), and their earnings characteristics differ from those of non-financial firms. Muchmore, the models employed to capture earning management behavior haven't been designed and tested for the financial sector's purposes (Filip & Raffournier, 2014). The analysis covers the period from 2015 to 2021 in order to isolate the effects of pandemic crisis from those of the subsequent geopolitical crisis. This particular time-frame also enables the examination of the pandemic's moderating role on the relationship under investigation. After applying the industry and time-based exclusions, the sample was reduced to 5,698 companies, resulting in a panel of 39,886 company-year observations.

Tab. 1 – The sample. Source: own research

European listed companies classified within an industry sector, of which:	7,696
Financial and real estate sectors	(1,505)
Non-financial companies included in the sample, of which:	6,191
Companies with the last reporting year 2015 and after	*5,698*
Company-year observations for 2015-2021	39,886
Less Company-year observations with no reported ESG scores	(31,346)
Company-year observations for 2015-2021 with available ESG data, of which:	8,540
Less Company-year observations with no available data to compute discretionary accruals	(1,226)
Final number of company-year observations used for data analysis, of which:	*7,314*
Less Company-year observations with no available data for all control variables	(1,031)
Final number of company-year observations used for regression analysis	*6,283*

The final constraint applied to the sample excluded the observations with missing data for the dependent (AEM) and independent (ESG practices) variables. Hence, the sample was narrowed down to a total number of 7,314 company-year observations with available data for both ESG scores and determinants of discretionary accruals. For specific analysis testing the research hypotheses on the relationship between ESG practices and AEM, the sample included 6,283 common company-year observations.

The sample distributions by primary Global Industry Classification Standard (GICS) sector and by country of company headquarters are presented in Appendix A. The majority of companies

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included in the sample operate within Industrials (27.86%) and Consumer discretionary (14.81%) sectors, while the Energy (5.54%) and the Utilities (4.69%) sectors are the least represented. From a geographical perspective, the highest proportion of companies is headquartered in the UK (23.56%), followed by Germany (with 11.29%) and Sweden (with 10.73%). In comparison, smaller and particularly Eastern European countries contributed with the lowest number of observations to the sample.

3.2. Research variables

This study employs the multidimensional ESG score and its disaggregated environmental, social and governance pillars to investigate the impact on various proxies of earnings management practices. Two AEM models are utilized, each reflecting diverse management behavior (ethical vs. opportunistic). These models underscore the stewardship theory complemented by stakeholder theory, on one hand, and the agency theory, on the other. The AEM approach (also used in Choi et al., 2013; Martinez-Ferrero et al., 2015) was deliberately chosen over REM, aiming to address two facets of earnings manipulation (through performance and growth) in relation to ESG practices.

To better capture this relationship, a set of control variables and a moderating variable, drawn from prior literature, are included to enhance the analysis. Appendix B provides detailed descriptions of the dependent, independent, moderating, and control variables used in this study, while Figure 1 illustrates the methodological framework.

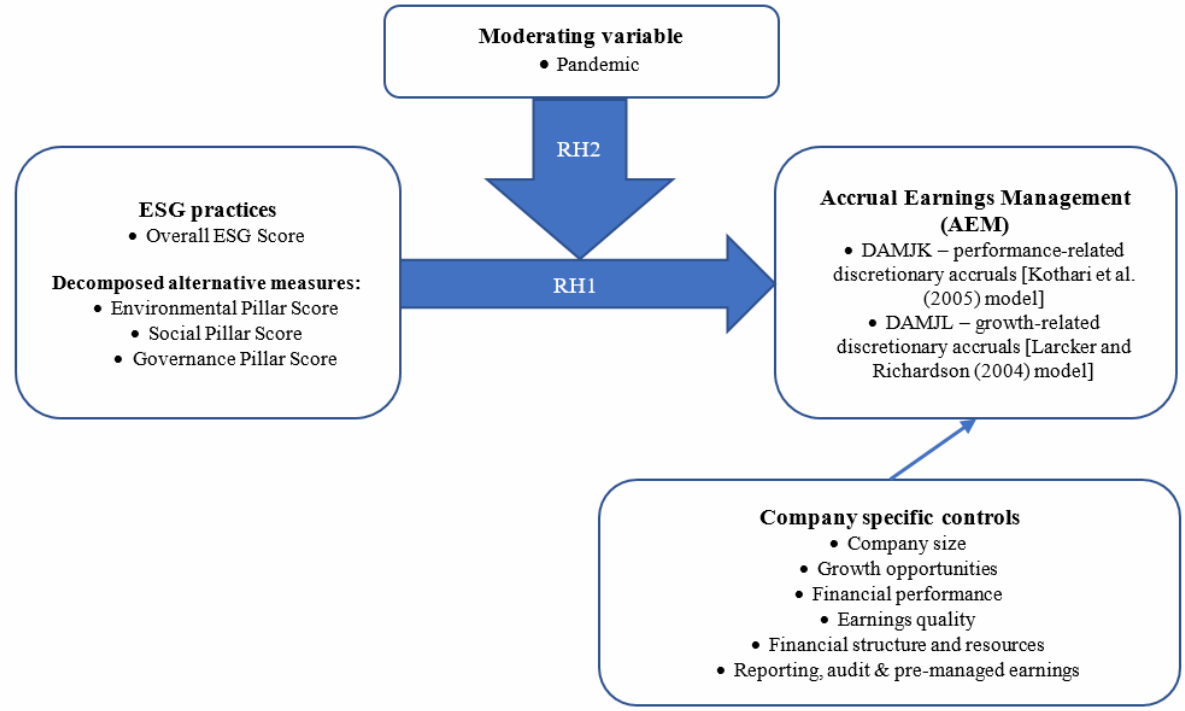

Fig. 1 – Methodological framework. Source: own design based on reviewed previous research

ESG variables

Since December 2014, under the European Non-Financial Reporting Directive (Directive 2014/95/EU), large companies (with more than 500 employees) have been required to disclose

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information on environmental, social, and corporate governance practices (European Parliament, 2014, October). All these characteristics are comprehensively reflected in various ESG methodologies. Over time, seminal research in this area has relied on aggregated ESG score assessed by various institutional databases, such as the Thomson Reuters (Refinitiv Eikon) database (Eccles et al., 2011; Velte, 2019; Duque-Grisales & Aguilera-Caracuel, 2021; Velte, 2021), the Kinder, Lydenberg and Domini (KLD) database (Cho et al., 2010; Kim et al., 2012), or the EIRIS database (Bozzolan et al., 2015; Martinez-Ferrero et al., 2015).

For the purpose of this study, the ESG scores are collected from Refinitiv Eikon database, one of the most comprehensive ESG databases, covering over 70% of global market capitalization. ESG scores are assessed based on publicly-reported information and comprise more than 500 company-level metrics, organized in 186 comparable measures. These measures are grouped into 10 categories, which are then clustered into three pillars (Refinitiv, 2022). Muchmore, the large number of metrics and the consistent clearing and normalizing procedures described by Refinitiv methodology enhance the objectivity of ESG measures.

Constructing on previous studies, this research deepens the analysis by disaggregating the ESG score into the three pillars: environmental (ENV), social (SOC), and governance (GOV), each measured on a 1-100 scale. Detailed description of each score is provided in Appendix B.

AEM variables

For the empirical analysis addressed in this study, the accrual-based techniques are considered. Prior research on earnings management (Jones et al., 2008; Dechow et al., 2010; Wilson, 2011; Kim et al., 2012; Christensen et al., 2013; Filip & Raffournier, 2014; Martinez-Ferrero et al., 2015; Almahrog et al., 2018; Wang et al., 2018; Velte, 2020 etc.) uses the discretionary component of accruals to measure the accounting manipulation practice. Discretionary accruals are defined as the difference between the total value of accruals and the normal level of accruals arising from legitimate business activity (Zang, 2012; Filip & Raffournier, 2014; Martinez-Ferrero et al., 2015). While total accruals are calculated as the difference between operating income and cash from operating activities, the normal level of accruals reflects expected accounting practices used to manage earnings.

In this research, discretionary accruals are estimated using two models that extend the Jones model modified by Dechow et al. (1995): Kothari et al. (2005) and Larcker and Richardson (2004). These models are selected with the purpose of differentiating between performance and growth management objectives. The specific features captured by these two extended models enhance the explanatory power of the analysis and discuss the mixed results obtained in previous research. Kothari et al. (2005) extend the model by including return on assets to control for the influence of company's performance on estimated discretionary accruals. Larcker and Richardson (2004) include in the model two additional independent variables to control for the growth of the company: the book-to-market ratio and the operating cash flows.

The discretionary accruals reflecting the modified Jones model extended by Kothari et al. (2005) (MJK model) and by Larcker and Richardson (2004) (MJL model) are estimated based on the Equations (1) and (2), respectively:

$$TA_{i,t}/A_{i,t-1} = \alpha_0 + \alpha_1(1/A_{i,t-1}) + \alpha_2[(\Delta REV_{i,t} - \Delta TR_{i,t})/A_{i,t-1}] + \alpha_3(PPE_{i,t}/A_{i,t-1}) + \alpha_4 ROA_{i,t} + \varepsilon_{i,t} \quad (1)$$

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$$TA_{i,t}/A_{i,t-1} = \alpha_0 + \alpha_1(1/A_{i,t-1}) + \alpha_2[(\Delta REV_{i,t} - \Delta TR_{i,t})/A_{i,t-1}] + \alpha_3(PPE_{i,t}/A_{i,t-1}) + \alpha_4 BM_{i,t} + \alpha_5(CFO_{i,t}/A_{i,t-1}) + \varepsilon_{i,t} \quad (2)$$

where:

$TA_{i,t}$ total accruals of company i in year t, calculated as the difference between operating income and cash from operating activities;

$A_{i,t-1}$ lagged total assets of company i in year t (used as a deflator to correct possible heteroskedasticity problems);

$\Delta REV_{i,t}$ change in sales of company i in year t;

$\Delta TR_{i,t}$ change in receivables of company i in year t;

$PPE_{i,t}$ gross property, plant and equipment of company i in year t;

$ROA_{i,t}$ return on assets of company i in year t, calculated as income before extraordinary items scaled by lagged total assets;

$BM_{i,t}$ book value of equity scaled by market value of equity of company i in year t;

$CFO_{i,t}$ cash flows from operating activities of company i in year t.

The estimated residuals generated from each model measure the abnormal accruals showing the managers' intentional adjustments of earnings (AEM). A higher value reflects increased earnings management, hence, stronger incentives of accounting manipulations. Muchmore, earnings management may include either increasing or decreasing adjustments of accruals (Kim et al., 2012). In line with this, the analysis considers the absolute, positive (income-increasing) and negative (income-decreasing) values of discretionary accruals as outlined in Appendix B.

Moderating variable

A Pandemic variable is employed as a moderating factor to capture the interaction with the independent variables of this study (Appendix B). The inclusion of this variable is also found in Goncalves et al. (2021), who argue that during periods of crisis, companies engaging more in CSR activities are also more likely to practice earnings management compared to boom years. Such a behavior is often motivated by the opportunity to clean up their accounting numbers in anticipation of improved performance during subsequent years. The use of moderating variable responds to the gap identified in previous literature (Carroll, 2021; Khanchel & Lassoued, 2022; Guaita Martinez et al., 2024), that calls for advancing the research to include specific effects of pandemic crisis on corporate competitiveness. In particular, it enhances the investigation on the relationship between ESG practices and AEM.

Control variables

To ensure homogeneity (Rahi et al., 2022) and to mitigate the risk of correlated omitted variables bias (Kim et al., 2012), control variables are incorporated into the regression models, as detailed in Appendix B. According to prior scientific literature, the most commonly employed control variables that may influence the relationship between sustainability metrics (e.g. ESG scores) and earnings management include: company size, growth opportunities, sector adjusted ROA, leverage, and company's age (Kim et al., 2012; Bozzolan et al., 2015; Martinez-Ferrero et al., 2015; Alipour et al., 2019; Velte, 2019; Rezaee et al., 2020). Other variables, such as sales growth, marketing capitalization, accounting standards (Bozzolan et al.,

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2015), auditor opinion (Rezaee et al., 2020), or research and development expenses intensity (Kim et al., 2012) are also used in literature, depending on the research context.

The company size (SIZEA) is measured by the natural logarithm of total assets and is used to control for both earnings management (as larger firms may exhibit potentially greater earnings variability) and ESG scores (as stakeholders' expectations are increased for larger firms) (Kim et al., 2012). To control for growth opportunities, the market-to-book equity ratio (MBV) and the change in sales (GROWTH) are used similar to Kim et al. (2012), Bozzolan et al. (2015), Wang et al. (2018), and Alipour et al. (2019).

To control for sector differences in financial performance and earnings quality, sector mean of adjusted ROA (avgROAind) and earnings quality country rank (EQUAL) are used. In addition, the influence of capital market is considered by including natural logarithm of market capitalization (LNMK). Company's financial structure is controlled using two variables: leverage (LEV) calculated as total debt scaled by total assets (Kim et al., 2012; Alipour et al., 2019; Velte, 2020) and financial resources (FINRES) calculated as the ratio of operating cash flow to total assets, with an assumed positive impact on earnings management. Additionally, dummy variables are included to illustrate whether companies prepare their financial statements using IFRS (ACCd), receive unqualified auditor opinion (ADTOPd), or report positive operating cash flows (CFOdummy).

3.3. Statistical analysis, regression models, diagnostic and endogeneity tests

Before conducting the statistical estimations on the relationship between ESG practices and AEM, a preliminary analysis of the sample is performed. Descriptive statistics are presented for all dependent, independent and control variables, based on the full sample of 7,314 company-years observations. To further explore the effects of COVID-19 crisis, the sample is divided into pre-pandemic and pandemic groups. Moreover, country-level institutional heterogeneity is considered by analyzing the sample for other two groups, according with the legal systems: common law versus civil law. Difference tests to estimate on equality of means and medians are performed using both parametric (ANOVA) and non-parametric (Mann Whitney Wilcoxon and Kruskal-Wallis) tests. These descriptive statistics' insights support the decision of further use of panel regression models for testing the research hypotheses.

Given that the level of discretionary accruals may vary over time, across industries, and across countries, all regression models include year, sector, and country fixed effects, as well as clustered robust errors. Fixed-effects (FE) panel regressions are based on the results of Breusch-Pagan Lagrange Multiplier (LM) test to choose between Ordinary Least Squares (OLS) and Random Effects (RE), followed by Hausman test, to decide between the use of FE and RE. To validate the regression models, a series of diagnostic tests are conducted. These include the modified Wald test for heteroskedasticity in fixed-effect regressions, the Breusch–Pagan/Cook–Weisberg test and Ramsey RESET test for omitted variables bias, and Variance Inflation Factor (VIF) to assess multicollinearity in regression models. To address potential endogeneity issues and to ensure the robustness of the results, two approaches are implemented: the one-step system Generalized Method of Moments (GMM) and the two-stage least squares (2SLS) method (Ullah et al., 2018; Rahi et al., 2022).

Equation (3) is applied to test the RH1 (There is a contingent impact of ESG practices on AEM, for European listed companies, depending on management behavior). Specifically, the analysis investigates whether ESG practices have a positive impact under the MJK model (RH1.1),

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suggesting an opportunistic management behavior, and a negative impact under the MJL model (RH1.2), indicating an ethically driven behavior.

$$AEM_{it} = \alpha_0 + \alpha_1 ESG_{it} + \alpha_2 SIZEA_{it} + \alpha_3 MBV_{it} + \alpha_4 avgROAind_{it} + \alpha_5 GROWTH_{it} + \alpha_6 LEV_{it} + \alpha_7 FINRES_{it} + \alpha_8 RDINT_{it} + \alpha_9 LNMK_{it} + \alpha_{10} EQUAL_{it} + \alpha_{11} AGEln_{it} + \alpha_{12} ACCd_{it} + \alpha_{13} ADTOPd_{it} + \alpha_{14} CFOdummy_{it} + u_{it} + \varepsilon_{it} \quad (3)$$

where,

AEM is the discretionary accruals, being subsequently replaced by each of the dependent variables listed in Appendix B, i represents the company, t represents the time period, u_{it} refers to year, sector, and country fixed effects, while ε_{it} is the error term. All variables are presented in Appendix B.

Next, the FE panel regression is re-estimated using Equation (4) to analyze the relationship between ESG practices and AEM, considering the moderating effect of pandemic period (to test the RH2). By including this interaction, the model is designed to address the bottlenecks identified in prior literature and provides empirical evidence on testing management behavior aimed at enhancing corporate competitiveness during times of crisis.

$$AEM_{it} = \alpha_0 + \alpha_1 ESG_{it} + \alpha_2 Pandemic_{it} + \alpha_3 ESG * Pandemic_{it} + \alpha_4 SIZEA_{it} + \alpha_5 MBV_{it} + \alpha_6 avgROAind_{it} + \alpha_7 GROWTH_{it} + \alpha_8 LEV_{it} + \alpha_9 FINRES_{it} + \alpha_{10} RDINT_{it} + \alpha_{11} LNMK_{it} + \alpha_{12} EQUAL_{it} + \alpha_{13} AGEln_{it} + \alpha_{14} ACCd_{it} + \alpha_{15} ADTOPd_{it} + \alpha_{16} CFOdummy_{it} + u_{it} + \varepsilon_{it} \quad (4)$$

where, Pandemic is a dummy variable equal to 1 for the years 2020 and 2021, and 0 for the years 2015 to 2019, and ESG*Pandemic represents the interaction variable between ESG practices and pandemic period. All other variables are defined in Appendix B.

To further explore the results, an additional analysis is conducted using alternative measures of independent variable (ESG), following a similar approach to that of Chouaibi and Zouari (2024). It may provide an enhanced and more detailed understanding of the relationship between specific ESG practices and AEM. Thus, the overall ESG score from Equations (3) and (4) is replaced with disaggregated scores: environmental (ENV), social (SOC), and governance (GOV).

$$AEM_{it} = \alpha_0 + \alpha_1 ENV_{it} + \alpha_2 SOC_{it} + \alpha_3 GOV_{it} + \alpha_4 SIZEA_{it} + \alpha_5 MBV_{it} + \alpha_6 avgROAind_{it} + \alpha_7 GROWTH_{it} + \alpha_8 LEV_{it} + \alpha_9 FINRES_{it} + \alpha_{10} RDINT_{it} + \alpha_{11} LNMK_{it} + \alpha_{12} EQUAL_{it} + \alpha_{13} AGEln_{it} + \alpha_{14} ACCd_{it} + \alpha_{15} ADTOPd_{it} + \alpha_{16} CFOdummy_{it} + u_{it} + \varepsilon_{it} \quad (5)$$

$$AEM_{it} = \alpha_0 + \alpha_1 ENV_{it} + \alpha_2 SOC_{it} + \alpha_3 GOV_{it} + \alpha_4 Pandemic_{it} + \alpha_5 ENV * Pandemic_{it} + \alpha_6 SOC * Pandemic_{it} + \alpha_7 GOV * Pandemic_{it} + \alpha_8 SIZEA_{it} + \alpha_9 MBV_{it} + \alpha_{10} avgROAind_{it} + \alpha_{11} GROWTH_{it} + \alpha_{12} LEV_{it} + \alpha_{13} FINRES_{it} + \alpha_{14} RDINT_{it} + \alpha_{15} LNMK_{it} + \alpha_{16} EQUAL_{it} + \alpha_{17} AGEln_{it} + \alpha_{18} ACCd_{it} + \alpha_{19} ADTOPd_{it} + \alpha_{20} CFOdummy_{it} + u_{it} + \varepsilon_{it} \quad (6)$$

All variables are defined in Appendix B.

Additionally, to address potential endogeneity concerns, the regression analysis is complemented by applying the one-step system GMM estimator. The method is particularly effective in addressing cross-sectional dependence and heteroscedasticity, and is well-suited for research involving smaller sized datasets (Rahi et al., 2022). GMM is widely recognized as a valid estimator to capture cause-effect relationship in dynamic panel data, offering more robust control over endogeneity, especially in business research context (Ullah et al., 2018). To capture the dynamic panel data estimation, lagged values of the dependent variables (L1.AEM) are used as explanatory variables. These lagged terms serve as internal instruments to control for

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endogenous relationships in the models and to connect the regressions in the levels with regressions in the first differences (Ullah et al., 2018; Rahi et al., 2022). To assess the validity of GMM estimation, several diagnostic tests are provided: Arellano-Bond test for AR(2) in first differences for serial correlation, as well as Sargan test and Hansen test for over-identification restrictions. Specifically, the Arellano-Bond test indicates whether the lagged variables are not correlated with the error term in the ESG – AEM equation, thus supporting the strong exogeneity assumption. The Sargan test and Hansen test are applied to evaluate the validity of the econometric model, and the correct specification of the instruments.

To ensure consistency with the previous models, the following one-step GMM equations are introduced.

$$\begin{aligned}\mathrm{AEM_{it}} = {} & \alpha_0 + \gamma \mathrm{L1.AEM_{it}} + \alpha_1 \mathrm{ESG_{it}} + \alpha_2 \mathrm{SIZEA_{it}} + \alpha_3 \mathrm{MBV_{it}} + \alpha_4 \mathrm{avgROAind_{it}} + \alpha_5 \mathrm{GROWTH_{it}} + \\ & \alpha_6 \mathrm{LEV_{it}} + \alpha_7 \mathrm{FINRES_{it}} + \alpha_8 \mathrm{RDINT_{it}} + \alpha_9 \mathrm{LNMK_{it}} + \alpha_{10} \mathrm{EQUAL_{it}} + \alpha_{11} \mathrm{AGEln_{it}} + \\ & \alpha_{12} \mathrm{ACCd_{it}} + \alpha_{13} \mathrm{ADTOPd_{it}} + \alpha_{14} \mathrm{CFOdummy_{it}} + \mathrm{u_{it}} + \varepsilon_{\mathrm{it}} \end{aligned} \quad (7)$$

$$\begin{aligned} AEM_{it} = {} & \alpha_0 + \gamma L1.AEM_{it} + \alpha_1 ESG_{it} + \alpha_2 Pandemic_{it} + \alpha_3 ESG * Pandemic_{it} + \alpha_4 SIZEA_{it} + \\ & \alpha_5 MBV_{it} + \alpha_6 avgROAind_{it} + \alpha_7 GROWTH_{it} + \alpha_8 LEV_{it} + \alpha_9 FINRES_{it} + \alpha_{10} RDINT_{it} + \\ & \alpha_{11} LNMK_{it} + \alpha_{12} EQUAL_{it} + \alpha_{13} AGEln_{it} + \alpha_{14} ACCd_{it} + \alpha_{15} ADTOPd_{it} + \\ & \alpha_{16} CFOdummy_{it} + u_{it} + \varepsilon_{it} \end{aligned} \quad (8)$$

$$\begin{aligned}\mathrm{AEM_{it}} = {} & \alpha_0 + \gamma \mathrm{L1.AEM_{it}} + \alpha_1 \mathrm{ENV_{it}} + \alpha_2 \mathrm{SOC_{it}} + \alpha_3 \mathrm{GOV_{it}} + \alpha_4 \mathrm{SIZEA_{it}} + \alpha_5 \mathrm{MBV_{it}} + \\ & \alpha_6 \mathrm{avgROAind_{it}} + \alpha_7 \mathrm{GROWTH_{it}} + \alpha_8 \mathrm{LEV_{it}} + \alpha_9 \mathrm{FINRES_{it}} + \alpha_{10} \mathrm{RDINT_{it}} + \alpha_{11} \mathrm{LNMK_{it}} + \\ & \alpha_{12} \mathrm{EQUAL_{it}} + \alpha_{13} \mathrm{AGEln_{it}} + \alpha_{14} \mathrm{ACCd_{it}} + \alpha_{15} \mathrm{ADTOPd_{it}} + \alpha_{16} \mathrm{CFOdummy_{it}} + \mathrm{u_{it}} + \varepsilon_{\mathrm{it}} \end{aligned} \quad (9)$$

$$\begin{aligned}\mathrm{AEM_{it}} = {} & \alpha_0 + \gamma \mathrm{L1.AEM_{it}} + \alpha_1 \mathrm{ENV_{it}} + \alpha_2 \mathrm{SOC_{it}} + \alpha_3 \mathrm{GOV_{it}} + \alpha_4 \mathrm{Pandemic_{it}} + \alpha_5 \mathrm{ENV} * \\ & \mathrm{Pandemic_{it}} + \alpha_6 \mathrm{SOC} * \mathrm{Pandemic_{it}} + \alpha_7 \mathrm{GOV} * \mathrm{Pandemic_{it}} + \alpha_8 \mathrm{SIZEA_{it}} + \alpha_9 \mathrm{MBV_{it}} + \\ & \alpha_{10} \mathrm{avgROAind_{it}} + \alpha_{11} \mathrm{GROWTH_{it}} + \alpha_{12} \mathrm{LEV_{it}} + \alpha_{13} \mathrm{FINRES_{it}} + \alpha_{14} \mathrm{RDINT_{it}} + \\ & \alpha_{15} \mathrm{LNMK_{it}} + \alpha_{16} \mathrm{EQUAL_{it}} + \alpha_{17} \mathrm{AGEln_{it}} + \alpha_{18} \mathrm{ACCd_{it}} + \alpha_{19} \mathrm{ADTOPd_{it}} + \\ & \alpha_{20} \mathrm{CFOdummy_{it}} + \mathrm{u_{it}} + \varepsilon_{\mathrm{it}} \end{aligned} \quad (10)$$

All variables are defined in Appendix B.

Although the endogeneity tests results based on the GMM estimations are generally robust, the findings for the MJL model reveal potential over-identification issues, which raise concerns regarding the validity of the model specification. To address this limitation and reinforce the reliability of the results, an alternative method is employed by implementing the instrumental variable approach through two-stage least squares (2SLS) estimation. According to Nguyen et al. (2024), the validity of the chosen instrumental variable is supported by strong correlation with the explanatory variable, without being directly associated with dependent variable.

In the first stage of the 2SLS method, a generalized linear regression model is applied to generate the fitted ESG value for the panel dataset with company-year observations. ESG score serves as the dependent variable, while the instrumental variable and the control variables are used as explanatory variables (Equation 11). In this respect, two instrumental variables are employed in this study: the lagged one-period ESG (following Wang et al., 2025) and industry-average ESG (following Nguyen et al., 2024).

$$\mathrm{ESG_{it}} = \alpha_0 + \alpha_1 \mathrm{IV_i} + \alpha_{2-14} \mathrm{Control\_Variables_{it}} + \mathrm{u_{it}} + \varepsilon_{\mathrm{it}} \quad (11)$$

In the second stage, AEM is modeled as a function of fitted ESG variable, obtained from the first stage regression, using the cross-sectional regression illustrated by Equation 12.

$$\mathrm{AEM_{it}} = \alpha_0 + \alpha_1 \mathrm{FittedESG_{it}} + \alpha_{2-14} \mathrm{Control\_Variables_{it}} + \mathrm{u_{it}} + \varepsilon_{\mathrm{it}} \quad (12)$$

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4 RESULTS AND DISCUSSION

4.1. Descriptive statistics and tests of differences

Table 2 reports the descriptive statistics for the full sample. Specifically, the statistics for discretionary accruals differ across the two AEM estimation models included in this study, which support the decision to use them both to ensure the complementarity of results and to enable discussion on the contingent impact when ethical versus opportunistic management behaviors are considered.

Discretionary accruals estimated using the Kothari et al. (2005) (MJK) model exhibit higher values compared to those estimated using the Larcker and Richardson (2004) (MJL) model. The mean values are 0.133 for DAMJKabs and 0.089 for DAMJLabs, suggesting that, on average, European companies demonstrate a relatively low level of engagement in AEM. However, the variations between the two models reflect differences in management behavior, potentially linked to the primary corporate objective as revealed through creative accounting practices. These findings are consistent with those reported by Goncalves et al. (2021) for European Union listed companies during the 2010-2018 period, or by Kim et al. (2012) for the US companies over the 1991-2009 period.

Tab. 2 – Descriptive statistics. Source: own research

Variables	N	Mean	Std. Dev.	Min	Max
DAMJKabs	7314	0.133	0.647	0	21.648
DAMJKpos	3520	0.200	0.908	0	21.648
DAMJKneg	3794	-0.071	0.190	-5.118	0
DAMJLabs	7314	0.089	0.221	0	11.932
DAMJLpos	3628	0.084	0.258	0	11.932
DAMJLneg	3686	-0.095	0.176	-4.582	0
ESG	7314	52.699	20.597	0.426	95.603
ENV	7314	46.733	27.012	0	99.211
SOC	7314	56.581	23.745	0.366	98.628
GOV	7314	52.092	22.489	0.760	98.591
SIZEA	7314	21.486	1.871	14.268	26.994
MBV	7314	3.510	47.309	-3519.627	1090.149
avgROAind	7314	-0.307	1.814	-19.375	18.498
GROWTH	7272	-1.115	64.197	-5226.040	10.027
LEV	7314	0.264	0.197	-0.002	2.961
FINRES	7314	0.086	0.144	-3.451	2.628
RDINT	7296	0.942	47.404	-18.630	3946.412

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LNMK	7314	21.425	1.758	14.371	26.629
EQUAL	7170	52.954	29.725	1	100
AGEln	6543	4.071	0.054	3.970	4.143
ACCd	7314	0.924	0.264	0	1
ADTOPd	7198	0.955	0.208	0	1
CFOdummy	7314	0.907	0.290	0	1
LawType	7314	0.724	0.447	0	1

Notes. Variables are defined in Appendix B.

The ESG score ranges from 0.426 to 95.603, with a mean value of 52.699, confirming a relatively balanced sample, characterized by above-average levels of transparency in publicly disclosed ESG practices. An analysis of the individual ESG pillars reveals that the environmental score is, on average, considerably lower (46.733) as compared to both the social (56.581) and the governance score (52.092). This may suggest a shift beginning in 2015, when the sustainability regulations placed greater emphasis on social and governance aspects, complementing the pre-existing environmental policies. The European listed companies appear to align with this regulatory trend. The sample is primarily composed of large companies, with high market capitalization, and a market value of equity of 3.51 times higher than their book value. Other key financial indicators show that companies included in the sample have an average leverage ratio (LEV) of 0.264, financial resources (FINRES) of 0.086, and research and development intensity (RDINT) of 0.942. Regarding accounting practices and financial health, 92.4% of the companies apply IFRSs (ACCd), while 95.5% received an unqualified audit opinion, and 90.7% report positive cash flows from operations (CFOdummy). In terms of institutional characteristics, 72.4% of the companies operate within countries governed by civil law, reflecting the heterogeneity of the sample in terms of country's legal system.

Table 3 illustrates the descriptive statistics for the variables across the two distinct periods: pre-pandemic (2015-2019) and pandemic (2020-2021). It also reports the significance of differences in means and medians using the ANOVA t-test and the Mann-Whitney-Wilcoxon test.

Tab. 3 – Tests for differences in means and medians. Source: own research

	Pre-pandemic (2015-2019)			Pandemic (2020-2021)			ANOVA t-test	Mann Whitney Wilcoxon test
	N	Mean	SD	N	Mean	SD	t-stat	z-stat
DAMJKabs	3864	0.191	0.871	3450	0.069	0.177	8.05***	-6.056***
DAMJKpos	1921	0.307	1.197	1599	0.071	0.247	7.75***	-2.437**
DAMJKneg	1943	-0.075	0.255	1851	-0.067	0.076	-1.40	6.031***
DAMJLabs	3864	0.072	0.164	3450	0.109	0.269	-7.35***	-17.521***
DAMJLpos	2038	0.068	0.106	1590	0.104	0.370	-4.20***	-8.210***

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DAMJLneg	1826	-0.076	0.210	1860	-0.114	0.133	6.55***	16.041***
ESG	3864	53.707	20.110	3450	51.569	21.074	4.45***	4.196***
ENV	3864	48.649	26.847	3450	44.586	27.038	6.45***	6.425***
SOC	3864	58.449	23.201	3450	54.488	24.173	7.15***	6.822***
GOV	3864	51.147	22.499	3450	53.150	22.433	-3.08***	-3.696***
SIZEA	3864	21.867	1.699	3450	21.061	1.961	18.85***	18.112***
MBV	3864	3.560	23.747	3450	3.454	64.141	0.10	-4.335***
avgROAind	3864	-0.172	0.821	3450	-0.458	2.486	6.75***	7.191***
GROWTH	3847	-1.433	84.427	3425	-0.757	27.298	-0.45	-4.056***
LEV	3864	0.258	0.189	3450	0.269	0.205	-2.35***	-1.550
FINRES	3864	0.094	0.125	3450	0.076	0.162	5.60***	2.984***
RDINT	3858	0.151	2.913	3438	1.828	68.982	-1.50	2.629***
LNMK	3864	21.753	1.601	3450	21.058	1.852	17.20***	17.069***
EQUAL	3796	53.773	29.153	3374	52.032	30.334	2.50**	2.275**
AGEln	3489	4.071	0.054	3054	4.070	0.053	0.60	0.702
ACCd	3864	0.933	0.250	3450	0.914	0.280	3.05***	3.026***
ADTOPd	3789	0.966	0.180	3409	0.942	0.234	5.05***	5.063***
CFOdummy	3864	0.934	0.249	3450	0.878	0.328	8.30***	8.253***

Notes. Variables are defined in Appendix B. The symbols *** and ** indicate significance at the 1% and 5% levels, respectively.

The magnitude of discretionary accruals measured in absolute, positive, and negative terms differs notably between the pandemic and pre-pandemic periods. When estimated with Kothari et al. (2005) model, the discretionary accruals are smaller during pandemic (mean DAMJKabs = 0.069) compared to pre-pandemic period (mean DAMJKabs = 0.191). In contrast, when estimated using the Larcker and Richardson (2004) model, the discretionary accruals are larger during the pandemic (mean DAMJLabs = 0.109) than in the pre-pandemic period (DAMJLabs = 0.072). Statistically significant differences in means and medians of key variables confirm these trends. Specifically, the findings suggest that during the pandemic, companies oriented toward performance (associated with MJK model) engaged less in earnings management compared to the pre-pandemic period. However, companies oriented toward growth (associated with MJL model) engaged more in earnings management during the pandemic as compared to pre-pandemic period. These contrasting patterns imply that in times of systemic crisis, companies pursue their competitiveness goals, shifting the behavior on the use of earnings management practices, either by reducing or increasing discretionary accruals, based on their underlying strategic objectives.

The mean values of ESG, ENV and SOC scores are significantly lower during the pandemic as compared with pre-pandemic period, while the GOV score is significantly higher. This suggests

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that, during crisis, companies generally involve less in sustainability, but focus more on financial survival and shareholder-oriented governance actions. Environmental and social initiatives may have been deprioritized, despite their materiality for the society and external stakeholders.

Significant differences may be also observed in most of the companies' characteristics between the two periods. During the pandemic, companies reported lower average values for total assets (SIZEA), market to book equity ratio (MBV), market capitalization (LNMK), and cash flow to total assets ratio (FINRES). Conversely, research and development intensity (RDINT) and debt ratio (LEV) were higher on average. Furthermore, a smaller proportion of European listed companies reported under IFRSs, received unqualified auditor opinion, and accounted for positive operating cash flows during pandemic, being significantly different when compared with pre-pandemic period.

Insightful differences (tabulated in Appendix C) are found across the two sets of variables measuring ESG practices and discretionary accruals, when country-level institutional heterogeneity is analyzed. To better understand companies operating in the European setting under relatively consistent legal requirements for both ESG reporting and financial accounting, this study examines the differences embodied by the underlying legal origin (common law versus civil law systems). Samudera Erlangga and Poespasari (2024) emphasize the critical role that the legal system plays in shaping how regulatory requirements are generally implemented, with substantial social, economic, and financial implications for management behavior. To assess the differences generated by the institutional context, two non-parametric tests, Mann Whitney Wilcoxon and Kruskal-Wallis, were employed. In line with the relevant literature, the results show significant differences between companies established in common law versus civil law countries. These differences are observed in absolute and income-decreasing discretionary accruals for European companies oriented both toward performance and growth, and across all ESG practices (overall and disaggregated by the three pillars). Companies operating under a civil law system exhibit higher tendency to manipulate earnings, particularly when driven by short-term performance objectives. At the same time, they are more involved in ESG, ENV and SOC practices, reflecting a stakeholder-oriented behavior. However, they tend to be less engaged in governance practices, a result aligned with the differences in corporate governance regulations for common law system (characterized by rules-based governance requirements) versus civil law system (characterized by principle-based requirements).

Pearson correlations results (tabulated in supplementary materials) indicate that ESG scores (overall and disaggregated) are negatively correlated with absolute and positive discretionary accruals, while positively correlated with negative discretionary accruals. These findings support the hypothesis of a contingent impact of ESG practices on AEM, depending on management behavior (ethical versus opportunistic). However, the high significance ($p<0.01$) of correlation between ESG and DAMJL along with mixed significance for DAMJK provide only partial support for RH1. This evidence suggests that when using the MJL model, companies with higher ESG scores are more likely to reduce the extent of earnings management through discretionary accruals. Similar patterns are reported by Kim et al. (2012), Velte (2019), and Velte (2021). Contrary to expectations and previous research, this study underscores non-significant correlations between the absolute and the positive discretionary accruals measured using MJK model and corporate governance practices (GOV). In general, although the correlations between ESG practices (overall and disaggregated) and AEM measures are statistically significant, they are relatively low, indicating the need for a further regression

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analysis that incorporates additional control variables. Pearson correlation matrix also reveals low correlations between discretionary accruals and most control variables, thereby mitigating the concerns about multicollinearity and validating their inclusion in the regression models.

4.2. The relationship between ESG practices and AEM

ESG overall score and AEM relationship

To test the RH1 and the two secondary hypotheses (RH1.1 and RH1.2), Table 4 presents the results of FE panel regression analysis examining the ESG score's impact on discretionary accruals estimated using both MJK and MJL models. Year, sector and country fixed effects were considered in the regression models to control for unobserved heterogeneity. The estimations were first performed for the full sample, using the absolute values of discretionary accruals (Table 4, Columns 1 and 4). Next, the regression was re-estimated for two sub-samples, considering the positive (Table 4, Columns 2 and 5) and the negative (Table 4, Columns 3 and 6) discretionary accruals. This approach allows for a more nuanced interpretation of whether the ESG practices differentially affect the companies engaged in income-increasing or in income-decreasing AEM. The regression models were estimated with robustness checks included in STATA codes, to correct for the presence of heteroskedasticity and autocorrelation in standard errors, thereby enhancing the reliability of statistical inference.

Tab. 4 – ESG overall score – AEM regression analysis. Source: own research

VARIABLES	Discretionary accruals: MJK model			Discretionary accruals: MJL model		
	DAMJKabs	DAMJKpos	DAMJKneg	DAMJLabs	DAMJLpos	DAMJLneg
	1	2	3	4	5	6
ESG	0.0010	0.0061***	0.0006*	-0.0006*	-0.0005	0.0002
	(0.9391)	(2.6482)	(1.8096)	(-1.7441)	(-1.5770)	(0.3977)
SIZEA	-0.0214	0.0360	-0.0199	0.0382*	0.0265	0.0078
	(-0.4540)	(0.2945)	(-0.9815)	(1.8948)	(1.0717)	(0.4275)
MBV	-0.0001	-0.0008	0.0001	0.0001	0.0003	0.0002
	(-0.2337)	(-0.7561)	(0.6649)	(0.3625)	(0.8138)	(0.7861)
avgROAind	-0.0059***	-0.0122**	-0.0008	-0.0008	-0.0010	0.0000
	(-3.5085)	(-2.4858)	(-0.9958)	(-1.2448)	(-0.7490)	(0.0298)
GROWTH	-0.0004***	-0.0904	0.0005***	0.0001***	0.0203***	-0.0000
	(-6.3511)	(-1.0511)	(26.5893)	(2.9383)	(2.9429)	(-0.7971)
LEV	-0.1320	-0.4201**	-0.0555*	-0.0203	-0.0173	-0.0284
	(-1.3922)	(-2.0485)	(-1.7058)	(-0.5225)	(-0.3836)	(-0.6342)
FINRES	0.2276	1.2544**	-0.6188***	0.2614***	0.0725	-0.3924***
	(1.0059)	(2.2334)	(-3.2185)	(3.1047)	(1.0570)	(-2.7134)
RDINT	-0.0001***	-0.0000	-0.0002	-0.0001***	0.0046***	0.0005*

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	(-3.4490)	(-0.7042)	(-0.2316)	(-9.0001)	(13.2335)	(1.7799)
LNMK	-0.0088	0.0279	0.0218*	-0.0177**	-0.0072	-0.0078
	(-0.3088)	(0.4821)	(1.7672)	(-2.1624)	(-0.7341)	(-0.7820)
EQUAL	0.0002	0.0001	0.0001	0.0002**	0.0001	-0.0001
	(0.6911)	(0.1419)	(0.7227)	(2.2551)	(0.8310)	(-0.7467)
ACCd	0.0524	0.5649***	Not included	-0.0381***	-0.0526***	Not included
	(0.1783)	(5.5023)		(-3.1433)	(-5.1300)	
ADTOPd	-0.0803	-0.1770	0.0120	-0.0027	-0.0080	0.0390**
	(-0.7321)	(-0.6596)	(1.3795)	(-0.1309)	(-0.5956)	(2.2731)
CFOdummy	-0.0953*	-0.1809**	0.0191	-0.0855***	-0.0564***	0.0896***
	(-1.7869)	(-2.1634)	(0.5887)	(-5.3715)	(-3.3854)	(3.6198)
Constant	0.7918	-1.7963	-0.0786	-0.2559	-0.2160	-0.1541
	(0.9575)	(-0.8211)	(-0.1568)	(-0.7407)	(-0.5393)	(-0.4175)
Observations	6,283	2,971	3,312	6,283	3,095	3,188
R-squared	0.0795	0.1017	0.1472	0.0499	0.0724	0.0785
Number of companies	1,709	1,346	1,388	1,709	1,351	1,399
Year fixed-effect	Yes	Yes	Yes	Yes	Yes	Yes
Sector fixed-effect	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed-effect	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table presents the results from FE panel regressions of the ESG score on AEM, estimated using both Kothari et al. (2005) – MJK model and Larcker and Richardson (2004) – MJL model for the period 2015-2021 for the total sample, as well as for the two sub-samples generated for income-increasing and income-decreasing discretionary accruals. The variables are defined in Appendix B. The p values are two-tailed. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Year, sector and country fixed effects were used. Robust t-statistics in parentheses. Data were analyzed with STATA statistical software.

The regression analysis partially confirms RH1, revealing mixed results of ESG practices on AEM among European companies during the 2015-2021 period. These impacts are contingent upon company's strategic orientation toward performance (MJK model) or growth (MJL model) objectives. Thus, for performance-oriented European companies, RH1.1 is validated by the positive coefficients of ESG across all three samples (absolute, positive, and negative accruals), although statistical significance is found only for the signed AEM measures. Contrary to the expected sign (Kim et al., 2012), the positive and significant coefficient of ESG in relation to DAMJKpos (α=0.0061, $p<0.01$) suggests that a higher ESG score is associated with greater engagement in income-increasing discretionary accruals. These results are consistent with Gaio et al. (2022) for the signed discretionary accruals. Moreover, in line with previous studies (Kim et al., 2012; Goncalves et al., 2021), the positive and significant association between ESG and DAMJKneg (α=0.0006, $p<0.1$) indicates that ESG practices are also related to reduction in income-decreasing earnings management for the performance-oriented companies. These

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findings support the agency theory, as they reflect opportunistic behavior of managers aimed at maintaining short-term performance. This could suggest that ESG practices may be used as a form of legitimacy to mask irresponsible actions without compromising corporate competitiveness.

In contrast, for growth-oriented European companies, RH1.2 is validated by the negative coefficients of ESG in relation to both absolute and positive accruals, though statistical significance is observed only for absolute AEM. Specifically, the negative and significant relationship between ESG score and DAMJLabs (α=-0.0006, $p<0.1$) suggests that a higher ESG score is associated with lower levels of earnings manipulation. Although similar relations may be observed for the signed discretionary accruals, these are not statistically significant. The findings align with the transparency financial reporting hypothesis proposed by Kim et al. (2012). In this case, the stewardship theory complemented by stakeholder theory may be validated, for the managers pursuing long-term growth objectives. These mixed results highlight the idea that the relationship between ESG practices and AEM is characterized by a trade-off between stewardship theory and agency theory, contingent upon the specific objectives of the managers.

Furthermore, the results suggest that performance-oriented companies (Table 4, Column 1) are less likely to engage in AEM when they operate in sectors with higher mean-adjusted ROA (avgROAind), exhibit higher growth opportunities (GROWTH) and higher research and development intensity (RDINT), or report pre-managed earnings (CFOdummy). In contrast, growth-oriented companies (Table 4, Column 4) engage more in earnings management when they are larger in size (SIZEA), have more growth opportunities (GROWTH), report a higher percentage of operating cash-flow (FINRES), or are established in countries with high earnings quality (EQUAL). However, these companies are less likely to manipulate their earnings through discretionary accruals whether they have higher research and development intensity (RDINT) and market capitalization (LNMK), apply IFRSs, or report pre-managed earnings (CFOdummy). These findings are partially consistent with prior literature, including Borralho et al. (2022) for French and Spanish companies, Kim et al. (2012) for US companies, or Bozzolan et al. (2015) and Martinez-Ferrero et al. (2015) for broader cross-country panels.

Moderating effect of pandemic period on ESG - AEM relationship

Particularly highlighted during crisis constraints, ESG syntagma has been imbedded in mainstream financial market discourse (Leins, 2020). Specifically, Goncalves et al. (2021) suggest that sustainability-oriented managers are more likely to address financial practices such as earnings management, during periods of crisis. Constructing on this perspective, the additional analysis in this study investigates whether the pandemic period moderates the relationship between ESG practices and AEM, considering different incentives of earnings manipulation (RH2). Evidence supporting RH2 is shown in Table 5, where FE panel regression models include the interaction variable (ESG*Pandemic) to allow for non-linearity in the ESG practices – AEM relationship. The regressions are estimated using both MJK model (reflecting performance-oriented objective) and MJL model (reflecting growth-oriented objective).

In both models, the coefficients of ESG remain consistent with the early results obtained without the interaction term. The coefficients of the interaction variable (ESG*Pandemic) exhibit similar signs as compared with ESG coefficients in the absolute and positive discretionary accruals regressions, but opposite signs in the negative discretionary accruals'

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regressions. In case of the MJK model, the Pandemic variable shows negative coefficients of absolute and positive discretionary accruals, and a positive coefficient for negative discretionary accruals, suggesting a reduction in income-increasing manipulation and an increase in income-decreasing practices. Conversely, in the MJL model, the signs of the Pandemic variable are reversed, indicating diverse management behavior depending on corporate orientation. These findings suggest that during the pandemic period managers alter the use of ESG practices in association with AEM, offering stronger support for the trade-off between stewardship and agency theories in the context of decision-making process.

Tab. 5 – ESG practices – AEM regression analysis with moderating effect of pandemic period. Source: own research

VARIABLES	Discretionary accruals: MJK model			Discretionary accruals: MJL model		
	DAMJKabs	DAMJKpos	DAMJKneg	DAMJLabs	DAMJLpos	DAMJLneg
	1	2	3	4	5	6
ESG	0.0010	0.0056**	0.0006*	-0.0006*	-0.0005	0.0002
	(0.8909)	(2.3933)	(1.8710)	(-1.7395)	(-1.4900)	(0.3965)
Pandemic	-0.0963	-0.2563	0.0849	0.0456**	0.0441**	-0.0335
	(-1.4035)	(-1.5897)	(1.5697)	(2.5126)	(2.2182)	(-1.0858)
ESG*Pandemic	0.0011	0.0045*	-0.0014*	-0.0001	-0.0005*	-0.0003
	(1.0981)	(1.9072)	(-1.7192)	(-0.3460)	(-1.6600)	(-0.8496)
SIZEA	-0.0194	0.0400	-0.0246	0.0380*	0.0249	0.0071
	(-0.4107)	(0.3262)	(-1.2237)	(1.8885)	(1.0391)	(0.3839)
MBV	-0.0001	-0.0008	0.0001	0.0001	0.0003	0.0002
	(-0.2317)	(-0.7512)	(0.8225)	(0.3621)	(0.8125)	(0.7924)
avgROAind	-0.0059***	-0.0109**	-0.0005	-0.0008	-0.0012	0.0001
	(-3.4772)	(-2.2160)	(-0.5513)	(-1.2455)	(-0.9232)	(0.0909)
GROWTH	-0.0003***	-0.0961	0.0005***	0.0001***	0.0216***	-0.0000
	(-5.9227)	(-1.1314)	(22.6788)	(2.8798)	(3.0296)	(-0.8973)
LEV	-0.1324	-0.4281**	-0.0528	-0.0202	-0.0157	-0.0283
	(-1.3916)	(-2.0878)	(-1.6400)	(-0.5216)	(-0.3524)	(-0.6306)
FINRES	0.2282	1.2697**	-0.6284***	0.2614***	0.0706	-0.3941***
	(1.0088)	(2.3075)	(-3.2793)	(3.1053)	(1.0309)	(-2.7165)
RDINT	-0.0001***	-0.0000	-0.0002	-0.0001***	0.0045***	0.0005*
	(-3.4820)	(-0.7994)	(-0.2668)	(-9.0072)	(12.8814)	(1.7971)
LNMK	-0.0095	0.0271	0.0241*	-0.0176**	-0.0065	-0.0076
	(-0.3317)	(0.4690)	(1.8405)	(-2.1510)	(-0.6692)	(-0.7636)
EQUAL	0.0002	0.0001	0.0001	0.0002**	0.0001	-0.0001
	(0.7206)	(0.2038)	(0.6656)	(2.2384)	(0.7214)	(-0.7366)

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ACCd	0.0621	0.7130***	Not included	-0.0389***	-0.0694***	Not included
	(0.1987)	(4.6072)		(-2.8226)	(-4.0214)	
ADTOPd	-0.0801	-0.1731	0.0134	-0.0027	-0.0085	0.0392**
	(-0.7317)	(-0.6542)	(1.4491)	(-0.1320)	(-0.6399)	(2.2726)
CFOdummy	-0.0952*	-0.1798**	0.0195	-0.0855***	-0.0561***	0.0896***
	(-1.7835)	(-2.1552)	(0.5972)	(-5.3756)	(-3.3914)	(3.6237)
Constant	0.7626	-1.9596	-0.0381	-0.2538	-0.1841	-0.1441
	(0.9162)	(-0.8920)	(-0.0775)	(-0.7356)	(-0.4783)	(-0.3892)
Observations	6,283	2,971	3,312	6,283	3,095	3,188
R-squared	0.0798	0.1050	0.1558	0.0500	0.0745	0.0789
Number of companies	1,709	1,346	1,388	1,709	1,351	1,399
Year fixed-effect	Yes	Yes	Yes	Yes	Yes	Yes
Sector fixed-effect	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed-effect	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table presents results from FE panel regressions of the ESG score on AEM estimated using both Kothari et al. (2005) model and Larcker and Richardson (2004) model considering the moderating effect of pandemics for the full sample and the two sub-samples generated for income-increasing and income-decreasing discretionary accruals. The variables are defined in Appendix B. The p values are two-tailed. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Year, sector and country fixed effects were used. Robust t-statistics in parentheses. Data were analyzed with STATA statistical software.

By including the Pandemic and interaction variables in the regressions, the results suggest that the intensity of this effect varies based on companies' orientation toward performance or growth, as well as their earnings management incentives, whether focused on income-increasing or income-decreasing strategies. These findings provide new evidence supporting the idea that enhanced European sustainability-related regulations may contribute to corporate competitiveness, particularly during periods of crisis.

For companies operating under the MJK model, the coefficient of the interaction variable (ESG*Pandemic) is not significant for the absolute value of discretionary accruals. However, it becomes significant for the signed values, with a positive marginal effect for companies engaged in income-increasing earnings management (α=0.0045, $p<0.1$), and a negative marginal effect for those involved in income-decreasing earnings management (α=-0.0014, $p<0.1$). When discretionary accruals are measured using the MJL model, the marginal effect of pandemics changes the relationship. Thus, the coefficient of the interaction variable (ESG*Pandemic) remains non-significant for the absolute value of discretionary accruals, however it becomes significant, with a negative marginal effect for companies engaged in income-increasing earnings management (α=-0.0005, $p<0.1$).

Considering the above discussion, the results provide partial confirmation of research hypothesis RH2, suggesting that the pandemic period acts as a moderator in the relationship

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between ESG practices and AEM, with mixed effects depending on the types of earnings manipulation and managerial orientation. The findings align, to some extent, with previous research that has explored management behavior during crisis periods. For instance, Bertomeu and Magee (2011) or Filip and Raffournier (2014) report an improvement in the quality of earnings management during financial crisis. Other studies suggest that companies investing their effort and resources in implementing ESG practices tend to reduce their earnings manipulation through discretionary accruals, suggesting a higher alignment with long-term value creation and stakeholder orientation. This study extends prior research by providing a dedicated analysis of the pandemic period (2020-2021) in comparison to non-pandemic period (2015-2019). It contributes to existing literature by building on the findings of Bozzolan et al. (2015) and Martinez-Ferrero et al. (2015), who investigate earlier crisis context (2003-2009 and 2002-2010, respectively) for a sample of international companies, as well as more recent research conducted by Rezaee et al. (2020), Gaio et al. (2022), and Saleh et al. (2023), which focus on pre-pandemic samples (2009-2015 and 2013-2019 periods).

Analysis of the individual pillars of ESG score's impact on AEM

To further explore and discuss the results, the overall ESG score is disaggregated into the three pillars, based on the Refinitiv ESG scores methodology: environmental (ENV), social (SOC), and governance (GOV). This approach aligns with prior literature (Kim et al., 2012; Alipour et al., 2019; Velte, 2019; Velte, 2021) which emphasizes the importance of examining both aggregated ESG scores and their individual components to capture nuanced corporate sustainability constructs.

Table 6 (Panel A and Panel B) reports the findings of the re-estimated regressions for absolute, positive and negative values of discretionary accruals using the MJK and MJL models, respectively. Panel A excludes the moderating effect of pandemic period, corresponding to the first research hypothesis (RH1), while Panel B incorporates the moderating effect, consistent with the second research hypothesis (RH2). All control variables were included in the regressions (tabulated in supplementary material), while year, sector, and country fixed effects were considered. The results presented in Table 6 indicate that, in most cases, the estimated coefficients retain similar signs when the three ESG pillars (ENV, SOC, and GOV) are used in place of the overall ESG score. However, statistical significance is observed only in the relationships between GOV and DAMJKpos, and between ENV and DAMJLpos. Regarding the interaction models, moderated relationship between the disaggregated ESG scores and discretionary accruals, the estimated coefficients of Pandemic variable in the disaggregated ESG-AEM regressions are consistent with those obtained for the models estimated without interaction. These findings allow for further support to the initial conclusions of the study.

Tab. 6 – Regression analysis of ESG individual pillars – AEM relation. Source: own research

VARIABLES	Discretionary accruals: MJK model			Discretionary accruals: MJL model		
	DAMJKabs	DAMJKpos	DAMJKneg	DAMJLabs	DAMJLpos	DAMJLneg
	1	*2*	*3*	*4*	*5*	*6*
Panel A. Pandemic period moderating effect – excluded (RH1)						
ENV	0.0006	0.0016	0.0001	-0.0002	-0.0006**	0.0001

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	(0.6528)	(0.8153)	(0.2814)	(-0.5781)	(-1.9782)	(0.3144)
SOC	-0.0002	0.0004	0.0004	-0.0005	-0.0003	-0.0001
	(-0.2698)	(0.2045)	(0.8624)	(-1.6205)	(-0.9872)	(-0.2871)
GOV	0.0006	0.0037**	0.0001	0.0001	0.0002	0.0002
	(0.8811)	(2.4193)	(0.4539)	(0.3105)	(1.1039)	(0.7662)
R-squared	0.0796	0.1025	0.1472	0.0503	0.0747	0.0787
Panel B. Pandemic period moderating effect – included (RH2)						
ENV	-0.0018	-0.0032	0.0000	-0.0002	-0.0007**	0.0002
	(-1.5906)	(-1.2272)	(0.1221)	(-0.6295)	(-2.2134)	(0.4651)
SOC	0.0019	0.0029	0.0003	-0.0006	-0.0002	-0.0001
	(1.6399)	(1.1850)	(0.6644)	(-1.6206)	(-0.7785)	(-0.2384)
GOV	0.0009	0.0053***	0.0002	0.0002	0.0003	0.0001
	(1.1566)	(3.0654)	(0.9175)	(0.9542)	(1.5608)	(0.2304)
Pandemic	-0.0264	-0.0661	0.0893	0.0471**	0.0484**	-0.0370
	(-0.3926)	(-0.4480)	(1.5308)	(2.5463)	(2.3561)	(-1.1638)
ENV*Pandemic	0.0072***	0.0151***	-0.0005	0.0001	0.0001	-0.0004
	(4.4158)	(3.6911)	(-1.1159)	(0.2004)	(0.3105)	(-0.9201)
SOC*Pandemic	-0.0066***	-0.0103***	-0.0003	0.0002	-0.0003	-0.0003
	(-4.2910)	(-2.6505)	(-0.6612)	(0.7097)	(-0.8921)	(-0.5073)
GOV*Pandemic	0.0002	-0.0020	-0.0006	-0.0004**	-0.0003	0.0004
	(0.2188)	(-1.2515)	(-1.1819)	(-2.0407)	(-1.2150)	(1.3660)
R-squared	0.0914	0.1337	0.1558	0.0511	0.0773	0.0806
Observations	6,283	2,971	3,312	6,283	3,095	3,188
Number of companies	1,709	1,346	1,388	1,709	1,351	1,399
Control variables included	Yes	Yes	Yes	Yes	Yes	Yes
Year, Sector, and Country FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table presents results from FE panel regressions of ENV, SOC, and GOV decomposition of the overall ESG score on AEM estimated using both Kothari et al. (2005) model and Larcker and Richardson (2004) model and controls over the period 2015-2021 for the total sample, and the two sub-samples generated for income-increasing and income-decreasing discretionary accruals. In Panel B the models consider the moderating effect of pandemic period. The variables are defined in Appendix B. The p values are two-tailed. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Year, sector and country fixed effects were used. Robust t-statistics in parentheses. Data were analyzed with STATA statistical software.

This detailed analysis of the disaggregated ESG scores reveals nuanced insights, reflecting the diversity of corporate strategies, by integrating various ESG practices, aimed at balancing

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competitiveness and transparency. Initially, the first research hypothesis (RH1) was supported when using the ESG score, specifically for the positive and negative values of discretionary accruals measured with MJK model, and for the absolute value of discretionary accruals under the MJL model. However, when the disaggregated ESG scores were included in the regression models, RH1 was confirmed only for the relationships between GOV and DAMJKpos, and between ENV and DAMJLpos (Table 6, Panel A). Notably, the findings suggest that an increase in governance practices among performance-oriented companies (MJK model) leads to higher levels of income-increasing discretionary accruals, which may indicate opportunistic management behavior, in line with agency theory. Conversely, greater engagement in environmental practices by growth-oriented companies (MJL model) relates to reduced income-increasing discretionary accruals, consistent with ethical management behavior, under the stewardship theory. No statistically significant relationships could be confirmed for the remaining regressions involving the other ESG pillars.

Specific differences emerge when examining the interaction between each ESG pillar and the pandemic period (RH2). Specifically, under the MJK model, a positive and statistically significant coefficient is found for ENV*Pandemic, whereas a negative and significant coefficient is observed for SOC*Pandemic, both in relation to absolute and positive discretionary accruals. These findings suggest that, for the absolute and positive discretionary accruals, during pandemics, an increase in environmental practices leads to greater earnings management (opportunistic behavior), while an increase in social practices determines a decrease in earnings management (ethical behavior). The moderating effect of pandemics on GOV practices – AEM relationship is significant only under the MJL model and aligns with an ethical perspective. The negative coefficient indicates that greater governance engagement during the pandemic is associated with a reduction in absolute discretionary accruals, suggesting more transparent financial reporting. The results are consistent with prior research addressing the role of specific aspects of ESG practices in relation to earnings management: environmental and social (Kim et al., 2012; Velte, 2019; Velte, 2021), or governance (Bozzolan et al., 2015). Furthermore, the findings align with previous empirical evidence concerning European companies over different time frames (Bozzolan et al., 2015; Martinez-Ferrero et al., 2015; Velte, 2019; Velte, 2021; Gaio et al., 2022), reinforcing the view that various measures of ESG practices differently affect AEM, depending on various context and managerial incentives.

Moreover, the analysis indicates that European companies show a limited tendency to engage in AEM, and exhibit varying degrees of involvement in ESG practices, with environmental score notably lower than social or governance scores. Further examination reveals that, during the pandemic, companies behave differently when engaging in discretionary accruals to manage their earnings. Specifically, under performance-oriented objectives, companies report lower values of discretionary accruals during the pandemic as compared to the pre-pandemic period. In contrast, companies driven by growth objectives exhibit higher discretionary accruals in the same period. Additionally, all ESG scores decline during the pandemic, except for the governance score, which indicates that in times of heightened uncertainty, companies may shift their focus away from environmental and social actions, toward strengthening governance actions. This observation supports the argument of Geldres-Weiss et al. (2024), who suggest managerial adaptability and strategic reorientation in times of crisis.

4.3. Robustness checks

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The robustness of the results is examined by carrying out two additional analyses. The endogeneity issues are addressed first, by applying one-step system GMM with lagged values of discretionary accruals variables, and second, by using 2SLS method with two subsequent instrumental variables: a lagged measure and an industry average variable of ESG. The methods are applied for all models designed to verify the research hypotheses.

Endogeneity check based on GMM

According to Choi and Byun (2018) and Chouaibi and Zouari (2024), confirmed by Velte (2024), the relationship between sustainability practices and earnings management is subject to endogeneity issues, since the two variables may be codetermined, thereby influencing each-other. Thereby, this study employs the one-step generalized method of moments (GMM) estimation for panel data. This approach, also utilized in prior research (Bui et al., 2021; Rahi et al., 2022), is preferred over alternative methods because the unobservable heterogeneity may be better controlled (Martinez-Ferrero et al., 2015).

Table 7 summarizes the results of re-estimations for all 12 regressions (MJK and MJL models, each applied for absolute, positive, and negative discretionary accruals, with the interaction of pandemic period included and excluded). Results are tabulated only for the independent and interactions variables. The Arellano-Bond, Sargan, and Hansen tests' results show relatively consistent values across regressions using ESG score (Table 7 Columns 1, 2, and 3 for MJK model, and Columns 7, 8, and 9 for MJL model) compared with the regressions using the three pillars: ENV, SOC and GOV (Table 7 Columns 4, 5, and 6 for MJK model, and Columns 10, 11, and 12 for MJL model). For the MJK model, the Sargan and Hansen tests yield p-values greater than 0.05, indicating that the null hypothesis of no over-identification cannot be rejected, hence, the instruments used in the regressions are valid. Furthermore, the AR(2) estimators of the Arellano-Bond test support the alternative hypothesis of no autocorrelation of errors in the models ($p>0.05$). However, for MJL model (Table 7 Columns 7 to 12), most regressions with the dependent variable DAMJLabs fail to satisfy endogeneity diagnostics based on the Sargan and Hansen tests, as the null hypothesis was rejected at significance levels below 0.05. This suggests that the relationship between ESG practices and AEM, as estimated by the Larcker and Richardson (2004) model, may be subject to simultaneity bias. Therefore, past-year discretionary accruals may influence current-year discretionary accruals in companies oriented toward growth, inferring the necessity for further investigation of endogeneity.

Tab. 7 – Endogeneity results using one-step GMM estimation. Source: own research

Panel A. MJK model						
VARIABLES	DAMJKabs	DAMJKpos	DAMJKneg	DAMJKabs	DAMJKpos	DAMJKneg
	1	*2*	*3*	*4*	*5*	*6*
RH1 validation: Robustness tests using one-step Generalized Method of Moments (GMM)						
L1.DAabs	-0.0031			-0.0033		
	(-0.4123)			(-0.4093)		
L1.DApos		0.0021			0.0049	
		(0.0553)			(0.1258)	

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L1.DAneg			-0.0283***			-0.0280***
			(-3.5129)			(-3.4281)
ESG	0.0028	0.0014	0.0002			
	(1.1632)	(0.3000)	(0.3148)			
ENV				0.0031*	0.0034	0.0000
				(1.8472)	(0.9920)	(0.0645)
SOC				-0.0026	0.0005	-0.0001
				(-1.4863)	(0.2510)	(-0.1806)
GOV				0.0020	-0.0003	0.0002
				(1.5410)	(-0.1218)	(0.6880)
Arellano-Bond: AR(2)	-1.14 (0.255)	-1.20 (0.231)	0.82 (0.411)	-1.19 (0.235)	-1.22 (0.223)	0.81 (0.419)
Sargan test	4.39 (0.222)	1.68 (0.641)	1.24 (0.745)	4.42 (0.219)	1.75 (0.626)	1.16 (0.762)
Hansen test	4.40 (0.221)	3.05 (0.384)	1.21 (0.750)	4.93 (0.177)	3.27 (0.352)	1.10 (0.776)
RH2 validation: Robustness tests using one-step Generalized Method of Moments (GMM)						
L1.DAabs	-0.0031			-0.0016		
	(-0.4074)			(-0.1928)		
L1.DApos		0.0046			0.0130	
		(0.1220)			(0.3480)	
L1.DAneg			-0.0293***			-0.0289***
			(-3.5210)			(-3.4636)
ESG	0.0029	-0.0028	0.0003			
	(1.1328)	(-0.5947)	(0.5665)			
ENV				-0.0027	-0.0054	-0.0000
				(-1.1696)	(-1.4523)	(-0.0175)
SOC				0.0025	0.0036	0.0001
				(1.1275)	(0.9895)	(0.1099)
GOV				0.0031*	0.0042	0.0002
				(1.7427)	(1.2786)	(0.5842)
Pandemic	-0.3347**	-0.9869**	0.0436	-0.1894	-0.7762*	0.0458*
	(-2.4683)	(-1.9831)	(1.6397)	(-1.5268)	(-1.9436)	(1.8566)
ESG*Pandemic	-0.0003	0.0115	-0.0005*			
	(-0.1303)	(1.5924)	(-1.6722)			
ENV*Pandemic				0.0135***	0.0236**	-0.0000
				(4.4373)	(2.4238)	(-0.0750)

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SOC*Pandemic				-0.0125***	-0.0074	-0.0005
				(-4.7926)	(-1.2586)	(-0.9323)
GOV*Pandemic				-0.0018	-0.0061	-0.0001
				(-0.8947)	(-1.4355)	(-0.2108)
Arellano-Bond: AR(2)	-1.14 (0.255)	-1.15 (0.250)	1.02 (0.308)	-1.18 (0.239)	-1.14 (0.254)	1.04 (0.298)
Sargan test	4.37 (0.224)	1.36 (0.714)	1.20 (0.754)	2.96 (0.398)	1.38 (0.710)	1.12 (0.773)
Hansen test	4.42 (0.220)	2.53 (0.470)	1.17 (0.760)	3.99 (0.262)	3.08 (0.379)	1.07 (0.783)
Observations	3,067	504	597	3,067	504	597
Number of companies	1,099	304	338	1,099	304	338
Control variables included	Yes	Yes	Yes	Yes	Yes	Yes
Year, Sector, and Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Panel B. MJL model						
VARIABLES	DAMJLabs	DAMJLpos	DAMJLneg	DAMJLabs	DAMJLpos	DAMJLneg
	7	*8*	*9*	*10*	*11*	*12*
RH1 validation: Robustness tests using one-step Generalized Method of Moments (GMM)						
L1.DAabs	-0.0721***			-0.0719***		
	(-3.2576)			(-3.2320)		
L1.DApos		0.0484			0.0486	
		(1.1777)			(1.2208)	
L1.DAneg			0.4026**			0.4007**
			(2.0174)			(1.9881)
ESG	-0.0002	0.0001	-0.0009			
	(-0.3521)	(0.0813)	(-0.4081)			
ENV				0.0001	-0.0010*	0.0000
				(0.1862)	(-1.6742)	(0.0228)
SOC				-0.0002	0.0001	-0.0008
				(-0.4445)	(0.2639)	(-0.8238)
GOV				0.0000	0.0004	-0.0000
				(0.0997)	(0.9688)	(-0.0363)
Arellano-Bond: AR(2)	1.33 (0.184)	2.03 (0.042)	-1.75 (0.080)	1.34 (0.182)	1.99 (0.047)	-1.76 (0.079)
Sargan test	36.00 (0.000)	12.72 (0.005)	2.29 (0.514)	35.96 (0.000)	11.19 (0.011)	2.27 (0.519)

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Hansen test	15.79 (0.001)	5.97 (0.113)	7.09 (0.069)	15.57 (0.001)	6.19 (0.103)	7.05 (0.070)
RH2 validation: Robustness tests using one-step Generalized Method of Moments (GMM)						
L1.DAabs	-0.0717***	-0.0727***				
	(-3.2312)	(-3.3194)				
L1.DApos			0.0506	0.0488		
			(1.2407)	(1.2061)		
L1.DAneg					0.4025**	0.3847*
					(2.0257)	(1.9370)
ESG	-0.0002		0.0001		-0.0007	
	(-0.3003)		(0.1983)		(-0.3404)	
ENV		-0.0003		-0.0011*		0.0007
		(-0.8387)		(-1.7371)		(0.5663)
SOC		0.0001		0.0002		-0.0011
		(0.1165)		(0.2935)		(-1.0544)
GOV		0.0002		0.0007		-0.0002
		(0.5820)		(1.5379)		(-0.2515)
Pandemic	0.0375**	0.0284*	0.0333	0.0518**	0.0051	0.0421
	(2.2805)	(1.8357)	(1.1258)	(1.9793)	(0.1155)	(0.6274)
ESG*Pandemic	-0.0001		-0.0003		-0.0006	
	(-0.4332)		(-0.7686)		(-1.0093)	
ENV*Pandemic		0.0009***		0.0004		-0.0016*
		(3.4531)		(0.8445)		(-1.8463)
SOC*Pandemic		-0.0008***		-0.0001		0.0009
		(-2.6322)		(-0.3007)		(1.1864)
GOV*Pandemic		-0.0003		-0.0009**		0.0004
		(-1.1971)		(-2.0549)		(0.6652)
Arellano-Bond: AR(2)	1.34 (0.181)	-1.71 (0.088)	2.08 (0.037)	2.05 (0.040)	1.37 (0.170)	-1.71 (0.087)
Sargan test	36.03 (0.000)	2.26 (0.521)	10.93 (0.012)	12.80 (0.005)	35.60 (0.000)	2.07 (0.558)
Hansen test	15.73 (0.001)	7.02 (0.071)	6.43 (0.092)	6.05 (0.109)	14.05 (0.003)	6.39 (0.094)
Observations	3,067	504	597	3,067	504	597
Number of companies	1,099	304	338	1,099	304	338
Control variables included	Yes	Yes	Yes	Yes	Yes	Yes
Year, Sector, and	Yes	Yes	Yes	Yes	Yes	Yes

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Country FE						

Notes: This table presents results from one-step GMM robust panel regressions for the ESG, as well as for the ENV, SOC, and GOV decomposition of the overall ESG score on AEM estimated using both Kothari et al. (2005) model and Larcker and Richardson (2004) model. The GMM method is applied both excluding (for RH1) and including (for RH2) the moderating effect of pandemics for the full sample and the two sub-samples generated for income-increasing and income-decreasing discretionary accruals. For Arellano-Bond AR(2) test, Sargan test and Hansen test, the Table 7 shows the z-statistic and Chi statistics, with p values disclosed in parenthesis. L1.DA is the lagged value of each discretionary accruals variable. The variables are defined in Appendix B. The p values are two-tailed. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Year, sector and country fixed effects were used. Robust t-statistics in parentheses. Data were analyzed with STATA statistical software.

The estimated coefficients for the relationship between ESG (overall or disaggregated) support RH1 for the ENV-DAMJKabs (α=+0.0031, p<0.1) and the ENV-DAMJLpos (α=-0.0010, p<0.1) associations. When considering the moderating effect of pandemic period, RH2 is confirmed for several relationships, including ESG-DAMJKneg (α=-0.0005, p<0.1), ENV-DAMJKabs (α=+0.0135, p<0.01), ENV-DAMJKpos (α=0.0236, p<0.05), ENV-DAMJKabs (α=+0.0009, p<0.01), ENV-DAMJKneg (α=-0.0016, p<0.1), SOC-DAMJKabs (α=-0.0125, p<0.01), SOC-DAMJLabs (α=-0.0008, p<0.01), GOV-DAMJLpos (α=-0.0098, p<0.05). These endogeneity tests validate the initial findings, indicating that while the relationship between ESG practices and AEM is significant in limited number of cases, with notably increased significance during pandemic period.

Endogeneity check based on 2SLS method

The inconclusive results previously obtained from the GMM estimations, particularly in relation to the Sargan and Hansen tests for the MJL model, may be attributed to dynamic influences. To further address endogeneity concern, an instrumental variable approach is employed. The two-stage least squares method's results are reported in Table 8 and Table 9, corresponding to the two alternatives proposed for the IVs. Muchmore, the regressions are conducted on the absolute, positive, and negative values of AEM, respectively.

Tab. 8 – Endogeneity results using 2SLS method with lagged ESG as instrumental variable. Source: own research

VARIABLES	MJK model					
	1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage
	ESG	DAMJKabs	ESG	DAMJKpos	ESG	DAMJKneg
RH1 validation: Robustness tests using 2SLS method						
ESG		0.0013**		0.0005		0.0001
		(2.2111)		(0.3915)		(0.6969)
L1.ESG	0.8201***		0.8324***		0.8725***	
	(100.3676)		(61.6947)		(80.7042)	
F-statistics	22869.3***		5973.67***		8573.5***	

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(instrument)						
RH2 validation: Robustness tests using 2SLS method						
ESG		0.0008		-0.0018		0.0004*
		(0.9774)		(-1.1362)		(1.7570)
L1.ESG	0.7846***		0.7531***		0.8140***	
	(76.0512)		(42.4281)		(53.7879)	
Pandemic	-9.1957***	-0.4129***	-10.0596***	-0.5107***	-7.5549***	0.0244
	(-13.2169)	(-7.7679)	(-8.3915)	(-4.8144)	(-6.7143)	(1.5671)
ESG*Pandemic	0.1778***	0.0010	0.2006***	0.0043**	0.1507***	-0.0005**
	(16.2225)	(1.1867)	(10.8266)	(2.4741)	(8.6150)	(-2.1098)
F-statistics (instrument)	14,078.9***		3647.55***		5186.96***	
Observations	4,568		1,223	1,223	1,480	1,480
No. of companies	1,450		675	675	793	793
VARIABLES	MJL model					
	1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage
	ESG	DAMJLabs	ESG	DAMJLpos	ESG	DAMJLneg
RH1 validation: Robustness tests using 2SLS method						
ESG		-0.0001		-0.0002		0.0003
		(-0.7583)		(-1.1677)		(1.0710)
L1.ESG	0.8201***		0.8248***		0.8674***	
	(100.3676)		(57.0608)		(82.8650)	
F-statistics (instrument)	22869.3***		7074.6***		5009.02***	
RH2 validation: Robustness tests using 2SLS method						
ESG		0.0002		0.0001		0.0004
		(1.0194)		(0.2619)		(0.9364)
L1.ESG	0.7846***		0.7810***		0.7873***	
	(76.0512)		(45.0265)		(51.1351)	
Pandemic	-9.1957***	0.0804***	-7.8569***	0.0427***	-9.4265***	-0.0461
	(-13.2169)	(4.8989)	(-6.0571)	(2.7369)	(-8.3188)	(-1.4804)
ESG*Pandemic	0.1778***	-0.0007***	0.1509***	-0.0006**	0.1866***	-0.0001
	(16.2225)	(-2.7792)	(7.7847)	(-2.2067)	(10.4710)	(-0.2745)
F-statistics (instrument)	14,078.9***		5009.02***		4246.34***	
Observations	4,568	4,568	1,300	1,300	1,372	1,372
No. of companies	1,450	1,450	679	679	757	757

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Notes: L1.ESG is the lagged ESG used as instrumental variable. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Year, sector and country fixed effects were used. Robust t-statistics in parentheses. Data were analyzed with STATA statistical software.

As shown in Table 8, in the first stage of the regression analysis, the coefficients of the lagged one-period ESG variable (L1.ESG) exceed 0.8 and are statistically significant at the $p<0.01$, indicating that this variable strongly predicts the independent variable. In the second stage, the coefficients of fitted ESG (estimations based on one-year lagged ESG) exhibit signs consistent with those observed in the baseline regressions (presented in Tables 4 and 5), aligning with previous findings in this study. Furthermore, the F-test statistics for the instruments range from 5,009.02 to 22,869.3 ($p < 0.01$) when the pandemic is not included as moderating variable, and from 3,647.55 to 14,078.9 ($p<0.01$) when the pandemic is considered. These results demonstrate that L1.ESG is a robust and valid instrumental variable, free from collinearity concerns and not weak. Consequently, the analytical conclusions drawn earlier on this study remain unaffected by the endogeneity issues.

Building on the argument of Nguyen et al. (2024), a company's ESG score tends to correlate with that of its industry peers due to similarities in business composition and investment prospects, whereas its engagement in earnings manipulation is not directly influenced by the industry average. This rationale supports the use of the industry-average value of ESG as a valid instrumental variable. The results are synthesized in Table 9.

Tab. 9 – Endogeneity results using 2SLS method with IND_ESG as instrumental variable. Source: own research

VARIABLES	MJK model					
	1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage
	ESG	DAMJKabs	ESG	DAMJKpos	ESG	DAMJKneg
RH1 validation: Robustness tests using 2SLS method						
ESG		-0.0132***		-0.0191**		0.0048***
		(-3.1751)		(-2.3343)		(2.9316)
IND_ESG	0.2858***		0.2555***		0.3042***	
	(4.8572)		(3.3327)		(4.8705)	
F-statistics (instrument)	94.4632***		45.4227***		48.0968***	
RH2 validation: Robustness tests using 2SLS method						
ESG		-0.0191***		-0.0287**		0.0065***
		(-3.2844)		(-2.4080)		(3.0141)
IND_ESG	0.2376***		0.2330***		0.2449***	
	(4.6792)		(3.4280)		(4.5438)	
Pandemic	-6.3402***	-0.7299***	-6.5350***	-1.0921***	-6.9370***	0.2343***
	(-7.1247)	(-3.7698)	(-5.3411)	(-2.7608)	(-5.6299)	(3.2369)
ESG*Pandemic	0.2649***	0.0146***	0.2777***	0.0221***	0.2634***	-0.0049***

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	(19.4725)	(3.6635)	(15.1522)	(2.6933)	(14.5850)	(-3.3161)
F-statistics (instrument)	70.9033***		31.8358***		39.5217***	
Observations	6,283	6,283	2,971	2,971	3,312	3,312
No. of companies	1,709	1,709	1,346	1,346	1,388	1,388
VARIABLES	MJL model					
	1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage
	ESG	DAMJLabs	ESG	DAMJLpos	ESG	DAMJLneg
RH1 validation: Robustness tests using 2SLS method						
ESG		-0.0066***		-0.0063***		0.0072***
		(-4.8573)		(-3.2112)		(3.8857)
IND_ESG	0.2858***		0.2738***		0.3186***	
	(4.8572)		(3.6757)		(5.0885)	
F-statistics (instrument)	94.4632***		39.779***		55.4938***	
RH2 validation: Robustness tests using 2SLS method						
ESG		-0.0089***		-0.0089***		0.0095***
		(-4.6135)		(-2.9223)		(3.8373)
IND_ESG	0.2376***		0.2423***		0.2628***	
	(4.6792)		(3.6608)		(5.0361)	
Pandemic	-6.3402***	-0.2265***	-6.0055***	-0.1996**	-10.0832***	0.2830***
	(-7.1247)	(-3.5196)	(-4.8584)	(-2.1045)	(-7.8282)	(3.2479)
ESG*Pandemic	0.2649***	0.0058***	0.2628***	0.0053***	0.3133***	-0.0066***
	(19.4725)	(4.3580)	(13.9716)	(2.6534)	(17.2514)	(-3.8121)
F-statistics (instrument)	70.9033***		25.5367***		48.2117***	
Observations	6,283	6,283	3,095	3,095	3,188	3,188
No. of companies	1,709	1,709	1,351	1,351	1,399	1,399

Notes: IND_ESG is the industry-average value of ESG used as instrumental variable. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Year, sector and country fixed effects were used. Robust t-statistics in parentheses. Data were analyzed with STATA statistical software.

As shown in Table 9, in the first stage regression, the coefficients of IND_ESG range from 0.2555 to 0.3186 and are statistically significant at $p<0.01$ level, confirming that this variable is a strong predictor of ESG score. In the second-stage regression, the coefficients of fitted ESG variable (derived from the industry-average ESG score) exhibit signs consistent with those obtained in the baseline regressions (presented in Tables 4 and 5) across most models, thereby supporting the robustness of earlier results. Notably, all second-stage coefficients are statistically significant at least at $p<0.05$ level. Additionally, the F-statistics for the instrumental

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variable range from 25.5367 (in the DAMLJpos model) to 94.4632 (in the DAMJKabs model), all significant at $p<0.01$ level. These results confirm that IND_ESG functions as a valid and strong instrument, reinforcing the conclusion that the regression estimates are not biased by endogeneity concerns.

5 CONCLUSION

The aim of this study is to examine the relationship between ESG practices and AEM orientation of European companies in light of ongoing changes in legal requirements aimed at providing more transparent information to investors. This research seeks to contribute to the understanding of how diverse management behavior shapes corporate competitiveness. The theoretical background integrates two perspectives of management behavior identified in the relevant literature: stewardship theory complemented by stakeholder theory (ethical managers) and agency theory (opportunistic managers). This dual approach is justified by the diverse and often conflicting empirical results reported in prior studies, which include positive, negative, mixed, or no correlation, depending on the type of earnings management (Deng et al., 2024).

The findings offer partial support for the first research hypothesis (RH1). Specifically, a significant impact of ESG practices on AEM may be observed only through positive and negative discretionary accruals in the MJK model, and absolute values within the MJL model. It is noteworthy that the significance and strength of these relationships is contingent upon management behavior, indicating higher earnings manipulation observed in performance-oriented companies (RH1.1) and lower earnings manipulation in growth-oriented companies (RH1.2), as the managers are more engaged in ESG practices. Additional insights relate to managerial incentives to manipulate earnings through income-increasing or income-decreasing techniques. The positive relationship between ESG practices and DAMJKpos indicates that European companies driven by short-term performance (MJK model) tend to engage more in income-increasing accruals. This result supports the opportunistic management behavior consistent with the agency theory. In this case, corporate managers manipulate earnings under the disguise of enhanced ESG practices. Results also suggest that companies with higher ESG scores tend to be less involved in income-decreasing accruals based on the MJK model and exhibit lower levels of accruals manipulation in the MJL model, regardless of the sign (absolute value). These findings imply that European companies actively engaged in ESG practices are more likely to pursue long-term growth objectives, thereby reducing incentives to manage earnings. In line with stewardship theory complemented by stakeholder theory, companies more concerned with ESG practices may behave more ethically, fostering more transparent, reliable, and high-quality financial information disclosure under specific circumstances.

Further analysis reveals specific nuances in the relationship between ESG practices and earnings management when the moderating effect of the pandemic period is considered. The estimating coefficients of ESG scores remain consistently significant and similar in magnitude compared to the scenario that excludes the pandemics' influence. However, the significance and the values of the interaction variable (ESG*Pandemic) differ markedly and only partially validate the second research hypothesis (RH2). These findings suggest that, for the European companies included in this study, the pandemic period exerts a moderating influence on the relationship between ESG practices and AEM, affecting both its magnitude and direction. Specifically, the pandemic period appears to amplify the relationship, with partial significance indicating an increase in earnings management practices as ESG scores increase when

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discretionary accruals are estimated with MJK model. This behavior aligns with agency theory, implying opportunistic incentives for European companies. In contrast, when discretionary accruals are estimated with MJL model, the significance shifts from the absolute accruals to positive accruals in relation to ESG scores, with negative impact, thereby supporting the stewardship theory.

Additionally, by examining European companies' disaggregated ESG scores across the three pillars (ENV, SOC, and GOV) during the 2015-2021 period, this study offers new insights into the role of management in mitigating earnings manipulation through specific ESG practices required by changes in sustainability regulations. The analysis is further enriched by considering the influence of the pandemic crisis. The findings reveal mixed results, showcasing the varying impacts of environmental, social, and governance practices on discretionary accruals. Among the three pillars, the governance score indicates the strongest and most statistically significant impact on positive discretionary accruals in comparison to environmental and social aspects, particularly in companies oriented toward performance (MJK model), primarily responding to shareholders' expectations. Notably, the positive coefficient shows a higher engagement in earnings management when the GOV score increases, suggesting opportunistic management behavior. According to agency theory, this may imply that European companies enhance their corporate governance practices as a means to conceal income-increasing earnings manipulations. This window-dressing practice identified in the study may be partially explained by the absence of mandatory governance-related requirements imbedded into sustainability reporting. The new, enhanced, provisions under the CSRD, extended toward governance aspects, could offer a valid response to realign management behavior and improve corporate competitiveness. Muchmore, companies with a growth-oriented perspective (MJL model) tend to place greater emphasis on environmental practices, aligning more closely with stakeholders' expectations. Results reveal that a higher environmental score is associated with reduced earnings management through positive discretionary accruals, supporting the compliance with sustainability requirements, leading to greater transparency in the information reported for stakeholders. Interestingly, for European companies that prioritize social aspects, the ESG practices – AEM relationship is found to be statistically insignificant. However, when analysis is moderated by the pandemic period, the impact on both absolute and positive accruals becomes significant for performance-oriented companies (MJK model) involved in environmental and social practices. Meanwhile, governance practices are found to exert a significant negative impact on absolute discretionary accruals among growth-oriented companies. These results underscore the changing behavior of managers under external conditions such as pandemic crisis, in combination with evolving internal strategies (performance versus growth orientation). Considering the pandemic influence, this study highlights changes in management behavior, illustrated by the higher significance and magnitude of ENV and SOC scores on absolute and positive discretionary accruals in MJK model, and of GOV score on absolute values of discretionary accruals in MJL model. Specifically, during the pandemic, companies oriented toward performance objectives exhibited significant increase in earnings management associated with greater engagement on environmental practices, but lower on social practices. Meanwhile, governance practices had a negative impact on earnings management among growth-oriented companies. This suggests that under extreme and unpredictable conditions, management behavior may align with stewardship theory, displaying less opportunism in the use of social and governance practices to manage earnings. Simultaneously, it appears that environmental practices were leveraged to

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conceal increased earnings manipulation, emphasizing the agency gap between management (agents) and shareholders (principals). To address endogeneity and ensure the robustness of the findings, this study employs the Generalized Method of Moments and the Two-Stage Least Squares (2SLS) estimation techniques.

Results may support further approaches debated in connection with IOSCO (2020) report's conclusion that companies are considerably more engaged in reporting non-financial information during the pandemic period. Specifically, practical implications reside in setting actionable insights for both companies and policymakers. One key recommendation is the need for differentiated strategies when integrating ESG practices, in order to balance competitiveness with financial transparency.

This study contributes to the literature by providing a comprehensive discussion grounded in empirical analysis of the contrasting behaviors of ethical versus opportunistic managers aiming to enhance corporate competitiveness during times of crisis. It offers new evidence relevant to corporate competitiveness in light of the ongoing European sustainability-related requirements, particularly under the unique influence of the pandemics. By considering managerial objectives and stakeholders' expectations, as framed by stewardship, stakeholders and agency theories, the findings suggest contingent engagement of ESG-oriented companies in earnings management, with notable behavioral shifts during pandemic period. Moreover, the environmental, social and governance pillars yield divergent implications for ESG practices on the accrual earnings management. For instance, one possible explanation for the conflicting impact of environmental score on earnings management (the positive relationship suggesting the opportunistic behavior) may be related to the relatively lower importance placed by stakeholders on environmental practices during pandemics, prioritizing social and governance aspects instead.

This paper is relevant to researchers, regulators, and practitioners as it highlights the incentives for using specific ESG practices considering each pillar distinctly and linking corporate objectives related to performance or growth with earnings management incentives. In this context, the extension of financial reporting toward sustainability reporting becomes increasingly important. This is currently a key priority both at the European level (the recent release and changes in the Corporate Sustainability Reporting Directive enforcement) and internationally (the IASB initiative to establish the International Sustainability Standards Board for setting IFRS Sustainability Standards). Furthermore, the mandatory provisions introduced by the Corporate Governance Codes and various regulations following the previous financial crisis, combined with disclosure requirements for social and environmental practices among European listed companies, provide an important setting for restricting discretionary earnings management. Management behavior supporting transparency, honesty and trustworthiness may be encouraged through sustainability incentives. Companies that aim to serve the interests of all stakeholders generally demonstrate more conservative approaches to earnings management. Extending these contributions, future research may advance by incorporating legitimacy theory alongside signaling theory to frame the concept of greenwashing through a negative narrative in corporate reporting. Thus, research may support companies in identifying appropriate practices to gain legitimacy by aligning with sustainability requirements and societal expectations, in order to reconcile their interests with those of stakeholders, without concealing poor performance or increased risks through earnings management.

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Potential limitations were addressed in this research by employing multiple measures of discretional accruals and by focusing specifically on European companies, facing similar legal requirements. However, this study covered a relatively short time frame, which limits the possibility of generalizing the findings. Further research may benefit from longitudinal studies that extend the analysis over a longer time span or explore other crisis contexts, characterizing the post-2021 period (such as the ongoing geopolitical conflicts) by including additional constraints that may affect corporate competitiveness. Moreover, the analysis was limited to European companies and relied exclusively on ESG (environmental, social, and governance) scores assessed and reported by Refinitiv Eikon database. Further research could investigate specific ESG categories or individual metrics disclosed by companies to better explain their earnings management behavior. Comparative research between emerging and developed European capital markets, or broader cross-regional analyses may enrich the understanding of contextual differences. Additionally, examining the moderating effect of various institutional, ethical, and cultural factors may offer deeper explanations for variations in management behavior. The significant differences observed between common law and civil law systems call for future research on complementary analysis of regulatory stringency and investor protection laws, aiming to enhance the granularity of the findings. Nonetheless, future research may explore the need to evaluate the relationship between corporate characteristics and the orientation toward double materiality. As a critical task for preparers, this line of investigation may provide further evidence on the discussion regarding the balance between financial and non-financial information disclosure.

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Contact information

Prof. Camelia Iuliana Lungu, Ph.D., Director of Doctoral School of Accounting
Bucharest University of Economic Studies
Faculty of Accounting and Management Information Systems
Department Accounting and Audit
Romania
E-mail: camelia.lungu@cig.ase.ro
ORCID: 0000-0003-3627-7493

Prof. Chirata Caraiani, Ph.D.
Bucharest University of Economic Studies
Faculty of Accounting and Management Information Systems
Department Accounting and Audit
Romania
E-mail: chirata.caraiani@cig.ase.ro
ORCID: 0000-0002-0568-3854

Prof. Cornelia Dascalu, Ph.D.
Bucharest University of Economic Studies
Faculty of Accounting and Management Information Systems
Department Accounting and Audit
Romania
E-mail: cornelia.dascalu@cig.ase.ro
ORCID: 0000-0002-8624-2312

Lecturer Florentin Caloian, Ph.D.
Bucharest University of Economic Studies
Faculty of Accounting and Management Information Systems
Department Accounting and Audit
Romania
E-mail: florentin.caloian@cig.ase.ro
ORCID: 0009-0007-9130-207X

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Appendix A – Sample description. Source: own research

Distribution of company-year observations by GICS sector

GICS Sector Name	GICS Sector Code	Freq.	Percent	Cum.
Communication Services	50	547	7.48	7.48
Consumer Discretionary	25	1083	14.81	22.29
Consumer Staples	30	544	7.44	29.72
Energy	10	405	5.54	35.26
Health Care	35	808	11.05	46.31
Industrials	20	2038	27.86	74.17
Information Technology	45	727	9.94	84.11
Materials	15	819	11.20	95.31
Utilities	55	343	4.69	100.00
Total		7314	100.00	

Distribution of company-year observations by country

Country of Headquarters	Freq.	Percent	Cum.
Austria	122	1.67	1.67
Belgium	174	2.38	4.05
Cyprus	30	0.41	4.46
Czech Republic	3	0.04	4.50
Denmark	217	2.97	7.47
Faroe Islands	4	0.05	7.52
Finland	230	3.14	10.66
France	621	8.49	19.16
Germany	826	11.29	30.45
Gibraltar	6	0.08	30.53
Greece	98	1.34	31.87
Guernsey	10	0.14	32.01
Hungary	23	0.31	32.32
Iceland	12	0.16	32.49
Ireland; Republic of	214	2.93	35.41
Isle of Man	12	0.16	35.58
Italy	298	4.07	39.65
Jersey	27	0.37	40.02

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Country of Headquarters	Freq.	Percent	Cum.
Luxembourg	104	1.42	41.44
Malta	21	0.29	41.73
Monaco	14	0.19	41.92
Netherlands	270	3.69	45.61
Norway	225	3.08	48.69
Poland	119	1.63	50.31
Portugal	54	0.74	51.05
Romania	1	0.01	51.07
Russia	196	2.68	53.75
Slovenia	5	0.07	53.81
Spain	284	3.88	57.70
Sweden	785	10.73	68.43
Switzerland	581	7.94	76.37
Ukraine	5	0.07	76.44
United Kingdom	1723	23.56	100.00
Total	7314	100.00	

Note. The frequency distributions are illustrated for the total number of company-year observations for which ESG and discretionary accruals are available in Eikon Refinitiv database for 2015-2021 period in European countries.

Appendix B – Variables and definitions. Source: own research

Variable	Definition
Dependent variables: Accrual Earnings Management (AEM)	
DAMJKabs	Absolute value of discretionary accruals estimated based on Kothari et al. (2005) model
DAMJKpos	Positive value of discretionary accruals estimated based on Kothari et al. (2005) model
DAMJKneg	Negative value of discretionary accruals estimated based on Kothari et al. (2005) model
DAMJLabs	Absolute value of discretionary accruals estimated based on Larcker and Richardson (2004) model
DAMJLpos	Positive value of discretionary accruals estimated based on Larcker and Richardson (2004) model

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Variable	Definition
DAMJLneg	Negative value of discretionary accruals estimated based on Larcker and Richardson (2004) model
Independent variables: Scores calculated based on Refinitiv (2022) methodology	
ESG	Refinitiv ESG Score is an overall company score based on the self-reported information in the environmental, social and corporate governance pillars.
ENV	The environmental pillar measures a company's impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long term shareholder value.
SOC	The social pillar measures a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It reflects company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value.
GOV	The corporate governance pillar measures a company's systems and processes, which ensure that its board members and executives act in the best interests of its long-term shareholders. It reflects a company's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks and balances in order to generate long term shareholder value.
Moderating variable	
Pandemic	Dummy variable equal to 1 for the pandemic crisis period (years 2020 and 2021), and 0 for the non-pandemic period (years 2015 to 2019)
Control variables	
SIZEA	Natural logarithm of total assets
MBV	Market value of equity scaled by book value of equity
avgROAind	Sector mean-adjusted ROA calculated based on lagged assets
GROWTH	Natural logarithm of absolute change in sales
LEV	Total debt scaled by total assets
FINRES	Cash flow from operating activities scaled by total assets
RDINT	R&D intensity calculated as R&D expense/net sales
LNMK	Natural logarithm of company’s market capitalization
EQUAL	Earnings quality country rank based on StarMine's Earnings Quality model, reflecting the degree to which past earnings are reliable and likely to persist, calculated as the percentile rank in which a security is compared to all other securities trading in the same country.
AGEln	Natural logarithm of (1 + the number of years since the date of incorporation)

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Variable	Definition
ACCd	Dummy variable equal to 1 if the company applies IFRS, and 0 if applies national accounting standards
ADTOPd	Dummy variable equal to 1 if the company has an unqualified audit opinion for the financial statements, and 0 otherwise
CFOdummy	Dummy variable equal to 1 if the company reports pre-managed earnings (measured by operating cash flow) higher than zero, and 0 otherwise
LawType	Dummy variable equal to 1 if the company is established in a civil law system and 0 if the company is established in a common law system

Appendix C – Tests for differences according to institutional context (LawType). Source: own research

Variables	Common Law		Civil Law		Std. Error	Mann Whitney Wilcoxon test	Kruskal-Wallis test
	N	Mean	N	Mean		z-stat	χ^2-stat
DAMJKabs	2022	0.107	5292	0.143	0.017	2.012**	4.050**
DAMJKpos	912	0.151	2608	0.217	0.035	-0.459	0.210
DAMJKneg	1110	-0.071	2684	-0.071	0.007	-3.121***	9.743***
DAMJLabs	2022	0.088	5292	0.090	0.006	2.508**	6.288**
DAMJLpos	971	0.078	2657	0.086	0.009	0.819	0.670
DAMJLneg	1051	-0.097	2635	-0.094	0.006	-2.576**	6.635**
ESG	2022	49.658	5292	53.860	0.536	-8.256***	68.160***
ENV	2022	41.731	5292	48.643	0.701	-10.068***	101.345***
SOC	2022	51.614	5292	58.479	0.615	-11.892***	141.428***
GOV	2022	54.065	5292	51.337	0.587	4.656***	21.680***

Notes. Variables are defined in Appendix B. The symbols ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

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