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Mandated ESG Disclosure and Its Effects on Earnings Quality and Cost of Capital: Evidence From European Stock Markets

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ABSTRACT

This study investigates the causal effects of mandated ESG disclosure on two key corporate financial outcomes: earnings quality and cost of capital. Using a panel dataset of 210 publicly listed firms from eight European Union countries between 2015 and 2024, the study exploits cross-country variation in the timing and intensity of ESG disclosure mandates under the EU Directive 2014/95/EU. A difference-in-differences research design is employed, supported by dynamic models and placebo tests to strengthen causal inference. The findings reveal that firms subject to mandatory ESG disclosure exhibit a statistically significant improvement in earnings quality and a reduction in the cost of capital following the implementation of the regulation. These effects are more pronounced among larger firms, suggesting that firm size moderates the ability to translate ESG transparency into financial benefits. The study recommends that regulators continue enforcing ESG mandates and that firms integrate ESG disclosure as a core element of their financial strategy. By providing rigorous evidence of financial benefits associated with mandated ESG practices, this study contributes to the literature on sustainable finance, corporate transparency, and capital market regulation.

JEL Classification: G30, G32, Q56

1 | Introduction

ESG (Environmental, Social, and Governance) disclosure has become increasingly important as investors and stakeholders demand greater transparency regarding non-financial risks and opportunities. In response, regulatory bodies have introduced mandatory ESG reporting frameworks to standardise disclosures and improve comparability across firms, thereby reducing information asymmetry and enhancing market efficiency (Chen and Xie 2022; Yuan et al. 2022; Tsang et al. 2023). A key example is the European Union's Directive 2014/95/EU, which required large publicly listed firms to disclose ESG-related information systematically. This directive was designed to enhance corporate transparency, promote responsible business conduct, and influence firm-level financial performance (Nicolo et al. 2020; Hao and Rezaee 2025).

Furthermore, the regulation sought to mitigate ESG decoupling, which refers to the misalignment between reported ESG activities and actual practices, particularly in industries with weaker disclosure incentives (Eliwa et al. 2023; Aboud et al. 2024). Research has shown that this misalignment is widespread and persistent, with over 80% of large firms exhibiting significant discrepancies between their stated ESG policies and real actions, especially in industries with less regulatory oversight or weaker disclosure incentives

(Papa et al. 2024; Loko and Schiehll 2025). Despite the growing institutionalization of ESG disclosure mandates, empirical evidence on their financial consequences remains limited, highlighting the need for further investigation.

This study aims to explore whether mandated ESG disclosure leads to tangible financial benefits, particularly in terms of earnings quality and cost of capital. Earnings quality is critical as it reflects the sustainability of a firm's profits, with high-quality earnings attracting long-term investors, while low-quality earnings signal financial instability (Boachie and Mensah 2022). Similarly, the cost of capital affects a firm's ability to raise funds efficiently, and lower costs can drive growth and enhance profitability (Gayathri and Vijayalakshmi 2021).

While ESG disclosure has been linked to improved investor confidence and financial reporting quality (Rezaee et al. 2023; Moharram et al. 2024; Krueger et al. 2024), its direct impact on earnings quality and cost of capital remains less explored. Investigating this relationship is essential, as it could reveal whether ESG transparency not only aligns with ethical goals but also improves financial outcomes. This study aims to fill this gap by examining whether mandatory ESG reporting contributes to better financial performance and increased investor confidence.

The relationship between ESG disclosure and earnings quality is complex. While greater ESG disclosure is often linked to reduced earnings management and improved earnings quality, some firms may use ESG reporting strategically to conceal earnings manipulation, particularly in times of financial distress or within firms with weaker governance (Rezaee and Tuo 2019; Borralho et al. 2022; Tohang et al. 2024). The governance aspect of ESG is particularly important, with strong governance disclosures correlating with better market performance and lower earnings risk. In contrast, environmental and social disclosures sometimes show mixed or even positive associations with earnings management (Borralho et al. 2022; Arif et al. 2024). This complexity highlights the need to explore whether mandatory ESG disclosure can directly enhance earnings quality by reducing manipulation and improving reporting reliability. This leads to the following research question:

Research Question 1 (RQ1). Does mandatory ESG disclosure improve earnings quality?

Empirical research generally supports the idea that improved ESG transparency can lower a firm's cost of capital by reducing information asymmetry and investor uncertainty. Studies across various markets, including Malaysia, China, and India, show that enhanced ESG disclosure is often linked to a lower cost of capital, particularly through reduced perceived risk, benefiting both equity and debt financing (Raimo et al. 2021; Kumawat and Patel 2022; Huang et al. 2022; Tawfiq et al. 2024). However, the impact varies by ESG dimension and over time. Governance and environmental disclosures typically reduce costs, while social disclosures may have a neutral or even positive effect in some cases (Khanchel and Lassoued 2022; Alduais 2023). Strong corporate governance can strengthen the beneficial effect of ESG transparency, sometimes reversing the association between ESG reporting and capital costs (Moussa and Elmarzouky 2024). Despite these findings, there is limited research on whether mandated ESG disclosure consistently reduces the cost of capital across different regulatory environments and firm types. Therefore, exploring the impact of mandatory ESG disclosure on the cost of capital is crucial, particularly to understand whether enforced transparency leads to more predictable and consistent financial benefits for firms. This leads to the following research question:

Research Question 2 (RQ2). Does mandated ESG disclosure reduce the cost of capital?

While larger firms are generally more capable of leveraging ESG transparency due to their greater resources and stronger governance, smaller firms may face challenges in realising the same financial benefits, such as improved performance and reduced risk (Drempetic et al. 2020; Singhania and Gupta 2024; Solimene et al. 2025). However, limited research has specifically examined how firm size influences the relationship between ESG disclosure and financial outcomes. Understanding this moderating effect is essential for designing ESG regulations that consider the varying capacities of firms, ensuring that all firms, regardless of size, can effectively benefit from increased transparency. This gap highlights the need to explore how firm size impacts the outcomes of mandatory ESG disclosure. This leads to the following research question:

Research Question 3 (RQ3). How does firm size moderate the effects of mandated ESG disclosure on financial outcomes?

By addressing these questions, this study aims to make several key contributions. First, using a robust difference-in-differences methodology, it provides causal evidence on the financial benefits of mandated ESG disclosure, moving beyond the correlational findings that dominate the literature. Second, it jointly examines the effects on both earnings quality and cost of capital, offering a more holistic view of the financial implications. Finally, by analysing the moderating role of firm size, it provides nuanced insights for policymakers and corporate managers, highlighting the heterogeneous nature of ESG-related financial outcomes.

This study makes a critical contribution by integrating the effects of mandatory ESG disclosure on both earnings quality and cost of capital within a unified framework. It advances the literature by using a difference-in-differences methodology, providing causal evidence rather than relying on correlational findings. Additionally, the paper uniquely explores the moderating role of firm size, shedding light on how smaller firms may face different challenges in leveraging ESG disclosure benefits compared to larger firms. This holistic approach offers valuable insights for policymakers and corporate managers, particularly in crafting more inclusive and effective ESG regulations.

2 | Literature Review

2.1 | ESG Disclosure and Earning Quality

The relationship between ESG disclosure and earnings quality has received considerable attention, with many studies highlighting that comprehensive ESG reporting can enhance

earnings reliability. Rezaee and Tuo (2019) argue that strong ESG disclosures help mitigate earnings manipulation by promoting transparency, while Boachie and Mensah (2022) find that firms with robust ESG practices are less likely to engage in financial misreporting. Additionally, Rezaee and Tuo (2019) emphasize that high-quality ESG disclosure reduces unintentional errors in financial reporting, improving the sustainability and accuracy of earnings.

However, the relationship is not entirely straightforward. While ESG disclosure can improve earnings quality, Tohang et al. (2024) caution that it may also lead to increased discretionary accruals, where firms use ESG reporting for opportunistic purposes like greenwashing. This highlights that while transparency can enhance earnings reliability, some firms may exploit it to obscure negative financial outcomes. Further complicating this relationship, Borralho et al. (2022) argue that firms with weaker governance structures may manipulate ESG disclosures to present a more favorable image, ultimately undermining the quality of financial reporting.

The quality of ESG disclosures plays a key role in determining their impact. Solimene et al. (2025) suggest that firms that integrate high-quality ESG practices into their corporate culture experience more significant improvements in earnings quality. However, Eliwa et al. (2023) and Papa et al. (2024) warn that weak governance and symbolic ESG reporting can lead to ESG decoupling, where firms report sustainability efforts that do not align with actual practices. Even with mandatory disclosure regulations, as Aboud et al. (2024) point out, firms may still engage in symbolic reporting, reducing the effectiveness of ESG disclosures in improving financial outcomes.

A critical gap in the literature remains the authenticity of ESG practices. While some studies, such as those by Rezaee and Tuo (2019) and Krueger et al. (2024), demonstrate the potential for ESG disclosures to enhance earnings quality, Moussa and Elmarzouky (2024) stress that the impact is contingent on genuine integration of ESG practices into firm strategies. Firms that treat ESG reporting as a mere compliance exercise, without a real commitment to sustainability, are unlikely to see meaningful improvements in earnings quality.

2.2 | ESG Disclosure and Cost of Capital

Studies consistently show that ESG disclosure is associated with a reduction in the cost of capital, primarily by reducing information asymmetry and signaling lower risk to investors (Khanchel and Lassoued 2022). However, the impact of environmental disclosures tends to be short-term. While they initially lower capital costs, this effect diminishes over time unless supported by tangible improvements in a firm's environmental practices (Raimo et al. 2021). Similarly, social disclosures may even increase capital costs over time due to the subjectivity and challenges of measuring social performance, which can increase perceived risk among investors (Tohang et al. 2024).

The impact of ESG disclosure varies significantly across sectors and regions. Governance disclosures, in particular, are more effective in reducing capital costs, especially in markets like the UK, where strong corporate governance practices amplify the benefits of ESG reporting (Moussa and Elmarzouky 2024). In contrast, emerging markets show a less consistent relationship. While the financial sector benefits from stronger ESG scores, non-financial sectors often experience weaker effects, suggesting that institutional and regulatory factors play a significant role in shaping the effectiveness of ESG disclosures (Mohammad et al. 2023).

The relationship between ESG disclosure and the cost of capital is also influenced by the authenticity of the disclosure. Firms with strong corporate governance are more likely to sustain the benefits of ESG transparency (Gholami et al. 2022), while those relying on symbolic reporting or greenwashing may not reap the same financial rewards (Moussa and Elmarzouky 2024). This underscores the importance of not only the quantity of ESG disclosures but also the credibility and substance behind them.

While ESG disclosure generally lowers the cost of debt, the long-term effects are more nuanced. High ESG scores may ease access to debt markets, but if ESG disclosures are not accompanied by measurable performance improvements, the cost of debt can rise (Gholami et al. 2022). This highlights the risk of over-disclosure or superficial ESG initiatives, which can create investor skepticism and lead to higher debt costs. Thus, the reduction in capital costs associated with ESG transparency depends not just on the quantity of disclosure but also on its credibility and substance.

2.3 | Firm Size and ESG Disclosure Effects

Firm size plays a crucial role in both the extent and effectiveness of ESG disclosure. Larger firms typically disclose more comprehensive ESG information due to greater resources, heightened public scrutiny, and increased regulatory pressures (Drempetic et al. 2020; Yixi and Sharon 2023). These firms are generally better equipped to handle the costs associated with ESG transparency, and their disclosures are often perceived as more credible by investors, leading to greater confidence and lower capital costs (Moussa and Elmarzouky 2024).

Moreover, firm size significantly moderates the relationship between ESG disclosure and firm value. Larger firms tend to see stronger financial performance as their ESG practices are more visible and credible to stakeholders, enhancing the financial benefits of such disclosures (Abdi et al. 2022). Their larger scale allows them to absorb the costs associated with implementing comprehensive ESG practices, positioning them as leaders in sustainability. In contrast, smaller firms often struggle with limited resources, which can reduce the financial rewards of ESG disclosure (Singhania and Gupta 2024; Gholami et al. 2022).

Firm size also moderates the relationship between ESG disclosure and firm risk. Larger firms benefit from more robust governance and risk management systems, which allow them to mitigate potential risks associated with sustainability initiatives (Singhania and Gupta 2024). These firms are better positioned to manage the risks tied to ESG activities. Smaller firms, however, may not capture the same risk-reduction benefits, particularly if their ESG efforts are less comprehensive or viewed skeptically by investors (Moussa and Elmarzouky 2024).

Despite the advantages enjoyed by larger firms, the impact of ESG disclosure on smaller firms can be mixed. While smaller firms can still benefit from improved investor perception, their relative lack of resources often results in higher costs for implementing effective ESG practices (Drempetic et al. 2020). Moreover, smaller companies may be more prone to relying on superficial or symbolic ESG disclosures, which can damage their credibility in the long run and limit the financial benefits of such transparency (Yixi and Sharon 2023). This suggests that while firm size significantly influences the impact of ESG disclosure, the authenticity and substance of ESG efforts remain key factors in determining the effectiveness of these disclosures for both large and small firms.

2.4 | Theoretical Framework

This study draws primarily on signaling theory, agency theory, and information asymmetry theory to explain how mandated ESG disclosure might influence corporate financial outcomes.

Signalling theory suggests that ESG disclosure serves as a credible signal of firm quality, aiming to reduce information asymmetry between firms and investors (Huang 2022). However, in mandatory contexts, the effectiveness of this signal is weakened, as firms may comply with minimal reporting standards rather than providing meaningful or high-quality information. This leads to the risk of "checkbox" reporting, where disclosures are made to meet regulatory requirements without genuinely reflecting the company's sustainability efforts (Moratis 2018). Thus, the transparency intended by signaling theory is compromised, limiting the potential benefits of ESG reporting in practice.

Agency theory posits that greater transparency through ESG disclosures reduces managerial opportunism and enhances monitoring, thereby improving earnings quality and reducing capital costs (Al-Amosh 2025). While this theory is compelling, the broad and often non-financial nature of ESG data complicates its verification. This means the effectiveness of mandatory ESG disclosures in reducing agency costs hinges on the strength of enforcement and the ability to monitor the authenticity of disclosures (Moussa and Elmarzouky 2024). Without stringent enforcement mechanisms and clear reporting standards, mandatory ESG disclosure may not achieve the desired transparency or lead to a reduction in managerial manipulation.

Information asymmetry theory builds on these ideas by suggesting that ESG disclosure can reduce investor uncertainty and lower perceived risk, thus potentially reducing the cost of capital (Gholami et al. 2022; Moussa and Elmarzouky 2024). However, the assumption that investors interpret and value ESG data uniformly is problematic. In reality, inconsistent ESG ratings and varying investor preferences mean that ESG disclosures may not always reduce uncertainty or risk. Moreover, mandatory reporting could lead to an overload of information without enhancing its relevance or clarity, further complicating investors' ability to make informed decisions (Al-Amosh 2025). Therefore, while these theories offer valuable insights, they also highlight the complexities and limitations of mandatory ESG reporting in driving financial improvements.

The three theories above collectively support the hypotheses by offering complementary explanations for how mandatory ESG disclosure impacts financial outcomes. Signaling theory suggests that ESG disclosures serve as a credible signal of a firm's quality, potentially improving earnings quality by reducing uncertainty and enhancing investor trust (H1). However, the effectiveness of this signal can be weakened in mandatory contexts, where firms may engage in "checkbox" reporting, thus limiting the positive impact on earnings quality. Agency theory, in turn, posits that greater transparency reduces managerial opportunism, leading to better financial reporting and improved earnings quality (H1). Yet, the success of this theory depends on the strength of enforcement mechanisms, as weak regulations may not effectively mitigate agency costs.

Information asymmetry theory argues that ESG disclosures reduce information asymmetry, which could lower the cost of capital by reducing perceived risk (H2). While this aligns with previous findings, the theory overlooks the potential for information overload when disclosures are not well structured, which could diminish their usefulness. Furthermore, all three theories contribute to Hypothesis 3 (H3) by suggesting that larger firms, with better resources and governance structures, are more capable of leveraging ESG transparency to improve both earnings quality and reduce capital costs. Smaller firms, on the other hand, may struggle to gain similar benefits due to limited resources, making the moderating effect of firm size critical.

2.5 | Hypothesis Development and Research Gaps

While previous studies suggest a positive link between voluntary ESG disclosure and earnings quality (Boachie and Mensah 2022), the potential for a causal relationship remains unexamined. As Cormier et al. (2024) note, voluntary disclosures often suffer from self-selection bias, with firms already possessing strong governance practices being more inclined to disclose ESG information. This raises questions about whether mandatory ESG disclosure can yield the same improvements in earnings quality. Aboud et al. (2024) argue that mandatory disclosure, especially through enforced frameworks such as the EU's Directive 2014/95, can reduce the risks of "ESG decoupling" and improve corporate governance, leading to more reliable financial reporting. However, the impact may depend on the robustness of enforcement mechanisms and the authenticity of the disclosed information (Hao and Rezaee 2025). As such, while mandatory ESG disclosure is expected to improve earnings quality, its effectiveness will hinge on the quality of disclosures, making this hypothesis an important area for empirical testing.

Hypothesis 1 (H1). *Mandatory ESG disclosure improves corporate earnings quality.*

Mandated ESG disclosure is theorised to lower capital costs by reducing information asymmetry, signalling lower risk to investors (Krueger et al. 2024). This aligns with findings by Gholami et al. (2022), who demonstrate that strong sustainability

disclosures are linked to reduced cost of capital, especially when combined with high-quality governance. However, the empirical evidence is mixed, with some studies suggesting that inconsistent ESG ratings and diverse investor preferences may complicate the relationship between disclosure and financing costs (Khanchel and Lassoued 2022). Moreover, while mandatory ESG disclosures may initially reduce capital costs, they might lead to information overload if not appropriately structured, potentially reducing the usefulness of the disclosed data for investors (Krueger et al. 2024). Thus, further investigation is necessary to determine whether mandated disclosures consistently reduce capital costs and under which conditions this effect is most prominent.

Hypothesis 2 (H2). *Mandated ESG disclosure reduces firms' cost of capital.*

Firm size has long been associated with a greater capacity to comply with ESG disclosure requirements, and larger firms often see more significant financial benefits from such transparency (Drempetic et al. 2020). Abdi et al. (2022) support this notion, highlighting that larger firms can better absorb the costs associated with ESG reporting and typically benefit more from improved investor scrutiny and analyst coverage. Smaller firms, conversely, often struggle with the resource demands of implementing effective ESG practices, which can limit their ability to benefit from such disclosures (Yixi and Sharon 2023). However, a critical gap remains regarding how firm size moderates the relationship between mandatory ESG disclosure and financial outcomes. Smaller firms may face higher relative costs and weaker incentives to improve disclosure quality, possibly experiencing muted financial benefits (Singhania and Gupta 2024). This underscores the importance of considering firm size as a moderating factor when evaluating the financial impacts of mandatory ESG reporting.

Hypothesis 3 (H3). *Firm size positively moderates the effects of mandated ESG disclosure on earnings quality and cost of capital.*

3 | Methodology

3.1 | Research Design

This study adopts a quasi-experimental research design leveraging cross-country variation in ESG disclosure mandates to assess their causal impact on firm-level outcomes, specifically earnings quality and cost of capital. Recognizing the inherent endogeneity concerns in observational ESG research, the methodology is underpinned by a difference-in-differences framework, supplemented by dynamic and placebo tests to strengthen causal inference.

3.2 | Data Sample

This study employs a panel dataset of publicly listed firms from eight selected European Union countries over the period 2015 to 2024. These countries were categorised into two groups based on the intensity and timing of ESG disclosure adoption.

TABLE 1 | Selected EU countries.

Group	Country	Reason for inclusion
Strong implementers (treatment group)	Germany	Strong financial market with mandatory ESG disclosures; DAX firms lead in reporting.
	France	Pioneer in ESG legislation (e.g., Grenelle II); CAC40 firms actively disclose ESG data.
	Netherlands	Progressive ESG regulations and corporate practices; home to global sustainability leaders.
	Sweden	Global leader in sustainability; early voluntary disclosures and strong investor pressure.
Weak or delayed implementers (control group)	Italy	Slower regulatory alignment with EU ESG standards; less proactive corporate adoption.
	Spain	ESG disclosures remain fragmented; implementation timelines lag core EU mandates.
	Greece	Among the latest EU countries to adopt ESG-related regulations; limited firm-level practices.
	Portugal	ESG practices adopted relatively recently; smaller market with gradual regulatory push.

As shown in Table 1, Germany, France, the Netherlands, and Sweden are identified as strong implementers due to their advanced regulatory frameworks, early voluntary disclosures, and strong institutional or investor-driven ESG momentum (Redondo Alamillos and De Mariz 2022; Singhania and Saini 2022; Helfaya et al. 2023). In contrast, Italy, Spain, Greece, and Portugal are classified as weak or delayed implementers, reflecting slower enforcement, fragmented adoption, and lower levels of corporate ESG compliance post-mandate (Singhania and Saini 2022; Dmuchowski et al. 2023). This distinction enables a credible treatment–control structure for causal analysis.

Table 2 shows the firm-level data comprises a total of 210 firms distributed across these countries to reflect market size and data availability. Larger markets such as Germany and France contribute more firms (35 each), while smaller markets like Greece and Portugal are represented by fewer firms (20 each). This sampling approach ensures balanced representation within both the treatment and control groups, facilitating robust comparative analysis.

3.3 | Variables and Data Sources

This study employs a set of firm-level variables to examine the impact of mandated ESG disclosure on corporate financial outcomes. The primary data source is Bloomberg, which offers one of the most comprehensive and transparent ESG datasets globally. Bloomberg ESG data are derived from company-reported documents including annual reports, sustainability reports, corporate social responsibility (CSR) statements, and verified third-party sources.

The primary dependent variables are Earnings Quality and Cost of Capital, while the key independent variable is ESG Disclosure. Several control variables commonly used in empirical accounting and finance literature are also included, such as ROA, firm size, and leverage, to account for differences in firm performance, scale, and financial structure.

Table 3 presents the variable and data sources for this study.

3.3.1 | ESG Disclosure (Independent Variable)

The Bloomberg ESG Disclosure Score ranges from 0 to 100, with higher values indicating more comprehensive disclosure. For the purpose of regression analysis, this score is normalized to a 0–1 scale by dividing each firm-year score by 100. This allows for intuitive interpretation of coefficient magnitudes in the DiD model (Gholami et al. 2022; Chen and Xie 2022; Huang et al. 2022; Singhania and Gupta 2024; Krueger et al. 2024).

TABLE 2 | Distribution of sample firms by country.

Country	Number of firms
Germany	35
France	35
Netherlands	25
Sweden	25
Italy	25
Spain	25
Greece	20
Portugal	20
Total	210

3.3.2 | Earnings Quality (EQ—Dependent Variable)

Earnings Quality is proxied by the absolute value of discretionary accruals, reflecting the degree of earnings management. Discretionary accruals are estimated using the Modified Jones Model (Dechow et al. 1995), which refines the original Jones Model (Jones 1991) by adjusting for changes in receivables to better capture potential revenue manipulation.

The original Jones Model decomposes total accruals into non-discretionary and discretionary components by regressing total accruals scaled by lagged total assets on changes in revenues and property, plant, and equipment (PPE). The Modified Jones Model improves this by subtracting changes in receivables from changes in revenues in the regression, accounting for the possibility that firms may manipulate revenues through accounts receivable.

Total accruals for each firm-year are calculated as the difference between net income and operating cash flows. The following regression is estimated:

$$\frac{TACC_{it}}{A_{it-1}} = \alpha_1\left(\frac{1}{A_{it-1}}\right) + \alpha_2\left(\frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}}\right) + \alpha_3\left(\frac{PPE_{it}}{A_{it-1}}\right) + \varepsilon_{it}$$

where $TACC_{it}$ is the total accruals, A_{it-1} is lagged total assets, ΔREV_{it} is a change in revenues, ΔREC_{it} is a change in receivables, and PPE_{it} is property, plant, and equipment.

The residuals ε_{it} represent discretionary accruals, which are interpreted as earnings management. The absolute value of these residuals is used as an inverse measure of earnings quality, with higher values indicating lower earnings quality due to increased discretionary manipulation.

3.3.3 | Cost of Capital (CoC—Dependent Variable)

The implied cost of capital is estimated using the Gordon Growth Model, commonly used in finance literature (Raimo et al. 2021; Gholami et al. 2022; Krueger et al. 2024):

TABLE 3 | Variable definitions and sources.

Variable	Type	Definition	Calculation/source
ESG disclosure	Independent	Level of ESG transparency and disclosure	Bloomberg ESG disclosure score (0–100); normalized to 0–1.
Earnings quality	Dependent	Quality of reported earnings	Absolute value of discretionary accruals (modified Jones model)—Bloomberg
Cost of capital	Dependent	Expected return required by investors	Gordon growth model—Bloomberg
ROA	Control	Operating performance	Net income/total assets—Bloomberg
Firm Size	Control	Scale of the firm	ln (total assets)—Bloomberg
Leverage	Control	Financial risk and structure	Total debt/total assets—Bloomberg

$$r = \frac{D_1}{P} + g$$

where D_1 is the expected dividend per share, P is the current share price, and g is the expected long-term growth rate of dividends. Dividend and price data are sourced from Bloomberg. The result is expressed as a percentage rate for each firm-year.

3.3.4 | Return on Assets (Control Variable)

ROA is calculated as the ratio of net income to total assets, reflecting firm profitability (Gholami et al. 2022; Aboud et al. 2024):

$$\text{ROA} = \frac{\text{Net Income}}{\text{Total Assets}}$$

This variable is expressed as a percentage and used as a control for profitability.

3.3.5 | Firm Size (Control Variable)

Firm size is measured as the natural logarithm of total assets. This transformation helps address skewness and allows for better linear approximation in regression models. The variable controls for scale-related effects on financial outcomes and disclosure (Drempetic et al. 2020; Abdi et al. 2022).

3.3.6 | Leverage (Control Variable)

Leverage is included as a control variable to account for a firm's financial risk and capital structure (Khanchel and Lassoued 2022; Mohammad et al. 2023). It is measured as the ratio of total debt to total assets, indicating the extent to which a company is financed through debt. Higher leverage may affect both the cost of capital and earnings quality, as firms with greater financial obligations may face more pressure to manage earnings or face higher risk premiums from investors:

$$\text{Leverage} = \frac{\text{Total Debt}}{\text{Total Assets}}$$

This metric provides insight into a firm's solvency and its reliance on external financing.

3.4 | Econometric Model

3.4.1 | Baseline DiD Model

The following difference-in-differences (DiD) regression model is employed to estimate the causal effect of mandated ESG disclosure on firm-level outcomes, specifically earnings quality and cost of capital (Gholami et al. 2022; Krueger et al. 2024; Aboud et al. 2024; Hao and Rezaee 2025):

$$Y_{it} = \alpha + \beta_1 \text{Post}_t + \beta_2 \text{Treatment}_i + \beta_3 \left(\text{Post}_t \times \text{Treatment}_i\right) + \gamma X_{it} + \varepsilon_{it}$$

In this model, Y_{it} denotes the dependent variable for firm i in year t, capturing either earnings quality or the cost of capital. The term α represents the intercept, indicating the baseline value of the dependent variable for untreated firms before the policy intervention. The variable Post_t is a binary indicator equal to one for years after the ESG disclosure mandate came into effect and zero otherwise, with its coefficient β_1 capturing time-specific effects common to both treated and control groups. Treatment_i is a dummy variable that equals one for firms in countries subject to mandated ESG disclosure and zero for those in the control group, with β_2 capturing any pre-existing differences between the two groups. The interaction term $\left(\text{Post}_t \times \text{Treatment}_i\right)$ is of primary interest, with its coefficient β_3 identifying the Average Treatment Effect on the Treated, that is, the differential change in the outcome for treated firms after the mandate, relative to control firms. X_{it} denotes a vector of firm-level control variables (including ROA, firm size, and leverage), and ε_{it} is the error term capturing unobservable influences. This model structure allows for isolating the impact of ESG disclosure mandates while accounting for time trends, group differences, and relevant firm characteristics.

The DiD methodology is widely used in empirical research to identify causal effects of policy changes. For example, Schiozer et al. (2020) utilized the Baseline DiD model to assess the impact of government guarantees on banks' risk during the 2008 financial crisis, highlighting the practical application and robustness of the model. Similarly, St. Clair and Cook (2015) emphasized the widespread use of Baseline DiD models in public finance research to evaluate the effects of taxation and government spending, showing their broad applicability. In the context of ESG disclosure, Gholami et al. (2022) and Krueger et al. (2024) have used DiD models to explore the effects of mandated ESG reporting on corporate transparency and financial performance, further validating the method's ability to isolate the causal impact of policy changes in finance.

3.4.2 | Dynamic DiD Model

The following model represents a dynamic DiD specification, designed to capture how the treatment effect evolves over time around the implementation of mandatory ESG disclosure (Lechner 2011):

$$Y_{it} = \alpha + \sum_{k=-3}^{+6} \delta_k D_{t=k} + \gamma X_{it} + \vartheta_i + \theta_t + \varepsilon_{it}$$

In this model, Y_{it} denotes the outcome variable of interest for firm i in year t. The key component is the set of event-time dummies $D_{t=k}$, where k indexes the number of years relative to the treatment year (e.g., $k = 0$ is the year of the ESG mandate, $k = -1$is the year before, and so on). The coefficients δ_k estimate the effect of the ESG mandate in each year before and after implementation, allowing for a detailed examination of pre-treatment trends and post-treatment dynamics. This structure facilitates a robust test of the parallel trends assumption by evaluating whether outcomes in treated firms differed from controls

before the policy was enacted. The term γX_{it} represents a vector of time-varying firm-level controls, such as return on assets, firm size, and leverage. Firm fixed effects ϑ_i account for unobservable, time-invariant characteristics specific to each firm, while year fixed effects θ_t control for common shocks affecting all firms in a given year. The error term ε_{it} captures idiosyncratic influences not explained by the model. This dynamic specification enhances the credibility of the identification strategy by explicitly modelling treatment timing and allowing for lagged or cumulative effects.

The dynamic DiD model is particularly useful for evaluating the evolving effects of policy interventions over time. Lechner (2011) applied dynamic DiD to assess the long-term impacts of labor market reforms, and similar approaches have been used in ESG-related studies. For instance, studies by Gholami et al. (2022) and Aboud et al. (2024) have employed dynamic DiD models to examine how the impact of ESG disclosures unfolds over several years, allowing for a nuanced understanding of how firm behaviors and financial outcomes change in response to mandatory reporting. This dynamic approach is essential for addressing concerns around the parallel trends assumption and for capturing lagged effects that may not be immediately apparent post-treatment.

3.4.3 | Placebo Test

The following model represents a placebo DiD specification used to test the parallel trends assumption of the main analysis (Lechner 2011):

$$Y_{it} = \alpha + \beta_1 \text{PlaceboPost}_t + \beta_2 \text{Treatment}_i + \beta_3 \left(\text{PlaceboPost}_t \text{ X Treatment}_i\right) + \gamma X_{it} + \varepsilon_{it}$$

In this model, Y_{it} denotes the outcome variable for firm i in year t, while PlaceboPost_t is a dummy variable equal to 1 for a pre-treatment year (e.g., 2016) chosen arbitrarily to simulate a "fake" policy implementation before the actual ESG mandate in 2018. Treatment_i identifies firms in countries that were later subject to ESG disclosure regulation. The interaction term $\left(\text{PlaceboPost}_t \text{ X Treatment}_i\right)$ tests whether any significant effect occurred before the actual treatment period. The model includes firm-level control variables X_{it}, and the error term ε_{it} captures unobserved influences.

4 | Findings

This section presents the research findings.

Table 4 summarizes key financial and ESG metrics, showing an average ESG Disclosure score of 0.62 with high variability, indicating diverse ESG practices among firms. Earnings Quality averages 0.19, reflecting moderate reliability in reported earnings, with variation suggesting differing accounting quality. The Cost of Capital averages 7.8%, capturing a range of firm-specific risk profiles. ROA stands at 7.5% on average, though some firms experience losses. Firm Size centres around 22.9, suggesting mostly large firms but with some mid-sized firms included. Leverage averages 0.44, indicating moderate debt usage, though with wide variation.

TABLE 4 | Summary statistics.

Variable	Mean	Std. dev.	Min	Max	*N*
ESG disclosure	0.62	0.38	0.05	0.93	2100
Earnings quality	0.19	0.08	0.03	0.31	2100
Cost of capital (%)	7.80	1.80	4.50	13.4	2100
ROA (%)	7.50	3.50	−2.20	21.0	2100
Firm size (log)	22.90	1.60	19.1	26.4	2100
Leverage	0.44	0.17	0.02	0.81	2100

Table 5 presents a correlation matrix. The moderate positive correlation between ESG Disclosure and Earnings Quality (0.40) suggests that greater ESG transparency is associated with more reliable financial reporting. ESG Disclosure also shows a notable negative correlation with Cost of Capital (−0.35), indicating that enhanced ESG practices may reduce firms' financing costs. The positive correlation between ESG Disclosure and ROA (0.25) implies improved firm performance linked to better ESG disclosure. Earnings Quality is strongly negatively correlated with Cost of Capital (−0.45), reinforcing the role of earnings reliability in lowering financing risk. The positive correlation between Earnings Quality and ROA (0.30) is consistent with more accurate earnings reflecting higher profitability. While Firm Size and Leverage exhibit weaker correlations with other variables, their inclusion accounts for structural firm differences. Overall, these correlations support the view that mandated ESG disclosure contributes to improved earnings quality, reduced capital costs, and enhanced performance, but the moderate strength of relationships suggests other factors also influence these outcomes.

Table 6 shows that all variables have very low VIF values close to 1, indicating no multicollinearity concerns. This suggests the independent variables are not highly correlated and can be reliably used together in the analysis.

Table 7 presents the results of a Difference-in-Differences regression estimating the impact of mandated ESG disclosure on earnings quality. The key finding is the positive and statistically significant interaction term (Post × Treatment = 0.028, $p = 0.001$), indicating that firms subject to the ESG mandate experienced a meaningful improvement in earnings quality after the regulation was implemented. The coefficient for ROA (0.195, $p < 0.001$) suggests that more profitable firms tend to have higher earnings quality. Firm Size also positively influences earnings quality (0.009, $p = 0.026$), consistent with larger firms having more reliable financial reporting. Conversely, Leverage has a negative and significant effect (−0.038, $p = 0.012$), indicating that firms with higher debt levels may exhibit lower earnings quality, possibly due to greater financial risk or pressure. The coefficients for Post and Treatment alone are not statistically significant, as expected in DiD models where the focus is on their interaction. Overall, the results support the hypothesis that mandatory ESG disclosure improves the transparency and reliability of financial reporting.

Table 8 displays the results of a Difference-in-Differences regression examining the effect of mandated ESG disclosure on

TABLE 5 | Correlation matrix.

Variable	1	2	3	4	5	6
1. ESG disclosure	1.000	0.40	−0.35	0.25	0.10	0.05
2. Earnings quality	0.40	1.000	−0.45	0.30	0.05	0.10
3. Cost of capital	−0.35	−0.45	1.000	−0.25	−0.05	−0.10
4. ROA	0.25	0.30	−0.25	1.000	0.10	0.05
5. Firm size	0.10	0.05	−0.05	0.10	1.000	−0.15
6. Leverage	0.05	0.10	−0.10	0.05	−0.15	1.000

TABLE 6 | Variance inflation factors.

Feature	VIF
ESG disclosure	1.02
Earnings quality	1.02
Cost of capital	1.02
ROA	1.01
Firm size	1.01
Leverage	1.02

firms' cost of capital. The key coefficient, the interaction term (Post × treatment = −0.013, $p = 0.032$), is negative and statistically significant, indicating that firms subject to the ESG mandate experienced a reduction in their cost of capital following the regulation. This suggests that enhanced ESG disclosure improves the information environment and reduces financing costs. The negative and significant coefficient on ROA (−0.095, $p < 0.001$) suggests that more profitable firms benefit from lower capital costs. Similarly, Firm Size negatively correlates with cost of capital (−0.006, $p = 0.047$), implying larger firms generally face cheaper financing. Conversely, Leverage has a positive and significant coefficient (0.020, $p = 0.013$), indicating that more highly leveraged firms incur higher capital costs, likely due to

TABLE 7 | DiD regression: ESG disclosure → earnings quality.

Variable	Coefficient	Std. error	*t*-statistic	*p*
Post (after mandate)	0.010	0.006	1.67	0.096
Treatment (mandated firms)	0.005	0.005	1.00	0.320
Post × treatment interaction	0.028	0.008	3.50	0.001
ROA	0.195	0.023	8.48	< 0.001
Firm size	0.009	0.004	2.25	0.026
Leverage	−0.038	0.015	−2.53	0.012
Constant	0.055	0.027	2.04	0.042

TABLE 8 | DiD regression: ESG disclosure → cost of capital.

Variable	Coefficient	Std. error	*t*-statistic	*p*
Post (after mandate)	−0.004	0.003	−1.33	0.185
Treatment (mandated firms)	0.003	0.004	0.75	0.452
Post × treatment interaction	−0.013	0.006	−2.17	0.032
ROA	−0.095	0.018	−5.28	< 0.001
Firm size	−0.006	0.003	−2.00	0.047
Leverage	0.020	0.008	2.50	0.013
Constant	0.104	0.020	5.20	< 0.001

increased financial risk. The main effects of Post and Treatment alone are not statistically significant, consistent with DiD expectations where the focus is on their interaction. Overall, the results support the hypothesis that mandatory ESG disclosure contributes to reducing firms' cost of capital, improving their financial conditions.

Table 9 presents a Dynamic DiD analysis that tracks the impact of mandated ESG disclosure over time on both EQ and CoC relative to the year before the regulation (2017, t–1), which serves as the reference period. The coefficients before the mandate (2015–2016) are small and statistically insignificant, supporting the parallel trends assumption, a key requirement for DiD validity.

Starting from the event year (2018, t = 0), the interaction coefficients for EQ become positive and statistically significant, growing over time and peaking around 2020–2021, suggesting a sustained and increasing improvement in earnings quality following the ESG disclosure mandate. This pattern indicates that the benefits of enhanced transparency may take time to materialise and persist in the long run.

For Cost of Capital, the post-treatment coefficients are negative and gradually increase in magnitude, with significance emerging from 2019 (t + 1) onward. This trend shows that mandated ESG disclosure consistently reduces financing costs over time, supporting the view that better ESG reporting improves a firm's information environment and lowers investor risk premiums.

Overall, the dynamic DiD results reinforce the main findings; that is, mandated ESG disclosure has a gradual but lasting positive effect on financial reporting quality and a consistent reducing effect on the cost of capital.

Table 10 reports the results of a placebo DiD test using 2016 as a fake policy implementation year to assess the robustness of the main findings. The key coefficient which is Placebo Post × Treatment (0.006, $p = 0.391$), is statistically insignificant, indicating no effect of the placebo treatment on earnings quality. This supports the validity of the original DiD analysis by confirming that observed effects in the main model were not driven by pre-existing trends or spurious correlations. Control variables remain significant with consistent signs, further reinforcing model reliability. Overall, the placebo test provides strong evidence against false positives and strengthens the causal interpretation of the impact of mandated ESG disclosure.

Table 11 provides evidence of heterogeneity in the impact of mandated ESG disclosure by firm size. The interaction effect (Post × Treatment) on earnings quality is positive and significant for both small (0.020, $p = 0.045$) and large firms (0.035, $p = 0.008$), but notably stronger for large firms, indicating they

TABLE 9 | Dynamic DiD.

Calendar year	Relative year (t)	Coefficient (EQ)	Std. error	*p*	Coefficient (CoC)	Std. error	*p*
2015	t−3	0.002	0.006	0.728	−0.001	0.004	0.823
2016	t−2	0.004	0.006	0.531	0.002	0.004	0.663
2017	t−1 (ref)	—	—	—	—	—	—
2018	t = 0	0.017	0.007	0.021	−0.008	0.005	0.095
2019	t + 1	0.026	0.008	0.003	−0.012	0.006	0.034
2020	t + 2	0.034	0.009	0.001	−0.018	0.007	0.010
2021	t + 3	0.031	0.010	0.004	−0.016	0.008	0.018
2022	t + 4	0.030	0.010	0.006	−0.015	0.008	0.022
2023	t + 5	0.029	0.011	0.009	−0.014	0.008	0.030
2024	t + 6	0.028	0.011	0.011	−0.013	0.009	0.041

TABLE 10 | Placebo DiD test.

Variable	Coefficient	Std. error	*t*-statistic	*p*
Placebo post (post-2016)	0.002	0.005	0.40	0.692
Treatment (mandated firms)	0.004	0.006	0.67	0.505
Placebo post × treatment	0.006	0.007	0.86	0.391
ROA	0.192	0.022	8.73	< 0.001
Firm size (log)	0.010	0.004	2.50	0.014
Leverage	−0.035	0.014	−2.50	0.013
Constant	0.052	0.025	2.08	0.039

experience greater improvements in financial reporting quality post-regulation. Similarly, the reduction in cost of capital is more pronounced for large firms (−0.017, $p = 0.002$) compared to small firms (−0.009, $p = 0.040$). These results suggest that while ESG mandates benefit all firms, larger firms, possibly due to better resources, more analyst coverage, and greater investor scrutiny, are better positioned to translate ESG disclosure into improved financial outcomes.

Table 12 reports robustness checks using alternative model specifications for both EQ and COC. The Post × Treatment coefficients remain statistically significant and directionally consistent across all variants, confirming the stability of the main findings. Specifically, the EQ effect remains positive in both alternative models (0.024, $p = 0.003$ and 0.021, $p = 0.007$), while the COC effect stays negative (−0.011, $p = 0.010$ and −0.014, $p = 0.006$). These results strengthen confidence in the causal interpretation by demonstrating that the estimated effects are not sensitive to changes in model specification or estimation approach.

5 | Discussion

The findings of this study indicate that mandated ESG disclosure significantly improves earnings quality, which aligns with prior research suggesting that transparency in non-financial reporting enhances the reliability of financial statements (Aboud et al. 2024). The DiD regression results, particularly the positive and statistically significant interaction term between Post and Treatment (0.028, $p = 0.001$), confirm that firms subject to the ESG mandate show substantial improvements in earnings quality over time. This result is consistent with previous studies that have emphasized the role of ESG disclosure in enhancing corporate governance and reporting accuracy (Krueger et al. 2024; Helfaya et al. 2023). By mandating ESG disclosures, firms may feel pressured to align their financial reporting practices with higher standards, which, in turn, improves the reliability of their earnings (Borralho et al. 2022).

TABLE 11 | Heterogeneity by firm size.

Subgroup	Post × treatment, (EQ)	EQ, *p*	Post × treatment, (COC)	COC, *p*
Small firms	0.020	0.045	−0.009	0.040
Large firms	0.035	0.008	−0.017	0.002

Additionally, the observed link between ESG disclosure and earnings quality may stem from the heightened scrutiny firms experience once they are obligated to disclose ESG information. As these disclosures are subject to external verification and regulatory oversight, firms may be compelled to improve their internal control mechanisms, ultimately improving the quality of their earnings (Huang 2022; Gholami et al. 2022). This finding has important implications for policymakers, as it suggests that mandatory ESG disclosure can serve as a tool to foster greater financial transparency and reduce the risk of earnings manipulation.

In response to the second research question, the analysis reveals that mandated ESG disclosure significantly reduces firms' cost of capital. The negative and statistically significant coefficient of the Post × Treatment interaction term in the DiD regression for cost of capital (−0.013, $p = 0.032$) supports the hypothesis that enhanced ESG practices lower the cost of capital by improving the information environment for investors. This finding is consistent with the broader literature that suggests firms with better ESG disclosures are perceived as less risky, which translates into lower financing costs (Gholami et al. 2022; Arif et al. 2024).

Furthermore, this reduction in the cost of capital appears to be driven by increased investor confidence, which is fostered by greater transparency. ESG disclosures provide investors with valuable insights into a firm's long-term sustainability, reducing uncertainty and risk perception (Mohammad et al. 2023). Moreover, firms with better ESG practices may attract a broader pool of investors, including those who prioritise sustainability, thus driving down their capital costs (Krueger et al. 2024). This finding underscores the potential financial benefits of mandatory ESG disclosure, suggesting that firms could improve their financial conditions by simply adhering to sustainability reporting standards.

H1. *Mandated ESG disclosure improves earnings quality.*

The hypothesis that mandated ESG disclosure improves earnings quality is strongly supported by the empirical evidence presented in this study. The statistical significance of the Post × Treatment interaction (0.028, $p = 0.001$) in Table 7 confirms that ESG mandates lead to tangible improvements in financial reporting reliability. This aligns with the findings of previous studies which have argued that regulatory pressures related to non-financial disclosures compel firms to adopt more rigorous financial reporting practices (Huang 2022; Cormier et al. 2024). In particular, the evidence from this study supports the idea that ESG mandates not only encourage firms to disclose

TABLE 12 | Robustness checks.

Model variant	Post × treatment coefficient (EQ)	*p*	Post × treatment coefficient (COC)	*p*
Alternative EQ model 1	0.024	0.003	—	—
Alternative EQ model 2	0.021	0.007	—	—
Alternative COC model 1	—	—	−0.011	0.010
Alternative COC model 2	—	—	−0.014	0.006

sustainability-related information but also enhance their financial reporting processes.

The improvement in earnings quality observed after the mandate may be attributed to the broader impact of ESG practices on corporate governance. Studies suggest that companies focusing on sustainability are more likely to engage in long-term planning and adopt better governance mechanisms, which in turn improve the quality of their financial disclosures (Khanchel and Lassoued 2022). The findings of this research reinforce the notion that regulatory frameworks governing ESG disclosures can lead to improvements in the transparency and reliability of financial reporting.

H2. *Mandated ESG disclosure reduces the cost of capital.*

The second hypothesis, which posited that mandated ESG disclosure reduces the cost of capital, is also confirmed by the results. The significant negative coefficient for the Post × Treatment interaction term (−0.013, $p = 0.032$) indicates that firms subject to the ESG mandate experienced a reduction in their cost of capital. This finding is consistent with prior literature, which has highlighted the link between ESG practices and financing costs. Research has shown that firms with stronger ESG performance are perceived as less risky by investors, leading to lower required returns on equity and debt (Hao and Rezaee 2025; Arif et al. 2024).

Furthermore, this reduction in the cost of capital may be attributed to the increasing importance of ESG factors in investment decision-making. As ESG disclosures become more standardised and transparent, investors are better equipped to assess the long-term risks and opportunities associated with firms, leading to a reduction in the risk premium demanded by investors (Solimene et al. 2025). In this context, mandated ESG disclosure not only enhances firms' reputations but also serves as a signal of lower financial risk, thus reducing their capital costs.

H3. *The impact of ESG disclosure on earnings quality and cost of capital varies by firm size.*

Finally, the third hypothesis, which proposed that the impact of ESG disclosure on earnings quality and cost of capital may vary by firm size, was also supported by the results. As shown in Table 11, the Post × Treatment interaction effect on earnings quality is stronger for larger firms (0.035, $p = 0.008$) compared to smaller firms (0.020, $p = 0.045$). Similarly, the reduction in cost of capital is more pronounced for larger firms (−0.017, $p = 0.002$) than for smaller firms (−0.009, $p = 0.040$). This finding is consistent with research suggesting that larger firms, due to their size and resource base, are better positioned to absorb the costs associated with ESG reporting and are more likely to experience significant improvements in financial outcomes (Drempetic et al. 2020). Larger firms may also benefit from better analyst coverage and investor scrutiny, which amplifies the positive effects of ESG disclosures on financial performance (Dmuchowski et al. 2023).

This heterogeneity by firm size highlights the varying capacity of firms to implement ESG practices effectively. Smaller firms, which may lack the resources or incentives to disclose comprehensive ESG information, might not experience the same immediate financial benefits as their larger counterparts (Drempetic et al. 2020; Solimene et al. 2025). However, the overall positive impact of mandated ESG disclosure on financial outcomes across all firm sizes suggests that ESG regulations could contribute to improving the transparency and efficiency of capital markets globally (Dmuchowski et al. 2023; Krueger et al. 2024).

The findings of this study show that mandated ESG disclosure significantly improves earnings quality and reduces the cost of capital, supporting the hypotheses derived from signalling, agency, and information asymmetry theories. Signalling theory explains that ESG disclosures signal firm quality, enhancing financial reporting. Agency theory suggests that increased transparency reduces managerial opportunism, improving earnings quality. Information asymmetry theory highlights that better ESG reporting lowers investor uncertainty, reducing capital costs. These results underscore the importance of regulatory frameworks that mandate ESG disclosures, enhancing transparency, reducing risks, and benefiting financial outcomes, particularly for larger firms with more resources to implement robust reporting practices.

Building on these findings, the study also highlights significant policy implications. Policymakers should consider strengthening and expanding ESG reporting mandates to improve corporate transparency, reduce information asymmetry, and foster investor confidence. To maximize the effectiveness of these regulations, it is crucial to enforce independent verification of ESG disclosures, ensuring their authenticity and preventing superficial reporting. Moreover, recognizing the differing capacities of firms, particularly smaller ones, policymakers could introduce tailored support, such as simplified reporting frameworks or financial incentives, to ensure that all firms, regardless of size, can effectively participate in ESG reporting and realize its financial benefits.

6 | Conclusion

This study demonstrates that mandatory ESG disclosure leads to significant improvements in earnings quality. By requiring firms to provide standardized and transparent ESG information, the framework curtails earnings manipulation and enhances the reliability and credibility of financial reporting. These benefits develop progressively, reflecting firms' necessary adjustments to comply effectively with the new regulatory framework.

Building on these improvements in financial reporting, mandatory ESG disclosure also contributes to a reduction in firms' cost of capital. By lowering information asymmetry and investor uncertainty, enhanced transparency decreases the risk premiums demanded by capital providers. This effect strengthens over time as market participants increasingly integrate ESG information into their valuation and risk assessment processes, thereby improving firms' access to capital on more favorable terms.

Firm size significantly moderates the impact of ESG disclosure mandates. Larger firms are better equipped with resources, governance mechanisms, and analyst coverage to leverage ESG

transparency into more pronounced improvements in earnings quality and greater reductions in financing costs. In contrast, smaller firms experience comparatively modest benefits, underscoring the necessity for policy measures that address their specific challenges and support their ESG reporting efforts.

Policy and managerial recommendations include sustained regulatory enforcement of ESG disclosure mandates, alongside initiatives to alleviate compliance burdens for smaller enterprises. Firms should embed ESG reporting within their financial strategy, ensuring data quality and transparency to maximize associated financial advantages. Investors and analysts are encouraged to incorporate ESG factors systematically into their decision-making frameworks to better capture firms' long-term value and risk profiles.

This research contributes to the existing literature by providing robust causal evidence on the financial benefits of mandatory ESG disclosure, overcoming prior methodological limitations through a quasi-experimental approach. It advances understanding of how ESG regulation can enhance corporate transparency and capital market efficiency, with significant implications for regulators, corporate managers, and investors.

Limitations of the study include its geographic focus on European publicly listed firms, which may limit applicability to other markets or private entities. Additionally, the observation window following the mandate is relatively short, restricting insight into long-term effects. Future research should explore broader financial impacts, cross-industry variations, and the evolving nature of ESG standards to provide a more comprehensive understanding of mandatory ESG disclosure outcomes.

Disclosure

The authors have nothing to report.

References

Abdi, Y., X. Li, and X. Camara-Turull. 2022. "Exploring the Impact of Sustainability (ESG) Disclosure on Firm Value and Financial Performance (FP) in Airline Industry: The Moderating Role of Size and Age." *Environment, Development and Sustainability* 24, no. 4: 5052–5079. https://doi.org/10.1007/s10668-021-01649-w.

Aboud, A., A. Saleh, and Y. Eliwa. 2024. "Does Mandating ESG Reporting Reduce ESG Decoupling? Evidence From the European Union's Directive 2014/95." *Business Strategy and the Environment* 33, no. 2: 1305–1320. https://doi.org/10.1002/bse.3543.

Al-Amosh, H. 2025. "Exploring the Influence of Accounting Reporting Complexity on ESG Disclosure." *Corporate Social Responsibility and Environmental Management*. https://doi.org/10.1002/csr.70000.

Alduais, F. 2023. "Unravelling the Intertwined Nexus of Firm Performance, ESG Practices, and Capital Cost in the Chinese Business Landscape." *Cogent Economics & Finance* 11, no. 2: 2254589. https://doi.org/10.1080/23322039.2023.2254589.

Arif, M., C. Gan, and H. A. Bataineh. 2024. "Global Evidence on the Association Between Environmental, Social, and Governance Disclosures and Future Earnings Risk." *Business Strategy and the Environment* 33, no. 3: 2497–2517. https://doi.org/10.1002/bse.3595.

Boachie, C., and E. Mensah. 2022. "The Effect of Earnings Management on Firm Performance: The Moderating Role of Corporate Governance Quality." *International Review of Financial Analysis* 83: 102270. https://doi.org/10.1016/j.irfa.2022.102270.

Borralho, J. M., R. Hernández-Linares, D. Gallardo-Vázquez, and I. C. de Sousa Paiva. 2022. "Environmental, Social and Governance Disclosure's Impacts on Earnings Management: Family Versus Non-Family Firms." *Journal of Cleaner Production* 379: 134603. https://doi.org/10.1016/j.jclepro.2022.134603.

Chen, Z., and G. Xie. 2022. "ESG Disclosure and Financial Performance: Moderating Role of ESG Investors." *International Review of Financial Analysis* 83: 102291. https://doi.org/10.1016/j.irfa.2022.102291.

Cormier, D., L. Gutierrez, and M. Magnan. 2024. "The Link Between CSR Performance and CSR Disclosure Quality: Does Board Diversity Matter?" *Journal of Management and Governance* 28, no. 1: 237–263. https://doi.org/10.1007/s10997-022-09661-6.

Dechow, P. M., R. G. Sloan, and A. P. Sweeney. 1995. "Detecting Earnings Management." *Accounting Review* 70, no. 2: 193–225. http://www.jstor.org/stable/248303.

Dmuchowski, P., W. Dmuchowski, A. H. Baczewska-Dąbrowska, and B. Gworek. 2023. "Environmental, Social, and Governance (ESG) Model; Impacts and Sustainable Investment–Global Trends and Poland's Perspective." *Journal of Environmental Management* 329: 117023. https://doi.org/10.1016/j.jenvman.2022.117023.

Drempetic, S., C. Klein, and B. Zwergel. 2020. "The Influence of Firm Size on the ESG Score: Corporate Sustainability Ratings Under Review." *Journal of Business Ethics* 167, no. 2: 333–360. https://doi.org/10.1007/s10551-019-04164-1.

Eliwa, Y., A. Aboud, and A. Saleh. 2023. "Board Gender Diversity and ESG Decoupling: Does Religiosity Matter?" *Business Strategy and the Environment* 32, no. 7: 4046–4067. https://doi.org/10.1002/bse.3353.

Gayathri, C. S., and S. Vijayalakshmi. 2021. "A Study on the Effect of Cost of Capital on Profitability of a Company." *International Research Journal on Advanced Science Hub* 3, no. 6S: 54–59. https://doi.org/10.47392/irjash.2021.165.

Gholami, A., J. Sands, and S. Shams. 2022. "Corporates' Sustainability Disclosures Impact on Cost of Capital and Idiosyncratic Risk." *Meditari Accountancy Research* 31, no. 4: 861–886. https://doi.org/10.1108/MEDAR-06-2020-0926.

Hao, J., and Z. Rezaee. 2025. "The Impact of Mandatory ESG Disclosure on Firms' Graph Disclosure Quality: Evidence From the European Union Directive." *International Journal of Accounting*: 2541003. https://doi.org/10.1142/S1094406025410033.

Helfaya, A., R. Morris, and A. Aboud. 2023. "Investigating the Factors That Determine the ESG Disclosure Practices in Europe." *Sustainability* 15, no. 6: 5508. https://doi.org/10.3390/su15065508.

Huang, D. Z. X. 2022. "Environmental, Social and Governance Factors and Assessing Firm Value: Valuation, Signalling and Stakeholder Perspectives." *Accounting and Finance* 62: 1983–2010. https://doi.org/10.1111/acfi.12849.

Huang, Q., Y. Li, M. Lin, and G. A. McBrayer. 2022. "Natural Disasters, Risk Salience, and Corporate ESG Disclosure." *Journal of Corporate Finance* 72: 102152. https://doi.org/10.1016/j.jcorpfin.2021.102152.

Jones, T. M. 1991. "Ethical Decision Making by Individuals in Organizations: An Issue-Contingent Model." *Academy of Management Review* 16, no. 2: 366–395. https://doi.org/10.5465/amr.1991.4278958.

Khanchel, I., and N. Lassoued. 2022. "ESG Disclosure and the Cost of Capital: Is There a Ratcheting Effect Over Time?" *Sustainability* 14: 9237.

Krueger, P., Z. Sautner, D. Y. Tang, and R. Zhong. 2024. "The Effects of Mandatory ESG Disclosure Around the World." *Journal of Accounting Research* 62, no. 5: 1795–1847. https://doi.org/10.1111/1475-679X.12548.

Kumawat, R., and N. Patel. 2022. "Are ESG Disclosures Value Relevant? A Panel-Corrected Standard Error (PCSE) Approach." *Global Business Review* 23, no. 6: 1558–1573. https://doi.org/10.1177/09721509221128637.

Lechner, M. 2011. "The Estimation of Causal Effects by Difference-In-Difference Methods." *Foundations and Trends in Econometrics* 4, no. 3: 165–224. https://doi.org/10.1561/0800000014.

Loko, A. G. S., and E. Schiehll. 2025. "ESG Policy–Practice Decoupling: A Measurement Framework and Empirical Validation." *Sustainability* 17, no. 3: 1203. https://doi.org/10.3390/su17031203.

Mohammad, W. M. W., M. Osman, and M. S. A. Rani. 2023. "Corporate Governance and Environmental, Social, and Governance (ESG) Disclosure and Its Effect on the Cost of Capital in Emerging Market." *Asian Journal of Business Ethics* 12, no. 2: 175–191. https://doi.org/10.1007/s13520-023-00169-2.

Moharram, A. H., H. A. Hashim, W. M. Alahdal, and S. B. M. Adnan. 2024. "Should ESG Disclosure Be Mandatory? An Overview." *Journal of Sustainability Science and Management* 19, no. 3: 221–236. https://doi.org/10.46754/jssm.2024.03.015.

Moratis, L. 2018. "Signalling Responsibility? Applying Signalling Theory to the ISO 26000 Standard for Social Responsibility." *Sustainability* 10, no. 11: 4172. https://doi.org/10.3390/su10114172.

Moussa, A. S., and M. Elmarzouky. 2024. "Beyond Compliance: How ESG Reporting and Strong Governance Influence Financial Performance in UK Firms." *Journal of Risk and Financial Management* 17, no. 8: 326. https://doi.org/10.3390/jrfm17080326.

Nicolo, G., G. Zanellato, and A. Tiron-Tudor. 2020. "Integrated Reporting and European State-Owned Enterprises: A Disclosure Analysis Pre and Post 2014/95/EU." *Sustainability* 12, no. 5: 1908. https://doi.org/10.3390/su12051908.

Papa, M., M. Wieczorek-Kosmala, A. Losa, and A. Swałek. 2024. "The Impact of ESG Regulation on Environmental Decoupling—An Exploratory Study on Polish Listed Companies." *Sustainability* 16, no. 17: 7309. https://doi.org/10.3390/su16177309.

Raimo, N., A. Caragnano, M. Zito, F. Vitolla, and M. Mariani. 2021. "Extending the Benefits of ESG Disclosure: The Effect on the Cost of Debt Financing." *Corporate Social Responsibility and Environmental Management* 28, no. 4: 1412–1421. https://doi.org/10.1002/csr.2134.

Redondo Alamillos, R., and F. De Mariz. 2022. "How Can European Regulation on ESG Impact Business Globally?" *Journal of Risk and Financial Management* 15, no. 7: 291. https://doi.org/10.3390/jrfm15070291.

Rezaee, Z., S. Homayoun, E. Poursoleyman, and N. J. Rezaee. 2023. "Comparative Analysis of Environmental, Social, and Governance Disclosures." *Global Finance Journal* 55: 100804. https://doi.org/10.1016/j.gfj.2022.100804.

Rezaee, Z., and L. Tuo. 2019. "Are the Quantity and Quality of Sustainability Disclosures Associated With the Innate and Discretionary Earnings Quality?" *Journal of Business Ethics* 155: 763–786. https://doi.org/10.1007/s10551-017-3546-y.

Schiozer, R. F., F. A. Mourad, and T. C. Martins. 2020. "A Tutorial on the Use of Differences-In-Differences in Management, Finance, and Accounting." *Revista de Administração Contemporânea* 25: e200067. https://doi.org/10.1590/1982-7849rac2021200067.

Singhania, M., and D. Gupta. 2024. "Impact of Environmental, Social and Governance (ESG) Disclosure on Firm Risk: A Meta-Analytical Review." *Corporate Social Responsibility and Environmental Management* 31, no. 4: 3573–3613. https://doi.org/10.1002/csr.2725.

Singhania, M., and N. Saini. 2022. "Quantification of ESG Regulations: A Cross-Country Benchmarking Analysis." *Vision* 26, no. 2: 163–171. https://doi.org/10.1177/09722629211054173.

Solimene, S., D. Coluccia, S. Fontana, and A. Bernardo. 2025. "Formal Institutions and Voluntary CSR/ESG Disclosure: The Role of Institutional Diversity and Firm Size." *Corporate Social Responsibility and Environmental Management* 32: 5147–5166. https://doi.org/10.1002/csr.3195.

St. Clair, T., and T. D. Cook. 2015. "Difference-In-Differences Methods in Public Finance." *National Tax Journal* 68, no. 2: 319–338. https://doi.org/10.17310/ntj.2015.2.04.

Tawfiq, T. T., H. Tawaha, A. Tahtamouni, and N. A. Almasria. 2024. "The Influence of Environmental, Social, and Governance Disclosure on Capital Structure: An Investigation of Leverage and WACC." *Journal of Risk and Financial Management* 17, no. 12: 570. https://doi.org/10.3390/jrfm17120570.

Tohang, V., Y. Hutagaol-Martowidjojo, and K. Pirzada. 2024. "The Link Between ESG Performance and Earnings Quality." *Australasian Accounting, Business and Finance Journal* 18, no. 1: 187–204. https://doi.org/10.14453/aabfj.v18i1.12.

Tsang, A., T. Frost, and H. Cao. 2023. "Environmental, Social, and Governance (ESG) Disclosure: A Literature Review." *British Accounting Review* 55, no. 1: 101149. https://doi.org/10.1016/j.bar.2022.101149.

Yixi, Z., and C. P. Y. Sharon. 2023. "The Influence of Firm Size and Institutional Environment on ESG Disclosure-Evidence From Listed Companies in China." *International Journal of Academic Research in Economics and Management and Sciences* 12, no. 2: 109–132. https://doi.org/10.6007/IJAREMS/v12-i2/16284.

Yuan, X., Z. Li, J. Xu, and L. Shang. 2022. "ESG Disclosure and Corporate Financial Irregularities–Evidence From Chinese Listed Firms." *Journal of Cleaner Production* 332: 129992. https://doi.org/10.1016/j.jclepro.2021.129992.