

Regulatory influence, Corporate Governance and ESG Transparency: Evidence from emerging economies

Wafaa Salah

Accounting, Faculty of Business Administration, Economics, and Political Science, The British
University in Egypt, Cairo, Egypt
Wafaa.salah@bue.edu.eg

Abstract— In response to the increasing global demand for sustainable practices, the Egyptian Financial Regulatory Authority [1] issued decree 107 in 2021, mandating that Egyptian listed non-financial firms with issued capital of at least EGP 100 million disclose their ESG practices annually, thereby aligning their practices with international sustainability standards. The objective of this study is to investigate the impact of leverage and independence of audit committees on the level of ESG disclosure. Also, it is to examine the moderating effect of Decree 107 on the relationship between leverage and ESG disclosure. A panel data analysis is employed using a balanced panel of 53 listed firms from 2019 to 2024. The analysis utilized Pooled OLS regression, fixed effects, and random effects models. The findings show that Decree 107 has a significant positive effect on ESG disclosure level, highlighting the positive impact of regulations in emerging economies. The independence of the audit committee significantly influences ESG disclosure level, thus it shows the supportive role of internal governance mechanisms. Even though leverage is not significantly affecting the disclosure level, its positive interaction with Decree 107 shows that rules may motivate financially distressed firms to enhance transparency. This shows how the power of regulations may override internal financial pressures. This research contributes to the literature by demonstrating how regulations and internal governance might influence disclosure behaviour in emerging economies.

Keywords: Decree 107, ESG disclosure, Leverage, corporate governance

1. Introduction

Historically, financial results were considered to be the most important metric for the overall evaluation of the firm and consequently influenced investors' decisions. Whereas the impact of climate change, poverty, and social injustices on firm performance, investors and stakeholders expect that firms should be liable for their environment and social impacts[2, 3]. The disclosure of environmental, social, and governance (ESG) issues has rapidly moved from a marginal aspect of firm reporting to a central issue of not only regulatory debate but also academic discussions. ESG has become essential for investors, government, and society for efficient evaluation of the long-term sustainability, potential risk, and the ethical issue of firms[4]. It has influenced business research, investment frameworks, and sustainable development strategies globally since their inception. Additionally, it supports the UN Sustainable Development Goals (SDGs) that address poverty, inequality, and climate change. According to Pollman [5], firms should improve their ESG performance and convey their value drivers and obstacles. However, lack of high-quality, consistent data hinders ESG integration, which can be addressed by creating worldwide framework and reporting standards[6, 7]. ESG reporting has experienced rapid growth in developed markets; however, emerging economies exhibit varied disclosure practices, weak enforcement, and a significant dependence on voluntary frameworks. This result in challenges related to transparency, comparability, and verifiability [8-10]. These challenges have led to increased demands for

regulatory intervention to ensure that sustainability reporting moves from mere compliance to substantive accountability.

Against this backdrop, many governments and regulatory bodies around the world began to mandate ESG disclosure which transform sustainability reporting from a discretionary corporate choice into a compulsory obligation. Mandatory ESG regulations have demonstrated the ability to increase transparency, reduce information asymmetry, and improve market discipline, in particular, when voluntary incentives are weak[11-13]. However, the effectiveness of these regulations depends upon the institutional framework, quality of enforcement, and internal governance structures of firms. As a result, academics increasingly focus on understanding how regulatory intervention interact with firm-level characteristics in influencing the ESG practices of firms[14, 15].

Egypt provides a compelling setting in which to examine these dynamics. Historically, the disclosure of ESG by Egyptian listed firms was characterized by low levels of voluntary transparency, concentrated ownership structures, bank-dominated financing, and limited integration of sustainability considerations into credit and investment decisions[9, 16]. In response to growing international pressure and domestic sustainability ambitions, the Egyptian Financial Regulatory Authority (FRA) issued Decree No. 107 of 2021. It mandates annual ESG disclosure for listed non-financial firms with net shareholder equity exceeding EGP 100m. This decree represents a major institutional shift by formally embedding ESG reporting into the regulatory framework and linking sustainability disclosure to enforcement mechanisms[1]. Yet, despite its significance, empirical evidence on the consequences of Decree 107 remains limited.

The factors affecting the level of ESG disclosure have been the focus of many studies especially the role of corporate governance mechanisms in enhancing transparency and monitoring managerial behavior[3, 17, 18]. Audit committees independence (ACI) are often seen as the most effective tool of internal governance that reduces agency problems, , strengthens oversight, and enhances both the financial and non-financial reporting quality [19-21]. The empirical results from both developed and developing countries strongly support that there is a direct relationship between ACI and ESG disclosure, even if the degree of this effect differs across institutional setting [3, 4].

In theoretical and empirical studies, the relationship between financial leverage (lev) and ESG disclosure continues to be ambiguous. According to the agency theory, high debt may affect the level of ESG disclose positively due to rigorous scrutiny of creditors and their demand for transparency [22, 23]. In the opposite view, highly leveraged firms may reduce the level of ESG disclosure to save resources, avoid transparency, or hide financial risk, particularly in environments where legal regulations are weak [24, 25]. Meta-analytical and cross-country evidence has also confirmed that the lev-ESG relationship is highly context-dependent and influenced by the strength of institutions and the enforcement of regulations[14].

Despite these advances, however, there is still a significant gap in literature. Most studies tend to focus on either the direct effects of governance mechanisms or lev on ESG disclosure without predominately considering the moderating role of regulatory intervention, particularly in developing countries. In fact, the literature has largely neglected the question of whether mandatory ESG regulation could prevail over internal financial constraints and consequently affect the disclosure behavior of leveraged firms. This gap is most pronounced in the Egyptian context where Decree 107 constitutes a regulatory intervention yet remains underexplored in academic research.

This study contributes to the current body of knowledge in the following ways. First, it offers the first empirical evidence on the impact of Decree 107 by informing regulators and policymakers of the outcomes of ESG regulatory reform in Egypt. Second, it adds to the corporate governance literature by showing the complementary roles of ACI and regulation in improving ESG disclosure. Third, it extends ESG research in emerging economies by demonstrating how regulatory intervention can affect disclosure incentives for financially constrained firms.

Accordingly, this study investigates three interrelated objectives. First, it examines the effect of ACI on ESG disclosure among Egyptian listed non-financial firms. Second, it analyzes the relationship between financial lev and ESG disclosure. Finally, it evaluates whether Decree 107 moderates the lev-ESG relationship, thereby assessing the capability of regulation to reshape disclosure incentives under financial pressure. Using a balanced panel of 53 firms over the period 2019–2024 and employing pooled OLS, fixed-effects, and random-effects models, this study provides systematic evidence on how regulation and governance interact to influence ESG transparency. The study findings show that ACI has a significant positive effect on the level of ESG disclosure. Additionally, Decree 107 also has a significant influence on ESG practices, highlighting the positive impact of regulations in emerging economies. Finally, although lev has an insignificant impact on disclosure levels, its positive interaction with Decree 107 indicates that rules may motivate financially distressed firms to enhance transparency, underscoring the power of regulations override internal financial pressures.

The next section develops the theoretical background and hypotheses. Section 3 describes the sample, variables, and method. Section 4 presents the main and robust study results. Section 5 discusses and concludes the study with limitations and suggestions for future research.

II. Theoretical background and hypotheses development

II.1. Theoretical background

There are several theories that provide explanation of why corporate governance, regulatory intervention, and capital structure influence the level of ESG disclosure.

II.1.1. Agency theory

According to agency theory, agency problems including information asymmetry and conflict of interest between managers and shareholders may be mitigated by the ACI as they oversee management, particularly in the disclosure practices [26, 27]. Furthermore, ACI improve objectivity, reduce management influence on reporting decisions and ensure the integrity and openness of the financial reporting process, thus reducing information asymmetry [17, 20, 28]. This study suggests that ACIP is a significant factor affecting the level of ESG disclosure, which subsequently improves non-financial disclosure and reduces agency costs.

Lev increases shareholder-creditor agency conflicts. Creditors need greater transparency to evaluate default risk, but heavily indebted firms may withhold ESG data to avoid scrutiny or covenant violations. Lev may control agency issues by disciplining managers financially [22]. To reduce agency conflicts, businesses with limited shareholder rights use greater debt ratios. In regulated enterprises like utilities, lev has lower control on agency costs since regulation reduces conflicts [22]. Regulatory intervention affects significantly the relationship between lev and ESG disclosure. Mandatory ESG disclosure regimes like

Germany and India reduce rating variance and improve ESG reporting. This regulatory control enhances stakeholder trust and minimizes information asymmetry which supports agency theories [15]. This study suggests that legal intervention is a significant factor affecting the level of ESG disclosure and moderate the impact of Lev on the level of disclosure, which subsequently improves non-financial disclosure and reduces agency costs.

II.1.2. Legitimacy theory

Legitimacy theory explains the reasons behind the modification in firm behavior imposed by Decree 107. Legitimacy theory posits that firms can gain stakeholder trust only by aligning their behavior with societal norms and expectations [3]. According to legitimacy theory, firms operate within a social compact, where their survival depends on aligning their practices with prevailing society standards [8, 29]. Firms modify their disclosure practices in an effort to regain or sustain social acceptability whenever their legitimacy is at risk, whether it as a result of new regulations, increased public scrutiny, or financial difficulties [30].

Mandatory disclosure regimes make ESG reporting a compliance responsibility, decreasing management discretion and symbolic reporting. Mandatory ESG reporting improves comparability, credibility, and accountability over voluntary disclosure, strengthening institutional legitimacy [12]. Moreover, regulatory enforcement may enhance ESG reporting for leveraged firms to retain stakeholder confidence and improve financial performance [31, 32].

II.1.3. Stakeholder theory

Ulupui, et al. [33] define the stakeholder theory as a theory that "postulates that an organization or company should not only pay attention to the proprietors of the firm and profitability but also take care of society, the environment, and the economy in which it functions.". Agency theory focuses on monitoring and control, whereas stakeholder theory, on the other hand, expands the ESG disclosure range by recognizing the firms' responsibility to various stakeholders other than shareholders, such as employees, customers, suppliers, creditors, regulators, and society as a whole [34]. From this perspective, ESG disclosure is not only a means to lower agency costs, but also a strategic communication tool through which firms control relations with various stakeholder groups.

Stakeholder theory argues that firms achieve long-term sustainability by managing stakeholder interests and responding to stakeholder demands for transparency, ethical behavior, and social responsibility. ESG enables firms to express their commitment to sustainable development and signal that they are responding to stakeholders' concerns which in turn improve their trust and legitimacy across stakeholder groups [35, 36]. The increasing emphasis on ESG disclosure in the emerging economies reflects the growing expectation of stakeholders for accountability, which is beyond the financial performance [37]. Corporate governance mechanisms are significant in ensuring that ESG disclosures reflect stakeholder-oriented objectives than managerial self-interest. ACI, for example, foster stakeholder-oriented reporting by promoting transparency, objectivity, and accountability in the disclosure process [38]. By practicing their independence the credibility of ESG disclosure is fortified, thus making sure that the disclosures align with stakeholders' expectations rather than being just symbolic compliance or selective reporting [19, 39]. Also, stakeholder theory indicates that regulatory frameworks strengthen stakeholder pressure by formalizing societal expectations into mandatory disclosure requirements. Hence, regulatory

intervention strengthens stakeholder influence by promoting norms of transparency and requires firms to address ESG issues even when voluntary incentives are weak [40].

II.2. Literature review and hypotheses development

II.2.1. Independent Audit Committee and the level of ESG disclosure

The ACI is regarded as a crucial internal governance mechanism that enhances the reliability and transparency of ESG reports. It reduces management opportunism[19, 39, 41], improves compliance with reporting requirements[42], and strengthens the trustworthiness of financial and non-financial disclosures[43]. Since ESG disclosure is often complicated, discretionary, and impacted by management bias, the monitoring role becomes even more crucial in these settings[17, 19]. Empirical evidence consistently shows that ACI has a significant and positive impact on the level of ESG disclosure. In developed countries, ACI improve ESG reporting by improving oversight and ensuring disclosure of the best practices [20, 44]. In developing countries, ACI reduce information asymmetry and strengthen accountability which increase transparency [3, 21]. Additionally, ACI improves disclosure levels by influencing compliance and assurance procedures. Independent members are more likely to demand strong internal controls, work with external auditors, and align ESG narratives with firm practices[39, 45]. Chariri, et al. [26] mention that independent AC supervise sustainability-related risks and help firms meet changing regulatory and stakeholder expectations.

Nevertheless, other studies did not find any significant relationships. According to Lakhani and Herbert [46] and Velte [47], AC mainly act symbolically by abiding to the societal norms as opposed to actively fostering ESG reporting. The AC independent members may enhance the firm's legitimacy without changing more efficient monitoring, intellectual capital, or ESG disclosures [48]. Comparative studies across institutional contexts demonstrate significant disparities between developed and emerging economies. firms in developed economies have strong enforcement and mature governance frameworks, while firms in emerging economies depend more on internal governance mechanisms to make up for weaker external monitoring [49, 50]. Research from Saudi Arabia, India, China, and South Africa consistently demonstrates that ACI exerts a more significant marginal impact on ESG disclosure in emerging contexts, where regulatory enforcement is still developing[3, 4, 51]. This indicates that ACIP serves as an essential governance alternative in contexts marked by higher information asymmetry. Even though there is a growing literature, evidence from Egypt is still limited, especially after Decree 107 came into effect. The studies carried out in Egypt are mostly concentrated on voluntary disclosure or financial reporting quality and they only give general ideas on ESG transparency [9, 10]. As a result, there is a limited understanding of the impact of ACI on ESG transparency in the context of Egypt's shifting regulatory environment. In light of the observed gap in the Egyptian context, this study proposes the following hypothesis:

H1: Independent audit committee positively affects the level of ESG disclosure.

II.2.2. Leverage and the level of ESG disclosure

In the context of emerging economies, the association between lev and ESG disclosure is still an ambiguous issue both in theory and in empirical settings. From one perspective, lev can

be the driving force for higher ESG disclosure because of the enhanced monitoring activities of creditors. Lenders require firms with higher debt levels to enhance transparency regarding risks and sustainability practices to assess long-term risk [23, 30]. In this perspective, ESG disclosure is considered a tool for risk mitigation and a way to signal the lower information asymmetry between firms and providers of debt, and this ultimately leads to the reduction of agency costs and the increase of external financing. Empirical evidence from developed countries confirm the posit that some lenders have begun to incorporate even ESG factors into their lending decisions particularly in circumstances where the institutional framework is strong and financial markets are developed and mature [11, 13]. On the contrary side, some studies show that lev is negatively associated with ESG disclosure. Highly leveraged firms may be unable to afford the necessary expenditures to initiate or maintain high level of ESG standards or issue long-term sustainability reports of high quality [52]. Besides, lev can give rise to the possibilities for managers' opportunism, due to which firms deliberately are less transparent about the financial likelihoods or troubles. It has been pointed out in various studies that firms overwhelmed by financial issues or with great amounts of lev tend to reduce the ESG disclosure, instead they focus on the liquidity and viability in the short term rather than sustainability in a long run [24, 25]. Meta-analytical study and analysis across different countries have shown that this negative relationship is prevalent in the case of countries where the creditor place weaker emphasis on ESG details and the institutional monitoring mechanisms are not sufficiently developed [14].

Also, Recent research shows that the Lev-ESG intersection is always nonlinear or context-dependent. Recent studies show that while moderate Lev may reduce ESG disclosure, highly leveraged firms may increase their ESG disclosure as a reputational or legitimacy-seeking reaction to reduce the cost of capital [53, 54]. Nonetheless, the disclosure-based strategies were mostly denounced for symbolic compliance rather than showing core ESG performance in a weak regulatory framework [55]. This contradiction makes it clear that it is the institutional environment that matters, since the creditor's reliance on ESG information is different from one country to another and also it shifts with the regulatory regimes. In Emerging economies like Egypt, capital markets tend to demonstrate concentrated ownership structures, bank-dominated financing, and a low integration of ESG criteria in credit risk assessments. Previous studies on ESG disclosure in developing countries have suggested that the level of Lev may not be the only factor that would drive the firm to disclose information unless it is backed by proper regulatory and governance mechanisms [10, 16]. As a result, the mixed empirical results suggest that the relationship between Lev and ESG disclosure should not be viewed as either positive or negative but rather depends on regulatory and institutional factors. Based on the foregoing discussion, this study proposes the following hypothesis:

H2: Leverage affects ESG disclosure.

II.2.3. Moderating Role of Regulation on the Leverage-ESG Relationship

The growing distinction between mandatory and voluntary ESG disclosure regimes attract scholarly attention to how regulation reshapes firms' disclosure incentives especially in financially constrained settings. Mandatory disclosure regimes compel firms to alter their behaviors irrespective of financial considerations, whereas voluntary ESG disclosure relies on private sector and market incentives [8, 29]. Based on the results of recent studies [13, 55], if regulators intervene to alter the ESG disclosure cost-benefit analysis, the disclosure

may move from an optional signalling tool to a binding compliance requirement. Previous studies show that mandatory ESG disclosures enhance transparency and reduce information asymmetry, especially among firms with the least involvement in sustainability reporting [55, 56]. Several studies on mandatory ESG show that regulation enhance the level and comparability of ESG information, reduces earnings management, and positively influences market discipline [11-13]. Additionally, the regulatory intervention effectively compels firms facing higher financial risks, as external enforcement substitutes for insufficient internal incentives to disclose [15].

regulatory pressure plays a crucial role for highly leveraged firms because these firms may strategically minimize ESG disclosure in the absence of regulation. This may result from the significant resources necessary for high-quality ESG reporting, leading firms to either conserve resources or obscure their risk exposure [24, 25]. However, A positive correlation between Lev and ESG transparency post-regulation occurs when regulatory pressure replaces stakeholder pressure under mandatory disclosure regimes. This means that firms are compelled to disclose ESG information regardless of their financial constraints [57]. Several studies find that mandatory disclosure mitigates withholding of non-financial information and reduces heterogeneity in disclosure practices across firms with varying debt levels [57-59]. The impact of regulation as a moderator is especially seen in emerging economies where ESG information reliance by creditors is low and voluntary disclosure incentives are constrained by the institutional voids. Singhania and Chadha [14] indicate the fact that the Lev-ESG relationship is systematically different in different countries depending on the regulatory strength, enforcement quality, and investor protection level. In circumstances of weak institutions, Lev alone might not be able to create enough motivation for ESG disclosure, but the regulatory policies can establish the communication channels needed by imposing common-reporting and enhancing enforcement credibility [60]. For example, the government policy in the Asian Basic materials sector is associated with the increase in the relationship between ESG scores and the cost of equity [61]. In another research, it was found that mandatory ESG disclosure in 17 emerging countries decreased firms' default risk, which suggests that such regulations improve corporate transparency and act as a substitute for corporate governance mechanisms [56].

Egypt has been largely characterized by the absence of voluntary transparency, weak enforcement, and lack of the integration of sustainability dimensions in the lending decision-making process [10, 16]. The introduction of Decree No. 107 in July 2021 by FRA was a turning point as it made the ESG disclosure a compulsion for all listed non-financial firms with net shareholder equity exceeding EGP 100m as well as linking sustainability reporting to regulatory oversight. Despite its significance, empirical evidence on how Decree 107 interacts with firms' financial structures to affect ESG practices remains absent from the literature. Accordingly, building on the mandatory disclosure of literature, this study posits the following hypothesis:

H3: Decree 107 moderates the relationship between leverage and ESG disclosure.

III. Data and methodology

III.1. Sample and data

Data for this study are collected from different sources. The ESG scores are collected from Egypt for Information Dissemination (EGID) database, a subsidiary of the Egyptian Stock Exchange Market and the sole authorized data provider for EGX market data. [62]. The governance data were extracted from annual reports collected through Thomson Reuters database, a global source of financial and governance data [63]. The financial data were extracted from Thomson Reuters database. Panel A of Table I presents the sampling selection procedures. The initial sample consists of 1,500 firm-year observations. Firms not listed in the EGX 100 were excluded (900). Next, financial institutions were excluded (120) to be consistent with Decree 107 which excluded financial firms from mandatory disclosure. Finally, firms with missing financial or governance data were excluded (162). The final sample is composed of 318 firm-year observations cover the years 2019 to 2024. The study period starts from 2019 and includes three years before the implementation of decree 107 (2019-2021) and three years after its implementation (2022-2024). The last year of the study was 2024 it represents the most recent year for which comprehensive data is accessible. The use of a balanced panel pre-post dataset facilitates the assessment of regulatory effects through consistent firm-level time series and enables clear causal inference and minimizes noise resulting from unequal firm observations across years [64, 65]. Panel B displays the sectoral composition of the sample. The sampled firms operate in seven sectors, with the highest representation from Real Estate (24.5%), followed by Basic Materials and Consumer Non-Cyclicals (20.8%). The lowest representation arises from Technology and Healthcare (3.8%).

TABLE II SAMPLING AND SELECTED SECTORS

Panel A: Sampling procedures			Sample Size
Initial Sample			1500
Firms not listed in EGX 100			(900)
Financial Institutions			(120)
Firms with missing data			(162)
Final Sample			318
Panel B: Sample firms by sector			
Sector	Number of firms	Firm-years observations	Percentage
Basic Materials	11	66	20.8
Consumer on-Cyclicals	11	66	20.8
Consumer Cyclicals	8	48	15.1
Industrials	6	36	11.3
Real Estate	13	78	24.5
Technology	2	12	3.8
Healthcare	2	12	3.8
Total	53	318	100

Source: Author own work

III.2. Measurement of study variables

The dependent variable in this study is the level of ESG disclosure (ESG). Inline With previous studies, ESG is measured using the normalized ESG score provided by EGID database[16, 66-68]. This index combines a normalized governance score and a normalized environmental and social score to result in a composite score that ranges from 0 to 100. A higher score indicates greater transparency and comprehensiveness in ESG disclosure. Liu, et al. [67] highlight the ability of the index to rank firms according to their ESG performance. They mentioned that ESG index is derived from the Egyptian S&P/ESG index data, compiled by Standard & Poor's (S&P) in collaboration with the Egyptian Exchange (EGX), the Egyptian Corporate Social Responsibility Center, and Credit Rating Information Services (CRISIL). Similarly, Shehata, et al. [68] use this construct to evaluate the relationship between ESG and performance under macroeconomic instability.

This study uses Lev as an independent variable and is measured as total debt of a firm's scaled by total assets[10, 67, 69]. In addition, audit committee independence percentage (ACIP) is included as an independent variable to represent internal governance quality. It is measured as the proportion of independent non-executive members on the AC to the total number of AC members at the end of the financial year[3, 18, 19, 39]. To test for institutional influence, Decree 107(Decree) is introduced as a moderator to analyze the impact of regulatory intervention on the Lev-ESG relationship. The variable is defined as a dummy variable, assuming a value of 0 for the years 2019-2021 (pre-enforcement period) and a value of 1 for the years 2022-2024 (post-enforcement period). The interaction term is calculated as the product of Lev and decree107 (Decree*Lev) to capture whether the presence of regulatory intervention mitigates the impact of financial Lev on disclosure practices.

This study also controls several firm-specific variables that have been shown in previous studies to affect the level of ESG. Firm size (Fsize) is measured as the natural logarithm of total assets[10, 70]. Larger firms face greater scrutiny from stockholders and increased public visibility, which affect positively their ESG disclosure practices [19, 39, 71]. Firm age [72] is calculated as the natural logarithm of the number of years since incorporation. Older firms may possess greater experience in complying with regulatory requirements and ensuring transparency, which can result in enhanced level of disclosures.[18, 24, 39, 53, 73]. To account for firm performance, ROA is used and is measured as net income divided by total assets. Profitable firms often have more resources to invest in comprehensive ESG practices and reporting[19, 28]. Additionally, Sales growth(SG) is measured by subtracting the current year net sales from the previous year's net sales divided by the previous year's net sales [74, 75]. High growth firms are more likely to disclose ESG practices to signal stability and credibility[76]. Liquidity (Liq) is measured by current ratio (current assets divided by current liabilities). Liquid firms are more capable to cover short-term debt and capable of investing in and disclosing their ESG practices[49]. Audit quality [49] is measured as a dummy variable taking the value of 1 if the firm is audited by a big four firm, and 0 otherwise [77]. Prior studies suggest that higher audit quality enhance the transparency of ESG disclosure[45, 78]. Finally, the sector (SEC) is controlled using a dummy variable for sector in which a firm is active [25].

III.3. Model specification

To test the study hypotheses, we employ pooled ordinary least squares (OLS), random-effects model (REM), and fixed-effects model (FEM) to account for the variations in the independent among firms and overtime[79].

To examine the effect of ACIP and Lev on the level of ESG, we construct the following regression model:

$$ESG_{it} = \alpha_0 + \alpha_1 ACIP_{it} + \alpha_2 Lev_{it} + \alpha_3 Decree_{it} + \alpha_4 Fsize_{it} + \alpha_5 AQ_{it} + \alpha_6 ROA_{it} + \alpha_7 SG_{it} + \alpha_8 Liq_{it} + \alpha_9 Age_{it} + \sum_{j=10}^{15} \alpha_j SEC_{it} + (\mu_i + \varepsilon_{it}) \quad (1)$$

where i denotes firm and t denotes year, ESG_{it} denotes the level of ESG disclosure for firm i in year t ; $ACIP_{it}$ represents the audit committee independence percentage; Lev_{it} is the financial Lev.; $Decree_{it}$ is the regulatory reform; $Fsize_{it}$, AQ_{it} , ROA_{it} , SG_{it} , Liq_{it} , and age_{it} are control variables representing firm size, audit quality, firm performance, sales growth, liquidity, and firm age, respectively. SEC denotes sector fixed effect to control for sector-level heterogeneity. α_0 is the intercept, $\alpha_1, \alpha_2, \dots, \alpha_n$ are the regression coefficients; μ_i captures the unobserved firm-specific effects; and ε_{it} is the error term.

To examine the moderating effect of Decree 107, the following regression model is constructed:

$$ESG_{it} = \alpha_0 + \alpha_1 ACIP_{it} + \alpha_2 Lev_{it} + \alpha_3 Decree_{it} + \alpha_4 (Lev_{it} * Decree_{it}) + \alpha_5 Fsize_{it} + \alpha_6 AQ_{it} + \alpha_7 ROA_{it} + \alpha_8 SG_{it} + \alpha_9 Liq_{it} + \alpha_{10} Age_{it} + \sum_{j=11}^{16} \alpha_j SEC_{it} + (\mu_i + \varepsilon_{it}) \quad (2)$$

Where $Lev_{it} * Decree_{it}$ is the interaction term capturing the moderating effect of regulation on leverage-disclosure relationship. To mitigate potential multicollinearity, Lev was mean-centered[80]. Figure 1 illustrates the conceptual framework of the study.

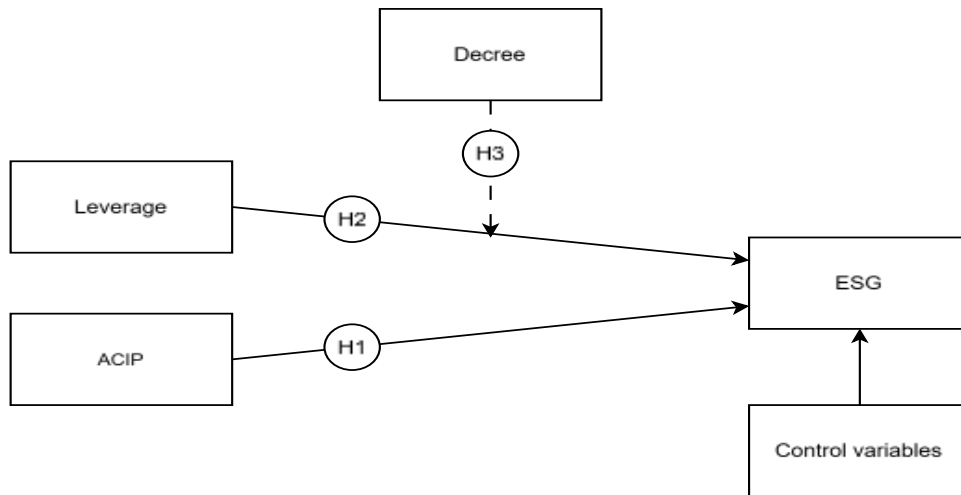


Fig. 1 Conceptual framework

IV. Results and discussion

IV.1. Descriptive statistics and correlation analyses

Table III displays the descriptive statistics for the study variables. The mean ESG score is 28.25 with SD=11.38, indicating a low level of ESG information. The between variation of 8.82 exceeds the within variation of 7.27. This indicates that firms exhibit a relatively stable level of disclosure over time and significant differences between them. Figure 2 presents the median ESG scores for the years 2019 through 2024. The ESG score exhibited a low median from 2019 to 2021 with a slight decrease in 2020 which may be due to the pandemic that year. However, a significant increase began in 2022 with the median ESG rising sharply in 2024. The observed increase may be attributed to the implementation of Decree 107 which mandates ESG disclosure starting in 2022. This enforcement appears to influence corporate reporting behavior by enhancing the transparency of ESG practices. However, there is still room for improvement. Table II also shows mean value of 0.50 for ACIP with SD = .32. This suggests that on average, 50% of AC members across firms are independent, which reflects a moderate level of independence. The minimum value is 0 and the maximum is 1, which indicates that some firms lack independent AC which suggests weak governance. While other firms have a fully independent committee which indicates a significant variation in governance quality among the sample firms. The between variation in ACIP (0.26) is significantly greater than the variation observed within the same firm over time (0.19). Lev shows significant variability among firms, with a minimum value of 0 and a maximum of 6.92. This range indicates that certain firms within the sample are heavily dependent on debt to finance their assets. Lev has a mean of 0.77 and SD = 1.54. The between variation of 1.31 is higher than within variation which indicates that firms exhibit differing levels of debt. This may result from variations in industry practices or firm-specific strategies.

The mean Fsize of 21.75 suggests that the firms in the sample are large. The range of 17.56 to 26.03 indicates significant size variation. The mean ROA is 0.05, with a range spanning from -0.50 to 0.52 and this indicates that some firms are experiencing financial difficulties while others are achieving high profitability. The mean value of SG is 0.66 with a standard deviation of 1.89. The variation between firms is significant (1.72), which indicates that SG exhibits considerable variability over time. Liq has a mean of 1.75 and a range from 0.08 to 9.01 which indicates that certain firms encounter liquidity challenges while others maintain a robust position. The between variation (1.25) exceeds the within variation (0.75) which suggests that Liq differences are more significant across firms than within individual firms over time. The average age of firms is 33 years. The age range of 3 to 96 years suggests considerable variability among firms which may affect their ESG disclosure practices. Older firms may possess more established sustainability protocols. On the other hand, newer firms might exhibit greater adaptability in their reporting methodologies. Finally, 38.4% of the sampled firms are audited by Big Four accounting firms.

TABLE IV DESCRIPTIVE STATISTICS

Variab les	Mean	SD (overall)	SD (between)	SD (within)	Min	Max
ESG	28.25	11.38	8.82	7.27	10.38	87
ACIP	.50	.32	.26	.19	0	1
Lev	.77	1.54	1.31	.82	0	6.92
Fsize	21.75	1.91	1.90	.317	17.56	26.03
ROA	.05	.11	.07	.08	-.50	.52
SG	.66	1.89	.78	1.72	-.91	10.31

Liq	1.75	1.45	1.25	.75	.08	9.01
Age	33.40	18.29	18.36	1.71	3	96
Panel E: dichotomous variables						
	0		1		Company observations	
Decree	159 (50%)	159(50%)		318		
AQ	196 (61.6%)	122 (38.4%)		318		

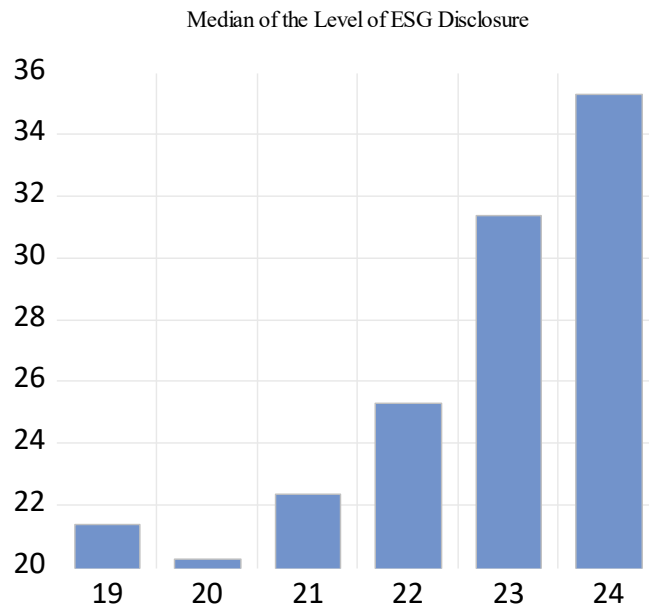


Fig. 2 ESG disclosure level from 2019 to 2024

Table V presents the Pearson correlation coefficients for the study variables. The findings indicate a positive and significant correlation between ESG disclosure and ACIP, Lev, Fsize, and ROA, whereas a negative correlation exists with liq and Age. This suggests that firms with strong governance structure and larger operational capacities are likely to provide more ESG disclosures. All correlation coefficients among the study variables are below the threshold of 0.7, indicating that multicollinearity is not a significant concern [81]. The variance inflation factor (VIF) test further supports this result, as all values remain significantly below the conventional threshold of 10, with a mean VIF of 1.23[82].

TABLE VI CORRELATION ANALYSIS

	ESG	ACI P	Lev	Fsiz e	ROA	SG	Liq	Age
ESG	0							
ACI P	.189**	0						

Lev	.136*	.065	0					
Fsize	.461**	.037	303	0				
ROA	.266**	-.012	-.137*	.137*	0			
SG	.023	-.055	-.061	-.163**	.013	0		
Liq	-.160**	-.063	-.299**	-.338**	.170*	.054	0	
Age	-.182**	-.220**	-.051	-.188**	.113*	.101	.026	0

*, ** denote Significant at 0.05 and 0.01, respectively.

IV.2. Multivariate analysis

To determine the appropriate model, Hausman test, Breusch-Pagan Lagrange Multiplier LM test, and F-test were applied as shown in Table VII. Hausman test ($\chi^2 = 13.279$, $p > 0.05$) supports the use of REM [83]. Furthermore, the LM test indicated that the REM is preferred over the pooled OLS (LM = 145.57, $p < 0.01$) due to significant unobserved heterogeneity [84]. Finally, F-test supports that FEM is preferred over pooled OLS ($F = 7.42$, $p < 0.01$) due to significant individual heterogeneity [79]. Based on these results, the REM is used in the main study results, while FEM and pooled OLS are used for robustness. Furthermore, various tests are conducted to evaluate the validity of the regression model. The variance inflation factor (VIF) test is utilized to assess multicollinearity. The findings show an acceptable level of VIF among the study variables and all values remain below the conventional threshold of 10 with mean VIF equal to 1.23 [82]. Subsequently, LM test for serial autocorrelation test (LM = 138.84, $P < 0.01$) show the existence of a significant serial correlation across time within firms [79]. The Pesaran [85] test (CD = 8.089, $P < 0.01$) shows that firm-level residuals are correlated across cross-sections. Subsequently, heteroscedasticity is analyzed through panel groupwise heteroskedasticity tests using the maximum likelihood specification (xtreghet). The three statistics—LM, LR, and Wald—are found to be highly significant (p -value < 0.01), indicating that error variance varies across firms [79]. The Ramsey RESET test is conducted to evaluate specification errors. The RESETF1 and RESETF2 tests show no indication of omitted variable bias or functional form misspecification [86]. As a result of the presence of serial correlation, heteroscedasticity, and cross section dependence, the study employed panel corrected standard errors (PCSE) across pooled OLS, FEM, and REM to obtain reliable inference. It is designed to correct these problems in panel data when the number of cross section exceed time periods [87, 88].

Table VIII presents the regression outcomes for models 1 and 2 pertaining to REM, model 2 for FEM, and pooled OLS. Model 1 investigates the direct effects of ACIP, Lev, and Decree on the level of ESG, while model 2 captures the moderating effect of Decree on the relationship between Lev and ESG. Model 1 accounts for 39.38% of the variance in ESG disclosure, while Model 2 accounts for 39.88% of the variance in ESG disclosure. The modest rise indicates that the moderating impact enhances the model's explanatory power. Starting with model 1, the findings suggest that there is a positive relationship between ACI and ESG transparency ($\alpha_1 = 4.133$, p -value < 0.01). Therefore, H1 is accepted; firms with more independent audit committees disclose higher levels of ESG disclosure. This result is also valid for REM (model 2), FEM, and pooled OLS. This result is supported by prior studies that document that ACI enhance the quality and extent of ESG disclosure through mitigating managerial opportunism, strengthening oversight, and compliance with rules and regulations [20, 44]. It is also supported by agency theory which suggests that ACI demand high quality disclosure, minimize conflicts of interest, and enhances the effectiveness of monitoring [27]. Stakeholder

theory is another support for this result which suggests that ACI contribute to better ESG disclosures and facilitate accountability to a wider range of stakeholders[38]. On the other hand, Lev does not show any significant relationships with ESG ($\alpha_1 = 0.204$, $p\text{-value} > 0.01$). This suggests that debt pressure does not independently influence ESG disclosure. Therefore, H2 is rejected; firms with higher debt exhibit higher levels of ESG disclosure. This result holds true for REM (model 2) and FEM. This result contradicts studies that find a significant positive relationship between Lev and disclosure [11, 13] and others that reveal a significant and negative relationship between Lev and ESG ratings[24, 52]. Nonetheless, the result aligns with the study conducted by Devika Rani, et al. [89], which finds no association between firm ESG performance and Lev. High Lev may increase external monitoring under agency theory, however, in economies characterized by relationship-based lending and weak creditor protection, Lev may not require firms to improve ESG disclosures[90]. Additionally, Furthermore, in regions with inadequate creditor protection, expenditure on ESG is perceived as expensive, leading to low levels of ESG disclosures as managers tend to prioritize short-term profits over long-term ESG investments [91].

Model 2 introduces the interaction term between Lev and Decree to investigate whether regulatory reform affects the influence of Lev on ESG disclosure. The results in model 2 (REM) reveal the moderating effect of Decree is positive and significant ($\alpha_1 = 1.183$, $p\text{-value} < 0.05$), reflecting the effectiveness of regulatory pressure in developing countries. Therefore, H3 is accepted; mandatory disclosure requirements enhance the responsiveness of highly leveraged firms to ESG reporting. This result holds true for FEM and pooled OLS models. This result is supported by prior studies that document that regulatory intervention reshapes the effect of financial pressure on disclosure behavior by reducing managerial discretion, increasing the demands for monitoring, and restricting the chances for voluntary reporting[57, 58]. It is also supported by legitimacy theory, which posits that firms engage in ESG disclosures to obtain legitimacy and support from stakeholders. Additionally, regulatory reform may exert pressure on firms to disclose ESG information to maintain their legitimacy. Leveraged firms react more strongly to regulatory reform to preserve legitimacy and avoid increased scrutiny[31, 32]. It is also supported stakeholder theory, as regulation enhances the expectations of stakeholders, including lenders. Leveraged firms exhibit increased levels of ESG disclosure to assure stakeholders of their long-term stability and compliance with regulations[40, 92, 93]. Figure 3 illustrates the moderating effect of Decree 107 using Johnson-Neyman output[94]. The figure shows that a significant positive impact of Lev on the level of ESG disclosure increases after the enforcement of Decree 107. This implies that regulatory reform stimulates the disclosure incentives linked to financial risk.

Regarding the control variables. Table IX illustrates that Fsize, ROA, and SG show significant positive effect on ESG performance across REM, FEM, and pooled OLS regression models. This indicates that larger, more profitable, and expanding firms have more resources and tend to report ESG practices more comprehensively [24, 95, 96]. Also, AQ shows a significant positive effect with ESG performance across all models. This indicates that high-quality audits enhance the transparency, reliability, and credibility of ESG disclosures [41, 97]. However, Liquidity and age show mixed results across the three models which indicate that their impact on ESG performance is variable and contingent upon firm-specific effects.

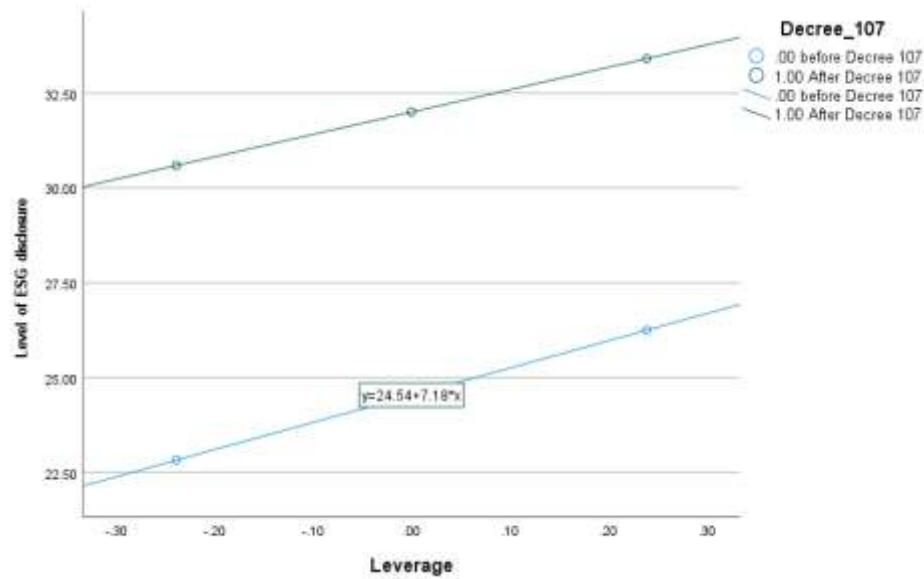


Fig. 3 The moderating effect of leverage and Decree 107 on ESG (Johnson-Neyman)

TABLE X REGRESSION RESULTS OF THE PCSE

Dependent variable = ESG	REM		FEM	Pooled OLS
	Model 1	Model 2	Model 2	Model 2
Variables	Coefficients			
ACIP	4.133*** (1.380)	4.143*** (1.378)	2.147** (0.849)	4.689*** (0.913)
Lev	0.204 (0.507)	-0.397 (0.548)	-0.115 (0.453)	-0.973** (0.412)
Decree	6.850*** (0.777)	7.020*** (0.782)	3.070*** (0.791)	8.462*** (0.598)
Fsize	2.614*** (0.485)	2.524*** (0.490)	1.334* (0.755)	1.802*** (0.199)
AQ	2.453** (1.079)	3.127*** (1.124)	3.472*** (0.726)	5.545*** (0.684)
ROA	10.609*** (3.730)	10.043*** (3.708)	7.295*** (2.623)	6.963** (2.982)
SG	0.615*** (0.184)	0.566*** (0.184)	0.191* (0.112)	0.590*** (0.142)
Liq	0.571* (0.331)	0.571* (0.335)	0.812*** (0.246)	-0.013 (0.184)
Age	-0.057 (0.038)	-0.053 (0.038)	1.615*** (0.270)	-
Lev*Decree	-	1.183** (0.545)	1.072*** (0.356)	0.049*** (0.012)
C	-	-	-	-13.108** (6.547)

Sector fixed effect	Yes	Yes	No	Yes
No. of Observations	318	318	318	318
Adjusted R²	39.38%	39.88%	81.86%	67.74%
Hausman test χ^2	13.981	13.279	-	-
likelihood ratio F-test	7.414***	-	7.427***	-
Breusch-Pagan LM	141.476***	-	-	145.578***

***p < 0.01, **p < 0.05, *p < 0.1 and robust SE between parentheses

IV.3. Robustness and Endogeneity checks

To ensure the robustness of the study results, several estimation methods are used: two-stage least squares (2SLS), errors-in-variables regressions (EIVREG), and a subsample estimation approach. These methods are commonly employed in corporate governance and disclosure research to address issues of simultaneity[98, 99], omitted variable bias[69, 100], or measurement error[96, 101] that may bias OLS results.

First: 2SLS regression with random effects technique is used to correct for endogeneity, which is considered a significant concern in ESG-related studies, particularly regarding variables such as ACIP and Lev [19, 98, 102]. In accordance with prior research, the lagged values of endogenous variables are used as instruments, since they alleviate issues pertaining to simultaneity and reverse causality, and are less susceptible to contemporaneous shocks or changes within the business or industry [103, 104]. To evaluate whether the independent variables are endogenous, several tests were conducted. The Durbin-Wu Hausman test ($\chi^2 = 2.73$, $p > 0.05$) and The Davidson-MacKinnon exogeneity test ($F = 0.622$, $p > 0.05$) fail to reject the null hypothesis that the suspected endogenous regressors are exogenous [105, 106]. The results displayed in Table XI show that there is a consistency between the 2SLS results and the main study findings. Second: the study employs errors-in-variables regression(EIVREG) assuming a reliability coefficient of 0.90 to address the issue of measurement errors in explanatory variables, a common challenge in financial datasets[107-109]. The results displayed in Table XII remained consistent with the main study findings. Finally, we randomly select 35 firms to examine whether the study results are robust to the exclusion of some firms. Using REM, the results remain unchanged.

TABLE XIII REGRESSION RESULTS USING TWO-STAGE LEAST SQUARE APPROACH

Dependent variable = ESG	2SLS	EIVREG	REM (subsample)
Variables	Coefficients		
ACIP	2.671**(1.252)	1.546**(0.465)	3.707**(1.459)
Lev	-0.903(0.656)	-0.903**(0.407)	-0.142(0.551)
Decree	5.729*** (0.921)	6.468*** (1.163)	5.410*** (0.715)

Fsize	1.781*** (0.558)	1.488*** (0.283)	1.742*** (0.517)
AQ	4.658** (1.630)	6.971*** (1.195)	4.061*** (1.443)
ROA	1.054** (0.413)	1.165** (0.531)	1.278*** (0.448)
SG	0.439*** (0.161)	0.450** (0.192)	0.232 (0.145)
Liq	0.620 (0.567)	-0.518 (0.379)	0.210 (0.339)
Age	0.032 (0.048)	-0.038* (0.021)	0.002 (0.047)
Lev*Decree	2.261*** (0.688)	1.545** (0.594)	1.211** (0.524)
C	-17.113* (12.079)	-8.992 (5.768)	-15.802 (11.392)
No. of Observations	318	318	210
R-squared	39.6%	42.4%	42.6%

Note: ***p < 0.01, **p < 0.05, *p < 0.1 and robust SE between parentheses

V. Conclusions, limitations, and avenues for future research

VI. This paper presents evidence on how regulatory intervention and internal governance mechanisms together influence the level of ESG disclosure in an emerging market context. Using a sample of Egyptian listed non-financial firms, the findings show that ACI has a significant positive effect on the level of ESG disclosure. Additionally, Decree 107 also has a significant influence on ESG practices, highlighting the positive impact of regulations in emerging economies. Finally, although leverage has an insignificant impact on disclosure levels, its positive interaction with Decree 107 indicates that rules may motivate financially distressed firms to enhance transparency, underscoring the power of regulations override internal financial pressures. These findings, in general, underscore the complementary roles played by institutional pressure and governance structures in promoting sustainability reporting in contexts characterized by high information asymmetry and weak incentives for voluntary disclosure. A theoretical standpoint, this positive and strong relationship between audit committee independence and the level of ESG disclosure strongly supports agency theory since this theory suggests that independent monitoring mechanisms have the ability to mitigate managerial opportunism and stimulate better-quality disclosure to reduce agency costs. An independent audit committee serves as an internal control mechanism that compels managers to adhere not only to financial reporting standards but also to broader expectations about ESG-related transparency. Additionally, the findings support the stakeholder theory in that higher independence enables accountability to a wider range of stakeholders, which includes regulators, creditors, and society in general.

Decree 107 provides support to the legitimacy theory in understanding how regulatory intervention affects firms' disclosure behavior. The positive impact of Decree 107 on the level of ESG disclosure signals that firms respond to institutional pressures by enhancing their reporting practices to respond to changing societal norms and regulatory expectations. Additionally, the moderating effect of Decree 107 on the leverage–ESG relationship suggests that regulation can mitigate internal financial pressures that might affect transparency. The findings provide useful insights into how firms under regulatory pressure may reduce non-financial disclosure to avoid scrutiny and preserve resources. However, the mandatory disclosure may exert pressure over these firms to enhance transparency. This finding shows that regulation can act as an enforcing tool to reduce heterogeneity in disclosure practices across firms with different financial profiles. The results of the study have implications for policymakers, regulators, and firm board in Egypt, and other emerging economies as well. For regulators and policymakers, this study findings highlight the importance of well-designed regulatory framework as effective tools for enhancing transparency, even among

firms facing financial constraints in environments characterized by high information asymmetry and weak incentives for voluntary disclosure. Practically stating, the results provide valuable insights for corporate boards. The findings underscore the need to enhance internal governance mechanisms to promote transparency and maintain legitimacy in increasingly regulated contexts.

Despite the contribution of this study, several limitations provide opportunities for further research. This study examines the influence of audit committee independence on ESG disclosure levels; however, further research may explore other governance characteristics, including board diversity, ownership concentration, and board independence to provide a deeper understanding of how internal governance complement external regulations. This research focuses on Egyptian non-financial listed enterprises, thus limiting the generalizability of the findings. Cross-country study in developing countries may be useful in determining whether the moderating effect of regulatory intervention on financially distressed firms is more universal or context specific. Finally, ESG disclosure is assessed by a composite metric. Future research examining the effects on each pillar may address variation across environmental, social, and governance dimensions.

References

- [1] F. R. A. FRA. "Financial Regulatory Authority Decrees No. 107 and 108." https://climate-laws.org/document/financial-regulatory-authority-decrees-no-107-and-108_8c56 (accessed November 26, 2025).
- [2] H. Diwan and B. A. Sreeraman, "From financial reporting to ESG reporting: a bibliometric analysis of the evolution in corporate sustainability disclosures," *Environment, development and sustainability*, vol. 26, no. 6, pp. 13769-13805, 2024.
- [3] R. M. Ruziwa and B. C. Nomlala, "Audit committee characteristics and environmental, social, and governance reporting quality: An analysis of top 100 JSE-listed corporations," *Accounting and Financial Control*, vol. 6, no. 1, pp. 38-52, 2025.
- [4] K. Chebbi and M. A. Ammer, "Board composition and ESG disclosure in Saudi Arabia: The moderating role of corporate governance reforms," *Sustainability*, vol. 14, no. 19, p. 12173, 2022.
- [5] E. Pollman, "The making and meaning of ESG," *Harv. Bus. L. Rev.*, vol. 14, pp. 403-453, 2024.
- [6] M. Joubrel and E. Maksimovich, "ESG data and scores," in *Valuation and Sustainability: A Guide to Include Environmental, Social, and Governance Data in Business Valuation*: Springer, 2023, pp. 67-98.
- [7] S. Tenorio-Salgueiro, M. Vivel-Búa, R. Lado-Sestayo, and A. Martínez-Salgueiro, "Sustainability and integration of ESG reporting: Regulatory frameworks, standardization, and the role of the ISSB," in *Adoption, Impact, and Challenges of International Financial Reporting Standards*, 2025, pp. 163-196.
- [8] C. Deegan, "Introduction: The legitimising effect of social and environmental disclosures—a theoretical foundation," *Accounting, auditing & accountability journal*, vol. 15, no. 3, pp. 282-311, 2002.
- [9] K. Samaha, K. Dahawy, K. Hussainey, and P. Stapleton, "The extent of corporate governance disclosure and its determinants in a developing market: The case of Egypt," *Advances in Accounting*, vol. 28, no. 1, pp. 168-178, 2012.

- [10] M. Elfeky and A. Nasiri, "The determinants of voluntary disclosure in emerging markets: the case of Egypt," *Journal of Poverty, Investment and Development*, vol. 36, no. 7, pp. 1-12, 2017.
- [11] L. L. Wang, "Transmission effects of ESG disclosure regulations through bank lending networks," *Journal of Accounting Research*, vol. 61, no. 3, pp. 935-978, 2023.
- [12] C.-C. Lee, C.-W. Wang, W.-L. Chen, and P.-C. Hong, "Compulsory disclosure regulation: the effect of ESG on extreme risk," *Applied Economics*, vol. 56, no. 32, pp. 3856-3869, 2024.
- [13] I. Akin and M. Akin, "Mandated ESG disclosure and its effects on earnings quality and cost of capital: evidence from European stock markets," *Corporate Social Responsibility and Environmental Management*, 2025.
- [14] M. Singhanian and G. Chadha, "Impact of debt on sustainability reporting: a meta-analysis of the moderating role of country characteristics," *Journal of Accounting Literature*, vol. 46, no. 4, pp. 671-721, 2024.
- [15] B. Lukács and P. Molnár, "Companies' ESG performance under soft and hard regulation environment," *Discover Sustainability*, vol. 6, no. 1, p. 701, 2025.
- [16] A. Aboud and A. Diab, "The impact of social, environmental and corporate governance disclosures on firm value: Evidence from Egypt," *Journal of Accounting in Emerging Economies*, vol. 8, no. 4, pp. 442-458, 2018.
- [17] R. Appuhami and S. Tashakor, "The impact of audit committee characteristics on CSR disclosure: An analysis of Australian firms," *Australian Accounting Review*, vol. 27, no. 4, pp. 400-420, 2017.
- [18] T. Sihombing and H. Nurhaliza, "The influence of audit committee characteristics and audit quality on ESG performance with sustainable growth rate as a moderation variable," *Corporate Governance and Sustainability Review*, vol. 9, no. 3, pp. 45-54, 2025.
- [19] M. Arif, A. Sajjad, S. Farooq, M. Abrar, and A. S. Joyo, "The impact of audit committee attributes on the quality and quantity of environmental, social and governance (ESG) disclosures," *Corporate Governance: The International Journal of Business in Society*, vol. 21, no. 3, pp. 497-514, 2021.
- [20] M. Pozzoli, A. Pagani, and F. Paolone, "The impact of audit committee characteristics on ESG performance in the European Union member states: Empirical evidence before and during the COVID-19 pandemic," *Journal of Cleaner Production*, vol. 371, p. 133411, 2022.
- [21] N. N. Jamil and E. T. Wahyuni, "Audit Committee Effectiveness and Environmental, Social and Governance Rating in Malaysia," *International Journal of Economics and Financial Issues*, vol. 15, no. 1, p. 272, 2025.
- [22] P. Jiraporn and K. C. Gleason, "Capital structure, shareholder rights, and corporate governance," *Journal of financial research*, vol. 30, no. 1, pp. 21-33, 2007.
- [23] G. Chadha and M. Singhanian, "Demystifying the influence of debt providers' preferences on sustainability reporting: A firm-level meta-analytical inquiry," *Environmental Science and Pollution Research*, vol. 31, no. 10, pp. 14704-14747, 2024.
- [24] I. Harymawan, F. K. G. Putra, B. A. Fianto, and W. A. Wan Ismail, "Financially distressed firms: Environmental, social, and governance reporting in Indonesia," *Sustainability*, vol. 13, no. 18, p. 10156, 2021.

- [25] A. Yadav, "Financial distress, ESG practices and firm valuation: comparing pre-and post-Paris Agreement periods," *Management Decision*, 2025, doi: <https://doi.org/10.1108/MD-05-2024-1159>.
- [26] A. Chariri, I. Januarti, and E. N. A. Yuyetta, "Audit committee characteristics and carbon emission disclosure," in *E3S web of conferences*, 2018, vol. 73: EDP Sciences, p. 02001.
- [27] M. C. Jensen and W. H. Meckling, "Theory of the firm: Managerial behavior, agency costs and ownership structure," in *Corporate governance: Gower*, 2019, pp. 77-132.
- [28] L. Conca, F. Manta, D. Morrone, and P. Toma, "The impact of direct environmental, social, and governance reporting: Empirical evidence in European-listed companies in the agri-food sector," *Business Strategy and the Environment*, vol. 30, no. 2, pp. 1080-1093, 2021.
- [29] M. C. Suchman, "Managing legitimacy: Strategic and institutional approaches," *Academy of management review*, vol. 20, no. 3, pp. 571-610, 1995.
- [30] N. Malik and S. Kashiramka, "ESG disclosure and its impact on firm leverage: Moderating role of quality of financial reporting and financial constraints," *Global Finance Journal*, vol. 65, p. 101099, 2025.
- [31] L. Y. Choy, "Hong Kong's changing regulatory approaches to corporate environmental, social, and governance ('ESG') disclosure: an evidence-based assessment," *Journal of Corporate Law Studies*, vol. 24, no. 1, pp. 137-167, 2024.
- [32] V. Minutiello and P. Tettamanzi, "Is It Just a Matter of Reputation? A Study on the Impact of ESG Controversies on Corporate Disclosure," in *The Development of Non-Financial Reporting: The Role of Sustainability Reporting and Integrated Reporting in Corporate Strategy*: Springer, 2025, pp. 67-91.
- [33] I. Ulupui, Y. Murdayanti, M. Yusuf, I. Pahala, and A. Zakaria, "Integrated reporting disclosure and its implications on investor reactions," *The Journal of Asian Finance, Economics and Business*, vol. 7, no. 12, pp. 433-444, 2020.
- [34] R. E. Freeman, *Strategic management: A stakeholder approach*. Pitman, Boston, MA, 1984.
- [35] I. Itan, S. Sylvia, S. Septiany, and R. Chen, "The influence of environmental, social, and governance disclosure on market reaction: evidence from emerging markets," *Discover Sustainability*, vol. 6, no. 1, p. 347, 2025.
- [36] N. Masoud, "Integrating theories for insight: corporate governance and environmental disclosure practices in the UAE," *Corporate Governance: The International Journal of Business in Society*, vol. 25, no. 7, pp. 1485-1502, 2025.
- [37] T. Ben Noamene, "Do private equity investors value ESG and SDGs? Evidence from Tunisia," *Society and Business Review*, vol. 20, no. 3, pp. 455-469, 2025.
- [38] V. Lagasio and N. Cucari, "Corporate governance and environmental social governance disclosure: A meta-analytical review," *Corporate social responsibility and environmental management*, vol. 26, no. 4, pp. 701-711, 2019.
- [39] A. Buallay and J. Al-Ajmi, "The role of audit committee attributes in corporate sustainability reporting: Evidence from banks in the Gulf Cooperation Council," *Journal of Applied Accounting Research*, vol. 21, no. 2, pp. 249-264, 2020.
- [40] K.-C. Yao, C.-C. Lai, W.-J. Shyr, D.-F. Chou, and K.-M. Huang, "Exploring key factors influencing ESG commitment: evidence from Taiwanese listed companies," *Sustainability*, vol. 17, no. 13, p. 6208, 2025.

- [41] L. Zamani, S. Borzoian, and S. Minaei, "The role of audit committee attributes in corporate sustainability reporting," *Operational and Performance Research in Accounting and Auditing*, vol. 3, no. 2, pp. 105-133, 2020.
- [42] A. Albawwat, "The influence of audit committee characteristics on voluntary disclosure of annual financial reports in Jordan," *Universal Journal of Accounting and Finance*, vol. 10, no. 1, pp. 161-170, 2022.
- [43] S. N. Bronson, J. V. Carcello, C. W. Hollingsworth, and T. L. Neal, "Are fully independent audit committees really necessary?," *Journal of accounting and public policy*, vol. 28, no. 4, pp. 265-280, 2009.
- [44] M. G. De Almeida and I. C. D. S. Paiva, "Audit committees and its effect on environmental, social, and governance disclosure," in *2022 17th Iberian Conference on Information Systems and Technologies (CISTI)*, 2022: IEEE, pp. 1-6.
- [45] A. Hammami and M. Hendijani Zadeh, "Audit quality, media coverage, environmental, social, and governance disclosure and firm investment efficiency: Evidence from Canada," *International Journal of Accounting & Information Management*, vol. 28, no. 1, pp. 45-72, 2020.
- [46] L. Lakhani and S. L. Herbert, "Theoretical frameworks applied in integrated reporting and sustainability reporting research," *South African Journal of Economic and Management Sciences*, vol. 25, no. 1, p. 4427, 2022.
- [47] P. Velte, "Meta-analyses on corporate social responsibility (CSR): a literature review," *Management Review Quarterly*, vol. 72, no. 3, pp. 627-675, 2022.
- [48] L. Girella, P. Rossi, and S. Zambon, "Exploring the firm and country determinants of the voluntary adoption of integrated reporting," *Business Strategy and the Environment*, vol. 28, no. 7, pp. 1323-1340, 2019.
- [49] F. Khalid, A. Razzaq, J. Ming, and U. Razi, "Firm characteristics, governance mechanisms, and ESG disclosure: how caring about sustainable concerns?," *Environmental Science and Pollution Research*, vol. 29, no. 54, pp. 82064-82077, 2022.
- [50] R. Chung, L. Bayne, and J. L. Birt, "Determinants of ESG disclosure among listed firms under voluntary and mandatory ESG disclosure regimes in Hong Kong," *Journal of Applied Accounting Research*, vol. 25, no. 4, pp. 812-836, 2024.
- [51] D. Q. Le, Q. N. Ngoc, T. M. N. Do, N. L. Hong, and M. A. V. Ngoc, "How does the audit committee affect ESG performance? A case of China," *Asian Economic and Financial Review*, vol. 15, no. 7, pp. 1058-1079, 2025.
- [52] S. Maurya, S. Nanda, and M. Riyath, "Do Firm-Specific Factors Matter for ESG Performance Disclosure? Evidence from Environmentally Sensitive Sectors in India," *Australasian Accounting, Business and Finance Journal*, vol. 19, no. 4, 2025.
- [53] T. Al Barrak, K. Chebbi, A. A. Aljughaiman, and M. Albarrak, "Exploring the interplay between sustainability and debt costs in an emerging market: does financial distress matter?," *Sustainability*, vol. 15, no. 12, p. 9273, 2023.
- [54] C. Lohmann, S. Möllenhoff, and S. Lehner, "On the Relationship between Financial Distress and ESG Scores," *Corporate Social Responsibility and Environmental Management*, 2025, doi: <https://doi.org/10.1002/csr.70033>.
- [55] X. Cui, R. Li, S. Xue, and X. Zhang, "Mandatory versus voluntary: The real effect of ESG disclosures on corporate earnings management," *Journal of International Money and Finance*, vol. 154, p. 103323, 2025.

- [56] T. K. Do and X. V. Vo, "Is mandatory sustainability disclosure associated with default risk? Evidence from emerging markets," *Finance Research Letters*, vol. 55, p. 103818, 2023.
- [57] E. Bolognesi, A. Burchi, J. W. Goodell, and A. Paltrinieri, "Stakeholders and regulatory pressure on ESG disclosure," *International Review of Financial Analysis*, vol. 103, p. 104145, 2025.
- [58] Y. Jiang and Q. Tang, "Mandatory carbon reporting, voluntary carbon disclosure and ESG performance," *Pacific Accounting Review*, vol. 35, no. 4, pp. 534-561, 2023.
- [59] A. Zanócz, "Non-financial reporting and assurance trends in selected Central European countries," *Public Finance Quarterly*, vol. 71, no. 3, pp. 100-122, 2025.
- [60] G. Vitale, S. Cupertino, G. Schiuma, and C. Troise, "Investigating How Mandatory Sustainability Reporting Influences Corporate Governance Effects on ESG Performance: From Obligation to Impact for Sustainable Development," *Corporate Social Responsibility and Environmental Management*, 2025, doi: <https://doi.org/10.1002/csr.70025>.
- [61] Y. Hutagaol-Martowidjojo, V. Tohang, and E. P. Payung, "The moderating role of policy intervention on the relationship of environment, social, and governance (ESG) and cost of equity capital: a study in basic materials companies in Asia," *Australasian Accounting, Business and Finance Journal*, vol. 17, no. 5, 2023.
- [62] N. Mohamed and A. Rashed, "An investigation of the relationship between corporate social responsibility and corporate financial performance in Egypt: The mediating role of information asymmetry," *Journal of Accounting, Business and Management (JABM)*, vol. 28, no. 1, pp. 73-86, 2021.
- [63] I. Gallego-Álvarez, M. B. Lozano, and M. Rodríguez-Rosa, "An analysis of the environmental information in international companies according to the new GRI standards," *Journal of cleaner production*, vol. 182, pp. 57-66, 2018.
- [64] C. Hsiao, *Analysis of panel data* (no. 64). Cambridge university press, 2022.
- [65] J. M. Wooldridge, "Econometric analysis of cross section and panel data MIT press," Cambridge, ma, vol. 108, no. 2, pp. 245-254, 2002.
- [66] A. Genedy and A. Sakr, "The relationship between corporate social responsibility and corporate financial performance in developing countries. Case of Egypt," *International Journal of Business and Economic Development (IJBED)*, vol. 5, no. 2, pp. 59-73, 2017.
- [67] T. Liu, A. Abdelbaky, A. A. Elamer, and M. Elmahgoub, "Real earnings management and ESG disclosure in emerging markets: The moderating effect of managerial ownership from a social norm perspective," *Heliyon*, vol. 9, no. 12, 2023.
- [68] N. Shehata, M. El-Helaly, and M. Hossain, "A tale of two revolutions: Environmental, social, and governance performance and dividend policy in Egyptian-listed companies during unstable times," *Research in International Business and Finance*, vol. 75, p. 102737, 2025.
- [69] M. Shan and J. Zhu, "Do ESG ratings inhibit corporate leverage manipulation? The moderating effects of internal and external supervision," *Sustainability Accounting, Management and Policy Journal*, vol. 16, no. 5, pp. 1269-1302, 2025.
- [70] M. Shan and J. Zhu, "Do ESG ratings inhibit corporate leverage manipulation? The moderating effects of internal and external supervision," *Sustainability Accounting, Management and Policy Journal*, no. ahead-of-print, 2024.

- [71] M. C. Minutolo, W. D. Kristjanpoller, and J. Stakeley, "Exploring environmental, social, and governance disclosure effects on the S&P 500 financial performance," *Business Strategy and the Environment*, vol. 28, no. 6, pp. 1083-1095, 2019.
- [72] M. Gidage and S. Bhide, "Exploring the ESG-audit fees nexus: insights from Indian firms," *Managerial Auditing Journal*, Article vol. 40, no. 7, pp. 1136-1167, 2025, doi: 10.1108/MAJ-09-2024-4510.
- [73] R. B. Amanamah, "Examining the Moderating Role of Firm Characteristics in the Corporate Governance-Financial Reporting Quality Nexus: Evidence From a Developing Country," *Business Ethics and Leadership*, vol. 8, no. 1, pp. 28-44, 2024.
- [74] F. Nyame-Asiamah and S. Ghulam, "The relationship between CSR activity and sales growth in the UK retailing sector," *Social Responsibility Journal*, vol. 16, no. 3, pp. 387-401, 2020, doi: 10.1108/SRJ-09-2018-0245.
- [75] F. Rauf, W. Wanqiu, K. Naveed, S. U. Qadri, and M. S. e. Ali, "How ESG reporting is effected by sustainable finance and green innovation: moderating role of sales growth," *Environmental Science and Pollution Research*, vol. 31, no. 5, pp. 7246-7263, 2024.
- [76] S. O. Ifedigbo, "Emerging Corporate Reporting Perspectives and Operational Performance of Listed Oil and Gas Firms in Nigeria," *International Journal of Economics, Business and Management Research*, vol. 6, no. 11, 2022.
- [77] S. Saleh, A. Elgharbawy, and O. Abouelela, "Does audit quality influence the relationship between ownership structure and environmental, social and governance disclosure? Evidence from Egypt," *Journal of Financial Reporting and Accounting*, vol. ahead-of-print, no. ahead-of-print, 2025, doi: <https://doi.org/10.1108/JFRA-11-2024-0780>.
- [78] M. Moalla and S. Dammak, "Do media coverage and audit quality of US companies affect their environmental, social and governance transparency?," *Journal of Financial Reporting and Accounting*, vol. 23, no. 5, pp. 2007-2026, 2025.
- [79] B. H. Baltagi and B. H. Baltagi, *Econometric analysis of panel data*. Springer, 2008.
- [80] L. S. Aiken, *Multiple regression: Testing and interpreting interactions*. sage, 1991.
- [81] J. F. Hair, *Multivariate data analysis*. Pearson, 2009.
- [82] D. N. Gujarati and D. C. Porter, *Basic econometrics*. McGraw-hill, 2009.
- [83] J. A. Hausman, "Specification tests in econometrics," *Econometrica: Journal of the econometric society*, pp. 1251-1271, 1978.
- [84] T. S. Breusch and A. R. Pagan, "The Lagrange multiplier test and its applications to model specification in econometrics," *The review of economic studies*, vol. 47, no. 1, pp. 239-253, 1980.
- [85] M. H. Pesaran, "General diagnostic tests for cross-sectional dependence in panels," *Empirical economics*, vol. 60, no. 1, pp. 13-50, 2021.
- [86] J. B. Ramsey, "Tests for specification errors in classical linear least-squares regression analysis," *Journal of the Royal Statistical Society Series B: Statistical Methodology*, vol. 31, no. 2, pp. 350-371, 1969.
- [87] N. Beck and J. N. Katz, "What to do (and not to do) with time-series cross-section data," *American political science review*, vol. 89, no. 3, pp. 634-647, 1995.
- [88] D. Hoechle, "Robust standard errors for panel regressions with cross-sectional dependence," *The stata journal*, vol. 7, no. 3, pp. 281-312, 2007.
- [89] N. Devika Rani, B. Shobha, S. Vincent Paul, P. Immaculate Joyce, N. Renuka Devi, and J. Nagarathnamma, "ESG-Driven Corporate Sustainability and Capital Structure

- Strategies: Perspectives from Indian Listed Companies," in *Data-Driven Decision Making for Sustainable Business Growth*: Springer, 2025, pp. 401-413.
- [90] M. Saharti, A. Saeed, S. M. Chaudhry, and R. Ahmed, "ESG Performance of Firms and the Structure of Loan Syndicates: Moderating Role of Relationship," *European Financial Management*, 2025.
- [91] R. Al-Khouri and A. A. Abdul Basith, "The status of environmental, social, and governance voluntary disclosure in the GCC banking industry: does it pay to be socially responsible?," in *Empirical Research in Banking and Corporate Finance*: Emerald Publishing Limited, 2022, pp. 155-189.
- [92] J. Dua and A. K. Sharma, "Unveiling the ESG-dividend nexus: the moderating role of investor protection and regulatory enforcement," *Journal of Indian Business Research*, vol. 16, no. 2, pp. 265-286, 2024.
- [93] R. Desai, "Statutory ESG reporting and investment efficiency: Evidence using quasi-natural experiment," *International Journal of Law and Management*, 2025.
- [94] P. O. Johnson and J. Neyman, "Tests of certain linear hypotheses and their application to some educational problems," *Statistical research memoirs*, 1936.
- [95] M. E. Nawaiseh, "Do firm size and financial performance affect corporate social responsibility disclosure: employees' and environmental dimensions?," *American Journal of Applied Sciences*, vol. 12, no. 12, p. 967, 2015.
- [96] M. H. Shakil, M. Tasnia, and M. I. Mostafiz, "Board gender diversity and environmental, social and governance performance of US banks: Moderating role of environmental, social and corporate governance controversies," *International Journal of Bank Marketing*, vol. 39, no. 4, pp. 661-677, 2021.
- [97] O. Pasko, L. Zhang, A. Oriekhova, V. Aleksanyan, M. Hordiyenko, and Y. Tkal, "Do financial auditors impact sustainability reporting? The effects of big four financial audits on the quality of CSR reports in China," *Intellectual Economics*, vol. 17, no. 2, pp. 330-361, 2023.
- [98] M. A. Intezar et al., "Unveiling the nexus between environmental, social, governance variables and firm performance: An empirical investigation," *Journal of Governance and Regulation/Volume*, vol. 13, no. 4, pp. 46-53, 2024.
- [99] A. A. Hashed, F. A. Almaqtari, A. Elmashtawy, and N. A. M. Raweh, "The Role of Governance Audit Mechanisms on Environmental Sustainability and Emissions in Saudi Arabia Under ESG Regulations," *Sustainability (Switzerland)*, vol. 17, no. 9, 2025, Art no. 4020, doi: 10.3390/su17094020.
- [100] M. R. Roberts and T. M. Whited, "Endogeneity in empirical corporate finance1," in *Handbook of the Economics of Finance*, vol. 2: Elsevier, 2013, pp. 493-572.
- [101] P. de Jong, "ESG Disclosure Inconsistency and Tail Risk," *Finance Research Letters*, p. 108928, 2025.
- [102] F. Su, M. Guan, Y. Liu, and J. Liu, "ESG performance and corporate fraudulence: Evidence from China," *International Review of Financial Analysis*, vol. 93, p. 103180, 2024.
- [103] S. F. Khatib, "An assessment of methods to deal with endogeneity in corporate governance and reporting research," *Corporate Governance: The International Journal of Business in Society*, vol. 25, no. 3, pp. 606-630, 2025.
- [104] M. B. Wintoki, J. S. Linck, and J. M. Netter, "Endogeneity and the dynamics of internal corporate governance," *Journal of financial economics*, vol. 105, no. 3, pp. 581-606, 2012.

- [105] D.-M. Wu, "Alternative tests of independence between stochastic regressors and disturbances," *Econometrica: journal of the Econometric Society*, vol. 41, no. 4, pp. 733-750, 1973.
- [106] R. Davidson and J. G. MacKinnon, *Estimation and inference in econometrics*. Oxford New York, 1993.
- [107] D. Kim, "The errors in the variables problem in the cross-section of expected stock returns," *The Journal of Finance*, vol. 50, no. 5, pp. 1605-1634, 1995.
- [108] I.-C. Yeh and W.-S. Chi, "Stock valuation model based on mean reversion of return on equity," *OPSEARCH*, pp. 1-37, 2025.
- [109] T. L. Squares, "Total Least Squares and Errors-in-Variables Modeling: Analysis, Algorithms and Applications," ed: Springer, 2002.