

Can ESG disclosure and digital accounting mitigate financial statement fraud? Evidence from the Fraud Hexagon perspective

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Abstract

Financial statement fraud threatens corporate reporting integrity amid increasing demands for ESG transparency and digital transformation. This study examines the effects of Fraud Hexagon dimensions on financial statement fraud and the moderating roles of ESG disclosure and digital accounting. Using secondary panel data from Energy, Basic Materials, and Industrials companies listed on the Indonesia Stock Exchange during 2021–2025, the study applies panel regression and moderation analysis. Financial statement fraud is measured using the Dechow F-Score, while ESG disclosure and digital accounting are measured using disclosure indices. The results show that pressure, opportunity, capability, and collusion significantly increase financial statement fraud, while rationalization and arrogance are insignificant. ESG disclosure significantly weakens the relationship between the Fraud Hexagon and financial statement fraud, as does digital accounting. The findings confirm the relevance of the Fraud Hexagon while demonstrating that sustainability transparency and digital accounting can serve as complementary governance mechanisms for strengthening financial reporting integrity.

Keywords: Digital Accounting; ESG Disclosure; Financial Statement Fraud; Fraud Hexagon; Green Governance.

Article History:

Received: August 20, 2026; Accepted: October 01, 2026; Published: October 14, 2026

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DOI:

<https://doi.org/10.30871/jaba.13967>

JEL Code:

M41, G34, G30

INTRODUCTION

Financial statement fraud remains a critical challenge to corporate accountability because the manipulation of financial information can distort investment decisions, reduce stakeholder trust, and undermine the credibility of corporate reporting. This challenge is increasingly relevant for Indonesian companies as stakeholders demand greater transparency in both financial and sustainability performance. The Fraud Hexagon framework provides a comprehensive explanation of fraudulent financial reporting through six dimensions: pressure, opportunity, rationalization, capability, arrogance, and collusion. Empirical studies in Indonesia have applied this framework across state-owned enterprises, banking, infrastructure, information technology, and energy sectors, demonstrating its relevance for identifying potential financial statement fraud (Achmad, Ghozali, Helmina, et al., 2022; Achmad, Ghozali, & Pamungkas, 2022; Nadziliyah & Primasari, 2022; Sihombing & Panggulu, 2022; Zulman et al., 2024). Recent evidence further confirms the relevance of Fraud Hexagon, although the significance of individual dimensions differs across industries and institutional settings (Adhanian et al., 2024; Amalia et al., 2025; Azhari & Lenggogeni, 2024; Hardila et al., 2026; Yulianti et al., 2024). These differences suggest that identifying fraud drivers alone may be insufficient and that further investigation is needed into governance mechanisms capable of constraining the conversion of fraud risk into fraudulent financial reporting.

Recent research has extended financial statement fraud studies toward sustainability, governance, and technology-enabled approaches. Achmad et al. (2024) incorporated Big Data Analytics, risk management, and Sustainable Development Goals into fraud detection, while Ghozali et al. (2025) integrated digital forensics and risk management into financial statement fraud mitigation. Hossain (2026) further proposed an AI-driven forensic accounting framework combining blockchain, machine learning, and ESG risk indicators. Although these studies demonstrate the increasing importance of technology in fraud-related research, their primary emphasis remains on fraud detection and forensic identification, rather than on digital accounting as an organizational reporting and governance mechanism. Digital accounting represents a distinct dimension because it concerns the digitalization of accounting information processes, financial reporting, data integration, traceability, and accessibility, which may directly influence the information environment in which fraudulent reporting occurs. At the sustainability level, ESG disclosure has increasingly been examined as a mechanism for enhancing corporate transparency, although ESG reporting itself may be exposed to greenwashing and data manipulation risks (Sun, 2025). Ischaq and Pamungkas (2025) provide particularly relevant evidence by examining ESG disclosure as a moderator of the relationship between Fraud Hexagon and fraudulent financial statements. However, this emerging literature does not yet integrate digital accounting into the same moderating framework. Consequently, the existing literature remains fragmented: Fraud Hexagon studies predominantly examine behavioral and organizational determinants of financial statement fraud, ESG research emphasizes sustainability transparency, and technology-oriented studies primarily focus on digital forensics, Big Data Analytics, blockchain, and artificial intelligence as fraud-detection tools (Achmad, Ghozali, Helmina, et al., 2022; Ghozali et al., 2025; Hossain, 2026).

This study addresses this gap by examining whether ESG disclosure and digital accounting jointly function as governance mechanisms that weaken the relationship between Fraud Hexagon dimensions and financial statement fraud. The distinction from previous research lies particularly in the treatment of digital accounting. Rather than conceptualizing digital technology merely as a tool for detecting fraud after it occurs, this study positions digital accounting as an *ex ante* governance mechanism that may strengthen the accounting information environment through greater timeliness, traceability, integration, and accessibility of financial information. In this framework, ESG disclosure and digital accounting operate through complementary channels: ESG disclosure strengthens external transparency and stakeholder scrutiny, whereas digital accounting strengthens the internal digital information environment and traceability of accounting processes. This positioning extends the study of

Ischaq and Pamungkas (2025), which examines ESG disclosure as a moderator, by introducing digital accounting as an additional technology-enabled moderating mechanism. It also extends technology-oriented fraud research by shifting attention from fraud detection toward the potential preventive governance function of digitalized accounting processes (Achmad, Ghozali, Helmina, et al., 2022; Ghozali et al., 2025; Hossain, 2026). Using secondary data from Indonesian listed companies, this study measures financial statement fraud using the Dechow F-Score, the six Fraud Hexagon dimensions using observable indicators, ESG disclosure using an ESG disclosure index, and digital accounting using a disclosure-based digital accounting index. Accordingly, the study aims to examine the effects of pressure, opportunity, rationalization, capability, arrogance, and collusion on financial statement fraud and to determine whether ESG disclosure and digital accounting weaken these relationships. The study contributes to the accounting literature by integrating fraud behavior, sustainability transparency, and digital accounting governance into a single empirical framework and provides an empirical foundation for developing a Digital Green Governance Framework for strengthening financial reporting integrity in Indonesian green-oriented and industrial sectors.

RESEARCH METHOD

This study employs a quantitative explanatory design using secondary panel data to examine the effects of the six Fraud Hexagon dimensions pressure, opportunity, rationalization, capability, arrogance, and collusion on financial statement fraud and to investigate the moderating roles of ESG disclosure and digital accounting. The population comprises companies listed on the Indonesia Stock Exchange (IDX) in the Energy, Basic Materials, and Industrials sectors during 2021–2025. These sectors are selected because of their strong relevance to industrialization, natural-resource utilization, environmental impacts, and sustainable economic transformation. Purposive sampling is employed based on the following criteria: (1) companies were continuously listed on the IDX during 2021–2025; (2) companies published annual financial statements and annual reports for each observation year; (3) companies provided sufficient information to measure the six Fraud Hexagon dimensions; (4) companies disclosed sufficient ESG-related information to construct the ESG Disclosure Index; and (5) companies disclosed sufficient information regarding digital accounting and reporting practices to construct the Digital Accounting Disclosure Index. Companies with substantially incomplete information are excluded. The unit of analysis is the firm-year observation. Data are obtained from the IDX and official company websites, including annual reports, audited financial statements, sustainability reports, and corporate governance disclosures. The sample selection process is presented in Table 1.

Table 1. Sample Selection Procedure

Sample Selection Criteria	Number of Firms
Initial population of companies in the Energy, Basic Materials, and Industrials sectors listed on IDX during 2021–2025	85
Companies not continuously listed during 2021–2025	17
Companies without complete annual reports during the observation period	12
Companies with insufficient information to measure Fraud Hexagon variables	15
Companies with insufficient ESG disclosure information	8
Companies with insufficient digital accounting disclosure information	13
Final sample	20
Observation period	5 years
Total firm-year observations	100

Source: Authors' screening based on IDX and company annual reports, audited financial statements, sustainability reports, and corporate governance disclosures, 2021–2025.

The sample-selection procedure began with 85 companies in the Energy, Basic Materials, and Industrials sectors listed on the IDX during the observation period. Seventeen companies were excluded because they were not continuously listed during 2021–2025, while 12 companies were excluded because complete annual reports were unavailable. A further 15 companies were excluded because the available disclosures were insufficient to measure the Fraud Hexagon variables. Eight companies were excluded because their ESG-related disclosures were insufficient to construct the ESG Disclosure Index, and 13 companies were excluded because information regarding digital accounting practices was insufficient to construct the Digital Accounting Disclosure Index. After applying all criteria, 20 companies remained as the final sample, resulting in 100 firm-year observations over five years.

Financial statement fraud (FFS), the dependent variable, is measured using the Dechow F-Score. The F-Score provides a quantitative measure of the likelihood of material financial statement misstatement and is therefore appropriate for identifying potential fraudulent financial reporting from publicly available financial information. The Fraud Hexagon variables are operationalized using observable financial, governance, and corporate-reporting indicators that have been employed in previous Fraud Hexagon studies. Pressure (PRESS) is measured by changes in total assets because rapid changes in company assets may reflect performance or growth pressures faced by management. Opportunity (OPP) is measured by the proportion of independent commissioners as an indicator of the effectiveness of independent monitoring and the opportunity for managerial intervention in financial reporting. Rationalization (RATION) is proxied by auditor switching because changes in auditors may be associated with changes in the reporting environment and management's justification of accounting practices. Capability (CAP) is measured by changes in directors or CEOs because individuals occupying these positions possess the authority, knowledge, and organizational access necessary to influence financial reporting. Arrogance (ARR) is measured by the number of CEO or director photographs in the annual report, reflecting the prominence and self-emphasis of senior executives in corporate communication. Collusion (COLL) is measured using disclosed related-party relationships or affiliation indicators because coordinated relationships among organizational parties may facilitate concealment or manipulation of financial information. The use of these proxies is consistent with previous empirical applications of the Fraud Hexagon framework in Indonesian companies, although the specific operationalization of individual dimensions may vary across industries and studies (Achmad, Ghazali, Helmina, et al., 2022; Achmad, Ghazali, & Pamungkas, 2022; Azhari & Lenggogeni, 2024; Nadziliyah & Primasari, 2022; Pranyanita et al., 2021; Sihombing & Panggulu, 2022; Yulianti et al., 2024; Zulman et al., 2024).

ESG disclosure (ESG) is measured using a disclosure index developed from information contained in annual reports and sustainability reports. The index consists of three dimensions: environmental, social, and governance. The environmental dimension includes energy consumption and efficiency, emissions, waste management, water and resource management, environmental policies, and environmental initiatives. The social dimension includes employee relations, occupational health and safety, employee training and development, diversity, human rights, community involvement, and customer responsibility. The governance dimension includes board structure, board independence, business ethics, anti-corruption practices, risk management, stakeholder rights, and corporate governance policies. Each item receives a score of 1 if the company explicitly discloses the relevant information and 0 if the information is not disclosed. The ESG Disclosure Index is calculated as follows:

$$ESG_it = \Sigma \text{ Disclosed ESG Items_it} / \Sigma \text{ Applicable ESG Items_it}$$

The resulting index ranges from 0 to 1, with higher values indicating more extensive ESG disclosure. This disclosure-based measurement is consistent with the use of ESG disclosure as a transparency and governance mechanism in financial statement fraud research (Ischaq &

Pamungkas, 2025). Because ESG information can also be subject to greenwashing and data-manipulation risks, systematic identification of disclosed ESG items is important for maintaining measurement consistency (Sun, 2025).

Digital accounting (DAC) is measured using a Digital Accounting Disclosure Index designed to capture the extent to which companies disclose the adoption or use of digitally enabled accounting and financial-reporting practices. The index consists of eight categories: (1) digital financial reporting; (2) accounting information systems; (3) electronic financial reporting or e-reporting; (4) accounting data analytics; (5) automated accounting processes; (6) digital or technology-enabled audit practices; (7) real-time or timely financial information; and (8) accounting data security and protection. Digital financial reporting refers to disclosed practices involving digitally prepared, processed, or disseminated financial information. Accounting information systems refer to integrated or computerized accounting systems. E-reporting covers electronic submission or dissemination of accounting and financial information. Accounting data analytics refers to the use of analytical technologies in accounting processes. Automated accounting covers automated recording, reconciliation, or other accounting procedures. Digital audit refers to technology-enabled auditing or audit-support systems. Real-time information refers to systems that provide timely or continuously updated financial information. Data security covers cybersecurity, access control, and protection of accounting and financial information. Each indicator is coded 1 when explicit evidence of the practice is disclosed and 0 otherwise. The Digital Accounting Disclosure Index is calculated as:

$$DAC_it = \Sigma \text{ Disclosed Digital Accounting Items_it} / \Sigma \text{ Applicable Digital Accounting Items_it}$$

A higher DAC value indicates a greater extent of disclosed digital accounting practices. This operationalization distinguishes digital accounting from digital forensics, Big Data Analytics, blockchain, and artificial intelligence when these technologies are used primarily for fraud detection. Previous studies have predominantly examined technology as a tool for detecting or investigating fraud, including Big Data Analytics, digital forensics, and AI-based approaches (Achmad et al., 2024; Ghazali et al., 2025; Hossain, 2026). In contrast, this study conceptualizes digital accounting as an organizational information and governance mechanism that may improve the timeliness, accessibility, integration, and traceability of accounting information.

The six Fraud Hexagon dimensions are first analyzed individually because pressure, opportunity, rationalization, capability, arrogance, and collusion represent theoretically distinct mechanisms. Accordingly, the direct-effect model includes PRESS, OPP, RATION, CAP, ARR, and COLL as separate explanatory variables. For the moderation analysis, these six dimensions are combined into a single composite Fraud Hexagon variable (FH). Because the six proxies have different measurement scales, each dimension is first standardized using a z-score transformation. The composite FH variable is then calculated as the arithmetic mean of the six standardized dimensions:

$$FH_it = (ZPRESS_it + ZOPP_it + ZRATION_it + ZCAP_it + ZARR_it + ZCOLL_it) / 6$$

A higher FH score represents a higher overall level of conditions associated with Fraud Hexagon risk. This procedure preserves the multidimensional nature of the Fraud Hexagon framework while allowing a single composite construct to be incorporated into the moderation model. The approach is consistent with the conceptualization of Fraud Hexagon as a framework consisting of multiple interacting fraud conditions rather than a single directly observable variable (Achmad, Ghazali, & Pamungkas, 2022; Siddiq & Sutopo, 2024).

Three control variables are included in the analysis: firm size (SIZE), leverage (LEV), and profitability (ROA). Firm size is measured as the natural logarithm of total assets, leverage is measured as total liabilities divided by total assets, and profitability is measured by return on

assets (ROA), calculated as net income divided by total assets. These variables are incorporated to account for differences in company scale, financial risk, and operating performance that may be associated with financial statement fraud.

The data are analyzed using panel-data regression. Descriptive statistics are first performed to describe the distribution of the variables, followed by diagnostic tests to evaluate the suitability of the regression models. The appropriate panel-data specification is determined using the Chow test, Hausman test, and Lagrange Multiplier test. The direct-effect model is specified as follows:

$$\text{FFS_it} = \beta_0 + \beta_1 \text{PRESS_it} + \beta_2 \text{OPP_it} + \beta_3 \text{RATION_it} + \beta_4 \text{CAP_it} + \beta_5 \text{ARR_it} + \beta_6 \text{COLL_it} + \beta_7 \text{SIZE_it} + \beta_8 \text{LEV_it} + \beta_9 \text{ROA_it} + \varepsilon_{it}$$

The moderation model examines whether ESG disclosure and digital accounting weaken the relationship between the composite Fraud Hexagon variable and financial statement fraud:

$$\text{FFS_it} = \beta_0 + \beta_1 \text{FH_it} + \beta_2 \text{ESG_it} + \beta_3 \text{DAC_it} + \beta_4 (\text{FH} \times \text{ESG})_{it} + \beta_5 (\text{FH} \times \text{DAC})_{it} + \beta_6 \text{SIZE_it} + \beta_7 \text{LEV_it} + \beta_8 \text{ROA_it} + \varepsilon_{it}$$

where FFS denotes financial statement fraud, FH denotes the composite Fraud Hexagon variable, ESG denotes ESG disclosure, DAC denotes digital accounting, SIZE denotes firm size, LEV denotes leverage, ROA denotes profitability, *i* denotes the company, *t* denotes the year, and ε denotes the error term. A negative and statistically significant coefficient for $\text{FH} \times \text{ESG}$ indicates that higher ESG disclosure weakens the relationship between Fraud Hexagon risk and financial statement fraud. Similarly, a negative and statistically significant coefficient for $\text{FH} \times \text{DAC}$ indicates that stronger digital accounting practices weaken the relationship between Fraud Hexagon risk and financial statement fraud. Statistical significance is evaluated at the 5% level.

To further examine whether the moderating effects differ across the six Fraud Hexagon dimensions, an additional robustness analysis is conducted by estimating separate interaction terms between each Fraud Hexagon dimension and ESG disclosure and between each dimension and digital accounting. The robustness model is specified as:

$$\text{FFS_it} = \beta_0 + \sum \beta_{k\text{FH}k} \text{FH}k_{it} + \beta_{\text{ESG}} \text{ESG_it} + \beta_{\text{DAC}} \text{DAC_it} + \sum \beta_{k\text{ESG}} (\text{FH}k \times \text{ESG})_{it} + \sum \beta_{k\text{DAC}} (\text{FH}k \times \text{DAC})_{it} + \beta_1 \text{SIZE_it} + \beta_2 \text{LEV_it} + \beta_3 \text{ROA_it} + \varepsilon_{it}$$

where FHk represents each of the six Fraud Hexagon dimensions. This additional specification allows the analysis to identify whether ESG disclosure and digital accounting moderate specific fraud mechanisms rather than assuming that the moderating effects are identical across all dimensions. Overall, the research model positions Fraud Hexagon as the principal explanatory framework, financial statement fraud as the outcome variable, and ESG disclosure and digital accounting as complementary governance-based moderators.

RESULTS AND DISCUSSION

Data Collection and Descriptive Statistics

This study examines 20 companies in the Energy, Basic Materials, and Industrials sectors listed on the Indonesia Stock Exchange (IDX) during 2021–2025, resulting in 100 firm-year observations. Data were obtained from annual reports, audited financial statements, sustainability reports, and corporate governance disclosures. Table 2 presents the descriptive statistics.

Table 2. Descriptive Statistics

Variable	Mean	Minimum	Maximum	Std. Dev.
FFS	0.94	0.21	2.31	0.43

Variable	Mean	Minimum	Maximum	Std. Dev.
PRESS	0.08	-0.32	0.74	0.16
OPP	0.41	0.20	0.67	0.11
RATION	0.27	0.00	1.00	0.45
CAP	0.31	0.00	1.00	0.46
ARR	8.52	1.00	25.00	4.91
COLL	0.34	0.00	1.00	0.48
ESG	0.62	0.31	0.91	0.14
DAC	0.57	0.20	0.90	0.17
SIZE	29.14	25.87	33.82	1.71
LEV	0.48	0.08	0.91	0.20
ROA	0.06	-0.14	0.31	0.08

Source: Data processed by the researchers, 2026.

The descriptive statistics show considerable heterogeneity in financial reporting risk and governance conditions. FFS ranges from 0.21 to 2.31, indicating substantial differences in potential financial statement misstatement across firm-years. Pressure also varies considerably (-0.32 to 0.74), suggesting differences in growth-related conditions among firms. RATION, CAP, and COLL have means of 0.27, 0.31, and 0.34, respectively, indicating that the corresponding events or indicators occur in a meaningful proportion of observations. ARR varies from 1 to 25 photographs, demonstrating substantial differences in executive prominence. ESG disclosure (mean = 0.62) is somewhat higher than digital accounting (mean = 0.57), while their ranges of 0.31–0.91 and 0.20–0.90 indicate considerable differences in corporate disclosure practices. This variation provides an appropriate basis for examining whether ESG transparency and digital accounting moderate fraud risk. The control variables also show variation in firm size, leverage, and profitability, supporting their inclusion in the regression models.

Regression Results and Hypothesis Testing

The Fixed Effects Model is selected based on the panel-data model-selection tests. The results are presented in Table 3.

Table 3. Effects of Fraud Hexagon Dimensions on Financial Statement Fraud

Variable	Coefficient	t-statistic	p-value	Decision
Pressure	0.284	2.41	0.018	H1 Supported
Opportunity	0.317	2.76	0.007	H2 Supported
Rationalization	0.146	1.98	0.051	H3 Not Supported
Capability	0.201	2.17	0.033	H4 Supported
Arrogance	0.119	1.72	0.089	H5 Not Supported
Collusion	0.265	2.31	0.023	H6 Supported
Firm Size	-0.071	-2.08	0.040	—
Leverage	0.228	2.29	0.024	—
ROA	-0.194	-2.13	0.036	—
Adjusted R ²	0.38			
F-statistic	7.84		<0.001	

Source: Data processed by the researchers, 2026.

Pressure, opportunity, capability, and collusion significantly increase financial statement fraud, supporting H1, H2, H4, and H6. Pressure ($\beta = 0.284$; $p = 0.018$) indicates that stronger growth or performance pressure may increase incentives for reporting manipulation, consistent with Achmad, Ghozali, and Pamungkas (2022) and Nadziliyah and Primasari (2022). Opportunity has the largest coefficient ($\beta = 0.317$; $p = 0.007$), suggesting that weaker monitoring may provide greater scope for managerial intervention in financial reporting, consistent with

Adhania et al. (2024) and Wulansari and Handayani (2025). Capability ($\beta = 0.201$; $p = 0.033$) and collusion ($\beta = 0.265$; $p = 0.023$) further indicate that the ability to exploit organizational weaknesses and coordination among parties can facilitate fraudulent reporting (Amalia et al., 2025; Siddiq & Sutopo, 2024).

Rationalization is positive but narrowly fails to reach the 5% significance level ($\beta = 0.146$; $p = 0.051$). Thus, H3 is not supported, although the result suggests a relationship that warrants further investigation. One possible explanation is that auditor switching, the selected proxy, does not directly capture management's psychological justification for fraud because auditor changes may also occur for legitimate reasons. Similarly, arrogance is insignificant ($\beta = 0.119$; $p = 0.089$), indicating that the number of executive photographs may not adequately capture managerial dominance or entitlement. Corporate communication practices may influence photographs independently of fraud risk. These findings do not necessarily invalidate the theoretical dimensions but suggest limitations in the observable proxies. Future research could employ alternative measures such as accounting-policy changes or textual indicators for rationalization and CEO dominance, ownership, or managerial power for arrogance. The heterogeneous findings are consistent with previous Fraud Hexagon research (Yulianti et al., 2024; Zulman et al., 2024).

Moderating Effects of ESG Disclosure and Digital Accounting

Table 4 presents the moderation results.

Table 4. Moderating Effects of ESG Disclosure and Digital Accounting

Variable	Coefficient	t-statistic	p-value	Decision
Fraud Hexagon	0.291	2.73	0.008	—
ESG Disclosure	-0.163	-2.11	0.037	—
Digital Accounting	-0.137	-1.99	0.049	—
FH $\times$ ESG	-0.254	-2.84	0.006	H7 Supported
FH $\times$ DAC	-0.219	-2.47	0.015	H8 Supported
Firm Size	-0.068	-2.02	0.046	—
Leverage	0.214	2.18	0.032	—
ROA	-0.183	-2.04	0.044	—
Adjusted R ²	0.45			
F-statistic	8.96		<0.001	

Source: Data processed by the researchers, 2026.

The interaction between Fraud Hexagon and ESG disclosure is negative and significant ($\beta = -0.254$; $p = 0.006$), supporting H7. The result indicates that the positive relationship between Fraud Hexagon risk and financial statement fraud becomes weaker as ESG disclosure increases. The conditional effect can be expressed as $0.291 - 0.254(\text{ESG})$. At the mean ESG level (0.62), the Fraud Hexagon effect is approximately 0.134, compared with 0.169 at one standard deviation below the mean and 0.098 at one standard deviation above the mean. Thus, ESG disclosure appears to reduce the strength of the fraud-risk relationship rather than eliminate it. This finding is consistent with Ischaq and Pamungkas (2025) and supports the view that greater transparency can strengthen stakeholder monitoring, although ESG information itself may remain exposed to greenwashing risks (Sun, 2025).

The FH $\times$ DAC interaction is also negative and significant ($\beta = -0.219$; $p = 0.015$), supporting H8. The conditional effect is $0.291 - 0.219(\text{DAC})$. At the mean DAC level (0.57), the Fraud Hexagon effect is approximately 0.166, compared with 0.203 at low DAC and 0.129 at high DAC. This indicates that greater digital accounting disclosure weakens the relationship between Fraud Hexagon risk and financial statement fraud. The finding extends previous studies that primarily position digital technologies such as Big Data Analytics, digital forensics, and AI as fraud-detection tools (Achmad et al., 2024; Ghazali et al., 2025; Hossain, 2026). In contrast,

the present finding supports the role of digital accounting as an ex ante governance mechanism that may improve information integration, traceability, accessibility, and timeliness.

The adjusted R^2 increases from 0.38 in the direct model to 0.45 in the moderation model, indicating additional explanatory value when ESG disclosure, digital accounting, and their interaction terms are incorporated. Overall, the findings suggest that Fraud Hexagon conditions are not equally influential and that their relationship with financial statement fraud depends partly on the firm's transparency and digital information environment. This provides a more integrated perspective in which behavioral fraud risks are considered together with sustainability disclosure and digital accounting governance.

CONCLUSION

This study finds that four Fraud Hexagon dimensions pressure, opportunity, capability, and collusion have positive and significant effects on financial statement fraud, supporting H1, H2, H4, and H6. In contrast, rationalization has a positive but insignificant effect ($p = 0.051$), while arrogance is also insignificant ($p = 0.089$); therefore, H3 and H5 are not supported. These results indicate that the contribution of Fraud Hexagon dimensions to financial statement fraud is not uniform and may depend on the characteristics of the proxies and organizational context. Furthermore, ESG disclosure significantly weakens the relationship between Fraud Hexagon and financial statement fraud ($\beta = -0.254$; $p = 0.006$), supporting H7. Digital accounting also has a significant negative moderating effect ($\beta = -0.219$; $p = 0.015$), supporting H8. The findings therefore indicate that ESG disclosure and digital accounting can function as complementary governance mechanisms in reducing the strength of the relationship between Fraud Hexagon-related risks and financial statement fraud. The study is limited by its reliance on secondary data, proxy-based measurement of several Fraud Hexagon dimensions, and its focus on selected Indonesian sectors during 2021–2025. Future research should employ broader cross-sector samples and alternative measures of rationalization, arrogance, ESG disclosure, and digital accounting to further examine the robustness of these relationships.

ACKNOWLEDGMENT

The authors gratefully acknowledge the Ministry of Higher Education, Science, and Technology of the Republic of Indonesia (Kemdiktisaintek) and the Universitas Pelita Bangsa for their financial and institutional support for this research. This article is part of the 2026 Beginner Lecturer Research (Penelitian Dosen Pemula/PDP) Grant under Main Contract No. 283/C3/DT.005.00/PL-BARU/2026 dated 30 January 2026 and Derivative Contract No. 1624/LL4/PG/2026 and 008/7/KP.H/UPB/2025 dated 21 April 2026, for the research entitled “Digital Green Governance: Integrasi Fraud Hexagon ESG Akuntansi Digital untuk Memperkuat Hilirisasi Industri Hijau dan Keuangan Berkelanjutan Berbasis Dampak,” conducted in 2026. The authors also thank the institution and all parties who supported the provision of research data and the completion of this study.

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