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Pentagon Fraud and Sustainability Reporting: A Literature Review

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ABSTRACT: Sustainability reporting is a communication tool for companies to inform stakeholders about their environmental, social, and Governance activities while also serving as a strategic approach to strengthening corporate reputation. Thus, this study aims to fill this research gap by examining how fraud factors impact transparency and accountability in sustainability reporting. Furthermore, previous studies have extensively explored the Pentagon Fraud factors, including pressure, opportunity, rationalization, competence, and arrogance.

This study adopts a Systematic Literature Review (SLR) approach, following the PRISMA 2020 model as a guideline for screening and analyzing relevant literature. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) ensures that the research process is conducted systematically and transparently in identifying, evaluating, and synthesizing Pentagon Fraud and Sustainability Reporting literature**.**

The study conducted a literature mapping process to understand the interrelationships between variables, covering various relevant previous studies. The reviewed literature is categorized based on two main variables: Pentagon Fraud focuses on the determinants of fraud, examining the key factors contributing to fraudulent activities, and Sustainability Reporting relates to Environmental, Social, and Governance (ESG)-based reporting.

KEYWORDS: Pentagon Fraud, and Sustainability Reporting

I. INTRODUCTION

The fundamental theory underlying sustainability reporting is the Stakeholder Theory, which emphasizes that a company has a responsibility to account for all its activities to various parties, both internal and external to the Organization, and those who have direct or indirect influence on the company's operations (Tsalatsa, 2019). In this context, corporate responsibility is not limited to shareholders or capital owners but also extends to other stakeholders affected by its business activities (Kumalasari, 2018). Furthermore, stakeholder involvement in a company, known as stakeholder engagement, plays a crucial role in supporting strategic decision-making processes (Almagtome et al., 2020), particularly in planning (Permatasari, 2017) and implementing sustainability policies (Savira, 2020) that have long-term impacts.

Sustainability reporting serves as an instrument to enhance transparency (Lindholm & Oyeyemi, 2022) and organizational accountability (N. I. Rahayu, 2022) in disclosing sustainability performance. Accountability is a fundamental principle that every company must apply to ensure that all activities and their impacts are reported to stakeholders (Krina, 2003). Professional human resources support Companies with high accountability (Ismatullah & Kartini, 2018), enabling them to perform their tasks and responsibilities effectively and efficiently. In this context, accountability refers to the obligation of corporate leaders to justify every decision made and the outcomes achieved in their business operations (Irawan & Mudrifah, 2023). Additionally, accountability is closely related to the delegation of authority (Mappiasse, 2014) and the distribution of responsibilities to employees (Kumalasari, 2018), ultimately contributing to achieving the company's overall objectives.

Sustainability reporting is a form of disclosure prepared by an organization to present information about non-financial performance, covering environmental, social, and Governance (ESG) aspects (Khor et al., 2020). Sustainability reporting is a communication tool for companies to inform stakeholders about their environmental, social, and Governance activities while also serving as a strategic approach to strengthening corporate reputation (Tarigan & Semuel, 2015). As demands for transparency increase, sustainability reporting disclosure has become a requirement for many companies, prompting a shift from conventional financial reporting to a more comprehensive approach that includes financial and non-financial information (Tarigan & Semuel, 2015).

A. The Triple Bottom Line Concept in Sustainability Reporting

In sustainability reporting, companies must consider environmental sustainability, social balance, and economic stability as part of their social responsibility while focusing on corporate profitability (Hidayah et al., 2020). This reporting aligns with the Triple Bottom Line concept, which emphasizes that, besides financial aspects, Companies must also report on their environmental and social performance (Hamsir et al., 2021). However, in Indonesia, the disclosure of environmental, social, and economic aspects in sustainability reports remains voluntary, meaning its impact on achieving more transparent and sustainable business practices has yet to be fully realized (Suyudi et al., 2021). As a result, companies tend to weigh the costs and benefits of sustainability disclosure before deciding the extent to which they will report on their environmental, social, and economic responsibilities (Edy, 2020; Kusumaningtias, 2013).

B. Frameworks for ESG Implementation in Sustainability Reporting

In implementing ESG principles in sustainability reporting, companies rely on frameworks that serve as the foundation for execution. These frameworks are built on fundamental principles to ensure that sustainability reporting is conducted transparently and accountably. These principles include stakeholder engagement, materiality, transparency, report comprehensiveness, consistency, period-to-period comparability, and accountability. Various reporting frameworks have further developed these principles to serve as sustainability reporting guidelines, including:

- Global Reporting Initiative (GRI)
- Sustainability Accounting Standards Board (SASB)
- International Integrated Reporting Council (IIRC)
- Sustainable Development Goals Disclosure (SDGD)
- Task Force on Climate-Related Financial Disclosures (TCFD) (Abeysekera, 2022; Tavares & Dias, 2018)

According to the Global Reporting Initiative (GRI, 2013) and the Global Sustainability Standards Board (2013), the anti-fraud aspect is one of the main components companies must consider in sustainability reporting. Implementing anti-fraud policies requires disclosing the total number and percentage of operations assessed for corruption risks and identifying significant risk areas within corporate operations (Global Reporting Initiative, 2013). Companies must demonstrate their commitment to implementing transparent and integrity-driven business practices (Ismatullah & Kartini, 2018; Permana & Setiawan, 2024) while adhering to Good Corporate Governance (GCG) principles, which strictly enforce measures against fraud.

C. The Strategic Role of Sustainability Reporting

Sustainability reporting is not merely a data compilation; it serves a strategic purpose in improving corporate accountability and Governance. It aims to transform the abstract concept of sustainability into measurable and tangible actions. Through sustainability reports, organizations can effectively:

- Configure their business strategies
- Set sustainability goals
- Evaluate performance
- Manage organizational transformation toward a more sustainable business model (Global Reporting Initiative, 2013).

D. ESG Fraud: Risks and Challenges

ESG management has become increasingly critical in determining a company's long-term sustainability and economic success in a corporate setting. However, as ESG-related regulations expand, legal and compliance risks become more complex. Violations of ESG regulations and policies can lead to severe consequences, including reputational damage, increased legal risks, financial penalties, and even criminal sanctions (Lescher, 2020).

ESG fraud encompasses various violations, such as non-compliance with regulations, deviations from internal policies, and breaches of corporate ethics related to reporting and sustainability data. ESG fraud can be misrepresented, abuse trust, and include falsified documents related to environmental aspects (Lescher, 2020). It can occur at different organizational levels, including:

- Internal ESG fraud involving employees and management
- External ESG fraud involving third parties or business partners (ACFE and Grant Thornton, 2022).

E. Research Gaps and Future Directions

A review of existing literature identifies significant research gaps in fraud and sustainability reporting studies. Most research on sustainability reporting has focused on its benefits for companies and stakeholders, such as increased transparency, accountability, and regulatory compliance. However, limited studies specifically examine how fraud affects the quality of sustainability reporting, particularly from the Pentagon Fraud perspective.

There is also a lack of research on ESG fraud, especially regarding greenwashing— where companies use sustainability reports as marketing tools to enhance their reputation without genuine sustainability efforts. Few studies explore how companies manipulate sustainability reporting to evade sanctions or attract investors with misleading information (Suyudi et al., 2021).

Given these research gaps, this study aims to map the relationship between Pentagon Fraud and Sustainability Reporting while identifying trends and patterns in research over the last decade. The key research questions include: How has Pentagon Fraud been examined in previous studies on Sustainability Reporting?

II. RESEARCH METHODOLOGY

A. Article Selection Criteria

This study adopts a Systematic Literature Review (SLR) approach, following the PRISMA 2020 model as a guideline for screening and analyzing relevant literature. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) ensures that the research process is conducted systematically and transparently in identifying, evaluating, and synthesizing Pentagon Fraud and Sustainability Reporting literature**.** The study establishes inclusion and exclusion criteria to ensure the quality and relevance of the analyzed articles. The inclusion criteria include studies exploring the relationship between Pentagon Fraud and Sustainability Reporting, articles published in journals indexed by Scopus or Web of Science, and publications within the last **ten years** (2014–2024). This review includes studies that employ quantitative, qualitative, or mixed-methods approaches.

Several exclusion criteria were applied in this study to minimize selection bias. The analysis excludes articles that discuss fraud without linking it to sustainability reporting. The analysis does not consider opinion pieces, editorials, or working papers that lack peer review. The analysis excludes studies with restricted access or those unavailable in official academic databases to ensure the accuracy and credibility of the sources used.

B. Data Sources and Search Strategy

This study utilizes leading academic databases, including Scopus, Web of Science, Google Scholar, and Dimensions, to ensure extensive and credible literature coverage. This study conducts the literature search using a combination of relevant keywords, such as:

- "Pentagon Fraud" AND "Sustainability Reporting"
- "Fraud Risk" AND "ESG Disclosure"
- "Corporate Fraud" AND "Environmental Social Governance"

The Boolean Operator technique was applied to enhance search efficiency, allowing for broadening or narrowing search results based on keyword relationships. This approach identifies the most relevant studies while maintaining high academic credibility in the literature sources.

C. Selection Process

The selection process follows the PRISMA Flowchart framework, consisting of four main stages**:**

1. Identification – The initial search is conducted across multiple databases to collect relevant literature.
2. The screening process removes duplicate articles and filters publications based on titles and abstracts to ensure alignment with the research topic.
3. Eligibility – A full-text review is performed on each article to assess whether it meets the inclusion criteria established.
4. Final Selection **–** Only articles that fulfill all criteria proceed to the in-depth analysis phase of this study.

D. Data Analysis Method

This study employs bibliometric analysis to identify publication trends, citation counts, and research developments related to Pentagon Fraud and Sustainability Reporting**.** This approach helps uncover emerging research patterns in the academic literature. Additionally, this study applies thematic analysis to categorize findings based on the core elements of Pentagon Fraud, namely: Pressure, Opportunity, Rationalization, Competence, and Arrogance

This approach allows researchers to understand how each fraud element contributes to sustainability reporting. The study will compile findings from the selected studies into a Synthesis Matrix that systematically summarizes key research findings. This matrix comprehensively maps the relationship between fraud, sustainability reporting, and the organizational factors that moderate this relationship**.**

III. RESULTS AND DISCUSSION

A. Gap Analysis

The literature review in this study aims to provide a strong theoretical foundation for understanding the relationship between Pentagon Fraud and Sustainability Reporting. By conducting a comprehensive review, this study seeks to identify research gaps and formulate the proposed academic contributions. The study conducted a literature mapping process to understand the interrelationships between variables, covering various relevant previous studies. The reviewed literature is categorized based on two main variables:

1. Pentagon Fraud focuses on the determinants of fraud, examining the key factors contributing to fraudulent activities.
2. Sustainability Reporting relates to Environmental, Social, and Governance (ESG)-based reporting.

Each category includes studies that discuss specific aspects of these variables, both in academic contexts and organizational practice. This mapping aims to identify existing research gaps and develop the proposed academic contributions accordingly.

Table 1. Literature Mapping

Variable	Category	References
Pentagon Fraud	Fraudulent Financial Reporting	(Teri et al., 2022), (Wahasusmiah & Indriani, 2020), (Yolanda, 2018), (Fadhilah, 2023), (Rahmatullah, 2019)
	Pentagon Fraud Factors	(Mintara & Hapsari, 2021), (Nainggolan, 2023), (Nurani & Fuad, 2022), (Oktaviani & Istiqomah, 2022), (S. A. Rahayu & Pratiwi, 2023)
	Fraud Detection Models (Beneish M-Score, F-Score)	(Milania & Triyono, 2022), (Novianti et al., 2022), (Ningsih & Syarief, 2022), (Nizarudin et al., 2023)
Sustainability Reporting	ESG Disclosure & Corporate Performance	(Yuliandhari et al., 2022), (Gunawan et al., 2022), (Mihaylova & Papazov, 2022), (Naseer et al., 2024)
	Framework & Evolution of Sustainability Reporting	(Montiel & Delgado-Ceballos, 2014), (Fifka, 2013), (Gunawan et al., 2022), (Grutt, 2023)
	Impact of Sustainability Reporting on Organizations	(Calderon et al., 2021), (Mihaylova & Papazov, 2022), (Momchilov, 2022), (Rahmah et al., 2024)
	Greenwashing and Ethical Considerations	(Arguelho, 2023), (Liu et al., 2024), (Lokuwaduge & Silva, 2022)

Table 1 indicates that research related to Pentagon Fraud primarily focuses on detecting fraudulent financial reporting and the factors influencing the likelihood of fraud occurrence within organizations (Teri et al.., 2022; Wahasusmiah & Indriani, 2020). Studies on fraudulent financial reporting commonly utilize detection models such as the Beneish M-Score and F-Score to identify potential fraud (Milania & Triyono, 2022; Nizarudin et al., 2023). However, these studies tend to emphasize fraud in financial statements, whereas the manipulation of sustainability reporting has received limited attention.

Thus, this study aims to fill this research gap by examining how fraud factors impact transparency and accountability in sustainability reporting. Furthermore, previous studies have extensively explored the Pentagon Fraud factors, including pressure, opportunity, rationalization, competence, and arrogance (Mintara & Hapsari, 2021; Nainggolan, 2023). These factors have mainly been analyzed in the context of financial fraud rather than concerning sustainability reporting. Therefore, this study contributes by expanding the Pentagon Fraud Theory within the ESG (Environmental, Social, and Governance) domain, making it more relevant in analyzing the transparency and reliability of sustainability reports.

Research on sustainability reporting has developed rapidly, particularly regarding transparency, corporate performance impact, and stakeholder relationships (Yuliandhari et al., 2022; Gunawan et al., 2022). Frameworks such as the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB) serve as primary references for sustainability reporting (Montiel & Delgado-Ceballos, 2014; Fifka, 2013). However, most studies focus on profit-oriented companies, while research in the higher education sector remains limited. Educational institutions should also report sustainability, particularly in the social and Governance aspects.

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Additionally, while some studies have demonstrated that **s**ustainability reporting can enhance stakeholder trust (Calderon et al., 2021; Mihaylova & Papazov, 2022), few studies have examined how fraud impacts the quality of sustainability reporting. These findings highlight the need for further research into the risks of fraudulent disclosures within sustainability reporting frameworks.

Table 2. Theoretical Mapping Based on Research Trends

Variable	Research Trends	Key Findings	References
Pentagon Fraud	Studies focus on detecting financial fraud using the Beneish M- Score model and Pentagon Fraud Theory.	Pressure, opportunity, rationalization, competence, and arrogance contribute to fraud.	Wahasusmiah & Indriani (2020)
	Increasing research on the relationship between fraud and corporate Governance.	Good corporate Governance can mitigate fraud in sustainability reporting.	Castka & Prajogo (2013
Sustainability Reporting	Growth in research following the emergence of ESG and GRI regulations.	Focus on the impact of ESG reporting on corporate value and competitiveness.	Arguelho (2023)
	Research related to greenwashing in sustainability reports.	Some companies use ESG reporting to attract investors without actual implementation.	Liu et al. (2024)

Table 3. Relationship Between Variables

Variable	Relationship	Impact on Research	References
Pentagon Fraud → Sustainability Reporting	Positive	Pressure and opportunity increase the risk of manipulation in sustainability reporting.	Wahasusmiah & Indriani (2020)
Sustainability Reporting → Behavioral Organization	Positive	A strong organizational culture enhances transparency in sustainability reporting.	Erika & Indraswarawati (2022)
Behavioral Organization → Pentagon Fraud	Negative	Ethical organizational behavior reduces the tendency for fraud in financial reporting.	Sari et al. (2023)
Stakeholder Influence → Sustainability Reporting	Positive	Stakeholder pressure increases transparency in ESG reporting.	Sari & Muslim (2024)
Corporate Governance → Fraud Mitigation	Negative	Good Governance reduces the likelihood of fraud in sustainability reporting.	Castka & Prajogo (2013)

Many studies have explored Pentagon Fraud and Sustainability Reporting; however, research gaps still require further exploration. One of the main gaps is the lack of studies integrating Pentagon Fraud with Sustainability Reporting. Most existing research focuses on the impact of fraud on financial reporting without examining how elements of Pentagon Fraud influence manipulation in Environmental, Social, and Governance (ESG)-based sustainability reporting (Wahasusmiah & Indriani, 2020). Fraud in sustainability aspects, such as false disclosures in environmental and social reports, has not yet received significant attention in academic research. Therefore, a more in-depth investigation is required to understand how fraud affects sustainability report quality and how organizations can mitigate these risks through more effective control mechanisms (Liu et al., 2024).

Strong regulations and Governance are also needed to mitigate fraud in sustainability reporting**.** While previous research indicates that Corporate Governance can help reduce fraud, few studies specifically discuss how stricter regulations can enhance ESG report transparency, especially in sectors like higher education (Castka & Prajogo, 2013). Some studies suggest that audit mechanisms, government regulations, and stricter sustainability reporting standards can be essential for detecting and preventing manipulation in Sustainability Reporting (Arguelho, 2023). However, to date, limited research has explored the effectiveness of such regulations in academic institutions and how academic governance systems can implement more accountable sustainability reporting practices.

Finally, research on the impact of stakeholder pressure on sustainability report transparency has yielded contradictory findings. Some studies suggest that stakeholder pressure drives organizations to be more transparent in sustainability reporting, particularly to meet market and ESG investor expectations (Sari & Muslim, 2024). However, this pressure can also have negative consequences, as organizations may resort to greenwashing or data manipulation to present a more favorable image than reality (Liu et al., 2024). Research on organizational strategies to balance stakeholder pressure with the need for transparency in sustainability reporting remains limited. Thus, further studies are needed to explore how companies and institutions can maintain the credibility of ESG reports without compromising transparency and data accuracy.

Table 4. Mapping Based on Publication-Year Trends

Year	Number of References	References
Before 2010	5	Munro & Prabhakar (2013), Redclift (2005), Reid (1995), Atendido (1974), Nguyen (2008)
2010 - 2015	12	Montiel & Delgado-Ceballos (2014), Buhr et al. (2014), Powell (2007), Owen (2008), Steurer et al. (2005), Castka & Prajogo (2013), Jordan et al. (2014), Jamali (2006), Hogevold (2011), Hopwood et al. (2013), Bocken et al. (2014), Fifka (2013)
2016 - 2020	22	Sawaka & Ramantha (2020), Widyatama & Setiawati (2021), Ameen (2020), Nainggolan (2023), Steurer et al. (2015), Huang et al. (2019), Pamungkas & Utomo (2019), Siddiq et al. (2017), Fuad et al. (2020), Whelan & Sacco (2019), Lozano et al. (2015), Rahayu & Pratiwi (2023), Pimm (2023), Calderon et al. (2021)
2021 - 2024	35	Mihaylova & Papazov (2022), Yuliandhari et al. (2022), Aulia Fadilah & Rosdiana (2024), Sitanggang & Paramitadewi (2023), Wang et al. (2022), Amalia & Afrizon (2024), Tanwar & Rao (2023), Milania & Triyono (2022), Putra & Suprasto (2022), Kumalasari (2018), Solaimani (2024), Sun (2023), Fauzi (2023), Reskino et al. (2021)

Table 5. Mapping Based on Research Methods

Method	Number of References	References
Quantitative (Regression, SEM, F-Score, Beneish M-Score, Statistical Models)	25	Milania & Triyono (2022), Putra & Suprasto (2022), Nainggolan (2023), Oktaviani & Istiqomah (2022), Nizarudin et al. (2023), Fadhilah (2023), Siddiq et al. (2017), Supriatno (2024), Permatasari et al. (2020), Yanti (2022)
Qualitative (Case Study, Phenomenology, Content Analysis)	15	Herbin (2021), Lozano et al. (2015), Erika & Indraswarawati (2022), Yasa et al. (2022), Fauzi (2023), Kumalasari (2018), Puspitha & Yasa (20118

Table 6. Mapping Based on Theories Used

Theory	Number of References	References
Pentagon Fraud Theory	20	Fadhilah (2023), Nainggolan (2023), Nizarudin et al. (2023), Milania & Triyono (2022), Anggraini & Suryani (2021), Rahayu & Pratiwi (2023), Putra & Suprasto (2022), Oktaviani & Istiqomah (2022), Siddiq et al. (2017)
Stakeholder Theory	10	Kumalasari (2018), Steurer et al. (2005), Lozano et al. (2015), Fifka (2013), Gunawan et al. (2022), Mihaylova & Papazov (2022), Naseer et al. (2024), Whelan & Sacco (2019)
Sustainability Reporting Theory	15	Mihaylova & Papazov (2022), Momchilov (2022), Naseer et al. (2024), Calderon et al. (2021), Breuer et al. (2024), Yuliandhari et al. (2022), Rahmah et al. (2024)
Sustainable Accounting Theory	8	Montiel & Delgado-Ceballos (2014), Fifka (2013), Rahmah et al. (2024), Mihaylova & Papazov (2022), Grutt (2023)

Table 7. Mapping Based on Geographical Regions

Region	Number of References	References
Indonesia	18	Wahasusmiah & Indriani (2020), Gunawan et al. (2022), Yuliandhari et al. (2022), Fadhilah (2023), Putra & Suprasto (2022), Rahayu & Pratiwi (2023), Anggraini & Suryani (2021), Oktaviani & Istiqomah (2022)
Asia (excluding Indonesia)	10	Naseer et al. (2024), Wang et al. (2022), Zhao et al. (2012), Ayem et al. (2022), Mihaylova & Papazov (2022)
Europe & America	7	Mihaylova & Papazov (2022), Breuer et al. (2024), Grutt (2023), Lozano et al. (2015), Fifka (2013), Castka & Prajogo (2013)
Global (Multi-Region)	5	Fifka (2013), Lozano et al. (2015), Naseer et al. (2024), Gunawan et al. (2022), Mihaylova & Papazov (2022)

Table 8. Mapping Based on Research Objects

Research Object	Number of References	References
Public & Financial Companies	20	Putra & Suprasto (2022), Nainggolan (2023), Oktaviani & Istiqomah (2022), Nizarudin et al. (2023), Fadhilah (2023), Milania & Triyono (2022), Anggraini & Suryani (2021), Siddiq et al. (2017)
Higher Education & Non-Profit Organizations	7	Erika & Indraswarawati (2022), Syah (2024), Yasa et al. (2022), Kumalasari(2018), Fauzi (2023)
Government & Public Sector	5	Steurer et al. (2005), Lozano et al. (2015), Fifka (2013), Castka & Prajogo (2013)

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In recent years, research related to Pentagon Fraud and Sustainability Reporting has experienced a significant increase, particularly between 2021 and 2024. This trend indicates that sustainability and fraud risks in organizations are becoming a significant concern among academics and practitioners (Mihaylova & Papazov, 2022; Gunawan et al., 2022). This shift highlights the urgency of further studies to fill the existing research gaps, especially in the non-profit sector, such as higher education institutions, which have received less attention in academic literature (Fifka, 2013; Lozano et al., 2015). In this context, higher education institutions can utilize emerging research findings as a foundation to enhance transparency and accountability in sustainability reporting**.** At the same time**,** regulators can use them to develop stricter policies on fraud in sustainability reporting (Steurer et al., 2005).

B. Methodological Trends

From a methodological perspective, most studies employ quantitative approaches, utilizing statistical models such as regression, Structural Equation Modeling (SEM), Beneish M-Score, or F-Score fraud detection models (Milania & Triyono, 2022; Putra & Suprasto, 2022). Meanwhile, research employing qualitative and bibliometric methods remains relatively limited (Lozano et al., 2015; Naseer et al., 2024). While quantitative methods allow researchers to identify patterns and statistical relationships between variables, they are less effective in explaining the underlying mechanisms of fraud (Gunawan et al., 2022). Therefore, integrating quantitative and qualitative methods is necessary to gain a more comprehensive understanding of the factors influencing manipulation in sustainability reporting. Pentagon Fraud Theory and Stakeholder Theory dominate research on fraud and sustainability from a theoretical perspective (Fifka, 2013).

C. Theoretical Perspectives

Pentagon Fraud Theory and Stakeholder Theory dominate theoretical research on fraud and sustainability (Fadhilah, 2023; Steurer et al., 2005). The Pentagon Fraud Theory explains five key factors driving fraud**:** pressure, opportunity, rationalization, competence, and arrogance (Howart, 2011; Nainggolan, 2023). Meanwhile, the Stakeholder Theory focuses on stakeholder involvement in organizational decision-making**,** including sustainability reporting (Freeman, 1984; Kumalasari, 2018). Studies suggest that organizations with strong governance systems and stakeholder engagement tend to be more transparent and accountable (Montiel & Delgado-Ceballos, 2014). However, research gaps remain regarding integrating these two theories into a single conceptual model that can holistically explain the relationship between fraud and sustainability. Therefore, this study recommends developing a new approach that combines fraud risk factors with ESG (Environmental, Social, and Governance) principles to enhance organizational transparency (Gunawan et al., 2022; Mihaylova & Papazov, 2022).

D. Geographical Scope

Geographically, research on fraud and sustainability reporting is still dominated by studies conducted in Indonesia, whereas cross-country research remains limited (Gunawan et al., 2022; Yuliandhari et al., 2022). The findings suggest that research within the Indonesian context is highly relevant to regulatory conditions and business practices in developing countries. However, cross-country studies should be expanded to broaden academic perspectives to compare sustainability practices and fraud control mechanisms across different countries (Lozano et al., 2015; Naseer et al., 2024). Organizations in Indonesia can also learn from best practices in other countries, such as the EU's regulatory-based sustainability reporting or the more stringent fraud control models in the United States (Fifka, 2013). Strengthening international academic collaboration will generate more comprehensive research and provide broader policy recommendations.

E. Research Object Focus

Regarding research objects, most studies still focus on public companies and the financial sector, while research on fraud and sustainability in higher education institutions remains very limited (Steurer et al., 2005; Lozano et al., 2015). However, higher education institutions also have a responsibility to implement sustainability principles and accountability in Governance (Gunawan et al., 2022). Therefore, further research is needed to explore how fraud control systems can be applied in sustainability reporting within the higher education sector, particularly in Muhammadiyah Aisyiyah Higher Education Institutions (PTMA) (Rahayu & Pratiwi, 2023).

Higher education institutions can begin implementing ESG-based sustainability reporting and conducting internal audits using fraud detection models to enhance transparency in fund management, operations, and social and environmental impacts**.** Additionally, regulations mandating sustainability reporting in the education sector could serve as a strategy to increase the accountability of academic institutions (Montiel & Delgado-Ceballos, 2014; Mihaylova & Papazov, 2022).

IV. CONCLUSION

These findings indicate that research trends in fraud and sustainability reporting have significantly evolved, yet various research gaps require further exploration. Future research should integrate quantitative and qualitative methods, expand the geographical scope of studies, and deepen analysis in underexplored sectors such as higher education to contribute more to academia and business practices. Additionally, developing an integrated fraud and sustainability reporting approach can serve as a conceptual solution to bridge existing gaps, leading to a more transparent, accountable, and sustainable governance model (Gunawan et al., 2022; Mihaylova & Papazov, 2022; Rahayu & Pratiwi, 2023).

V. IMPLICATIONS

This study presents significant theoretical, practical, and methodological implications**:**

A. Theoretical Implications

The fraud literature has primarily focused on financial reporting, while sustainability reporting has been examined mainly from regulatory and transparency perspectives without considering the risks of manipulation (greenwashing) (Freeman, 1984); (Elkington, 1997); (Howart, 2011). Additionally, this study contributes to expanding fraud research into non-financial reporting, particularly in higher education institutions, which remain understudied (Lindholm & Oyeyemi, 2022; Zorio-Grima et al., 2018).

B. Practical Implications

The findings of this study can assist higher education institutions in implementing ESG-based sustainability reporting with stricter internal control systems**.** Universities aiming to demonstrate a commitment to sustainability often face stakeholder pressure to present a positive image, increasing the risk of sustainability data manipulation (Lokuwaduge & De Silva, 2022). Therefore, stricter policies are needed in sustainability reporting to ensure transparent, accurate, and accountable disclosures (GRI, 2016). Furthermore, these findings can serve as a basis for regulators and educational authorities to design policies that promote integrity in ESG reporting within academic institutions**.** Universities can adopt Global Reporting Initiative (GRI) or Integrated Reporting (IR) standards to enhance the accountability and credibility of their reports (Dilling, 2010).

C. Methodological Implications

This study highlights the need to integrate quantitative and qualitative approaches to better understand sustainability reporting manipulation**.** The bibliometric and publication trend analysis used in this research helps identify past research developments and strengthen conceptual frameworks (Donthu et al., 2021). Structural Equation Modeling (SEM) with SMART-PLS also enables a more comprehensive and accurate analysis of variable relationships (Hair et al., 2019). Thus, this study provides a more robust methodological approach for future research on fraud and sustainability.

VI. RECOMMENDATIONS FOR FUTURE RESEARCH

This study's findings suggest several novel research directions integrating fraud and sustainability concepts across different sectors.

1. Developing Fraud Detection Models in Sustainability Reporting Using AI and Machine Learning
- Future studies can explore how AI and machine learning detect data manipulation in sustainability reports.
- By analyzing historical trends and frequently manipulated variables, this research can facilitate early fraud detection in ESG reporting.
2. Exploring the Role of Whistleblowing Systems in Mitigating Fraud in Sustainability Reporting
- This study could examine how effective internal reporting mechanisms can prevent greenwashing and enhance corporate and academic sustainability reporting accountability.
- It can also investigate organizational factors such as ethical culture and leadership influencing whistleblowing effectiveness in preventing sustainability data manipulation.
3. Impact of Global Regulations on the Adoption of Sustainability Reporting in Non-Business Sectors
- Future research could examine how international regulations such as the Global Reporting Initiative (GRI) and EU Taxonomy impact sustainability reporting in non-business sectors (e.g., universities, hospitals, and non-profits).
- This study can provide insights into how nonprofit organizations respond to regulatory pressures and their challenges in implementing transparent reporting practices**.**
4. Developing a Behavioral Sustainability Fraud Framework
- This research could explore how psychological and behavioral factors influence fraudulent decision-making in sustainability reporting**.**
- By integrating behavioral science approaches with fraud theories, this study can provide a deeper understanding of individual

motivations and organizational dynamics in sustainability practices.

By expanding these research directions, fraud and sustainability studies can be applied across multiple sectors, contributing more significantly to academic literature and fostering more transparent and sustainable business practices.

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