

AN ANALYSIS OF PENTAGON FRAUD IN SUSTAINABILITY REPORTING AND THE ROLE OF BEHAVIORAL ORGANIZATIONS AS AN INTERVENTION SOLUTION

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Abstract

Sustainability reporting is increasingly adopted as a strategic tool for organizations to communicate their environmental, social, and governance (ESG) practices. However, the potential for fraud—driven by the desire to uphold a green image and weak regulatory frameworks—has led to the manipulation of such disclosures. This study critically explores the Pentagon Fraud theory, which expands upon previous fraud frameworks by including arrogance and competence alongside pressure, opportunity, and rationalization. The primary objective of this research is to investigate how each of these five elements influences the tendency for fraud in sustainability reports. Moreover, it examines the role of organizational behavior as an intervention strategy to mitigate fraud risk. Using a qualitative literature review method, the study synthesizes data from scholarly articles, institutional reports, and empirical studies published between 2019 and 2024. Through thematic content analysis, it uncovers how fraud in sustainability reporting is frequently triggered by opportunity and rationalization, enabled by limited oversight and reputational pressure. Furthermore, the study identifies organizational behavior—especially ethical leadership, internal control systems, and whistleblowing mechanisms—as a critical deterrent to fraudulent activities. The findings suggest that integrating behavioral ethics into organizational governance and ESG reporting systems is vital for fraud prevention. The study contributes a conceptual model combining the Pentagon Fraud framework with behavioral interventions, offering both theoretical insight and practical guidelines for organizations, regulators, and auditors to enhance reporting credibility and integrity.

Keywords: *Sustainability Reporting, Fraud Pentagon Theory, Organizational Behavior.*

INTRODUCTION

Sustainability reporting has become a crucial tool for organizations to communicate their environmental, social, and governance (ESG) performance to stakeholders (García-Sánchez et al., 2023; García-Sánchez et al., 2019). However, in recent years, concerns over greenwashing and manipulation of sustainability information have exposed the potential for fraud within such reports (Sarikhani & Ebrahimi, 2022). One of the frameworks employed to understand this behavior is the Fraud Pentagon theory, an evolution of previous frameworks such as the Fraud Triangle and Fraud Diamond, enhanced by adding competence and arrogance as key elements (Manning, 2023; Rukmana, 2018)., Pentagon Fraud refers to a theoretical framework used to analyze and understand the motives behind fraudulent behavior, both in academia and in public and business sectors. This model extends earlier frameworks such as the Fraud Triangle and Fraud Diamond by adding two additional elements: arrogance and competence, alongside pressure, opportunity, and rationalization. Practically, this theory is applied to investigate manipulative actions conducted by individuals or institutions across various sectors, including the military—like the U.S. Pentagon—which has often faced scrutiny over its opaque and unauditible spending practices. While the term “Pentagon Fraud” can specifically refer to fraud within the U.S. Department of Defense, in academic discourse, particularly in Indonesia, it is more commonly used as a theoretical model to identify and prevent fraud. A recent study by Nurhalisa and Fauzan (2024) in the Business and Accounting Education Journal applied the Pentagon Fraud theory to assess academic cheating among university students, using intention as an intervening variable (Nurhalisa & Fauzan, 2024). The results indicated that all five elements of the Fraud Pentagon significantly influence the likelihood of fraudulent behavior, especially when an individual already has the intention to cheat. This demonstrates the broad applicability of the model, including in analyzing potential financial mismanagement in large institutions

such as the Pentagon. On a global level, the U.S. Government Accountability Office's 2020 report revealed issues in tracking billions of defense funds—an area where the Pentagon Fraud model could offer valuable analytical insights. The Fraud Pentagon theory has been widely applied to detect fraudulent financial reporting, particularly within industries under strong reputational pressure (Inayah & Chariri, 2024; Puspitha & Yasa, 2018). Each component of the theory—pressure, opportunity, rationalization, arrogance, and competence—serves as an analytical lens to assess fraud risk, especially when organizations face high public expectations and limited internal controls (Burlacu et al., 2025; Ibrahim & Darwis, 2024). Fraudulent sustainability reporting is often driven by the desire to uphold a green image and exploit weak organizational governance (Arfianto & Alexander, 2023; Mohamed et al., 2021).

In this context, organizational behavior plays a vital role in mitigating fraud, particularly through cultivating ethical culture, leadership integrity, and robust internal governance mechanisms (Bassasan et al., 2023; Mohamed et al., 2021). Recent studies suggest that organizations with strong ethical climates, transparent leadership, and effective whistleblowing systems demonstrate lower instances of fraud (Burlacu et al., 2025; Kusumawati et al., 2021). Therefore, analyzing the linkage between the Fraud Pentagon elements and organizational behavior is essential to develop holistic and effective interventions (Akbar, 2017; Apriliana & Agustina, 2017). The manipulation of sustainability reports not only affects corporate reputation but also undermines investor trust and market credibility (Burlacu et al., 2025). Failure to provide transparent and accurate disclosures can distort decision-making processes for stakeholders and create systemic risks (Shodiq et al., 2025; Taqi et al., 2024). Consequently, academic research must go beyond identifying fraud determinants to proposing behavior-based organizational solutions to enhance reporting credibility.

This research is urgent as it highlights the need for a multidisciplinary approach to address fraud in sustainability disclosures. By integrating the Fraud Pentagon theory with insights from organizational behavior, this study seeks to offer both practical and theoretical contributions for promoting transparent and accountable sustainability reporting (Ariyanto & Jhuniantara, 2021; Situngkir & Triyanto, 2020). Previous studies have primarily applied the Fraud Pentagon framework in the context of financial reporting fraud, with limited integration into sustainability reporting and organizational behavior interventions (Baridwan & Subroto, 2024; Fathmaningrum & Anggarani, 2021). While some research underscores the importance of ethical organizational culture, these factors have not yet been consolidated into a comprehensive analytical model (Nurcahyono & Hanum, 2023). Therefore, this study aims to analyze the relationship between the elements of the Fraud Pentagon theory and the tendency for fraud in sustainability reporting, while exploring how organizational behavior can serve as a preventive intervention mechanism. It is expected that this research will contribute to strengthening transparent, credible, and sustainable reporting systems.

METHOD

This study employs a qualitative approach using a literature review design, which aims to critically analyze the Fraud Pentagon concept in the context of sustainability reporting and explore the role of organizational behavior as a preventive intervention. A qualitative literature review is suitable for providing an in-depth conceptual understanding of a phenomenon by synthesizing theoretical models and prior empirical findings (Creswell & Poth, 2016; Riduwan, 2012). The literature review method is especially relevant for identifying patterns, conceptual gaps, and theoretical relationships in existing studies.

Data Source

The data used in this study is secondary in nature, derived from peer-reviewed journal articles, academic books, institutional reports, and credible research publications. All sources were selected based on relevance and recency, focusing on works published within the last five years (2019–2024) to ensure timeliness and alignment with current developments in fraud detection and sustainability reporting (Syamsuddin, 2021). Databases such as Google Scholar, Scopus, ScienceDirect, and ProQuest were used to locate the literature.

Data Collection Techniques

The data collection process was conducted through a systematic search strategy using keywords such as “fraud pentagon,” “sustainability reporting fraud,” “organizational behavior,” “greenwashing,” and “ethical governance.” Boolean operators and database filters (e.g., publication year, document type, subject area) were applied to narrow down the search results to only the most relevant literature. The selected publications were then categorized by themes, theoretical perspectives, and their contribution to the topic (Booth et al., 2021).

Analytical Techniques

This research uses content analysis to interpret and synthesize the findings from selected literature sources. Content analysis enables the researcher to extract core themes, conceptual relationships, and theoretical implications related to fraud indicators and organizational intervention (Krippendorff, 2018). The analysis was conducted in a narrative and thematic manner, grouping results under major themes relevant to the application of the Fraud Pentagon model and the organizational behavior framework. To ensure the credibility of the findings, the study used triangulation of sources and comparison across similar studies (Miles et al., 2020). Through this approach, the study aims to generate a robust theoretical understanding of how elements within the Fraud Pentagon influence sustainability report fraud and how organizational behavior can serve as an effective prevention mechanism.

RESULTS AND DISCUSSION

The data below is a result of the selection from several related articles discovered through literature search and research. These articles provide insights and understanding about the fraud pentagon concept and its relation to behavioral organizations in the context of sustainability reporting, along with the potential intervention solutions that can be implemented to reduce fraud.

Table 1. literature Review

No.	Article Title	Authors	Year
1	The Remote and Agile Auditing: a Fraud Prevention Effort To Navigate the Audit Process in the Covid-19 Pandemic	D Koerniawati	2021
2	Religiosity as the Moderating Effect of Diamond Fraud and Personal Ethics on Fraud Tendencies	YP Senjani, RU Istifadah	2020
3	Optimization of Green Value through the Application of the Determinant Pentagon Model in Prevention of Fraud in Financial Reports	H Darwis, L Ibrahim	2024
4	Revisiting the Fraud Triangle in Corporate Frauds: Towards a Polygon of Elements	P Roffia, M Poffo	2025
5	The Use of the Fraud Pentagon Model in Assessing the Risk of Fraudulent Financial Reporting	G Burlacu, IB Robu, I Anghel	2025
6	The Enigma of Fraud as a Unique Crime and its Resonance for Auditing Research and Practice	A Maulidi	2025
7	The Effect of Hexagon Fraud Theory on Financial Statement Fraud with Audit Committee As a Moderating Variable	F Rasheed, J Said, NI Khan	2023
8	Fathoming Fraud: Unveiling Theories, Investigating Pathways and Combating Fraud	D Aggarwal, NJ Sharma	2022
9	Corporate Culture and Managers Fraud Tendency Perception: Testing of Fraud Hexagon Theory	N Setiawan, N Soewarno	2025
10	The Effect of the Fraud Pentagon on Fraudulent Financial Statements and Their Impact on Funding Decisions	NHK Fadhillah, MZD Hatmoko	2024

The table presented earlier outlines a collection of academic works focusing on the Pentagon Fraud Theory and its relevance to sustainability reporting and behavioral organizational intervention solutions. These findings cover a broad spectrum of approaches and solutions aimed at understanding and addressing fraudulent behaviors within the context of financial and sustainability reporting. Below is a detailed descriptive summary of the findings based on the selected articles. The article "The Remote and Agile Auditing: a Fraud Prevention Effort To Navigate the Audit Process in the Covid-19 Pandemic" by D Koerniawati (2021) examines the influence of the COVID-19 pandemic on auditing processes and its implications for preventing fraud. The study highlights the challenges auditors face in navigating the audit process remotely, specifically in detecting and preventing fraud in the face of limited access and resources. The paper focuses on how the Fraud Pentagon Theory can be adapted to enhance fraud prevention strategies in this new context. The author suggests a blend of technological solutions and behavioral considerations to address the challenges posed by remote work and the pandemic's economic effects. The work presents the Fraud Pentagon theory as an essential tool in framing how organizational behavior, opportunity, pressure,

rationalization, and capability interact within the context of remote audits (Koerniawati, 2021). Next, in the article titled "Religiosity as the Moderating Effect of Diamond Fraud and Personal Ethics on Fraud Tendencies" by YP Senjani and RU Istifadah (2020), the authors explore the relationship between personal ethics, religiosity, and fraud tendencies in organizational settings. The study integrates the Diamond Fraud Model, which expands on the classic Fraud Triangle by adding the role of individual moral standards, such as religiosity, in moderating the likelihood of fraudulent behavior. The paper suggests that fostering ethical practices within organizations, particularly through the influence of personal values such as religiosity, could be a pivotal intervention in reducing fraud. This work reflects on how organizations can address fraud by integrating behavioral aspects, emphasizing personal ethics as a behavioral lever for intervention (Istifadah & Senjani, 2020).

In "Optimization of Green Value through the Application of the Determinant Pentagon Model in Prevention of Fraud in Financial Reports," H Darwis and L Ibrahim (2024) propose an extension of the Fraud Pentagon to address financial fraud within the sustainability framework. The paper presents an innovative approach by introducing a Determinant Pentagon Model, focusing on enhancing corporate sustainability by preventing fraud through organizational ethics, transparency, and green corporate practices. The authors argue that the traditional understanding of fraud must evolve to integrate sustainability values and the role of environmental responsibility in corporate behavior. The paper shows that aligning business objectives with green values can reduce opportunities for fraudulent behavior and improve the overall transparency and accountability of sustainability reporting (Ibrahim & Darwis, 2024).

Meanwhile, "Revisiting the Fraud Triangle in Corporate Frauds: Towards a Polygon of Elements" by P Roffia and M Poffo (2025) offers a critical reevaluation of the classic Fraud Triangle theory, proposing a broader conceptual framework called the Fraud Polygon. The authors suggest that while the Fraud Triangle has been instrumental in understanding fraud, it fails to capture the complexity of corporate fraud in contemporary environments. The Fraud Polygon expands the original theory by incorporating additional elements, such as risk-taking behavior, the psychological profile of fraud perpetrators, and broader organizational factors. The study emphasizes the need to incorporate these new dimensions, particularly in the context of globalized business practices and complex financial reporting systems. This work aligns with the evolving nature of fraud prevention and highlights how organizational behavioral elements contribute to fraudulent activities (Roffia & Poffo, 2025).

The article by G Burlacu, IB Robu, and I Anghel (2025), "The Use of the Fraud Pentagon Model in Assessing the Risk of Fraudulent Financial Reporting," delves into the application of the Fraud Pentagon Model to assess financial fraud risks specifically in the context of financial reporting. The authors examine how fraud-related behaviors such as opportunity, rationalization, and pressure manifest within financial reporting processes, particularly in the context of publicly listed companies. The paper proposes that integrating behavioral theories into financial audits and reporting systems could significantly reduce fraud risks. Furthermore, it suggests that organizational behavioral intervention, such as strengthening internal controls, can deter fraudulent financial activities by addressing key motivators and enabling better monitoring systems (Burlacu et al., 2025).

In "The Enigma of Fraud as a Unique Crime and its Resonance for Auditing Research and Practice," A Maulidi (2025) investigates fraud from a behavioral perspective, focusing on how fraud is perceived and addressed within the auditing profession. The study critiques traditional fraud detection methods and calls for a more comprehensive understanding of fraud's psychological and organizational underpinnings. The paper draws on the Fraud Pentagon theory to illustrate how behavioral factors influence fraud outcomes and stresses the importance of psychological readiness in auditors and organizations in recognizing fraud risks. The work underscores the role of organizational culture and ethical climate in shaping fraud behavior, suggesting that behavioral intervention strategies should be integrated into auditing practices for more effective fraud prevention (Maulidi, 2025).

The study "The Effect of Hexagon Fraud Theory on Financial Statement Fraud with Audit Committee As a Moderating Variable" by F Rasheed, J Said, and NI Khan (2023) further elaborates on the application of fraud theories, proposing the Hexagon Fraud Theory as an extension of the Fraud Pentagon. The paper highlights the role of the audit committee in moderating fraud risk and examines how organizational governance structures can influence the occurrence of financial fraud. The authors argue that the Hexagon Theory, which incorporates elements like capacity, personal ethics, and the psychological pressure to engage in fraud, provides a more nuanced understanding of fraud than the traditional Fraud Pentagon. By adding audit committee oversight as a moderating factor, the study suggests that organizational mechanisms can provide a buffer against the psychological and situational pressures that lead to fraudulent behavior (Hasna & Novianti, 2024). In "Fathoming Fraud: Unveiling Theories, Investigating Pathways and Combating Fraud," D Aggarwal and NJ Sharma (2022) explore the broader implications of fraud theories, including the Fraud Pentagon, on corporate governance and fraud prevention

strategies. The paper emphasizes that organizations must understand the pathways through which fraud develops, focusing on both the individual and organizational drivers of fraudulent actions. The authors provide a detailed analysis of fraud prevention measures, with a particular focus on organizational culture, internal controls, and employee training. The study advocates for a comprehensive approach to fraud prevention that integrates psychological insights with traditional auditing practices (Mandal & Amilan, 2023). The article "Corporate Culture and Managers Fraud Tendency Perception: Testing of Fraud Hexagon Theory" by N Setiawan and N Soewarno (2025) examines the role of corporate culture in influencing managers' perceptions of fraud and their propensity to engage in fraudulent activities. The study builds on the Hexagon Fraud Theory and underscores the significance of fostering a strong ethical culture within organizations. The authors argue that corporate culture plays a pivotal role in shaping managers' decisions and actions related to fraud, suggesting that organizations should promote ethical behavior and transparency as part of their core values to prevent fraud (Setiawan & Soewarno, 2025).

Finally, in "The Effect of the Fraud Pentagon on Fraudulent Financial Statements and Their Impact on Funding Decisions," NHK Fadhilah and MZD Hatmoko (2024) investigate the relationship between fraudulent financial reporting and its consequences on organizational funding decisions. The study applies the Fraud Pentagon Model to assess how organizational pressures and opportunities lead to fraudulent reporting behaviors and how these activities affect the financial decisions of investors and stakeholders. The authors highlight the impact of fraud on the credibility of financial statements and suggest that preventing fraud can significantly enhance the trustworthiness of financial reports, leading to better funding and investment decisions for companies (Fadhilah et al., 2024). These findings collectively illustrate the complexity of fraud within organizations, particularly in the context of sustainability reporting, and emphasize the need for integrated, multi-dimensional solutions. The research highlights the evolving nature of fraud theories, including the Fraud Pentagon and Hexagon Fraud Theory, and the essential role that behavioral factors, corporate culture, and ethical frameworks play in addressing and preventing fraud in organizational practices. These studies call for a more holistic approach, where both technological and behavioral interventions work together to reduce the likelihood of fraud and enhance transparency in financial and sustainability reporting.

Discussions

The Pentagon Fraud theory expands upon the classical Fraud Triangle and Diamond by adding a fifth element. The five elements are:

- a. Pressure
- b. Opportunity
- c. Rationalization
- d. Capability
- e. Arrogance

Table 2. Pentagon Fraud Framework Applied to Sustainability Reporting

Pentagon Fraud Element	Implication in Sustainability Reporting
Pressure	Pressure to present strong ESG performance or sustainability success may lead management to manipulate reports to gain investor trust or public legitimacy.
Opportunity	Weak external monitoring, non-binding ESG reporting standards, and limited regulatory oversight create opportunities for undetected manipulation.
Rationalization	Fraud perpetrators often justify their actions as being "for the company's survival" or "temporary," minimizing the perceived ethical breach.
Capability	Individuals with advanced knowledge of accounting or ESG reporting can commit sophisticated fraud that is harder to detect.
Arrogance	Senior executives or dominant stakeholders with unchecked power may feel immune to consequences, increasing the risk of unethical behavior.

All five elements of the Pentagon Fraud model show a significant correlation with the risk of fraud in sustainability reporting. "Opportunity" and "Rationalization" appear to be the most dominant drivers, particularly due to ESG flexibility and external pressure.

1. The Role of Organizational Behavior as a Preventive Intervention Mechanism

To address the role of organizational behavior as a preventive mechanism against fraud in sustainability reporting, it is essential to move beyond abstract principles and explore how internal dynamics, ethical leadership, and cultural alignment within organizations fundamentally shape transparency practices. Organizational behavior, as a discipline, examines how individuals and groups interact within institutional settings, and how these behaviors are influenced by organizational culture, leadership, and structural systems. When applied to the context of sustainability reporting, this framework becomes pivotal in both detecting and deterring fraudulent activities.



Figure 1. Organizational Behavior Interventions to Prevent Fraud in Sustainability Reporting

One of the most powerful tools in this preventive strategy is "tone at the top", which reflects how leaders' ethical orientations influence the entire corporate culture. Onesti and Palumbo (2023) emphasize that ethical tone from senior management has a cascading effect across all levels of the organization, shaping attitudes towards compliance and integrity in sustainability disclosures (Onesti & Palumbo, 2023). When executives prioritize ethical sustainability practices over symbolic compliance or greenwashing, it fosters an environment where fraudulent behaviors are less likely to emerge. The authors argue that without strong ethical governance at the top, even the most well-designed sustainability systems can be compromised. A real-world case that illustrates this is the Volkswagen emissions scandal ("Dieselgate"), where sustainability claims were falsified in official disclosures. The fraud was partly enabled by a corporate culture that emphasized competitive performance and technological dominance, without sufficient ethical oversight. Investigations revealed that senior management failed to prioritize ethical behavior, creating a culture where compliance teams were pressured to deliver desired results even at the expense of honesty. This culture failed to support internal whistleblowing or ethical dissent, allowing the fraud to persist for years.

Another critical factor is the implementation of risk-based ESG internal audits. In their study, Kazemi et al. (2025) used a DEMATEL-based approach to identify how internal control systems could better mitigate fraud risks in sustainability reporting (Kazemi et al., 2025). Their model suggests that internal audit functions must be reoriented to consider not just financial risks, but also ESG risks—particularly those involving reputational and compliance dimensions. This model emphasizes interdepartmental collaboration and ethical alignment, showing that isolated ESG reporting departments are more vulnerable to manipulation. Ethical culture must also be actively cultivated—not assumed. Rehman (2022) found that in Omani public companies, the presence of ethical codes alone was insufficient unless accompanied by behavioral reinforcement through training and performance evaluation systems (Rehman, 2022). Organizations with proactive ethical training, cross-functional ESG task forces, and protected internal whistleblowing mechanisms showed a significantly lower risk of ESG fraud. Lastly, a broader systemic perspective is provided by Cho et al. (2015), who warn against "organizational façades"—where companies appear compliant with ESG norms but internally lack the behavioral structures to support real ethical conduct. This "organized hypocrisy" becomes a form of strategic decoupling between stated sustainability commitments and actual practices. Their study implies that genuine ethical behavior—rooted in organizational behavior systems—is the only long-term antidote to this disconnect (Cho et al., 2015).

2. Strategic Contributions and Interventions
 - a. Pentagon Fraud Framework Application
 - Identifies five fraud drivers (Pressure, Opportunity, Rationalization, Capability, Arrogance) specific to sustainability reporting.
 - b. Behavioral-Based Fraud Prevention Strategy
 - Promotes ethical leadership, whistleblowing systems, internal ESG audits, and transparency across departments.
 - c. Value-Based ESG Reporting Model
 - Encourages a shift from compliance-oriented disclosure to ethics-driven, trustworthy sustainability reporting.
 - d. Integrated ESG Governance Systems
 - Combines behavioral mechanisms with internal controls to proactively prevent fraud and reinforce organizational accountability.
 - e. Strategic Blueprint for Practice
 - Provides actionable guidance for companies, regulators, and auditors to institutionalize integrity in ESG reporting.

CONCLUSION

This study concludes that the Pentagon Fraud theory provides a robust framework for understanding the drivers of fraud in sustainability reporting. Elements such as pressure, opportunity, and rationalization are particularly influential in shaping fraudulent behavior. Furthermore, the inclusion of arrogance and competence highlights how internal capabilities and unchecked power dynamics can exacerbate reporting manipulation. Organizational behavior emerges as a significant moderating factor, with ethical leadership, cultural alignment, and strong internal controls playing essential roles in preventing fraud.

Practical Suggestions

Organizations should:

- a. Establish ethical leadership and cultivate a "tone at the top" that promotes integrity.
- b. Integrate ESG risks into internal audits and align them with organizational controls.
- c. Develop and protect whistleblowing mechanisms and foster a culture of transparency.
- d. Train personnel on ethical standards and reinforce them with continuous evaluation and feedback mechanisms.

Research Recommendations

Future studies should:

- a. Conduct empirical investigations using mixed methods to measure the effectiveness of behavioral interventions in reducing ESG reporting fraud.
- b. Expand analysis beyond financial and corporate sectors to include governmental and non-profit organizations.
- c. Explore cross-cultural differences in how the Pentagon Fraud model operates under varying organizational and regulatory environments.

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