Journal of Informatics Education and Research
ISSN: 1526-4726
Vol 5 Issue 3 (2025)

Determinants of Financial Statement Fraud: ADO Framework

Himanshoo Dabar[1], Sunitha Guniganti[2]

[1]Research Scholar, Department of Management Studies National Institute of Technology, Warangal (NITW), India Email:hd22smr1r01@student.nitw.ac.in
[2]Associate Professor, Department of Management Studies National Institute of Technology, Warangal (NITW), India Email:sunitha@nitw.ac.in

Abstract

Purpose: The primary objective of this study is to explore the factors that contribute to the detection of Financial Statement Fraud (FSF) and to propose future research directions in the field of Financial Statement Fraud Detection (FSFD).

Design/Methodology/Approach: This study identifies the key determinants of fraud and organizes the findings using the Antecedents, Decision, and Outcomes (ADO) framework. This structured approach provides meaningful insights and offers clear directions for advancing research in the field.

Findings: The study uncovers eleven critical factors shaping FSFD, emphasizing four pivotal decisions that drive effective fraud detection. It also highlights ten key outcomes of FSFD, including enhanced governance, transparency, investor protection, risk optimization, and a stronger ethical framework. Additionally, the research introduces a conceptual framework, offering a deeper understanding of FSFD and pointing to essential areas for future exploration.

Research Implications: This study provides valuable insights for auditors by unraveling the complexities of fraud. By identifying the key factors influencing fraud detection and prevention, it enhances auditing practices, thereby promoting financial integrity and transparency.

Originality: This paper is one of the first to integrate the ADO framework to examine the factors impacting FSF detection. It proposes a comprehensive conceptual framework, offering vital insights into the dynamic evolution of FSFD and suggesting essential areas for future exploration.

Keywords: Financial statement fraud, ADO framework, Factor identification, Financial fraud

1 Introduction

Financial Statement Fraud remains a critical concern in the corporate world, posing severe risks to investors, stakeholders, and the integrity of financial markets. FSF presents a significant threat to investors and financiers, often resulting in irreversible financial losses. Empirical evidence from Beasley *et al.* (2000) indicates that companies accused of fraud experience an average stock price decline of 16.7%, with nearly 28% entering bankruptcy within two years. As such, FSF serves as a critical early signal of corporate failure. However, despite its importance, the detection of FSF remains challenging due to limited institutional resources and relatively ineffective punitive measures (Beasley *et al.*, 2010; Partnoy, 2010). Although auditors are legally obligated to assess fraud risk (ACFE, 2022) , traditional audit techniques often fall short in detecting complex and evolving fraud schemes, necessitating the development of advanced analytical models (Dorminey *et al.*, 2012).

A theoretical foundation for understanding FSF is provided by Cressey's (1953) fraud triangle (depicted in Figure 1), which posits that fraud is driven by three interrelated components:

pressure, opportunity, and rationalization. Pressure may stem from financial stress or performance expectations (Beasley, 1996; Rahman and Jie, 2024) , whereas opportunity is facilitated by weak internal controls and subjective accounting estimates (Dechow *et al.*, 2011; Spathis, 2002). Rationalization often involves ethical disengagement or a pattern of organizational misconduct (Gepp *et al.*, 2021). This framework is instrumental in identifying early warning signals or "red flags" (Hogan *et al.*, 2008).

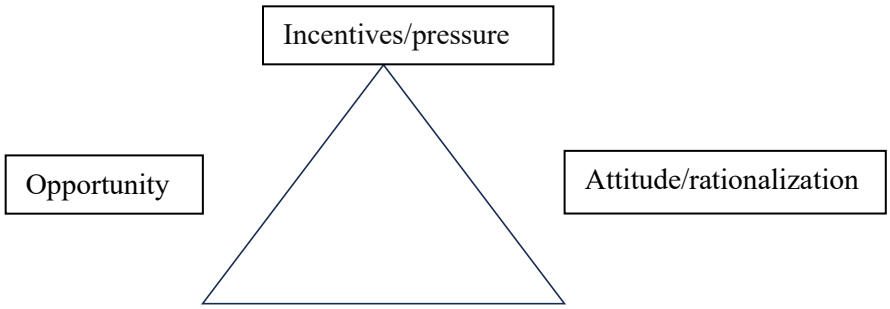

Figure. 1 Fraud triangle

Empirical studies investigating FSFD offer mixed findings. Beasley (1996) reported that audit committees alone may not be effective in preventing fraud; however, certain governance attributes—such as concentrated ownership, longer director tenure, and limited external directorships—can serve as deterrents. The role of auditor expertise is also emphasized, particularly in fraud-prone areas such as inventory and payroll (Moyes and Hasan, 1996). Additionally, indicators such as inconsistencies between earnings and cash flows (Lee *et al.*, 1999), evidence of earnings manipulation (Beneish, 1999), excessive time pressure (Braun, 2000), and poor internal control mechanisms (Bell and Carcello, 2000) have been found to correlate with fraudulent activity. Quantitative metrics, including financial ratios (Spathis, 2002; Zainudin and Hashim, 2016), and employee behavior anomalies (Perols, 2011), further enhance FSFD efforts. More recently, machine learning approaches utilizing social media data have demonstrated potential in uncovering fraudulent activities (Xu *et al.*, 2022), highlighting the value of interdisciplinary and integrative detection techniques. Despite the growing body of literature, research on FSFD remains fragmented. Existing reviews (Shahana *et al.*, 2023; Ashtiani and Raahemi, 2022; Ramzan and Lokanan, 2024) predominantly emphasize detection techniques while neglecting the contextual and organizational factors that may improve detection efficacy. This review aims to address this gap by analyzing the drivers of FSFD within the framework of the fraud triangle, with particular attention to antecedents, decision-making processes, and resultant outcomes.

Accordingly, this study seeks to answer two central research questions:

RQ1: What antecedents and understudied factors contribute to FSFD, and how do they influence financial reporting practices?

RQ2: What future research directions can be identified from the analysis of these factors?

The first research question offers a comprehensive overview of contributory fraud factors, while the second identifies opportunities for further exploration and development within the domain. This review contributes to the FSFD literature by mapping the antecedents and consequences of

fraud, providing evaluative guidance on the selection of relevant financial indicators for fraud detection (Gepp *et al.*, 2021). Additionally, it positions FSFD within broader discussions of firm performance and seeks to address methodological fragmentation through the proposal of a novel conceptual framework that integrates antecedents, decision-making dynamics, and outcomes. This framework aims to support stakeholders and auditors in enhancing fraud detection systems and financial reporting transparency.

The remainder of this paper is structured as follows: Section 2 outlines the methodological approach for literature selection, including inclusion criteria and search strategies. Section 3 presents the review's key findings of the studies using ADO framework. Section 4 outlines recommended avenues for future research. Section 5 discusses the practical and theoretical implications of the findings, while Section 6 concludes with the study's primary contributions and key takeaways in the field of FSFD.

2. Research Methodology

This review analyzes the extant literature using the antecedents-decisions-outcomes framework (Paul and Benito, 2018), as it imparts systematic, structured, and comprehensive approach, enhancing synthesis, transparency, and theoretical contributions while increasing the impact of the study. The ADO methodology has been used in various contexts, such as foreign direct investment and innovation implementation. This study follows the widely accepted guidelines and methodology found in the most downloaded review articles (Paul and Benito 2018; Paul and Rosado-Serrano 2019; Singh, Akbani, and Dhir 2020) in the ADO framework.

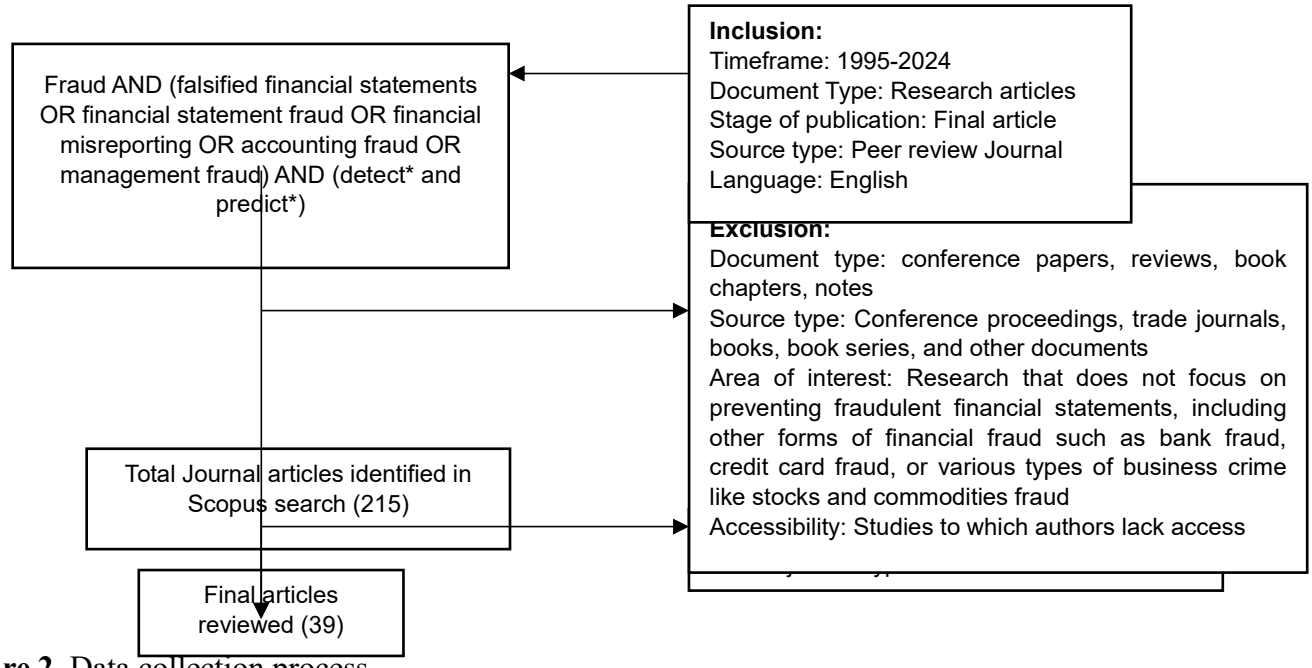

Figure 2. Data collection process

Figure 2 illustrates the process of selecting the articles. For the selection of the relevant literature, articles with keywords "Fraud", "falsified financial statements", "financial statement fraud", "financial misreporting", "accounting fraud", "management fraud", and "detect*" and "predict*" using the Boolean operators "OR" and "AND" in the title, abstract, or keywords were searched. The searches were performed in databases such as the Web of Science and Scopus for studies on FSFD from 1995 to 2024. The first relevant scientific publication appeared in 1995 (Shahana *et al.*,2023), so we set 1995 as the beginning date for selecting articles and ensuring the quality of the papers; only A and A* indexed journals were included. The initial search led us to 635 unique papers, reviewed by independent researchers who narrowed the selection to 39 unique papers after meeting the inclusion and exclusion criteria in Fig 3 and Table 1 presents the journals included in this review, and the next section presents the study's findings.

Table 1. The list of the journals included in the paper

Journals	frequency
Management Science	2
Auditing: A Journal of Practice and Theory	3
Contemporary Accounting Research	3
Financial Analysts Journal	1
Accounting, Organizations and Society	1
The European Accounting Review	1
Critical Perspectives on Accounting	1
Decision Support Systems	5
Journal of Forecasting	2
Managerial Auditing Journal	7
Knowledge-Based Systems	2
International Journal of Accounting Information Systems	1
The Accounting Review	3
Journal of Management Information Systems	1
Journal of Accounting Research	1
Accounting and Finance	1
Review of Accounting Studies	1
Journal of Business Ethics	1
Journal of International Accounting Research	1
MIS Quarterly: Management Information Systems	1

4. Findings

Antecedents, decisions and outcomes of FSFD

Figure 3 illustrates the FSFD-based ADO framework derived from the reviewed studies. A key strength of the ADO framework is its emphasis on the inter-relationships between elements (Singh and Trivedi, 2016). It demonstrates how antecedents (A) may influence decisions (D) to implement FSFDs, which in turn can affect outcomes (O), such as financial market sustainability. This interconnected approach provides a comprehensive view of the FSFD and its impacts. As

stated earlier, we incorporated the fraud triangle theory in this paper to categorized the factors as per SAS 99 into pressure, opportunity and rationalization.

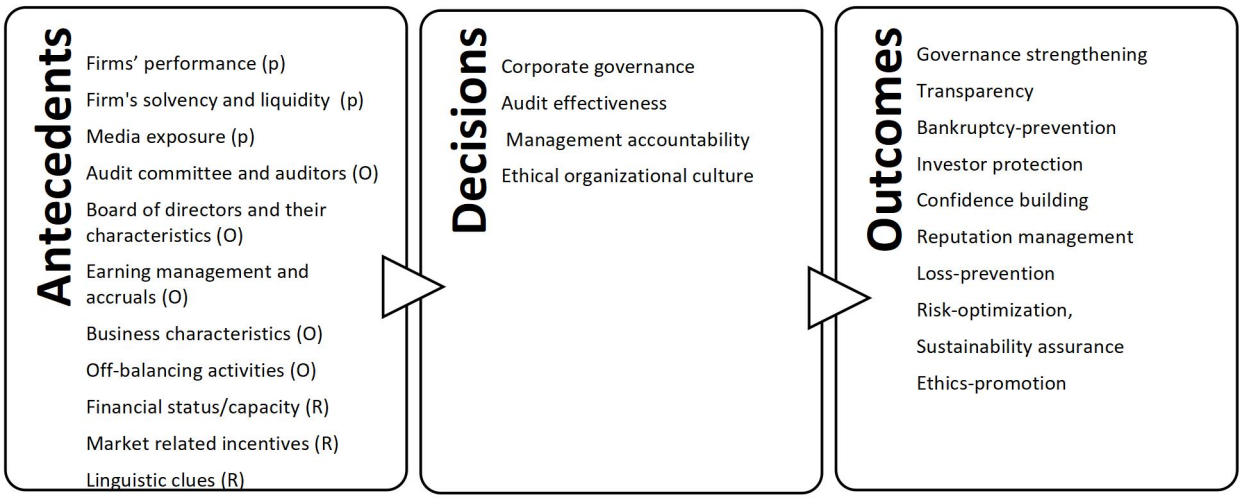

Figure 3. ADO framework using the fraud triangle theory

4.1 Antecedents of FSFD

The detection of the FSF is not a simple process, but rather a complex interplay of organizational factors and environmental pressures (from regulatory bodies and stakeholders). This section delves into these intricate drivers, shedding light on their roles in shaping strategies that help organizations identify and prevent fraudulent financial activities.

4.1.1 Firms Performance

Firm performance acts as a major driver for financial statement manipulation, especially under pressure to meet earnings expectations or when declining order backlogs suggest potential revenue misstatement. Sales, a key performance measure, are often manipulated to present a favorable image. Gepp *et al.* (2021) note cash sales are more vulnerable to fraud, as a decline signals operational issues not captured by accruals. Firms may also delay expense recognition or reclassify expenses as assets to inflate profits (Stice, 1991). Inventory manipulation through misstating obsolete stock or misclassifying costs is common (Kaminski *et al.*, 2004; Spathis *et al.*, 2002).

Lower sales-to-assets ratios indicate inefficiency and higher fraud risk (Persons, 1995). Declining sales growth, particularly in high-growth firms, increases manipulation pressure (Bell and Carcello, 2000). Fraud-prone firms often report unusually low SG&A expenses, suggesting profit overstatement (Abbasi *et al.*, 2012), masking solvency and liquidity concerns.

4.1.2 Solvency and liquidity related variables

Solvency and liquidity pressures are key incentives for financial misreporting. Financial distress drives firms to manipulate earnings and balance sheet items to protect reputation and avoid bankruptcy, layoffs, or shareholder backlash, increasing risks of overstated earnings, liabilities misrepresentation, and asset falsification. Weakened internal controls under stress heighten fraud

risk. High leverage pressures firms to meet debt covenants, fostering manipulation, though creditor oversight may deter fraud (Liang and Wu, 2005; Ding *et al.*, 2008). Debt-to-assets ratio, a leverage measure, shows higher values linked to stability fabrication (Spathis *et al.*, 2002). Fraudulent firms often restate long-term debt (Cecchini *et al.*, 2010).
Increased leverage invites scrutiny (Gepp *et al.*, 2011), while low leverage reduces oversight, raising fraud risks. Financially distressed firms show declining liquidity, profitability, and cash flows. Larger, weakly performing firms are vulnerable to restatements (Throckmorton *et al.*, 2017; Hajek and Henriques, 2017). Solvency problems motivate report falsification (Loebbecke *et al.*, 1989; Beasley, 1996; Dechow *et al.*, 2011).

4.1.3 Media exposure
Negative media attention constitutes an external pressure that may incentivize managerial manipulation of financial statements. Adverse publicity; triggered by poor earnings, regulatory sanctions, or corporate misconduct—threatens investor confidence and firm valuation. To mitigate reputational risks, managers may inflate earnings, misstate liabilities, or overvalue assets to preserve a facade of stability. Media coverage thus creates reputational pressure influencing fraud probability. The rise of digital platforms has intensified manipulation pressures and detection mechanisms. Dyck *et al.* (2021) identified media and whistleblowers as vital for uncovering fraud. Dong *et al.* (2018), Liou (2020), and Xu *et al.* (2022) emphasized social media's role in accelerating fraud detection and enhancing transparency, especially in emerging markets.

4.1.4 Audit Committees and Auditors
The audit committee and external auditors are critical in corporate governance and influence FSF. Ineffective audit committee oversight increases fraud risk, as firms involved in fraud often have weak audit structures (Dechow *et al.*, 1996; Uzun *et al.*, 2004). Auditor characteristics also shape fraud exposure, with experienced auditors and larger firms better at detecting irregularities (Moyes and Hasen, 1996; Francis, 2004). However, audit effectiveness may decrease under time pressure or extended auditor-client relationships (Braun, 2000). The fraud-mitigating role of large audit firms depends on the client's internal controls and audit quality (Carcello and Nagy, 2004; Farber, 2005; Mandal and Amilan, 2023). This study evaluates governance variables like audit committee independence, firm size, and tenure to assess their association with fraud risk.

4.1.5 Board of Directors and their characteristics
The composition and structure of the board of directors are crucial for fostering a governance environment that minimizes FSF. Peasnell *et al.* (2005) highlight that independent directors enhance board independence, but Romano and Guerrini (2012) note that fraud-prone firms often maintain high proportions of outside directors, suggesting inefficacy. Weak boards, with CEO dominance or limited independence, provide more opportunities for fraud (Finkelstein, 1992). In contrast, boards with more outside directors are more effective in monitoring management and deterring fraudulent activities (Weisbach, 1988; Beasley, 1996). However, excessive executive or inside directors may compromise board independence, facilitating misconduct. The presence of an effective, independent audit committee strengthens the board's capacity to detect fraud (Beasley, 1996). CEO duality, where one individual holds both the CEO and board chair roles, is

associated with weak internal controls and higher fraud risk (Jensen, 1993). Financial distress and insider trading activities also correlate with fraud risk (Gilson, 1990; Summers and Sweeney, 1998; Street and Hermanson, 2019).

4.1.6 Earning management

Earnings management involves manipulating financial reports to influence outcomes (Healy and Wahlen, 1999; Perols, 2011; Alves, 2023). It often occurs through accruals, with managers manipulating working capital (WC) accruals to reduce transparency. The RSST accruals measure (Richardson *et al.*, 2005) expands WC accruals, increasing opportunities for manipulation, aligning with the Fraud Triangle's "opportunity" aspect. Receivables and inventory are commonly manipulated to inflate sales growth and gross margins, reflecting "pressure," particularly in financially strained firms. Gepp *et al.* (2021) highlight the difficulty in detecting these components, while Dechow *et al.* (2011) introduced signed studentized DD residuals for more precise fraud detection.

4.1.7 Business Characteristics

Organizational characteristics like firm size, industry, and age significantly influence the likelihood of FSF. Smaller firms are more vulnerable due to limited resources and weaker internal controls, creating pressure to meet financial targets (Beasley *et al.*, 1999). Larger firms, though under scrutiny, may have more opportunities for fraud due to complex structures and management power, often influenced by regulatory pressures. Gepp *et al.* (2021) found that firms outside the technology sector are more prone to FSF due to industry-specific pressures. Younger firms, especially pre-IPO, are more susceptible to fraud due to a lack of internal controls and pressure to meet investor expectations (Gepp *et al.*, 2021). These factors, combined with financial pressures and weak internal controls, increase FSF risk.

4.1.8 Off-balancing-related activity

Off-balance-sheet activities can distort profitability and financial position, making it difficult for stakeholders to assess a firm’s true financial health. Labor cost manipulation presents an opportunity to misstate financial performance by reducing the workforce to cut costs despite declining performance, leading to inflated profits. Brazel *et al.* (2009) noted that comparing employee numbers to overstated assets may help identify fraudulent reporting. Operating leases also provide a chance for financial manipulation by moving liabilities off the balance sheet, inflating profitability. Gepp *et al.* (2021) highlighted that operating leases help avoid expense recognition, distorting financial statements. Firms under pressure to meet earnings targets are more likely to engage in such manipulations, reflecting both the "opportunity" and "pressure" components of the Fraud Triangle.

4.1.9 Macroeconomic factors

Macroeconomic factors play a significant role in detecting FSF. Economic downturns increase pressure to maintain performance, heightening the likelihood of financial misreporting. Key macroeconomic indicators like GDP, unemployment, and retail sales influence firms' propensity for fraud. The corporate governance index (G-index) shows that firms with more shareholder restrictions are more prone to fraud, indicating that weak governance structures create more

opportunities for manipulation. This aligns with the "rationalization" component of the Fraud Triangle, where management justifies fraud for financial stability. Interestingly, industry accounting complexity was not a significant predictor, emphasizing economic and governance factors.

4.1.10 Financial status/capacity

A company's financial health significantly impacts the likelihood of FSFD. Poor profitability increases the pressure to manipulate financial results. Loebbecke *et al.* (1989) found that 35% of firms with detected fraud had profitability below industry standards, indicating that low-profit firms are more prone to financial manipulation. This aligns with the "pressure" aspect of the Fraud Triangle, where financial strain leads managers to rationalize fraudulent actions. Spathis *et al.* (2002) highlighted profitability ratios, such as sales to total assets, as key fraud detection indicators. More profitable firms are less likely to commit fraud, while poor performance heightens the pressure to falsify results. Gepp *et al.* (2021) and others (Perols and Lougee, 2011) confirmed that poor performance increases the likelihood of fraud. Accounting-based measures like inventory and receivables are more reliable indicators than market-based measures, such as earnings per share (EPS), which are often manipulated under financial stress (Hajek and Henriques, 2017).

4.1.11 Market-related incentives

Market-related incentives significantly drive FSF, as managers manipulate reports to maintain high stock prices, benefiting both the firm and personal rewards. A strong stock price reduces equity costs, improves capital access, and minimizes shareholder dilution. Managerial compensation tied to stock performance, such as stock options or bonuses, further encourages FSF. This is particularly evident during debt or equity issuances, where firms may manipulate data to appear financially robust and secure better financing terms. Dechow *et al.* (2011) noted that firms with financial misstatements often report higher cash flows from financing activities. Gepp *et al.* (2021) observed that firms issuing new securities are pressured to appear financially strong, heightening fraud risk. Additionally, insider trading, such as stock sales before fraud detection, is common (Summers and Sweeney, 1998), while Bertomeu *et al.* (2021) highlighted short interest and stock return volatility as potential fraud indicators.

4.1.12 Linguistic clues

Management often employs specific language in annual reports to rationalize fraudulent actions, downplay negative financial information, or present an overly optimistic image, thereby obscuring fraudulent behavior and complicating detection. Cecchini *et al.* (2010) developed a dictionary for predicting fraud, identifying terms like "research development expense" and "interest income" as signals of concealment. Fraudulent MDAs often feature active language, imagery, modal verbs, and complex phrasing to minimize financial issues (Humpherys *et al.*, 2011). Glancy and Yadav (2011) found linguistic patterns in MD&A sections linked to fraud. Purda and Skillicorn (2015) noted that declining "probability-of-truth" in 10-K and 10-Q reports is associated with fraud. Hajek and Henriques (2017) observed that negative or uncertain language indicates higher fraud risks. Dong *et al.* (2018) highlighted how social media leaks can expose discrepancies and challenge corporate rationalizations.

4.2 Decisions of FSFD

Decisions in FSFD aim to strengthen key factors: corporate governance, audit effectiveness, management accountability, and ethical culture. These elements work together with internal controls and external pressures to enable proactive fraud detection and mitigation.

Corporate Governance ensures transparency, accountability, and ethical practices by forming independent boards and audit committees. Independent directors and committees enhance oversight, making fraud detection more effective (Beasley, 1996; Gepp *et al.*, 2021). Strong governance fosters trust, accountability, and alignment with regulatory standards (Moyes and Hasan, 1996).

Audit Effectiveness is vital for identifying fraud. Competent auditors, rigorous procedures, and advanced tools like data analytics improve fraud detection (Ravisankar *et al.*, 2010; Gepp *et al.*, 2021). Independence and continuous training ensure impartial, updated assessments of financial statements (Summer and Sweeney, 1998).

Management Accountability involves holding executives responsible for financial misrepresentation. Performance-based incentives aligned with long-term goals reduce fraud temptation, while whistleblower programs help uncover fraud (Dechow *et al.*, 2011). Disciplinary actions deter fraudulent behavior and reinforce transparency.

An Ethical Organizational Culture promotes integrity and transparency. Leadership sets the tone, and a code of conduct guides ethical behavior. Regular training on fraud prevention and encouraging employees to report misconduct strengthens fraud detection (Spathis *et al.*, 2002; Xu *et al.*, 2022).

4.3 Outcomes of FSFD

FSFD plays a vital role in minimizing the adverse effects of financial fraud by identifying and resolving discrepancies in financial reporting early. This early detection prevents significant financial losses, reputational harm, and legal penalties. By ensuring the integrity of financial statements, FSFD enhances transparency, builds stakeholder trust, and strengthens ethical business practices. It safeguards investors, protects shareholder value, and strengthens corporate governance, contributing to the organization’s long-term success and stability. The outcomes of FSFD are summarized as follows:

4.3.1 Transparency: FSFD ensures that all stakeholders have access to accurate financial data, addressing information asymmetry and reducing management's ability to manipulate information. It enhances transparency, reduces the agency problem, and allows for better regulatory oversight (Stalebrink and Sacco, 2007).

4.3.2 Bankruptcy Prevention: FSFD acts as an early warning system for financial distress, allowing organizations to identify and address potential financial problems before they escalate into bankruptcy (Abbasi *et al.*, 2012; Cecchini *et al.*, 2010). Timely intervention protects the company’s long-term viability.

4.3.3 Investor Protection: FSFD ensures that financial reporting is accurate, enabling informed decision-making by investors and stakeholders (Abbasi *et al.*, 2012). It helps prevent the misleading of investors, safeguarding their interests and protecting the company's financial position.

4.3.4 Confidence Building: FSFD reinforces investor confidence by ensuring that financial data is transparent and free from fraud. It assures investors that their resources are being managed responsibly, leading to greater trust in the company's future performance (Dong *et al.*, 2018).
4.3.5 Governance Strengthening: FSFD enhances corporate governance by promoting transparency, establishing strong oversight mechanisms, and improving internal controls. It leads to the formation of independent audit committees and a clear separation of management responsibilities (Fanning and Cogger, 1998; Beasley, 1996; Bertomeu *et al.*, 2021; Romano and Guerrini, 2012).
4.3.6 Reputation Management: FSFD helps preserve a company's reputation by detecting fraud before it becomes public, allowing for prompt corrective actions and demonstrating the company's commitment to ethical financial practices.
4.3.7 Loss Prevention: FSFD minimizes financial losses by detecting fraudulent activities early, enabling timely actions to prevent asset misappropriation and safeguard investor capital, thereby maintaining financial integrity.
4.3.8 Risk Optimization: FSFD improves the company's risk management framework by identifying financial reporting vulnerabilities and enabling management to address risks before they escalate, ensuring operational continuity and safeguarding against financial and reputational risks.
4.3.9 Sustainability Assurance: FSFD contributes to long-term sustainability by ensuring financial health and addressing fraudulent activities early. It helps the company remain resilient and adaptable, capable of navigating future challenges.
4.3.10 Ethics Promotion: FSFD promotes an ethical organizational culture by setting clear expectations against fraud and encouraging ethical behaviour at all levels. It fosters a work environment where employees are more likely to report suspicious activities, knowing they will be addressed.
The following section will provide the prospect for future research, and a summary of it is provided in Table 2.

Table 2. Summarize the research gaps

Category	Future Research Gaps
Antecedent	Individual Ethics in Fraud Perpetration
	Management Fraud Classification
	Audit Team Composition and Collaboration
	Board Composition and Governance
	Endogeneity in Board Composition
	Cash-Flow Management
	Internal Controls and Cash Management
	Quantitative Signals in Audit Risk Assessments

	Improvement in Detection Techniques
Decision	Regulatory Monitoring Enhancements
	Whistleblower Hotlines and Fraud Detection
	Impact of Political Party Affiliations on Rationalization of FSF
Outcome	Short-Term vs. Long-Term Benefits of Fraud
	Role of Personal Integrity and Corporate Culture in FSFD
Others	Future research in FSFD should focus on addressing key gaps to improve the accuracy, robustness, and timeliness of fraud detection systems.

5. Suggestions for future research

5.1 Future directions from the antecedent

To enhance FSFD model, future research should focus on integrating multidimensional indicators, such as behavioral and organizational factors, macroeconomic variables, and corporate strategies, to improve detection, prediction, and prevention of fraud. A promising avenue is exploring the ethical dimensions of fraud, examining how personal ethical traits, corporate culture, peer behavior, and psychological factors can serve as early fraud indicators. Additionally, differentiating fraud based on its beneficiaries and functional forms could lead to tailored detection systems addressing specific fraud motivations and structural pressures.

Further exploration is needed into audit team composition and governance mechanisms. Research should examine how interdisciplinary collaboration, cognitive diversity, and forensic specialization enhance fraud detection accuracy in complex environments. The influence of board independence, diversity, meeting frequency, and discussion depth on fraud risk also warrants investigation, particularly considering the endogeneity problem in the relationship between board composition and fraud risk (Hermalin and Weisbach, 2000). Advanced causal inference methods, such as instrumental variables or longitudinal models, can better capture the causal relationship between governance quality and fraud risk.

Macroeconomic indicators, while included in existing models like Gepp *et al.* (2021), need refinement. Incorporating dynamic variables like currency fluctuations, geographic factors, and sectoral business conditions could enhance their predictive power. Buehler *et al.* (2010) highlight how regional context, such as location in tourist or central areas, influences bankruptcy rates, underscoring the importance of incorporating geographical factors. Similarly, economic downturns (Helwege and Packer, 1999) should be studied as amplifiers of fraud risk.

The complexity of capital structures, particularly in large firms, also affects financial transparency. Research should investigate how secured debt and blanket liens impact fraud behavior and disclosure delays, as demonstrated by Hotchkiss *et al.* (2023). The high cost of credit, even years before bankruptcy (Aleksanyan and Huiban, 2016), suggests the need for FSFD models that incorporate credit risk and debt costs as early fraud indicators. Financial ratio analysis, including cash-based returns, valuation metrics, and solvency indicators, should be further explored to detect emerging financial stress. Furthermore, addressing cash-flow

manipulation techniques, which are challenging to isolate with traditional auditing methods, could benefit from advancements in machine learning and real-time forensic analytics.
CSR performance, generally seen as a risk-reducing factor (Albuquerque *et al.*, 2019; Sun and Cui, 2014), has recently been linked to increased financial distress when poorly executed (Li *et al.*, 2024). Research could investigate CSR as an indicator of stakeholder trust and reputational integrity, with deteriorating CSR practices possibly signaling fraudulent reporting to preserve market perception. Incorporating CSR performance into FSFD models may improve early detection of financial manipulation.
Finally, the relationship between R&D investment and fraud should be further explored. Financially strained firms often reduce R&D investment, which can signal distress (Lee and Choi, 2015; Pindado *et al.*, 2010). Abrupt reductions or inconsistencies in R&D spending, especially in high-growth firms, may indicate financial manipulation. R&D volatility could therefore serve as a red flag for potential fraud in future FSFD frameworks.

Based on the factors identified in the existing literature, we developed the conceptual framework presented below in Figure 4, which depicts how fraud occurs in an organization.

Conceptual framework:

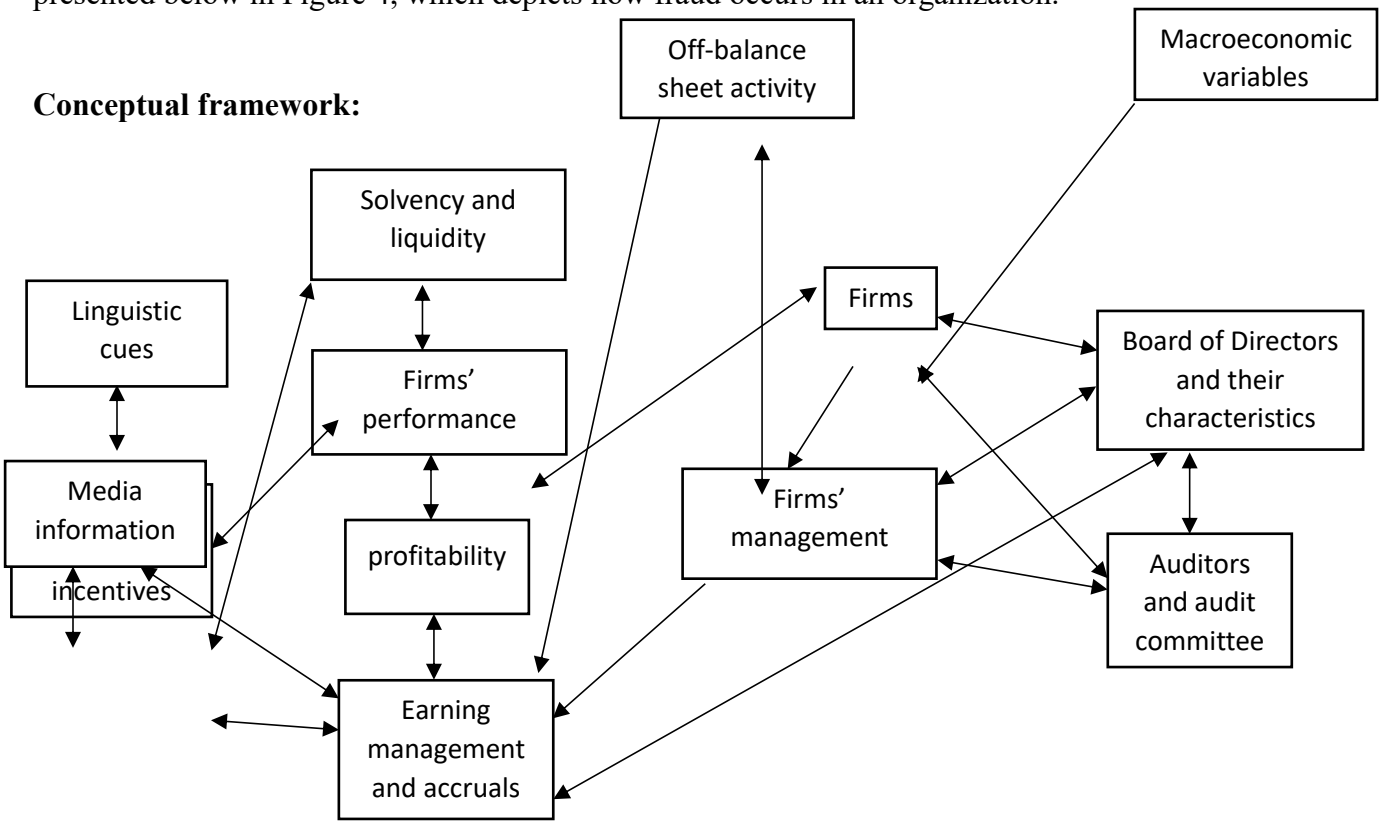

Figure 4. Conceptual framework in FSFD
Fraud occurs in the financial statements When the firm performance does not meet the expectations of the executive, primarily when their compensation and bonus are associated with the firm performance and of investors or to prevent damage to the firm's reputation, management attempts to inflate the accounting information so that to improve the solvency and liquidity of the

firm through enhancing the profitability. The firm's profitability is inflated positively using the earning management and accruals, leading to overstating assets and understating expenses. Management can only achieve its goal, which is to show the false healthy condition of firms, by weakening the company's internal control (Board of directors, auditors and audit committee) and reporting more positive or false information about the company in their report. The following paragraph will highlight the future agenda from the aspect of decision.

5.2 Future Directions from the Decision

Fraud tactics and methods evolve continually, requiring FSFD systems to adapt accordingly. Organizations must invest in upgrading their fraud detection technologies, utilizing advanced tools like data analytics and machine learning to enhance the detection of fraud and improve the accuracy of financial reporting (Chenni *et al.*, 2010). Regular updates ensure that systems remain effective in identifying emerging fraud risks and addressing future challenges.

Effective regulatory monitoring plays a critical role in fraud detection. It encourages accountability and compliance, reducing the likelihood of fraud due to the constant scrutiny of financial records. Gepp *et al.* (2021) observed that higher debt levels, which lead to better monitoring from creditors, reduce fraud risks. Regulatory oversight not only aids in early detection but also fosters transparency and trust, enhancing ethical behavior within firms.

Additionally, whistleblower hotlines are vital for uncovering FSF. These anonymous channels allow employees and stakeholders to report unethical actions without fear of retaliation, often revealing fraud that goes undetected through traditional audits. The presence of such hotlines serves as a psychological deterrent, reducing the chance of fraudulent activities. By promoting and maintaining whistleblower systems, firms demonstrate a commitment to ethical practices, improving governance and fraud detection. Ultimately, these systems create a culture of accountability, strengthening corporate integrity and protecting stakeholders' interests.

5.3 Future directions from the Outcome aspect

Future research in FSFD can explore various dimensions influencing fraud rationalization and its impact on organizations. One potential avenue is examining the effect of political party affiliations within organizations on fraud detection systems. Researchers could investigate how political ties shape the design, effectiveness, and ethical culture of fraud detection systems. Case studies of politically affiliated firms could reveal how political pressures influence corporate governance and responses to detected fraud. Comparative studies across different regulatory and political environments could highlight variations in rationalization practices post-detection, offering a more nuanced understanding of the relationship between political affiliations, fraud detection, and ethical decision-making.

Another research direction involves examining the beneficiaries of financial statement manipulation. Studies could explore whether fraud primarily benefits the perpetrator or the firm and assess the short-term and long-term consequences. Researchers could analyze how perpetrators gain initially, while firms suffer reputational and legal damage over time. Additionally, the role of internal controls, governance mechanisms, and board composition in facilitating or preventing fraud could be explored, along with market responses to financial

statement manipulation. Insights into how external stakeholders like investors and regulators perceive fraud over time would further elucidate the broader consequences of financial manipulation for both perpetrators and organizations.

The influence of personal integrity and corporate culture on FSF is another critical area for future exploration. Researchers could examine how ethical standards of key individuals, such as executives and auditors, impact financial reporting decisions. Understanding how personal integrity and organizational culture shape the likelihood of fraud could help identify the role of ethical leadership, transparency, and governance frameworks in preventing FSFD.

5.4 Further recommendation

The evolution of fraud detection has transitioned from traditional statistical techniques to more advanced computational methods, including machine learning and artificial intelligence (Ramzan & Lokanan, 2024). Despite these advancements, several gaps persist that could significantly improve the effectiveness of fraud detection systems. One critical area for enhancement is the integration of Multi-Criteria Decision Analysis (MCDA) techniques, which could incorporate variables such as board composition, financial manager turnover, and audit practices. These additions would allow models to better capture the complexities inherent in corporate governance and auditing, thereby improving their predictive accuracy. Furthermore, while existing models predominantly focus on detecting overstated earnings, there is a substantial gap in identifying understated earnings, particularly those arising from aggressive tax avoidance strategies. Baker et al. (2023) highlighted that such tax strategies diminish accounting comparability, suggesting the need to expand fraud detection approaches to address these issues. Additionally, models such as Support Vector Machine-Financial Kernel (SVM-FK) have shown promise in refining fraud detection accuracy. However, their application remains underexplored, particularly in relation to non-financial data sources like social media and managerial commentary. Leveraging deep learning techniques to analyze these non-financial signals could provide valuable insights into potential fraud risks, thereby enhancing the sophistication and reliability of fraud detection systems.

6. Implications of the study

6.1 Theoretical contribution

This study offers several theoretical implications. First, it contributes to the existing FSFD literature by providing new insights into the antecedents, decision-making processes, and outcome variables associated with FSFD. Second, based on the identified antecedents and the research gaps in the literature, future research directions have been proposed to enhance fraud detection methodologies and strategies. Third, the study presents a conceptual framework (Figure 5) that explains the complex process of FSF, which is a valuable tool for identifying and categorizing antecedents, thereby improving FSFD efforts. By synthesizing and comparing a wide range of reports from the existing literature, this study offers a comprehensive understanding of FSFD. It provides a roadmap for future research to advance fraud detection in corporate environments.

6.2 Practical Implication

This study aims to comprehensively understand the factors influencing fraud detection and corporate governance, offering valuable insights to various stakeholders involved in decision-making processes. As depicted in Figure 5, the following stakeholders will benefit significantly from the findings.

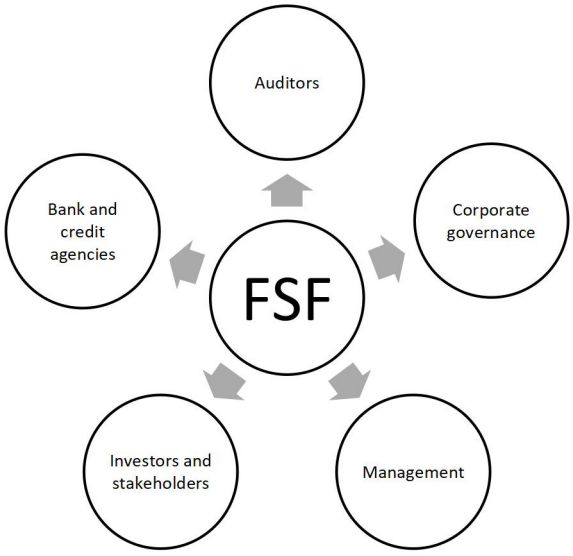

Figure 5. Implication of the study

6.1 Auditors: The study will provide auditors with a clearer understanding of critical variables related to fraud detection, allowing them to enhance the quality and accuracy of their audits. By recognizing key indicators of financial misreporting and fraud risks, auditors can refine their methods and focus on areas that require more scrutiny, ultimately improving the effectiveness of audits and reducing the likelihood of overlooking fraudulent activities.
6.2 Researchers: For researchers, the study serves as a foundation for further exploration into corporate governance structures and fraud detection mechanisms. It will provide valuable data and insights to guide future studies, especially those focused on the relationship between governance practices, board structures, and the risk of financial fraud. Researchers will be able to expand on these findings and contribute to developing more robust fraud detection tools and strategies.
6.3 Corporate Governance: The study will support the improvement of corporate governance by identifying the key factors that influence transparency, accountability, and effective decision-making within organizations. Understanding the role of independent directors, CEO power, and board composition will allow companies to structure their boards better, mitigate risks, and foster an environment of ethical corporate behaviour, reducing the potential for fraud.
6.4 Management: This study provides invaluable insights into the factors influencing an organization's financial integrity and corporate governance. By understanding how elements like board composition, CEO power, and institutional ownership affect the likelihood of fraud, management can make informed decisions to strengthen internal controls and improve organizational transparency. Furthermore, the study highlights the importance of ethical leadership and effective governance structures, allowing management to align their strategies

with best practices in fraud prevention. This proactive approach to governance will not only help mitigate the risk of fraud but also enhance the company's reputation, long-term sustainability, and ability to attract investors and stakeholders. By implementing the study's recommendations, management can foster a culture of integrity, responsibility, and accountability, ultimately contributing to better business performance and risk management.

6.5 Investors and Stakeholders: For investors and stakeholders, the study will provide crucial insights into identifying risk factors related to financial fraud. This knowledge will enable them to make more informed investment decisions, assess the financial health of companies more accurately, and evaluate the quality of governance structures in the organizations they invest in. By understanding the factors contributing to fraud risk, they can better protect their investments and advocate for stronger governance practices.

6.6 Banks and Credit Agencies: Banks and credit agencies will benefit from the study by better understanding financial stability and fraud risks. This knowledge will inform lending and credit decisions, helping these institutions assess the long-term viability of potential borrowers and prevent risky financial engagements. By incorporating the identified factors into their risk assessment models, banks can make more prudent lending decisions and reduce the chances of financial defaults due to fraud.

7. Conclusion

This study reviews the FSF literature through the ADO framework, identifying key antecedents that contribute to FSF detection. These include firm performance, solvency, media exposure, audit committees, board characteristics, earnings management, off-balance sheet activities, and financial incentives. The study highlights four pivotal decisions that enable effective FSF detection: corporate governance, audit effectiveness, management accountability, and fostering an ethical organizational culture. Furthermore, the study outlines the major outcomes of effective FSF detection, which include strengthening governance, improving transparency, preventing bankruptcy, ensuring investor protection, building confidence, managing reputation, preventing losses, optimizing risk, ensuring sustainability, and promoting ethics. Interestingly, the study also reveals that earlier research predominantly focused on financial indicators while neglecting the behavioral factors that influence managers' decisions to commit fraud and also developed the conceptual framework for FSFD. Lastly, the review suggests several promising avenues for future research. However, the review's limitations, such as stringent quality criteria and specific keywords used in the article selection process, may have resulted in the exclusion of relevant publications and non-peer-reviewed sources. Despite these limitations, the study makes a substantial contribution to the FSF detection literature, offering actionable insights for improving fraud detection practices.

References

1. Abbasi, A., Albrecht, C., Vance, A., Hansen, J., Albrecht, C., Vance, A. and Hansen, J. (2012), "MetaFraud: A Meta-Learning Framework for Detecting Financial Fraud", *MIS Quarterly: Management Information Systems*, Vol. 36 No. 4, pp. 1293–1327.
2. ACFE. (2022), "Occupational Fraud 2022: A Report to the nations", *Association of Certified Fraud Examiners*, pp. 1–96.

3. Bell, T.B. and Carcello, J. V. (2000), "A decision aid for assessing the likelihood of fraudulent financial reporting", *Auditing*, American Accounting Association, Vol. 19 No. 1, pp. 168–184.
4. Beneish, M.D. (1999), "The Detection of Earnings Manipulation", *Financial Analysts Journal*, Vol. 55 No. 5, pp. 24–36.
5. Braun, R.L. (2000), "The effect of time pressure on auditor attention to qualitative aspects of misstatements indicative of potential fraudulent financial reporting", *Accounting, Organizations and Society*, Vol. 25 No. 3, pp. 243–259.
6. Cecchini, M., Aytug, H., Koehler, G.J. and Pathak, P. (2010), "Detecting management fraud in public companies", *Management Science*, Vol. 56 No. 7, pp. 1146–1160.
7. Dechow, P.M., Ge, W., Larson, C.R. and Sloan, R.G. (2011), "Predicting Material Accounting Misstatements", *Contemporary Accounting Research*, Vol. 28 No. 1, pp. 17–82.
8. Dikmen, B. and Ḳkkocaŏlu, G. (2010), "The detection of earnings manipulation: The three-phase cutting plane algorithm using mathematical programming", *Journal of Forecasting*, Vol. 29 No. 5, pp. 442–466.
9. Gepp, A., Kumar, K. and Bhattacharya, S. (2021), "Lifting the numbers game: identifying key input variables and a best-performing model to detect financial statement fraud", *Accounting and Finance*, Vol. 61 No. 3, pp. 4601–4638.
10. Hajek, P. and Henriques, R. (2017), "Mining corporate annual reports for intelligent detection of financial statement fraud – A comparative study of machine learning methods", *Knowledge-Based Systems*, Elsevier B.V., Vol. 128, pp. 139–152.
11. Kaminski, K.A., Sterling Wetzel, T. and Guan, L. (2004), "Can financial ratios detect fraudulent financial reporting?", *Managerial Auditing Journal*, Vol. 19 No. 1, pp. 15–28.
12. Lin, J.W., Hwang, M.I. and Becker, J.D. (2003), "A fuzzy neural network for assessing the risk of fraudulent financial reporting", *Managerial Auditing Journal*, Vol. 18 No. 8, pp. 657–665.
13. Moyes, G.D. and Hasan, I. (1996), "An empirical analysis of fraud detection likelihood", *Managerial Auditing Journal*, Vol. 11 No. 3, pp. 41–46.
14. Perols, J. (2011), "Financial Statement Fraud Detection: An Analysis of Statistical and Machine Learning Algorithms", *AUDITING: A Journal of Practice and Theory*, American Accounting Association, Vol. 30 No. 2, pp. 19–50.
15. Rahman, M.J. and Jie, X. (2024), "Fraud detection using fraud triangle theory: evidence from China", *Journal of Financial Crime*, Vol. 31 No. 1, pp. 101–118.
16. Ravisankar, P., Ravi, V., Raghava Rao, G. and Bose, I. (2010), "Detection of financial statement fraud and feature selection using data mining techniques", *Decision Support Systems*, North-Holland, Vol. 50 No. 2, pp. 491–500.
17. Romano, G. and Guerrini, A. (2012), "Corporate governance and accounting enforcement actions in Italy", *Managerial Auditing Journal*, Vol. 27 No. 7, pp. 622–638.
18. Shahana, T., Lavanya, V. and Bhat, A.R. (2023), "State of the art in financial statement fraud detection: A systematic review", *Technological Forecasting and Social Change*, Elsevier Inc., Vol. 192 No. May 2022, p. 122527.
19. Spathis, C.T. (2002), "Detecting false financial statements using published data: some evidence from Greece", *Managerial Auditing Journal*, MCB UP Ltd, Vol. 17 No. 4, pp. 179–191.

20. Summers, S.L. and Sweeney, J.T. (1998), "Fraudulently misstated financial statements and insider trading: An empirical analysis", *Accounting Review*, Vol. 73 No. 1, pp. 131–146.
21. Wehrhahn, C. and Velte, P. (2024), "The relationship between audit committees, external auditors, and internal control systems: a literature review and a research agenda", *Journal of Financial Reporting and Accounting*.
22. Xu, X., Xiong, F. and An, Z. (2022), "Using Machine Learning to Predict Corporate Fraud: Evidence Based on the GONE Framework", *Journal of Business Ethics*, Springer Netherlands, Vol. 186 No. 1, pp. 137–158.