Revisiting Fraud Theories in Indonesian Context: A Systematic and Critical Literature Analysis

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A R T I C L E   I N F O

A B S T R A C T

Financial fraud, ranging from corporate mismanagement to embezzlement of public funds, remains a crucial issue in Indonesia, reflecting systemic weaknesses in governance and regulation. Utilizing theoretical frameworks, such as the fraud triangle, fraud diamond, fraud pentagon, and fraud hexagon, this study aims to explore various studies examining the factors contributing to financial fraud in Indonesia. This qualitative study uses the Charting the Field method to analyze 69 articles published in SINTA 2 and Scopus-indexed journals between 2016 and 2024. The results indicate inconsistencies in research findings due to methodological limitations, the use of incompatible dependent variables, and unrepresentative proxies for independent variables. There are gaps in author collaboration and thematic focus. Furthermore, some studies still focus on separate theoretical models. This study is expected to contribute to the accounting literature and serve as a reference for more innovative and contextually relevant further research.

A B S T R A K

Penipuan keuangan tetap menjadi isu krusial yang mencakup mismanajemen korporasi hingga penggelapan dana publik, menunjukkan adanya kelemahan sistemik dalam tata kelola dan regulasi. Penelitian ini bertujuan untuk mengeksplorasi berbagai studi yang membahas faktor-faktor penyebab penipuan keuangan di Indonesia, dengan menggunakan kerangka teori fraud triangle, fraud diamond, fraud pentagon, dan fraud hexagon. Pendekatan yang digunakan bersifat kualitatif dengan metode "Charting the Field," melalui analisis 69 artikel yang diterbitkan dalam jurnal terindeks SINTA 2 dan Scopus selama periode 2016–2024. Hasil analisis menunjukkan adanya ketidakkonsistenan temuan yang disebabkan oleh keterbatasan metodologi, penggunaan variabel dependen yang kurang tepat, serta proksi variabel independen yang tidak representatif. Selain itu, teridentifikasi kesenjangan kolaborasi antarpeneliti dan fokus tematik yang masih terbatas pada model teoritis yang terpisah. Studi ini diharapkan dapat memperkaya literatur akuntansi dan menjadi rujukan dalam pengembangan penelitian selanjutnya yang lebih inovatif dan kontekstual.

1. INTRODUCTION

Financial fraud, encompassing various forms of violations such as corporate mismanagement, financial misstatements, and embezzlement of public funds, continues to be a global issue. The numerous cases of financial fraud in Indonesia demonstrate systemic weaknesses in corporate governance and regulatory oversight. One recent example is the alleged IDR 2.5 trillion export financing corruption at Indonesia Eximbank (LPEI), which reportedly involved four companies in the palm oil, coal, nickel, and shipping sectors (BBC,

2024). The Corruption Eradication Commission (KPK) estimates that corruption in export credit provisions has resulted in state losses of IDR 3.451 trillion (Rahmawati, 2024). If not properly addressed and detected, financial reporting fraud, corruption, and similar violations can be extremely detrimental to the state. Therefore, decisive measures, starting with early detection efforts, are needed to address this financial fraud.

Financial fraud detection in Indonesia has evolved significantly over the years, with numerous methods proposed by researchers to address

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this issue. One notable approach is the use of fraud theories, which serve as a foundational framework for analysis. Researchers apply these theories to identify key indicators of fraud, using proxy variables to measure the significance of specific elements within the theory. By connecting these theoretical points to real-world data, researchers can assess the relevance and impact of each factor on the sample being studied, providing valuable insights into financial fraud detection.

The factors influencing fraud theory have evolved over time, starting with the fraud triangle and eventually developing into the fraud hexagon. According to Cressey (1953), there are three main drivers of fraud: pressure, opportunity, and rationalization. Hermanson later added the capability factor, expanding the concept into the fraud diamond (Wolfe & Hermanson, 2004). Horwath then introduced the arrogance factor, which later became the Fraud Pentagon (Howarts, 2011). Finally, Vousinas added collusion as a new factor, completing the development of the concept into the fraud hexagon (Vousinas, 2019).

This study aims to examine the application of various fraud theories, such as the fraud triangle, fraud diamond, fraud pentagon, and fraud hexagon, in the context of financial fraud research in Indonesia. By critically analyzing the existing literature, this study attempts to address the methodological and conceptual gaps identified in previous research. A broader sample size is used to enhance the comprehensiveness of the analysis and ensure greater relevance across various industrial sectors in Indonesia. Specifically, this study explores the most frequently discussed topics, commonly used research samples, dominant fraud factors, and collaboration patterns among academics. Furthermore, this study investigates the types of dependent and independent variables applied in previous research, as well as the role and effectiveness of moderating variables in shaping research outcomes.

Using this approach, this study provides a structured overview of recent developments and trends in fraud theory research in Indonesia, offering valuable insights for academics, practitioners, and policymakers seeking to strengthen anti-fraud frameworks and guide future research. This study explores the core elements of fraud theory to identify key factors and relationships influencing the field, with the goal of building a more integrated and impactful knowledge base for addressing fraud across multiple contexts.

2. THEORETICAL FRAMEWORK AND HYPOTHESES
Financial Fraud

Fraud has a broad and ongoing impact globally (Naomi & Akbar, 2023). Karyono, 2013 defines fraud as an intentional act of misconduct and violation of law with the intent to deceive or mislead others, both inside and outside an organization. Fraud poses a significant threat to both the public and private sectors (Triantoro et al., 2020), encompassing various forms of financial scandals and violations with the primary goal of personal enrichment (ACFE, 2024). Fraud negatively impacts not only individuals but also larger entities, such as corporations and countries. Fraud can lead to significant revenue losses, reduced investment, and damaged corporate reputations, ultimately hampering economic growth.

Fraud Triangle

As the name suggests, the fraud triangle is a theory that proposes three main factors that drive someone to commit fraud. Introduced by Cressey (1953), this model identifies pressure, opportunity, and rationalization as the key conditions underlying fraudulent behavior (Cressey, 1953). These elements also form the foundation of SAS No. 99 (Cressey, 1953). In Indonesia, several studies examining the fraud triangle have produced varying conclusions. For instance, the results of research conducted by Reskino & Anshori (2016) show that only pressure factor, represented by the financial target proxy ROA, can serve as a model for detecting financial statement fraud. Conversely, the results of research conducted by Wahyuni & Budiwitjaksono (2017) show that only rationalization factor, as indicated by changes in the external auditor (KAP), positively correlates with financial statement fraud. The results of research conducted by (Wulandari & Maulana, 2022) show that pressure factor, specifically proxied by financial stability, has a significant impact on fraudulent financial reporting practices.

Fraud Diamond

The fraud diamond is an extension of the fraud triangle, adding capability as a factor that drives someone to commit fraud (Emil Safitri & Baridwan, 2023). The first person to introduce this theory was Wolfe & Hermanson (2004). This theory identifies four key factors—pressure, opportunity, rationalization, and capability—as reasons why individuals commit fraud (Deliana et al., 2022). Similar to the fraud triangle, studies on the fraud diamond in Indonesia have yielded varying results. The results of research conducted by Yesiariani & Rahayu (2017) show that external pressure (proxied by LEV) and rationalization (proxied by TATA) have a significant and positive effect on financial state-

ment fraud. However, the results of research conducted by Komang et al. (2019) show that only opportunity (measured by the total inventory ratio) and rationalization (measured by the total accrual to total assets ratio) have a significant effect on financial statement fraud. Furthermore, the results of research conducted by Noble (2019) show that, using an f-test, all four factors significantly influence fraud. However, the t-test results indicate that only pressure (proxied by financial targets) and rationalization (proxied by auditor change) have a significant influence on fraud.

Fraud Pentagon

The fraud pentagon theory extends the fraud diamond by introducing a fifth factor: arrogance. Proposed by Horwats, the fraud pentagon identifies five causes of fraud: pressure, opportunity, rationalization, competence, and arrogance (Howarts, 2011). Research on this theory has produced varied findings. According to Reskino & Anshori (2016), adequate competence can prevent unethical behavior, thereby reducing the possibility of fraud. Meanwhile, the results of research conducted by Apriliana & Agustina (2017) show that pressure (with a proxy for financial stability), opportunity (with a proxy for the quality of external auditors), and arrogance (with a proxy for the frequency of CEO changes) significantly influence financial fraud. The results of research conducted by Yanti et al. (2023) show that opportunity (proxied by changes in internal auditors), rationalization (proxied by accounting policies), competence (proxied by special purpose entities), and arrogance (proxied by CEO photos) have an effect on fraudulent financial activities.

Fraud Hexagon

The most recent fraud theory, the fraud hexagon, includes six factors that contribute to fraudulent behavior. The additional factor in this theory is collusion, which refers to an agreement between two or more parties to commit fraud (Vousinas, 2019). Research on the fraud hexagon has also produced varying results. The results of research conducted by Tarjo et al. (2021), show that financial stability, financial targets, and external pressure (as proxies for pressure) have an effect on financial statement fraud. Additionally, industry nature (as a proxy for opportunity) and CEO duality (as a proxy for ego) have an effect on financial statement fraud. Similarly, the results of research conducted by Khamainy et al. (2022) show that external pressure (proxied by leverage), CEO duality (representing arrogance), and industry nature (indicating opportunity) are significant in detecting financial state-

ment fraud.

3. RESEARCH METHOD
Research Design

This study adopts qualitative research with a literature study approach assisted by machine learning tools to answer research question critically and systematically. According to Danial & Wasriah (2009), a literature study involves gathering relevant books, magazines, and other materials related to the research problem and objectives. A literature study is a theoretical examination and review of sources connected to the values, culture, and norms prevalent in the social context under investigation (Sugiyono, 2018). This study uses the Charting the Field method developed by Hesford et al. (2007). This method allows for the systematic categorization and mapping of previous research based on its themes, methodology, and theoretical framework.

To strengthen the critical review aspect, this study not only synthesizes existing research but also evaluates the developments, gaps, and methodological trends of fraud theories, including the Fraud Triangle, Diamond, Pentagon, and Hexagon, in the Indonesian context. This methodological innovation supports a more robust critique of current academic discourse and helps identify underexplored areas that can inform future research.

Data Source

The first step in this study is to collect journal references published in SINTA 2 and SCOPUS from 2016 to 2024, focusing on the topic of fraud theory. Data collection in SINTA 2 is carried out by searching for articles using the keywords accounting, economics, business, management, and finance. Meanwhile, data collection in SCOPUS is carried out by searching for articles using the keywords fraud triangle, fraud diamond, fraud pentagon, and fraud hexagon because the search bar in SCOPUS is much more sophisticated than SINTA 2. The selected articles are those that use Indonesian companies as their samples. The complete research sample criteria can be seen below.

a. Registered in SINTA 2 or the SCOPUS database
b. Focusing on financial fraud or accounting fraud and using fraud theories
c. Using Indonesian company as the sample
d. The research period is from 2016 to 2024 and falls under the business, management, and accounting category
e. The content of the articles is accessible to researchers
f. Published as journal articles
g. Written in Indonesian or English

This approach allows researchers to explore a broader range of audit topics. This study focuses on articles related to fraud, specifically financial fraud. Through this process, 56 articles meet the criteria in SINTA 2, but after further screening, 48 articles are deemed relevant for this study. Meanwhile, 21 articles meet the criteria in SCOPUS. Thus, the total number of articles used is 69.

Research Instrument

This is used as a guideline for content analysis which includes the related aspects observed. Table 1 is adapted from the results of research conducted by Susetyarini & Fauzi (2020) with some adjustment with the research topic. There are seven main aspects that need to be reviewed for content analysis in this study. These aspects include (1) number of citations; (2) number of publications per year; (3) type of research; (4) research sample; (5) proxies used; (6) treatment; (7) data collection instruments; and (8) data analysis methods.

Table 1
**The Aspects and Categories Used for Content Analysis in the Study**

Aspects	Categories	
Type of research	A.1 Qualitative Research A.2 Quantitative Research	A.3 Literature Review Research
Journal ranking	B.1 Q1 B.2 Q2	B.3 Q4 B.4 SINTA 2
Research sample	C.1 Manufacturing Company C.2 Property & Real Estate C.3 Mining Company	C.4 All company in IDX C.5 Banks C.6 State Owned Company C.7 Others
Proxy in Dependent Variable	D.1 F-Score D.2 M-Score D.3 Earnings Management	D.4 Dummy Variable
Proxy in Independent Variable	E.1 Proxy Pressure E.2 Proxy Opportunity E.3 Proxy Rationalization	E.4 Proxy in Capability E.5 Proxy in Arrogance E.6. Proxy in Collusion
Moderating Variable	F.1 Technology F.2 Institutional ownership F.3 Religiosity	F.4 GCG F.5 Governance and culture F.6 Audit committee

4. DATA ANALYSIS AND DISCUSSION
Publication Trends Analysis

The growing number of published articles re-

lated to fraud theories in Indonesia reflects the strong academic interest in this area. The trend over time highlights key phases of development and growth within the field. However, the number of publications does not follow a consistent annual pattern.
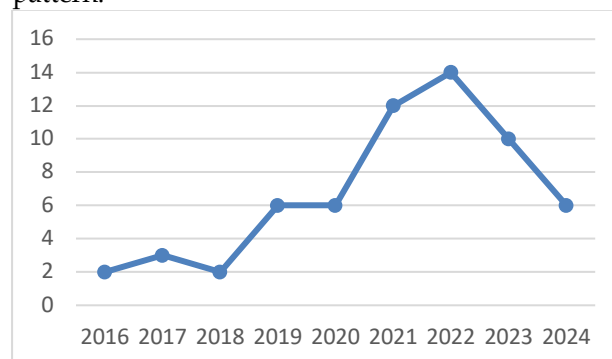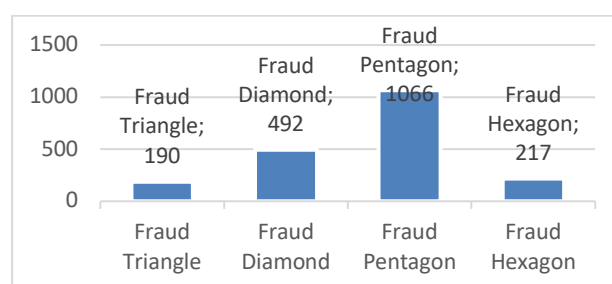
Figure 1
Publication Trend of Fraud Theories
Source: Data Processed

Research on fraud factors began with the fraud triangle in 2016. By 2017, it expanded to include the fraud diamond and fraud pentagon, continuing through 2018 to 2020. Studies on the fraud hexagon only started in 2021. Notably, no research on the fraud diamond was conducted in 2021, but it regained attention in 2022 and 2023. Meanwhile, interest in the fraud triangle has declined over the past two years.

Based on Figure 1, the number of publications has increased significantly since 2021 compared to previous years. This surge indicates the growing maturity and widespread application of fraud theory in the Indonesian context. This upward trend has continued, peaking with 14 articles in 2022. The number of publications is expected to continue to grow over time..

Highest-Cited Documents Analysis
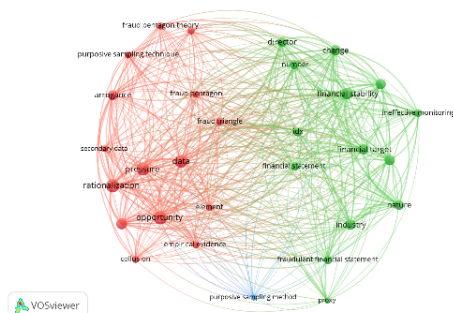
Figure 2
Most Cited Topic
Source: Data Processed

The documents with the most citations show their significant influence within the subject area. Fraud theory research has been cited over 1,500 times by researchers across various fields, empha-

sizing the need for reliable studies as a decision-making tool for information users. This growing number of citations indicates that fraud theories continue to serve as essential references in academic discussions, practical applications, and policy formulations related to financial fraud. Figure 2 shows the fraud theory topic with the highest citations. Fraud Pentagon has the highest number of citations, 1,066. This theory has gained substantial attention because it expands on previous models by incorporating additional dimension, arrogance, making it more comprehensive in identifying fraudulent behavior. Its relevance in the Indonesian context further explains its popularity, as scholars and practitioners seek frameworks that align more closely with local governance and organizational dynamics.

The high number of citations for the Pentagon Fraud theory demonstrates its relevance. However, it is important to recognize that the Fraud Hexagon offers a more holistic synthesis by encompassing core elements of the Triangle, Diamond, and Pentagon Fraud theories. The addition of 'collusion' as a sixth element broadens the theoretical perspective to address collective and systemic fraud risks, making it potentially more powerful in contexts where organizational involvement is prevalent, such as in developing countries. While theoretically comprehensive, the Fraud Hexagon theory remains under-explored in the literature, indicating a gap between its conceptual development and empirical application.

Co-occurrence Analysis

Figure 3
Co-occurrence analysis
Source: Data Processed

The co-occurrence of keywords is another science mapping technique where the keywords with the highest number of occurrences are represented in clusters. The co-word analysis assumes that the primary keywords used in the research words reflect the core context of scholarly literature—the keywords with higher occurrence are said to have similar themes, which later on can form clusters.

The keyword with the highest number of oc-currences appears bigger. The co-occurrence keyword visualization reveals a clear thematic separation between fraud theory–based approaches (red cluster) and corporate financial factor–based approaches (green cluster). Keywords such as rationalization, opportunity, and pressure serve as core nodes, representing individual psychological factors frequently discussed in the literature on fraud theories, particularly the Fraud Triangle and Hexagon. Meanwhile, keywords like financial target, financial stability, and ineffective monitoring are strongly connected to fraudulent financial statement, indicating a research trend focused on organizational and financial conditions as contributing factors to fraud.

The clear separation between clusters related to individual motivations and those related to corporate financial indicators indicates a fragmented approach in the literature. Few studies have integrated both dimensions holistically, thus limiting the understanding of how internal and external drivers of fraud interact in real-world contexts. Future research should aim to bridge this gap by using multi-theoretical or mixed-methods frameworks that simultaneously capture personal incentives and the institutional environment.

Journal Ranking Analysis

The following is the number of studies published on financial fraud theory in Indonesia. Table 2 presents a summary of research by journal and publication rank, including articles on fraud theory and financial fraud from 2016 to 2024 with a sample of 69 articles, N=69. A total of 19 articles (27.5%) are published in high-quality journals, indexed Q1 by Scimago (SJR), indicating increasing scientific interest at the international level. Meanwhile, one article (1.4%) is indexed Q2 by Scopus and one article (1.4%) is published by a medium-quality journal indexed Q4. The remaining 48 articles (69.5%) are published by local Indonesian journals with a SINTA 2 index.

Nearly 70% of studies published in local SINTA 2 journals highlight limited global reach. This suggests that fraud-related research in Indonesia has not been fully integrated into international academic discourse, potentially limiting its impact on global theory development or comparative studies. The limited number of articles in higher-ranked international journals may indicate challenges such as language barriers, limited access to international collaboration, or a focus on region-specific issues that may not yet attract global attention. Articles in lower-ranked journals may also indicate a tendency toward the repeated application of established theories, rather than the development of new concep-

tual frameworks. This explains the low number of Q1/Q2 publications, as leading journals typically prioritize originality and theoretical contributions. This trend also raises questions about the visibility, methodological rigor, and theoretical contributions of the existing body of research, suggesting the need to encourage more high-impact, globally oriented studies in this area.

Table 2
Number of Published Studies on Fraud Theory

| Sources	Publication Ranking	Article
Journal of Business and Retail Management Research (JBRMR)	Q1	1
International Journal of Recent Technology and Engineering	Q1	1
International Journal of Financial Research	Q1	2
Journal of Asian Finance, Economics and Business	Q1	1
Economic Annals-XXI	Q1	1
Quality - Access to Success	Q1	3
WSEAS Transactions on Business and Economics	Q1	1
International Workshop on Computer Science and Engineering (WCSE)	Q1	1
Economy	Q1	2
Cogent Business and Management	Q1	1
ECONOMICS - Innovative and Economics Research Journal	Q1	1
Pakistan Journal of Life and Social Sciences	Q1	1
International Journal of Data and Network Science	Q1	1
Journal of Governance and Regulation	Q1	1
Risk Governance & Control: Financial Markets & Institutions	Q1	1
Australasian Accounting, Business and Finance Journal	Q2	1
Revista de Gestao Social e Ambiental	Q4	1
Multiparadigm Accounting Journal	SINTA 2	2
Indonesian Journal of Accounting & Auditing	SINTA 2	2
JDA Journal of Accounting Dynamics	SINTA 2	3
Accounting Journal	SINTA 2	1
Indonesian Accounting and Finance Research	SINTA 2	1
The Indonesian Accounting Review	SINTA 2	1
Indonesian Journal of Accounting and Finance Research	SINTA 2	2
The Indonesian Journal of Accounting Research	SINTA 2	1
Journal of Economics, Business, & Accountancy Ventura	SINTA 2	1
Journal of Islamic Accounting and Finance Research	SINTA 2	2
Scientific Journal of Accounting and Business	SINTA 2	2
ACCRUAL: Accounting Journal	SINTA 2	1
Accounting Analysis Journal	SINTA 2	3
EQUITY (Journal of Economics and Finance)	SINTA 2	2
Journal of Accounting and Investment	SINTA 2	1
Journal of Contemporary Accounting Research	SINTA 2	3
IQTISHADIA	SINTA 2	2
Journal of Finance and Banking	SINTA 2	1
Integrated Journal of Business and Economics	SINTA 2	1
Journal of Accounting and Strategic Finance	SINTA 2	1
Indonesian Journal of Accounting and Finance	SINTA 2	1
Accounting, Auditing & Information Research Media	SINTA 2	2
ASET Journal (Accounting Research)	SINTA 2	5
Journal of Economics and Business	SINTA 2	1
Journal of Accounting Research, Organization, and Economics	SINTA 2	1
Indonesian Journal of Applied Accounting	SINTA 2	1
Attestation: Scientific Journal of Accounting	SINTA 2	1
International Journal of Social Science and Business	SINTA 2	1
Integrated Journal of Business and Economics	SINTA 2	2
Total Number of Articles		69

Source: Data Processed

Publication by Types of Research

The type and design of research determine the focus of a study. Based on Figure 3, quantitative research is the most dominant design. The number of quantitative studies is higher than the number of other types of studies. This indicates that researchers prefer quantitative research to qualitative research for fraud detection.
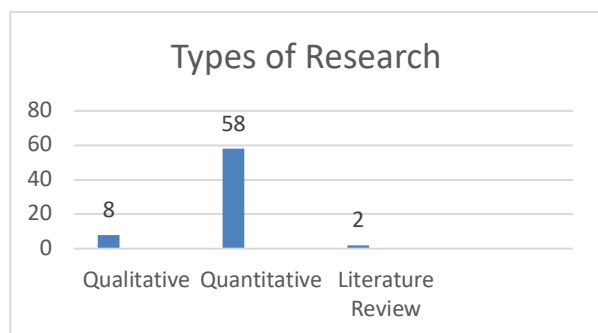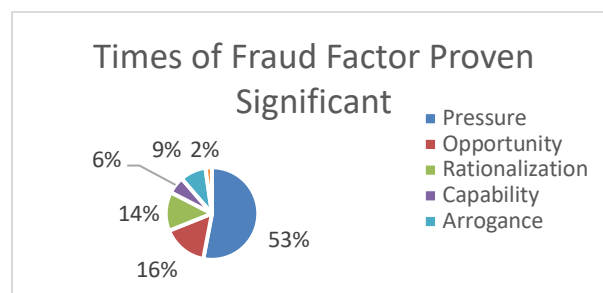
Figure 4
Types of Research
Source: Data Processed

Researchers in this field prefer quantitative methods because they are more time-efficient, especially when dealing with large data sets (Daniel, 2016). Additionally, researchers can analyze relationships, patterns, and cause and effect using statistical analysis. Qualitative methods cannot discover these because they are based on interviews or case studies that only capture specific moments. Quantitative methods are often well-suited for studying large populations, as they provide generalizable findings (Mohammad Zyoud et al., 2024).

By focusing solely on quantitative indicators, researchers may miss insights from key stakeholders (e.g., auditors, whistleblowers, executives) whose experiences and decisions can reveal how and why fraud actually occurs. Although quantitative studies often use proxy variables to represent internal factors (e.g., rationalization proxied by change in auditor), these proxies are indirect and may oversimplify complex behavioral dimensions. As a result, they lack the depth and contextual richness that insider perspectives (e.g., interviews, case studies) can provide. This weakens the explanatory power of fraud research and its usefulness for prevention strategies.

Fraud Factor Findings Analysis

Figure 5 below illustrates the frequency of fraud factors identified as statistically significant in studies conducted between 2016 and 2024. It should be noted that no study simultaneously confirmed all fraud factors as significant, indicating that each factor may contribute differently to the occurrence of financial fraud across organizational contexts.

Figure 5
Most Significant Factor
Source: Data Processed

Most research findings tend to identify only two to three significant factors, or a single factor represented by multiple proxy variables. For instance, the results of research conducted by Kirana et al. (2023) show that pressure, rationalization, and arrogance have a significant effect on financial statement fraud. Conversely, the results of research conducted by Jati & Setiyani (2024) show that only pressure has a significant effect on financial statement fraud.

Among all fraud factors examined, *pressure* emerges as the most frequently proven significant factor, approximately 53% of studies, followed by *opportunity* at 16%. This trend highlights the pivotal role of internal and external pressures, such as financial targets, debt obligations, or performance expectations, in motivating fraudulent behavior. The prominence of *pressure* supports the long-standing assumptions of the Fraud Triangle theory, positioning it as a foundational element in empirical fraud research.

While the dominance of the pressure factor aligns with traditional fraud models, it may also reflect a methodological bias toward variables that are easier to quantify using financial data. Other crucial factors, such as rationalization or collusion, may be underrepresented due to challenges in proxy development or data availability, rather than a lack of theoretical relevance.

It is also important to note that the majority of sampled companies are large companies listed on the Indonesia Stock Exchange (IDX), which generally operate with complex financial structures. This may influence which fraud factors appear statistically significant, as the manifestation of fraud risk can vary depending on company size, governance structure, and industry sector.

Research Sample Analysis

The diagram below illustrates that the manufacturing industry is the most frequently specifically analyzed sector in fraud-related research, accounting for 13 studies or 18.8% of the sample, fol-

lowed by studies that cover all sectors listed on the IDX, which make up 10 studies or 14.4%.
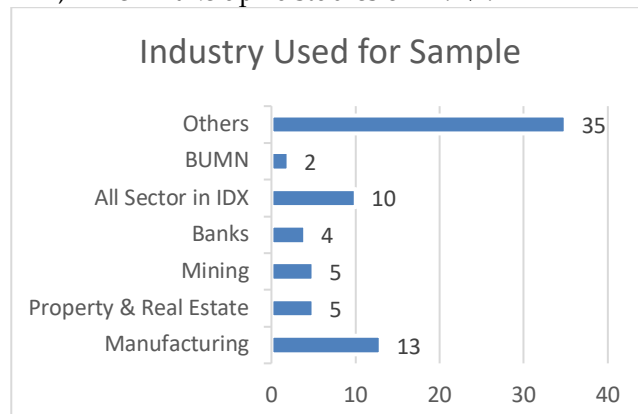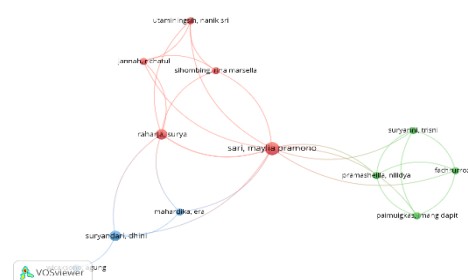

Figure 6
Industry Used for Sample
Source: Data Processed

The manufacturing sector is often the focus due to the inherent complexity of its business operations, which involve converting raw materials into finished products. The lengthy production process contributes to the complexity of accounting records in this sector (Warsono et al., 2014). Factors like intricate financial management and weak internal controls heighten the risk of financial fraud (Aivaz et al., 2024).

Beyond manufacturing and multi-sectoral studies, 5 studies focus on the mining industry, 5 on the property and real estate sector, and 4 on the banking sector. A significant portion 35 studies use samples that cannot be categorized into a specific sector due to the diversity of the samples exceeding the scope of this review. These are not detailed individually due to space constraints, but their presence indicates the wide range of contexts explored in the literature.

However, despite this sectoral variation, most studies apply similar fraud detection models and theoretical frameworks across industries without sufficient adaptation to industry-specific risk dynamics. This general approach may not be adequate to reflect the unique fraud risk structures, particularly in mining and banking sectors, where regulatory and operational environments differ significantly from manufacturing. Consequently, there is a clear need for more customized analytical models that are sensitive to sector-specific characteristics. Future research should aim to update existing fraud frameworks to better reflect the complexity, technology integration, and regulatory demands of each industry, enhancing both the relevance and predictive accuracy of fraud detection efforts.

Co-Authorship Analysis

Figure 7
Author Relations
Source: Data Processed

The co-authorship network map in Figure 7 above illustrates the collaborative structure among researchers in the field of fraud theory in Indonesia between 2016 and 2024. Sari, Maylia Pramono emerges as the most central and influential author, evidenced by the largest node size and the highest number of connections (link strength) to other authors. Her close collaborations with Raharja, Surya, Utaminingsih, Nanik Sri, and Jannah, Richatul form the core of the red cluster, indicating a dense and active research group likely focusing on similar theoretical perspectives. Several smaller clusters are also visible. For instance, the green cluster, comprising Suryarini, Trisni, Fachrurrozie, and Paimuigkas, Imang Dapit, represents another research group with internal collaboration, but with fewer cross-cluster connections. The blue cluster, consisting of Suryandari, Dhini, Mahardika, Era, and others, appears relatively isolated, suggesting topic divergence from the main research theme.

Despite the presence of collaboration, the network shows a moderate level of fragmentation, where many authors work within their own clusters, and inter-cluster collaboration remains limited. This fragmentation could limit the cross-pollination of ideas and hinder the development of more integrated, multi-theoretical approaches to understanding fraud.

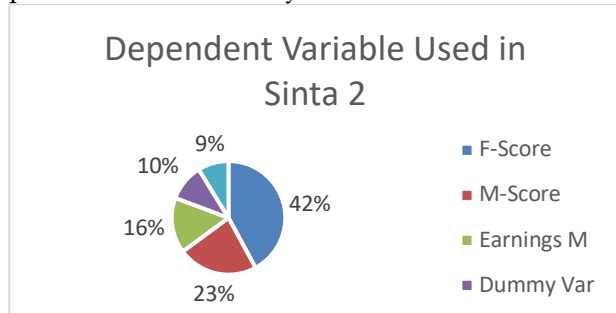**Dependent Variable Analysis**

In research methodology related to fraud theory, inconsistencies in findings can arise from various factors, including the use of x-scores as dependent variables. Examples of x-scores include f-scores, m-scores, and earnings management, which are often utilized as proxies for detecting financial fraud. However, these metrics present challenges in proving the existence of fraud due to two primary reasons (Byzalov & Basu, 2024):

1. Design Limitations: X-scores are not inherently designed to capture new sources of variation in financial fraud. This limits their ability to adapt to evolving patterns or novel fraud mechanisms.

2. Technical Assumptions: The accuracy of x-score estimates often relies on technical assumptions that may not be fully understood or universally applicable.

As a result, reliance on these variables can lead to inconsistent outcomes, underscoring the need for more robust methodologies or complementary approaches in fraud theory research.

Figure 8
Dependent Variable Used
Source: Data Processed

The diagram in Figure 8 above shows that 76% of fraud theory research in Indonesia, particularly in SINTA 2, relies on x-scores. This reliance likely contributes to inconsistent findings. X-scores, derived from regression models using standardized explanatory variables, are often used as proxies for underlying constructs like financial fraud (e.g., F-Score). However, their use in a second-stage analysis can lead to flawed conclusions due to the design limitations and assumption dependency. Such discussions are crucial, as even minor empirical adjustments can significantly affect these underlying assumptions and research outcomes.

Repeated use of the same proxy models (like Beneish M-score or Dechow F-score) across different studies risks reinforcing biased patterns, where models are continually validated based on the assumptions embedded in their own design. Therefore, future studies should consider combining x-scores with qualitative fraud indicators, case-based red flags, or even machine learning classification to overcome the rigidity of traditional proxy-based designs and capture a more holistic view of financial fraud.

Independent Variable Analysis
Beyond the issues with dependent variables, inconsistencies in fraud research findings also stem from the use of independent variables, many of which rely on proxies derived from audit procedures. While these proxies aim to operationalize abstract fraud factors, they introduce several methodological challenges. This traditional approach is time-consuming and sometimes impractical (Zhao et al., 2024). They identify several challenges:

1. Resource Constraints: Auditors often lack access to advanced technologies for detecting fraud.
2. Infrequent Events: Rare occurrences and remuneration structures reduce attention to irregularities.
3. Expert Manipulation: Corporate finance experts may deliberately mislead auditors.
4. Collusion Risks: Collusion between internal parties and auditors, driven by principal-agent issues, undermines monitoring.
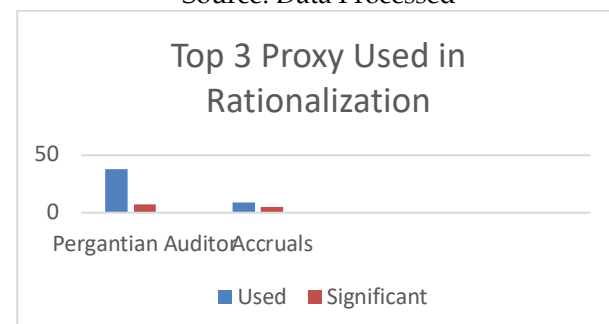
To improve fraud detection, research must evolve beyond these traditional methods by upgrading the independent variables used.
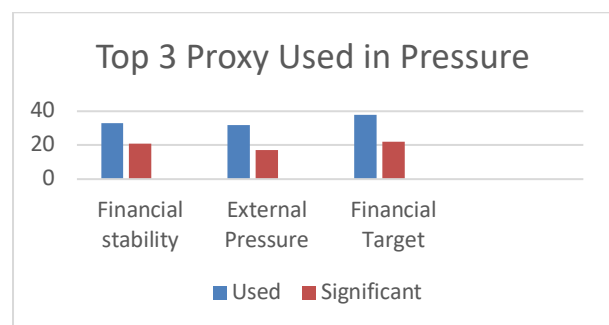
Figure 9
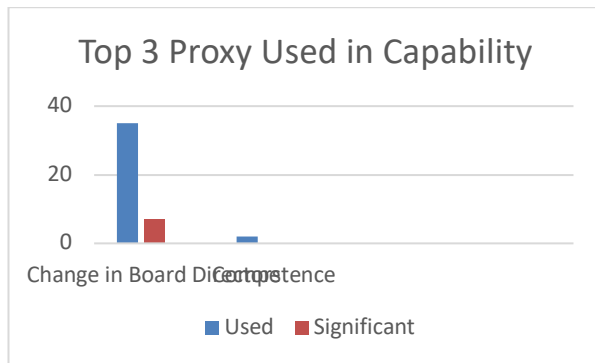**Proxy for Pressure**
Source: Data Processed
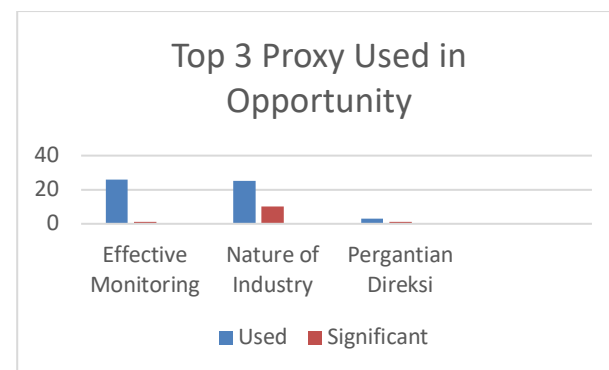
Figure 10
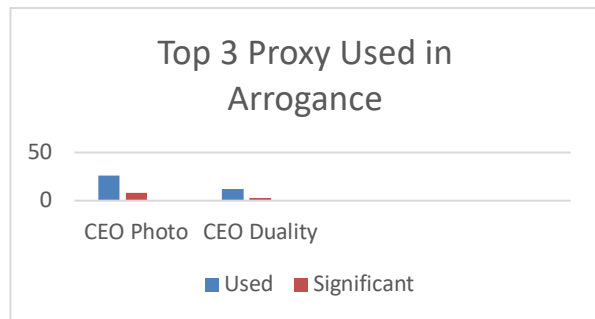**Proxy for Opportunity**
Source: Data Processed

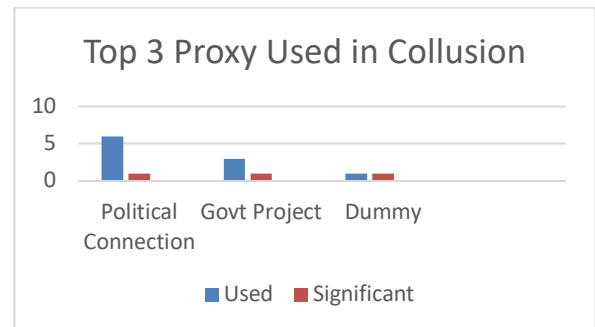**Figure 11**
Proxy for Rationalization

Source: Data Processed

Top 3 Proxy Used in Capability

Figure 12
Proxy for Capability
Source: Data Processed

Top 3 Proxy Used in Arrogance

Figure 13
Proxy for Arrogance
Source: Data Processed

Top 3 Proxy Used in Collusion

Figure 14
Proxy for Collusion
Source: Data Processed

The diagram presented compares the frequency of proxy usage with the number of times those proxies were found to be statistically significant in fraud detection models. The results reveal that many proxies struggle to prove the existence or influence of fraud factors—some have never been validated empirically. This raises serious concerns about their conceptual relevance and practical effectiveness in fraud theory research. Moreover, proxies may not accurately represent the theoretical constructs they are intended to measure. Proxies might not accurately represent the intended variables, potentially leading to biased research out-comes (Munteanu et al., 2024). Additionally, some proxies may lack relevance across different contexts or sectors, reducing the generalizability of findings (Aivaz et al., 2024). These findings suggest a pressing need to modernize and revalidate the proxies used as independent variables in fraud research. A move toward context-sensitive indicators, behavioral metrics, or even AI-assisted analytics may offer more reliable and adaptable tools for future investigations.

Moderating Variable Analysis

This section explores the role of moderating variables in shaping the relationship between fraud factors and fraudulent behavior. Several studies have attempted to enrich classical fraud models by introducing moderating influences, particularly in response to criticisms that existing theories lack contextual sensitivity. For instance, technology integration has been shown to moderate components of the Fraud Triangle, potentially reducing fraud risk by improving internal controls and data transparency (Mappadang & Yuliansyah, 2020). Similarly, institutional ownership can mitigate fraud-related pressure, especially pressures arising from financial targets or performance benchmarks (Anisykurlillah et al., 2023). Other scholars emphasize the moderating role of religious understanding, which is seen to reduce fraud tendencies by strengthening individual ethical standards, even under stressful or high-pressure conditions (Emil Safitri & Baridwan, 2023).

Effective corporate governance at all levels helps minimize fraud driven by opportunity and rationalization (Rohmatin et al., 2021). In the banking sector, despite good corporate governance practices, these measures have not effectively reduced the pressure and arrogance factors leading to misappropriation (Lastanti et al., 2022). Opportunities exploited to commit financial fraud are further weakened by the governance and culture instilled within the company. The audit committee plays a role in minimizing managerial behavior driven by motivation and opportunity to commit financial fraud (Nugroho & Diyanty, 2022). However, the committee's presence and size alone lack sufficient authority to detect fraud during financial reporting processes.

Despite growing interest in moderators, many studies fail to robustly test moderation effects, treating them as secondary rather than central elements of fraud models. Moreover, there is limited effort to theoretically justify why certain variables moderate specific fraud factors. As a result, moderation is often applied opportunistically driven by available data rather than grounded in behavioral

or organizational theory. The literature often assumes that moderators, such as ownership or governance, universally reduce fraud, ignoring the possibility of context-dependent or even reverse effects, such as ownership concentration facilitating collusion rather than preventing it. Also, the effectiveness of moderators, such as governance or religiosity, may be highly context-specific, limiting the generalizability of findings to other countries, cultures, or industries.

Table 3
Moderating Variable

Moderating Variable	Fraud Theory	Result
The technology integration	Fraud Triangle	Able to simultaneously moderate the effect of the fraud triangle variable.
Institutional ownership	Fraud Triangle	Institutional ownership can undermine the influence of financial targets on financial statement fraud.
Understanding of religiosity.	Fraud Diamond	The moderating variable of understanding religiosity successfully moderates the effect of pressure, opportunity, rationalization, ability and personal ethics on fraud tendency.
Religiosity	Fraud Diamond	With religiosity, they will be more capable in avoiding accounting fraudulent behavior even when being under pressures, be it financial pressures, work pressures, and other pressures.
Good Corporate Governance (GCG)	Fraud Pentagon	The implementation of effective corporate governance at all levels will help minimize the occurrence of fraud triggered by opportunities and rationalization, even though banks implement good corporate governance well, the results have not been able to reduce the pressure and arrogance factors that can trigger fraud.
Governance and culture: content analysis	Fraud Hexagon	Influence of opportunities to be exploited by FFS is also weakened by governance and culture implemented in company.
Audit Committee (AC)	Fraud Hexagon	The AC can minimize the behavior of motivated managers, see opportunities, and execute these opportunities into FFS.
Audit Committee	Fraud Hexagon	The existence and quantity of the audit committee as a supervisory board does not have sufficient authority to detect irregularities when preparing financial reports.

Source: Data Processed

Future Research Suggestion

Based on the above review, this study identifies several potential areas for future research. In terms of sample selection, future research could explore various industries such as aviation, healthcare, pharmaceuticals, and technology. Most existing research in Indonesia focuses on the manufacturing sector, leaving other industries underexplored. For example, the aviation industry has experienced significant financial fraud cases, such as

the Garuda Indonesia case. These cases highlight the need for contextualized fraud detection models tailored to industry-specific dynamics.

In addition to diversifying samples, further research can consider using advanced proxies to measure variables, such as machine learning. Machine learning can analyze data, identify patterns, and make decisions autonomously, assisting in decision-making processes (Kane, 2017). Although international studies have utilized technologies such as machine learning and artificial intelligence in data analysis, research on fraud theory in Indonesia has not yet adopted these tools.

One example of a machine learning platform is Jupyter Notebook, part of the Anaconda software suite, which uses Python programming or Bibliometrix which uses R programming. Jupyter enables users to clean and process data, perform machine learning, analyze text through natural language processing (NLP), and visualize results using libraries such as Matplotlib, Seaborn, and Plotly. Its flexibility makes it ideal for conducting fraud detection, classification, clustering, and sentiment analysis—especially when dealing with large and unstructured datasets. On the other hand, Bibliometrix is a comprehensive R-based tool specifically designed for bibliometric and scientific mapping analysis.

This study utilizes articles from SINTA-indexed journals, which often lack structured metadata such as citation networks, DOI information, and standardized reference formats commonly found in international databases like Scopus. As a result, advanced analytical tools such as Jupyter Notebook, Bibliometrix, and other machine learning-based bibliometric analysis are not applied in this study.
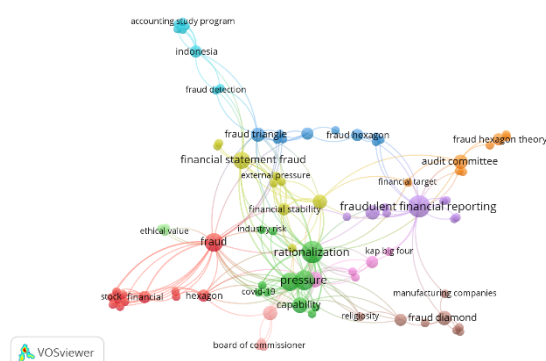
Figure 15
Keyword Co-Occurrence
Source: Data Processed

Keyword co-occurrence analysis using VOSviewer suggests multiple underdeveloped research themes. The network visualization reveals connections between core fraud factors and adja-

cent topics that remain fragmented or insufficiently explored. For instance, researchers could examine the influence of external pressure—such as macroeconomic instability or regulatory uncertainty on fraud occurrence, or assess the role of audit firm reputation (e.g., Big Four affiliation) in mitigating misstatement risks. However, the majority of current studies still focus on static models and isolated fraud factors, neglecting the potential for interactive or systemic approaches. Additionally, the keyword network reveals weak linkages between fraud research and interdisciplinary themes such as technology integration, ethics, and sustainability, suggesting a need for more holistic models.

The absence of keywords like "cyber fraud" and "whistleblowing" further highlights gaps in both theoretical diversity and practical application. These findings underscore the opportunity to expand fraud theory beyond conventional frameworks and build more dynamic, contextual, and data-integrated models in future research. Overall, the co-occurrence analysis not only suggests a strong foundation in traditional fraud theory but also highlights conceptual silos, limited technological integration, and thematic underdevelopment that future research can strategically address.

5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

Based on the discussion and analysis above, it is evident that research on fraud theory in Indonesia, particularly within SINTA 2, has served as a significant reference for numerous other studies. Since 2016, research on this topic has been cited over 1,500 times. This underscores the critical importance of such studies, which necessitate consistent and reliable results. However, inconsistencies still persist among research findings. Most studies manage to identify only 2 or 3 significant factors contributing to financial fraud. In addition, pressure is the most frequently occurring fraud factor, followed by opportunity, indicating a tendency to rely on conventional variables while ignoring emergent or context-specific factors.

The co-authorship and keyword co-occurrence analysis also reveal structural gaps in collaboration and thematic focus. Research remains clustered around a few dominant authors and tends to focus on isolated models, rarely integrating multidisciplinary insights or adopting emerging technologies like machine learning for fraud detection. Proxies for dependent and independent variables—especially x-scores—show inconsistency and conceptual limitations, which may explain the variance in findings across studies.

Theoretically, this study encourages the re-

evaluation of fraud models in light of Indonesia's unique corporate governance, cultural, and regulatory landscape. Practically, it urges researchers and institutions to adopt newer analytical tools, diversify industry samples (e.g., banking, mining, property, aviation), and expand beyond conventional proxies to ensure robust fraud detection frameworks.

Future research should integrate more qualitative or mixed-method approaches, especially to explore factors like ethical values, religiosity, and organizational culture—terms that appear in the keyword map but lack strong connections to core fraud theory. Technological advancements such as machine learning, big data analytics, and NLP tools like Jupyter Notebook and Bibliometrix also offer vast potential to improve research depth and validity.

This study is not without limitations. First, it only includes articles indexed in Scopus and SINTA 2, possibly omitting relevant insights from other databases. Second, the metadata extracted from local journals is often unstructured and lacks DOIs or citation networks, which limits the application of automated bibliometric tools. As a result, some visual analyses and interpretations are conducted manually, which may introduce subjective bias. Nevertheless, this study provides a valuable foundation for advancing fraud theory studies in Indonesia and serves as a roadmap for future investigations that aim to be more dynamic, data-driven, and interdisciplinary.

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