

Bibliometric Analysis and Visualization: Fraud Accounting Research

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ABSTRACT

This study systematically examines the intellectual structure of accounting fraud research, identifying key trends, gaps, and opportunities to guide future scholarly and practical efforts in fraud detection and prevention. Using bibliometric analysis, we evaluate 193 Scopus-indexed articles (1993–2024) with R-Studio, VOSviewer, and Excel to map influential authors, keyword networks, citation trends, and collaboration patterns. The field gained momentum post-2016, with the United States dominating research output. However, studies remain siloed, most focus on fraud detection rather than prevention, and minimal cross-author collaboration exists. Keyword analysis reveals evolving themes, yet few explore accounting techniques as proactive fraud deterrents. The study relies on Scopus data, potentially excluding relevant non-indexed works. Additionally, bibliometric analysis emphasizes trends over in-depth theoretical critique. Practitioners gain a consolidated view of fraud research, while researchers can leverage identified gaps, particularly in prevention strategies to design impactful studies. Policymakers may use findings to encourage interdisciplinary collaboration. This is among the first bibliometric reviews to systematically assess accounting fraud literature, offering a visual and analytical roadmap for future innovation in fraud prevention. By highlighting understudied areas, it challenges researchers to move beyond detection toward actionable solutions.

Keywords: Content Analysis, Bibliometrics, VOSviewer, Fraud, Accounting

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1. INTRODUCTION

Anti-fraud strategies in accounting research are critically important to understanding and urgency of fraudulent acts (Alfian et al., 2018). In an era of rapid globalization and digitalization, fraudulent practices in the business sector have become a significant challenge, harming individuals, organizations, and economies (Alderman, 2019; Eaton & Korach, 2016; Hamdan et al., 2017) this research explores the personality, psychology, and sociology of white-collar crime. While there has been much focus on various techniques (internal controls, prevention software, employee monitoring systems, etc..) According to the Association of Certified Fraud Examiners (ACFE), companies lose over 5% of annual revenue to fraud, with an average detection time of 12 months, highlighting the need for more effective and efficient anti-fraud strategies (Nurhajati et al., 2023). Forensic accounting, which merges accounting, investigation, and law, plays a pivotal role in detecting, preventing, and mitigating fraud (Brickner et al., 2010). Emerging technologies like big data analytics further empower professionals to identify suspicious patterns (Odia & Akpata, 2020).

However, while prior studies have explored fraud dynamics, few have systematically mapped the evolution of accounting fraud research using advanced bibliometric tools. Most reviews remain qualitative or focus on narrow subtopics, leaving gaps in understanding broader trends, authorship networks, and thematic shifts. For instance Alfian et al. (2018) and Nurhajati et al. (2023) emphasize anti-fraud frameworks but overlook macro-level patterns in publication growth, cross-country collaboration, or keyword co-occurrence. A bibliometric approach, leveraging tools like VOSviewer and R-Studio can reveal these hidden insights, offering a data-driven lens to identify underexplored areas and spur interdisciplinary research.

This gap is particularly pressing given the accelerating complexity of fraud schemes. Traditional literature reviews

struggle to capture the rapid dispersion of knowledge across journals, disciplines, and regions. By quantifying influences and visualizing conceptual clusters, bibliometrics can bridge the divide between theoretical research and practical anti-fraud innovations. Such analysis is absent in current discourse, despite its potential to guide funding priorities, policy interventions, and collaborative projects, ultimately addressing the ACFE's call for faster, more impactful fraud mitigation.

Forensic accounting, as a discipline that combines accounting, investigation and law, plays a crucial role in detecting, preventing and overcoming fraudulent practices (Brickner et al., 2010). By using the latest technology, including big data and big data analytics, accounting professionals can improve their ability to identify suspicious patterns and anomalies (Odia & Akpata, 2020).

This article can provide new contributions compared to previous studies such as Shahana et al. (2023), which focuses on the characteristics of financial statement fraud and supervised techniques are abundantly used to detect a phony financial statement through a systematic literature review method. Gupta & Mehta (2021) such as credit card frauds, loan and security frauds, corporate frauds, bank and insurance frauds, etc. Classification of data mining techniques, in recent years, has been accepted as one of the most credible methodologies for the detection of symptoms of financial statement frauds through scanning the published financial statements of companies. The retrieved literature that has used data mining classification techniques can be broadly categorized on the basis of the type of technique applied, as statistical techniques and machine learning techniques. The biggest challenge in executing the classification process using data mining techniques lies in collecting the data sample of fraudulent companies and mapping the sample of fraudulent companies against non-fraudulent companies. In this article, a systematic literature review (SLR, which

presents a narrative literature review on fraud and formulates recommendations for practitioners and regulators using data mining methods from financial statement fraud detection. Lokanan (2015) fraud is increasing with frequency and severity. In this paper, I explore the assertion of the fraud triangle as a useful practitioner framework employed to combat fraud. This paper is anchored through Fairclough's critical discourse theory, and is supported with evidence from three accounting fraud cases. The findings indicate that the Association of Certified Fraud Examiner's (ACFE, criticizes the Fraud Triangle theory in terms of its usefulness in practice. Lindez-Macarro et al. (2025) presents a bibliometric study but more on mapping general citations in the fraud literature in general. This article is different from the one that focuses specifically on the accounting domain, and includes a collaborative network analysis and identification of research gaps that can shape future research agendas. adopting a more quantitative and visual bibliometric approach to review content themes but also analyzing author networks, affiliations, countries, and keyword trends, which previous studies have not done by taking a neutral position and presenting the Fraud Triangle as part of one of the topical clusters (Corporate Governance), while suggesting further exploration of other theoretical models and the role of ethics and organizational culture in fraud detection.

Analysis of research literature regarding fraud in accounting is very important to understand the latest developments and challenges faced in this field (Mande & Anggraeni, 2022). With the increasing complexity and volume of data generated by organizations, as well as the evolution of increasingly sophisticated fraud methods, a deep understanding of the existing literature can provide valuable insights for practitioners and researchers. Literature research not only helps identify best practices and the latest technologies, such as big data and analytics, but also

reveals gaps in existing research, which can form the basis for further research. Additionally, by analyzing the different approaches that have been applied in various contexts, professionals can develop more effective and adaptive strategies for detecting and preventing fraud. Thus, the discussion of this literature study is not only relevant to improving forensic accounting practices, but also to protecting the financial integrity of organizations and supporting overall economic stability. So that it attracts the attention of researchers to research further by conducting literature research which leads to the following questions:

- Q1: Has research on fraud in the accounting domain increased over time?
- Q2: In which areas is research on fraud in accounting concentrated?
- Q3: In which countries is fraud research in the accounting domain concentrated?

This research reviews the literature on fraud in the accounting domain and uses various software, such as VOS viewer, R studio and excel, to build and describe bibliometric networks. Bibliometric reviews are essential because they can evaluate the impact of research, discover research trends, and assess overall research performance. The aim of this review is to explore previously published research as well as identify areas that remain unexplored and goals for future research. Bibliometric reviews can also track the progress and impact of research and evaluate collaborations and knowledge networks.

To address these challenges, this study offers a novel bibliometric perspective that not only maps the progress of accounting fraud research over three decades but also identifies emerging themes, research gaps, and collaboration patterns that have been overlooked in prior studies.

The structure of this research consists of section 2 outlining the literature review. Section 3 discusses the methodology and data collection process. Section 4 presents

the research results, which cover various themes such as influential authors and journals, keyword and theme analysis, significant citations, and network analysis and explores the content analysis and research agenda of the most cited articles. Finally, Section 5 concludes the study.

2. LITERATURE REVIEW AND HYPOTHESIS

Fraud

Fraud, in the context of business and finance, refers to fraudulent acts carried out intentionally to obtain illegitimate benefits, often to the detriment of another party (Wang et al., 2021). According to classical theory, fraud occurs when there is motivation, opportunity and rationalization, a concept known as the 'Fraud Triangle' introduced by Donald Cressey (Inácio & Santos, 2023). Motivation is often related to economic pressures or personal drives, whereas opportunities arise when there are weaknesses in internal control systems or weak oversight. Rationalization is a psychological process in which perpetrators justify their actions as legitimate or necessary. In addition, contemporary theories also emphasize the role of organizational culture, ethics, and risk management in fraud prevention and detection. Fraud can have significant impacts, including financial loss, reputational damage, and reduced public trust. Therefore, an in-depth understanding of the mechanisms and factors that influence fraud is very important in designing effective prevention and control strategies.

Fraud can have a detrimental impact, both directly and indirectly (Mohanty et al., 2019). Fraud can cause significant financial losses for organizations or individuals (Tutino & Merlo, 2019). This may involve loss of money, assets, or other resources. Organizations involved in fraud often experience reputational damage that impacts the trust of customers, business partners and the public. A bad reputation can affect business relationships and impact long-term performance. Fraud cases can reduce public trust in certain

institutions or sectors, which can result in decreased support and cooperation.

Fraud in Accounting Area

Fraud and accounting have a very close relationship because accounting often functions as a control and reporting system that can detect or prevent fraud. One of the main roles of accounting is implementing and managing an internal control system. This system is designed to prevent and detect fraud by ensuring that all transactions are recorded correctly, authorization is required for certain transactions, and there is a clear separation of duties. For example, the accountant must check that payments are made only after appropriate approvals and verification of documents. Accounting produces financial reports that provide an overview of the financial condition of an entity. Discrepancies or irregularities in financial reports can be an indicator of fraud. For example, discrepancies between the profit and loss statement and the balance sheet or unusual fluctuations in financial figures could indicate manipulation. Internal accountants and external auditors examine records and transactions to ensure accuracy and compliance with accounting policies and standards. This audit process often includes testing to detect possible fraud, such as asset attachment or document falsification.

Fraud in accounting practices such as embezzlement, this is a type of fraud where an accountant or employee who has access to company funds or assets abuses his authority to take money illegally. For example, an accountant who manipulates cash records to withdraw money from a company account. Financial statement falsification fraud involves manipulating or falsifying financial statements to misrepresent a company's financial health. This may involve inflating income, reducing expenses, or hiding debts to attract investors or obtain loans. Fraud in the procurement and payment process can occur if accountants or other employees create fictitious transactions or award

contracts to vendors they are personally associated with. This could result in unauthorized payments and financial loss for the company.

3. METHODS

The quantitative findings of this study on accounting fraud literature were derived using bibliometric methods. Currently, researchers are increasingly combining bibliometric analysis with content analysis (Koskinen et al., 2008). Bibliometric reviews are often integrated with descriptive, integrative, systematic, or meta-analytic reviews to highlight the quantitative aspects of the literature, enhancing validity and reliability (Raan, 2019). However, due to its advantages, bibliometric analysis represents a novel approach with diverse applications. Moreover, this method distinguishes itself from other verification techniques by examining significant, detailed characteristics of observed phenomena.

The three-step methodological framework applied in this study was adapted from Ismail & Aisyah (2022) original design. In the first stage, relevant publication databases were systematically searched to gather meta-literature. The second stage involved screening the selected database to identify pertinent literature. Finally, the third stage consisted of conducting a bibliometric analysis on the extracted data and drawing meaningful conclusions.

The bibliographic data for this study were extracted from the Scopus database, a prominent multidisciplinary repository owned by Elsevier. Scopus has been widely utilized in prior research (Kumar et al., 2022; Md Husin et al., 2024), and its selection for this study was

based on several key advantages. First, Scopus is the largest curated abstract and citation database of peer-reviewed literature, encompassing a broad range of disciplines. Second, it is recognized as the most authoritative source for finance-related publications. While Web of Science provides limited coverage of accounting fraud literature, and Google Scholar lacks rigorous quality control despite its extensive document collection, Scopus offers both comprehensive coverage and reliable scholarly content.

4. RESULTS AND DISCUSSION

This study confines its analytical scope to publications spanning from 1993 to 2024. As documented in Table 1, the dataset was finalized on July 23, 2024. The search yielded 193 relevant publications, contributed by 632 unique authors across 133 academic sources. Bibliometric indicators reveal a consistent upward trend in scholarly output, with an annual growth rate of 7.32%. The field of accounting fraud investigation has engaged 479 distinct researchers based on the collected literature.

The findings reveal a marked surge in accounting fraud publications post-2016. As depicted in Figure 1, annual output remained consistently low between 1993 and 2015, typically producing fewer than eight studies per year. However, the period from 2016 to 2024 witnessed a dramatic escalation in research output. This upward trend can be attributed to multiple factors, particularly the increasing scholarly interest in accounting fraud and the proliferation of real-world fraud incidents. Researchers have demonstrated growing engagement with this subject, reflected in the expanding body of literature

Table 1. Data Selection

Query Wording	Scopus search	Final only English
("Fraud" OR "Fraud Detection" OR "fraud prevention" AND Accounting) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English"))	287	193

Source: Processed Data

examining fraud dynamics and detection methodologies within accounting practice.

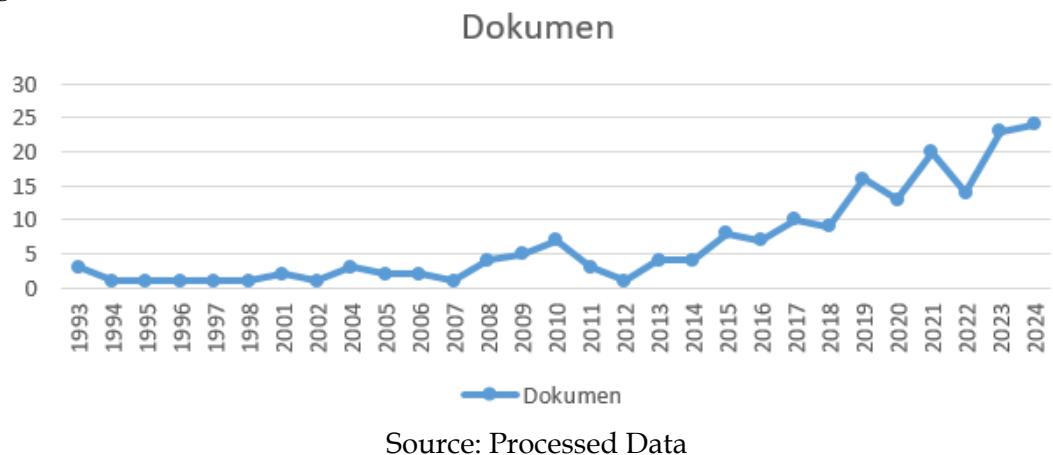
Most influential authors, affiliations and countries

Figure 2 presents the publication distribution among contributing authors. The data reveals Papoola, Samsudin, Rahman, and Rezaee as the most prolific contributors, each having authored three studies in this research domain. Several other scholars-including Akinbowale, Alharasis, Cao, Che Ahmad, Drabkova, and Haddad - have each produced two publications within the field.

Figure 3 illustrates the yearly publication patterns of contributing authors. The data highlights Papoola, Rezaee, and Samsudin as the most active contributors in this field. Rezaee's publications span from 1997 to 2009, while Papoola's research activity occurred between 2015 and 2020, followed by Samsudin's contributions from 2015 to 2021.

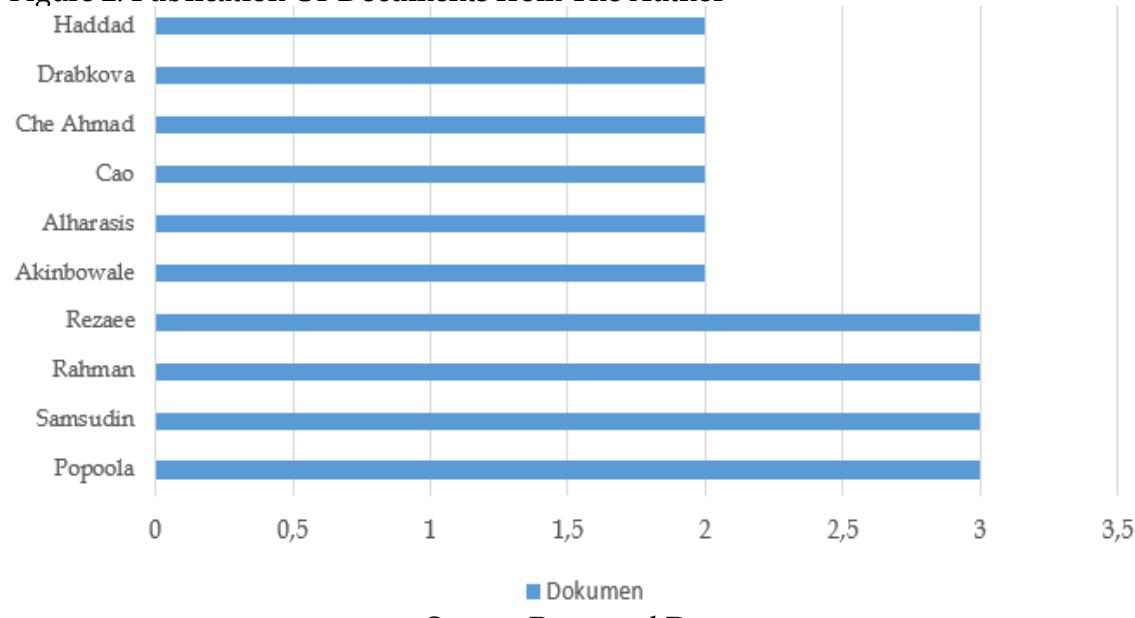
Figure 4 displays the institutional affiliations of contributing authors. The data reveals Universiti Utara Malaysia and University of Debrecen as the most productive institutions, each contributing six publications. Valahia University of

Figure 1. Annual Document Publications



Source: Processed Data

Figure 2. Publication Of Documents from The Author

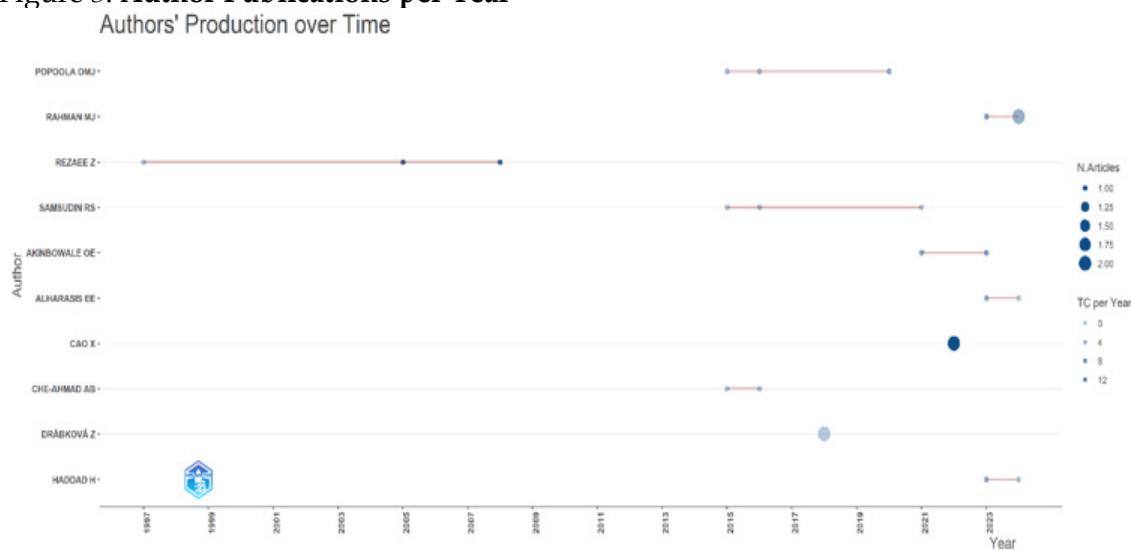


Source: Processed Data

Targoviste and Islamic University of Bandung follow closely with five articles each. Several other universities have made significant contributions, including Bielefeld University, Brawijaya University of Malang, Comenius University, Chana Communication Technology University, Multimedia University, and Qatar University, all with four publications apiece.

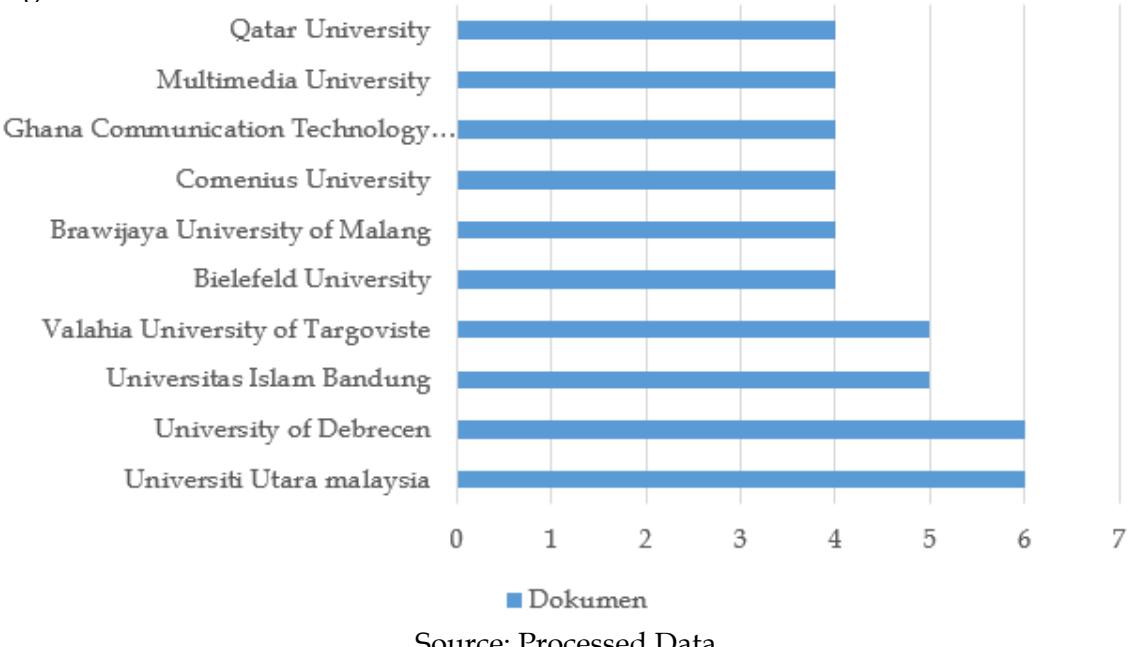
The citation analysis reveals a dominant contribution from the United States, which accounts for the majority of referenced publications. With over 940 citations, US-based research substantially surpasses that of other countries. As illustrated in Figure 5, the United States, China, and the United Kingdom emerge as the three most frequently cited nations in this research domain.

Figure 3. Author Publications per Year

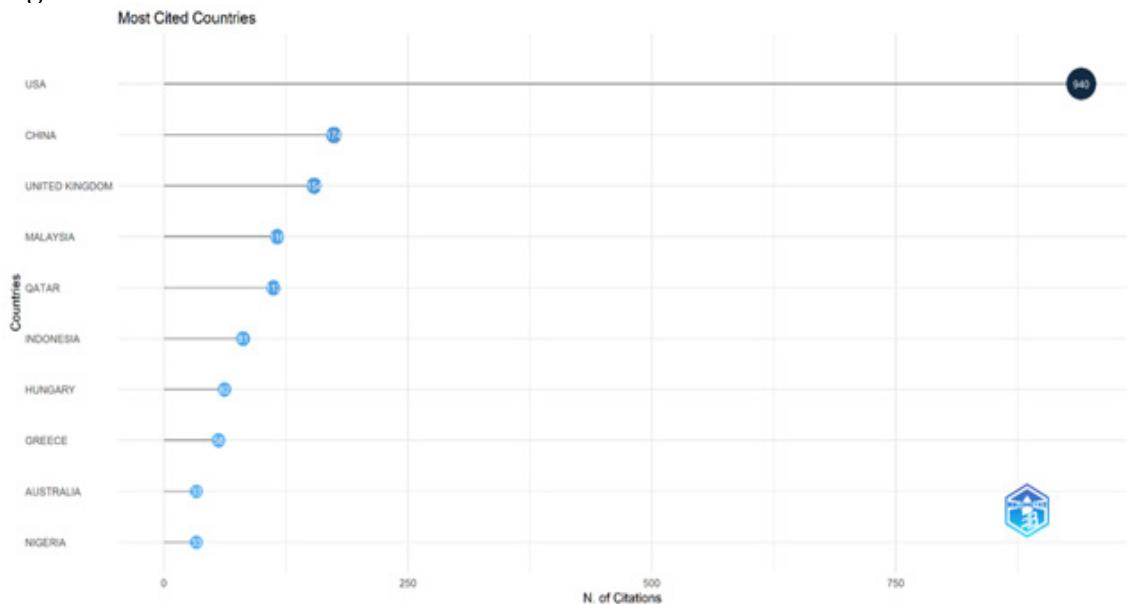


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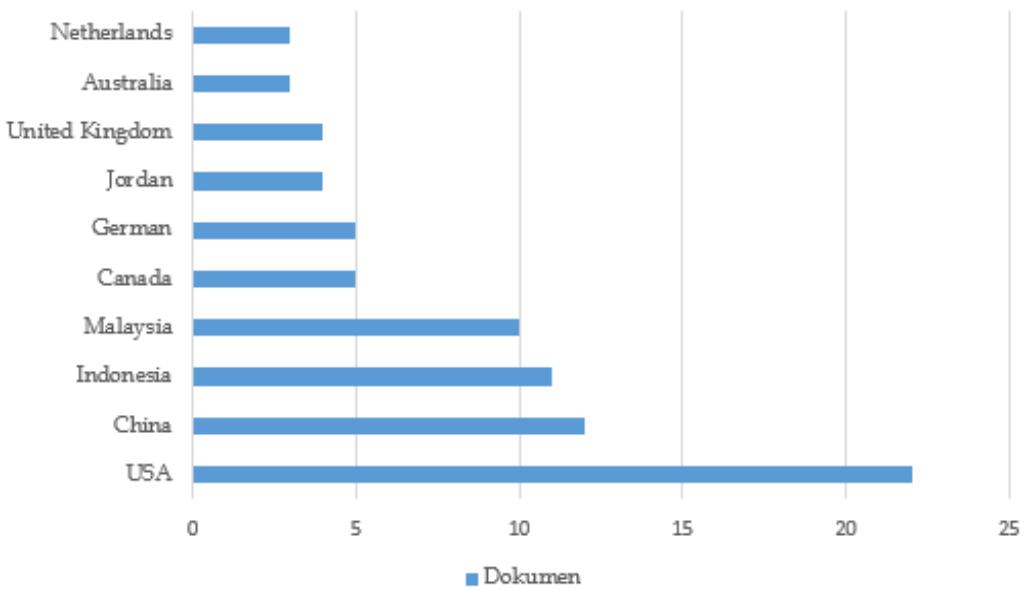
Figure 4. Publication of Documents from



Source: Processed Data

Figure 5. Publication of State Document Citations

Source: Processed Data

Figure 6. Publication of State Documents

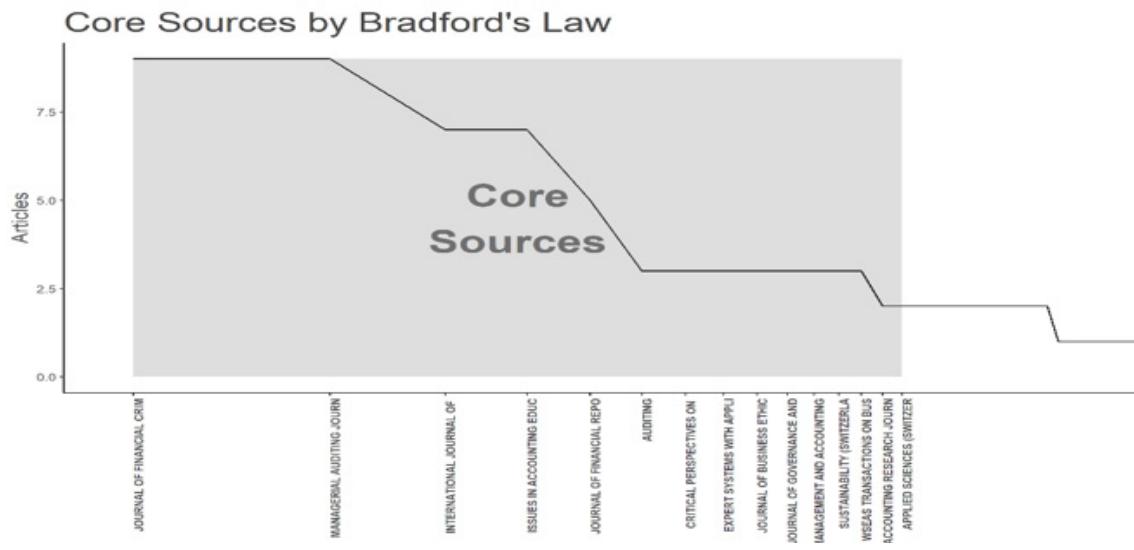
Source: Processed Data

The geographical distribution of research contributions reveals the United States as the predominant source, accounting for 22 publications. This is followed by China, Indonesia, Malaysia, Canada, Germany, Jordan, the United Kingdom, Australia, and the Netherlands in descending order. As evidenced in Figure 6, scholarly investigation of accounting fraud appears to be a global phenomenon, with participation from

both developed and emerging economies.

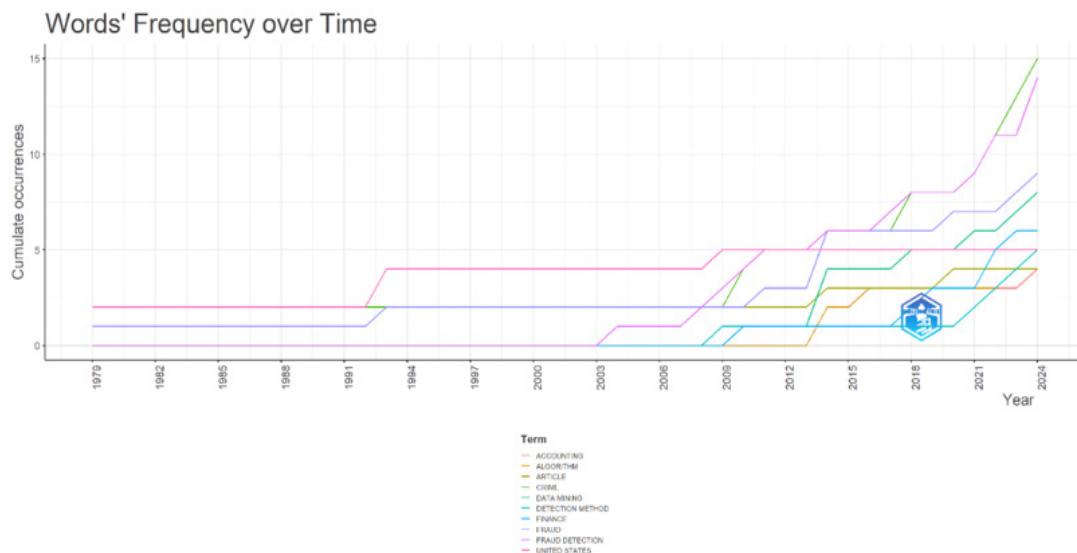
Figure 7 presents the distribution of published articles on accounting fraud across various journals. Bradford's Law of Scattering predicts an exponential decrease in journal productivity for this subject area. The law's principle suggests that when journals are categorized into three groups of equal article output (approximately one-third each), their distribution follows a proportional pattern of 1:n:n2. As depicted

Figure 7. Bradford's Law



Source: Processed Data

Figure 8. Keyword Growth



Source: Processed Data

in Figure 7, the Journal of Financial Crime emerges as the most prominent publication source, followed by other significant journals in the field.

Figure 8 presents a longitudinal analysis of keyword trends in accounting fraud research. The data reveals a period of stagnation from 1979 to 2003, with minimal growth in conceptual terminology. However, a notable shift occurred post-2003, marked by gradual expansion that accelerated significantly after 2015, indicating heightened scholarly attention

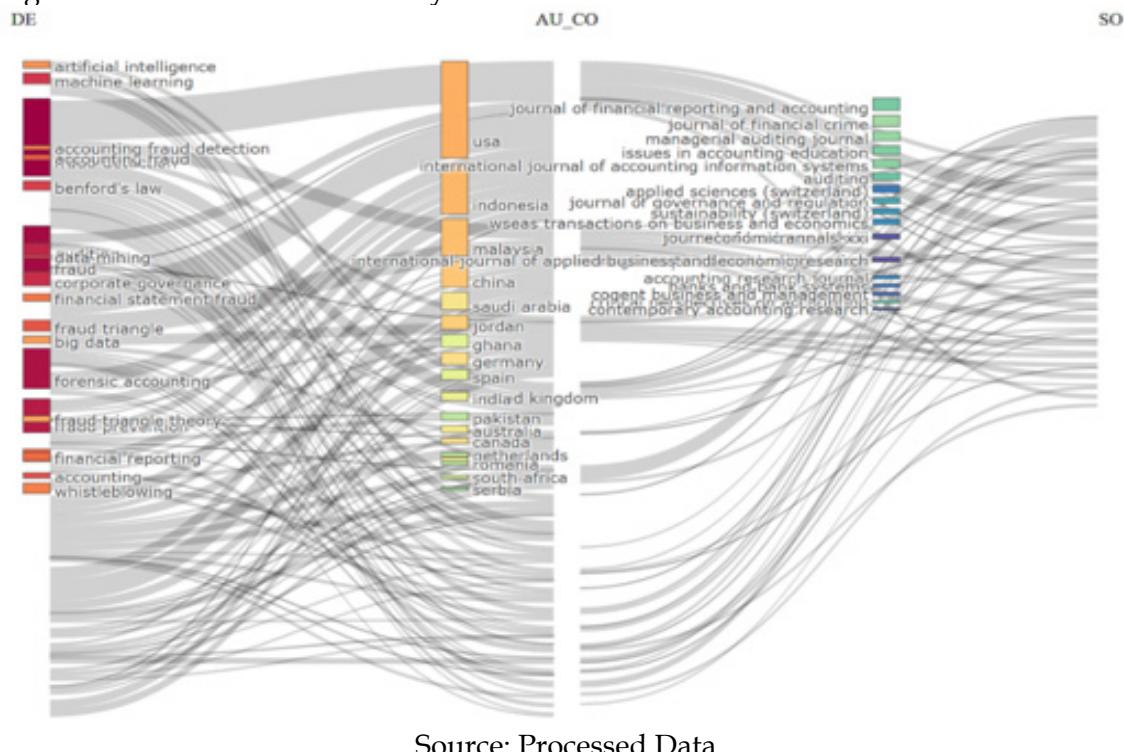
to this research domain.

Figure 9. World Cloud



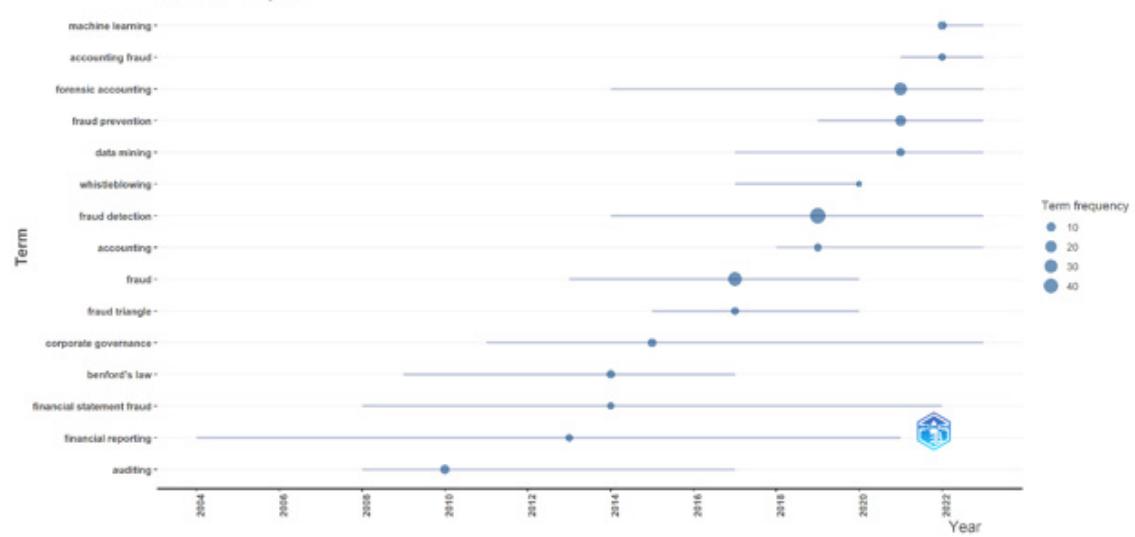
Source: Processed Data

Figure 10. Three-fields Plot Analysis



Source: Processed Data

Figure 11. Trend Topics



Source: Processed Data

Keyword Analysis and Thematic Analysis

The keyword co-occurrence analysis presented in Figure 9 reveals “*fraud detection*” and “*crime*” as the predominant thematic elements in this research domain. Secondary terms of significance include *risk management*, *data mining*, *financial fraud*, *detection method*, and *machine learning systems*, indicating the multidisciplinary

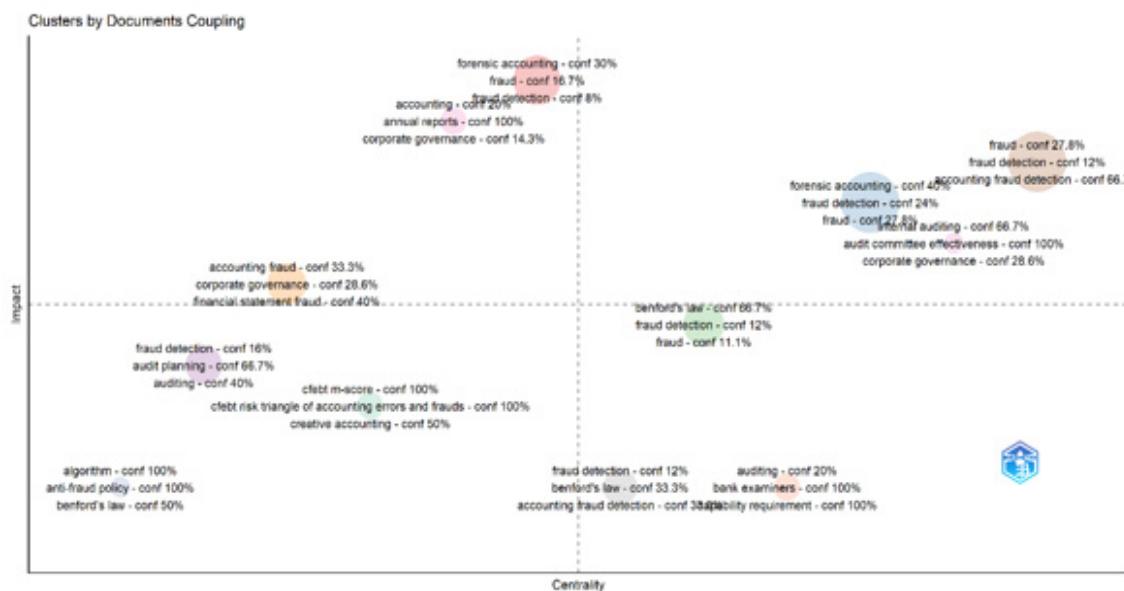
nature of contemporary accounting fraud research.

Figure 10 presents a three-field plot visualization of publication trends and geographic contributions. The analysis reveals the United States, Indonesia, and Malaysia as the most productive nations in this research domain, followed by China and Saudi Arabia. At the institutional level,

two journals emerge as dominant outlets: the Journal of Financial Reporting and Accounting and the Journal of Financial Crime collectively represent the core scholarly discourse in this field.

Figure 11, the research topic trends include machine learning, accounting fraud, forensic accounting, fraud preventions, data mining, fraud detection, corporate governance, financial statement fraud, and financial reporting.

Figure 12. Thematic Map



Source: Processed Data

Table 2. Author Impact

Author	h_index	g_index	m_index	T.C	N.P	PY_start
Popoola Omj	3	3	0.300	28	3	2015
Rezaee Z	3	3	0.107	496	3	1997
Akinbowale Oe	2	2	0.500	24	2	2021
Cao	2	2	0.667	47	2	2022
Che-Ahmad Ab	2	2	0.200	13	2	2015
Han D	2	2	0.250	12	2	2017
Law P	2	2	0.143	58	2	2011
Mate D	2	2	0.250	62	2	2017
Nigrini Mj	2	2	0.125	61	2	2009
Papík M	2	2	0.400	24	2	2020

Source: Processed Data

Figure 12, it can be seen that the initial focus of researchers is mostly on fraud, fraud detection, accounting fraud detection, forensic accounting, fraud detection, internal auditing, audit committee effectiveness, and corporate governance. Potential themes are more focused on forensic accounting, fraud, fraud detection, accounting, annual report, corporate governance, accounting fraud, corporate governance, and financial statement fraud.

Citation analysis

A citation analysis of influential works reveals key intellectual contributions to accounting fraud literature, as presented in Appendix 1. The analysis identifies three seminal studies that have shaped the field, Rezaee (2005) stands as the most cited work (259 citations), offering a comprehensive examination of corporate governance mechanisms, including board oversight, audit committees, and internal/external audit functions, in mitigating financial statement fraud risks. Hogan et al. (2008) (211 citations) synthesized critical research findings to support PCAOB initiatives, delivering actionable insights for auditing professionals, regulators, and scholars. Wang (2018) (151 citations) introduced an innovative blockchain framework for real-time accounting verification, incorporating advanced cryptographic techniques (zero-knowledge proofs and homomorphic encryption) to enhance transaction security. Additional notable contributions include; Trompeter (2013): 147 citations (audit quality research), Dong (2018): 137 citations (earnings manipulation analysis), Purda (2015): 135 citations (early fraud detection systems). This citation network

demonstrates the field's progression from foundational governance studies to technological innovations in fraud detection, reflecting the evolving nature of accounting research in response to emerging financial challenges.

Table 2 shows the most influential authors by h-index. Popoola is at the top of the list with the highest h-index of 3, followed by Rezaee with 3 h-index. Other authors, such as Akinbowale, Cao, Che-Ahmad, Han, Law, Mate, Nigrini, Papik, have 2 h-index.

Table 3 illustrates the journal's impact. The Journal of Financial Crime has a 5 h-index, the Managerial Auditing Journal has an 8 h-index, the International Journal of Accounting Information Systems has a 6 h-index, and there are several journals with indices below 5.

NETWORK ANALYSIS

Co-authoring

Co-authorship is a sign of collaborative writing between authors (Figure 13). Conversely, illustrates co-authorship between nations. The literature is dominated by the USA (Figure 14). These results shed light on the intellectual

Table 3. Source Impact

Source	h_index	g_index	m_index	T.C	N.P	PY_start
Managerial Auditing Journal	8	9	0.276	270	9	1996
International Journal of Accounting Information Systems	6	7	0.353	376	7	2008
Journal Of Financial Crime	5	9	0.625	100	9	2017
Issues In Accounting Education	4	6	0.250	38	7	2009
Auditing	3	3	0.176	403	3	2008
Critical Perspectives on Accounting	3	3	0.130	367	3	2002
Expert Systems With Applications	3	3	0.188	99	3	2009
Journal Of Business Ethics	3	3	0.500	47	3	2019
Accounting Research Journal	2	2	0.200	35	2	2015
Contemporary Accounting Research	2	2	0.065	148	2	1994

Source: Processed Data

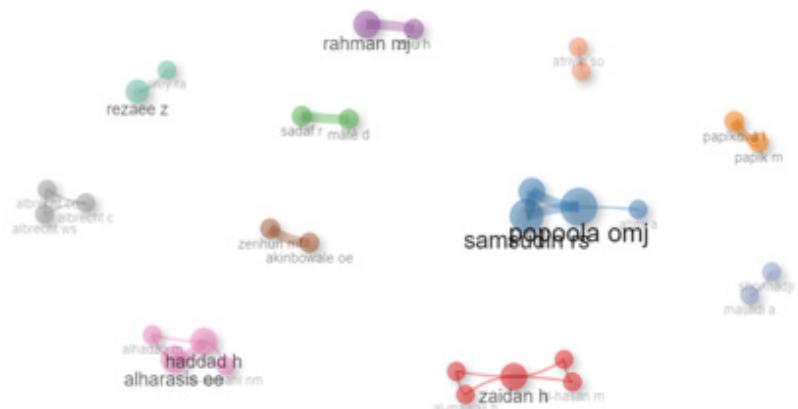
framework of the subject, but they may also encourage researchers studying accounting fraud to work together on new studies.

Bibliographic coupling

Based on Figure 14, Article Mukhtar & Butt (2012) the global trade is changing the way we perceive the origin of products and brands and their permissibility under Islamic Sharia laws. This apparently has serious implications for international companies operating in food, cosmetics and pharmaceutical products. The purpose of this paper is to investigate the role of Muslim attitude towards Halal products, their subjective norms and religiosity in predicting intention to choose Halal products. Design/

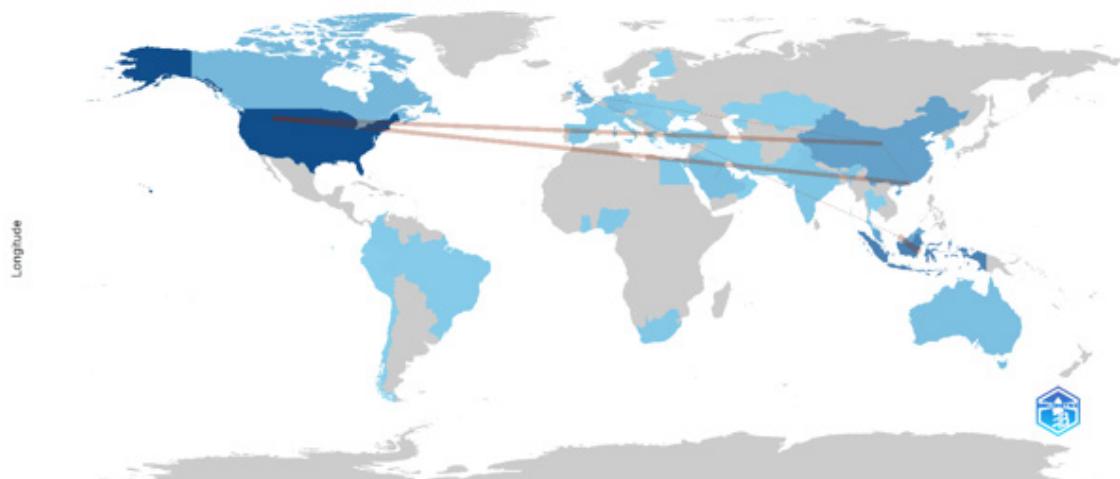
methodology/approach: A structured question was designed to elicit consumer attitude, subjective norms, intention to choose Halal products and degree of inter and intra personal religiosity. Data were collected from 180 adult respondents using a convenience sampling method. Only 150 responses were deemed suitable for further analysis, yielding a response rate of 83 per cent. Stepwise regression analysis was used to test the proposed model. Findings: The results indicated that theory of reasoned action (TRA) found to be the most cited document. In addition, articles written by Saeed et al. (2001) embedded in a strong ethical doctrine, can play a vital role in raising the standards of business conduct worldwide, while in no way compromising

Figure 13. Co-authorship



Source: Processed Data

Figure 14. Collaboration World Map

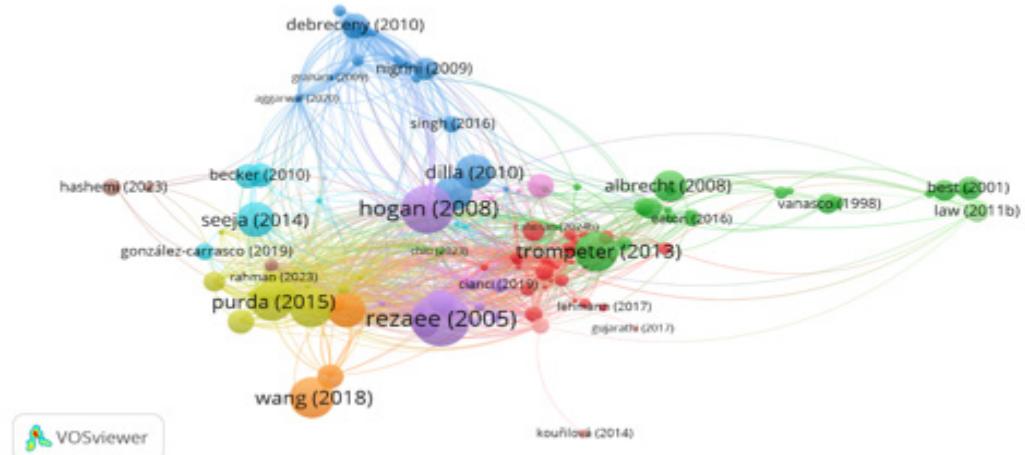


Source: Processed Data

the quality of services or products offered to customers, or surrendering the profit margins of businesses. Adherence to such ethical practices can help to elevate the standards of behavior and thus of living, of traders and consumers alike. Against this background, this paper endeavors to identify the salient features of the Islamic framework of International Marketing Ethics. In particular, it highlights the capabilities and strengths of this

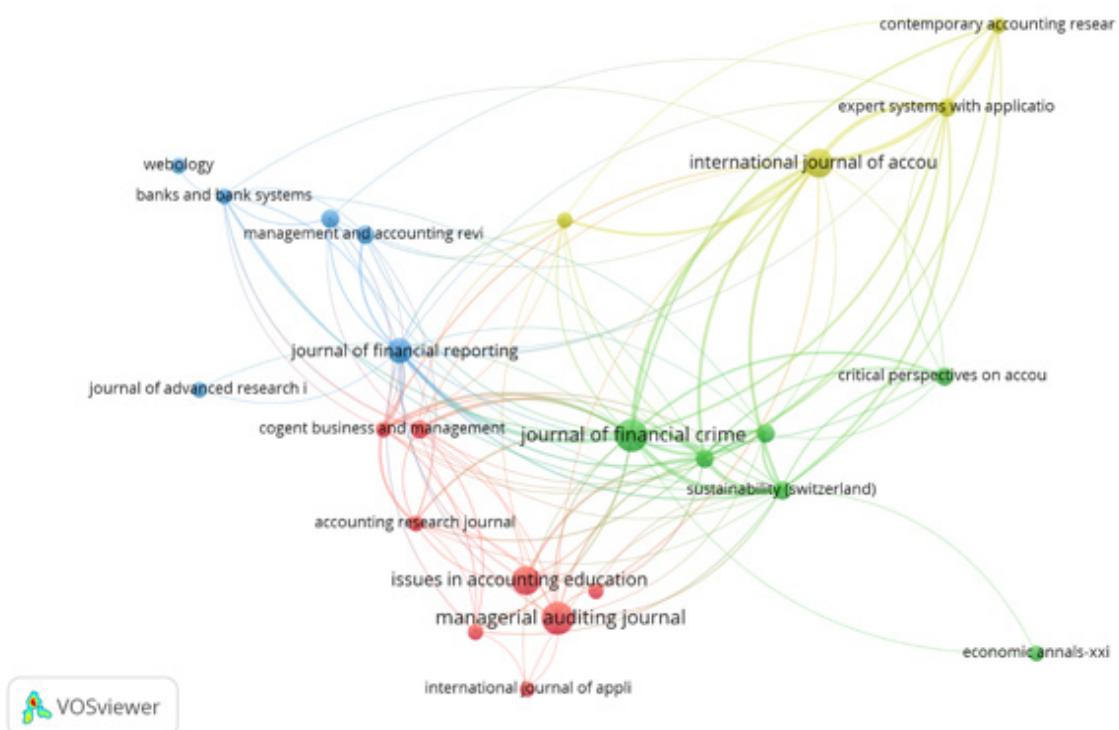
framework in creating and sustaining a strong ethical international marketing culture. At the heart of Islamic marketing is the principle of value-maximization based on equity and justice (constituting just dealing and fair play, Awan et al. (2015); Rahman et al. (2015) the existing literature focusses on Halal food products, and only a limited number of studies exist about Halal cosmetic products. This study assesses the effects of knowledge

Figure 15. Bibliographic Coupling of the Documents



Source: Processed Data

Figure 16. Bibliographic Coupling by Sources



Source: Processed Data

and religiosity on attitudes towards Halal cosmetics products, as well as the effect of those attitudes on the intention to buy the Halal cosmetic products. This study also investigates the existence of

differences between consumers' attitudes towards Halal cosmetics and Halal food products. Design/methodology/approach-This study used a self-administrated questionnaire with closed-

Figure 17. Bibliographic Coupling by Sources (Yearly)

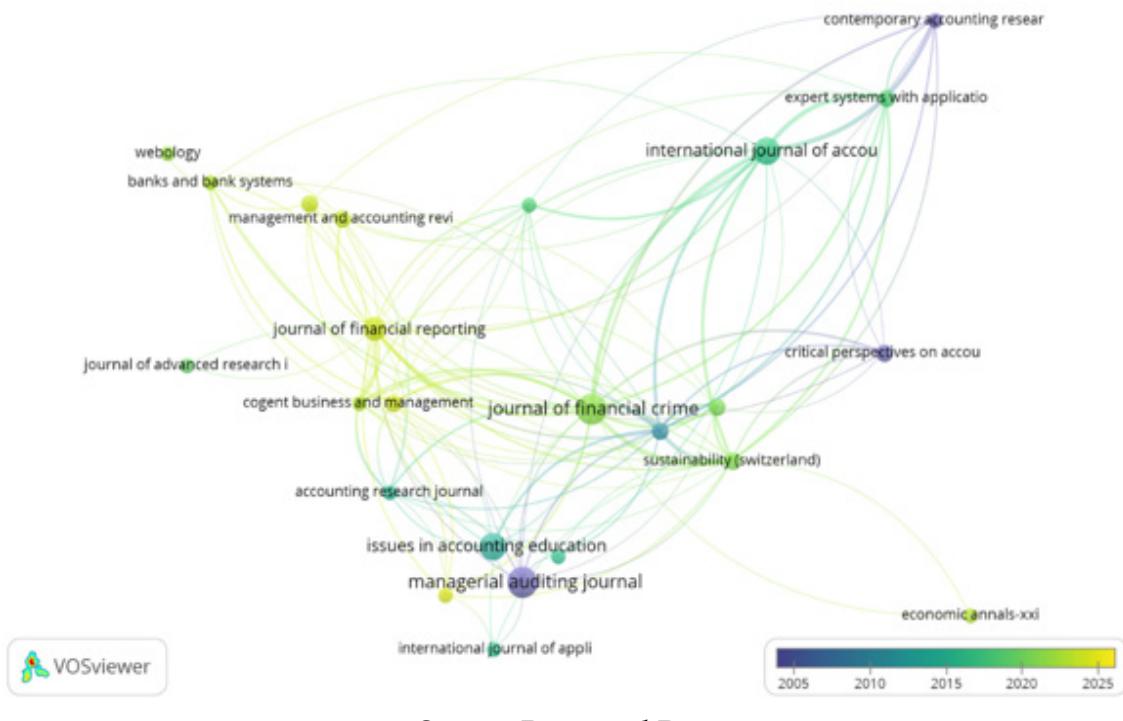
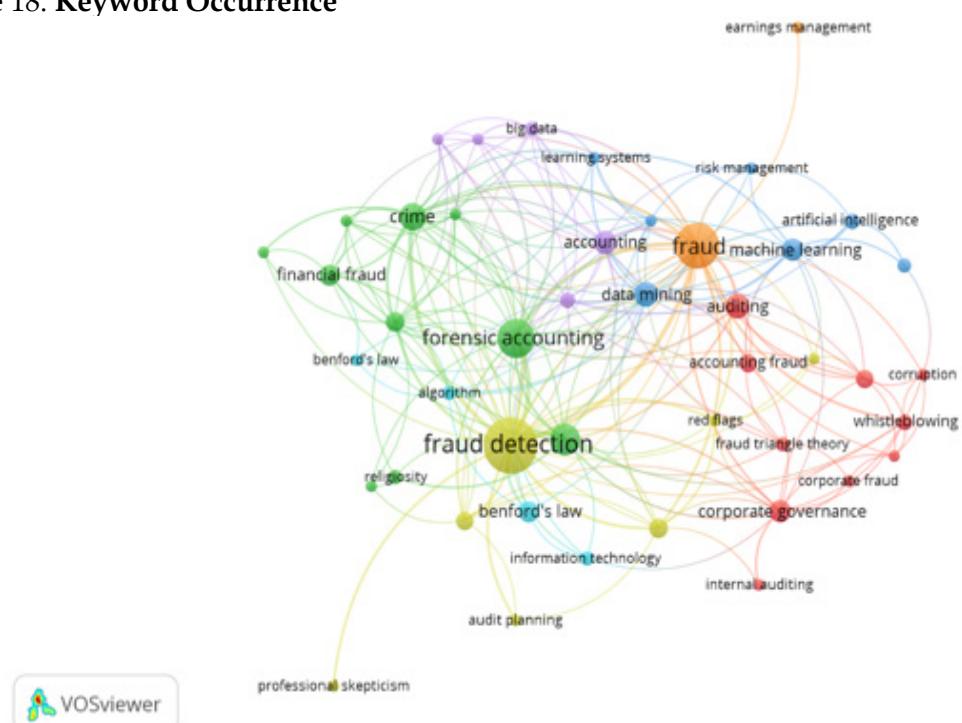


Figure 18. Keyword Occurrence



Source: Processed Data

ended questions. The questionnaire was distributed using non-probability convenience sampling. At the end of data collection period, a total of 110 usable questionnaires from Muslim respondents over the age of 18 years old were used for further analysis. To assess the relationship between knowledge, religiosity, attitude and intention, a structural equation modeling technique was used. And to investigate the difference between attitude and intention for Halal cosmetic and Halal food products, the pair sample t-test were applied. Findings-The findings of the study show that the relationship between knowledge and attitude is insignificant, but there is a significant positive relationship between religiosity and attitude. From the lens of theory of reasoned action (TRA, El-Bassiouny (2014) also documented in the bibliographic clutch.

This research limits the references cited to obtain maximum clusters from the data. A total of 7 clusters. Based on Figure 15, it can be seen that the Journal of Fraud in accounting has a strong relationship with other journals. The annual comparison

results for bibliometric coupling by source are depicted in Figure 16. It can be seen that various journals have published articles related to Fraud in accounting, including the Journal of Fraud in accounting.

Cartographic analysis.

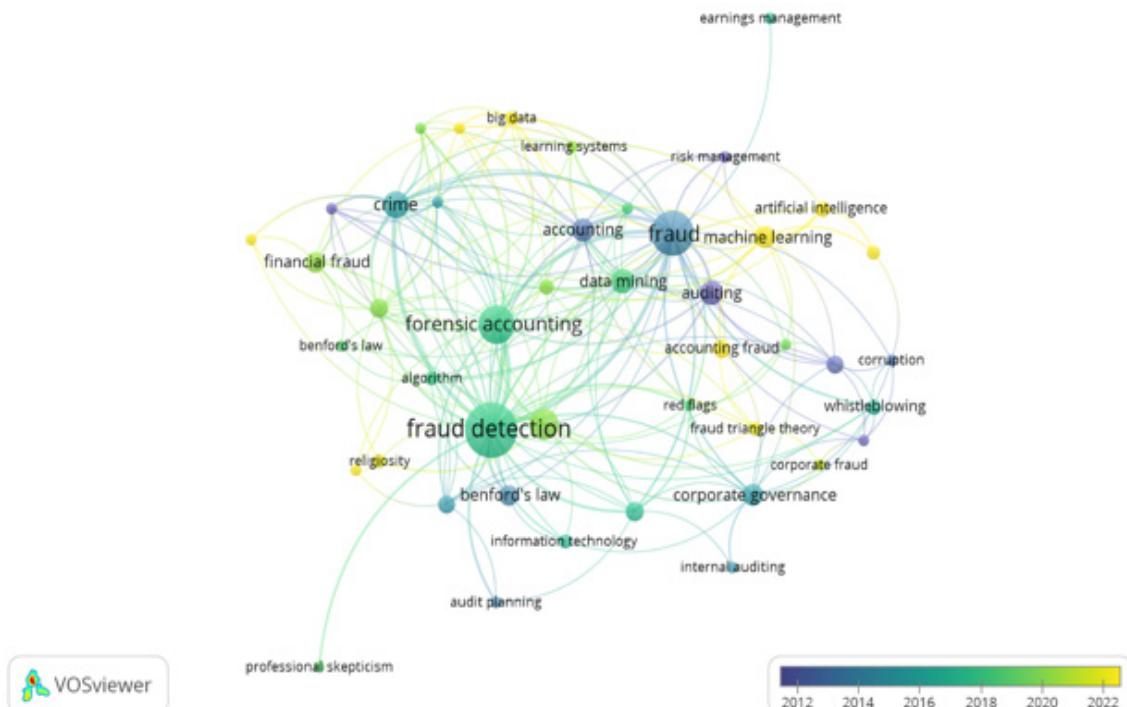
A cartographic mapping analysis was conducted to identify high-frequency keywords across research streams using co-word analysis, with a minimum occurrence threshold of 3 keywords. The results formed 7 distinct clusters (Figure 18), comprising 34 fraud-related terms in accounting research.

Content analysis and future research agenda

Content analysis

The main focus points covered in this research are divided into five clusters, namely 1) Fraud and information technology; 2) Forensic accounting; 3) Corporate governance; 4) Risk assessment; 5) Fraud detection. The results are presented in Table 4.

Figure 19. Keyword Occurrence (Yearly)



Source: Processed Data

Table 4. Research clusters

Cluster	Keywords	Fraud in Accounting
Fraud and information technology	Accounting; algorithms; Benford's Law; big data; data analytics; detection method; earnings management; forensic accounting; fraud; information technology	Liaise with accounting students to equip them with good integrity ethics to prevent fraud Use of information systems and technology for document processing with the use of AI to save time and reduce fraud. Use of big data and internal controls in detecting fraud
Forensic accounting	Commerce; computer crime; crime; finance; financial fraud; financial statements; forensic accounting; fraud awareness; fraud prevention; religiosity	Fraud detection through forensic accounting The use of accounting transactions is permitted and reduces fraud Application of accounting information system tools for fraud control
Corporate Governance	Accounting fraud; auditing; corporate fraud; corporate governance; corruption; financial reporting; fraud triangle theory; internal auditing; whistleblowing	Good corporate governance to reduce fraud in organizations Auditor skills and techniques are significant predictors of fraud detection Work culture, company work teams and financial reporting violations and improving financial reporting
Risk assessment	Accounting fraud detection; artificial intelligence; data mining; learning systems; machine learning; risk assessment; risk management	A good accounting system to prevent and detect fraud Use of information systems to produce good risk assessments Utilization of big data and AI in accounting
Fraud detection	Auditing; audit planning; financial statement fraud; fraud detection; fraud triangle; professional skepticism; red flags	Use of tools and methods to detect fraud Utilization of AI and machine learning to detect fraud Increased accounting competency

Source: Processed Data

Fraud in relation to information systems and technology represents a well-established yet evolving research domain within accounting science. As a social science discipline, accounting information systems play a crucial role in fraud-related studies. Tunca Caliyurt & Crowther (2006) it is argued that accounting academics should revise their course material to educate students more appropriately to the current environment. After several accounting scandals in the world, especially in the USA, ethics course in business schools have become required by accounting related institutions like the American International Certified Public Accountants (AICPA) emphasized the connection between accounting education and fraud prevention,

suggesting that curriculum enhancements could better equip students with ethical competencies and integrity awareness in dynamic business environments. Recent technological advancements have significantly influenced fraud detection methodologies. Zayed et al. (2024) demonstrated how accounting information system activities can be leveraged for fraud detection and prevention, particularly through algorithmic automation and artificial intelligence for document processing, which enhances efficiency while minimizing errors. Similarly Goh (2020) explored the application of data visualization tools, specifically testing Tableau's capability to implement Benford's Law analysis for initial fraud detection. However, research

findings present nuanced perspectives on technological efficacy. Meiryani et al. (2023) conducted a comprehensive examination of computerized accounting systems, big data analytics, and internal audits in fraud detection. Their results revealed that while big data analytics and internal audits showed significant effectiveness in identifying accounting fraud, traditional accounting information systems alone demonstrated limited detection capabilities.

Forensic accounting has emerged as a critical area of research due to its vital role in fraud prevention. Numerous studies have explored this field (Arboleda et al., 2018; Barzinji et al., 2024; Capras & Achim, 2023; Nigrini, 2012; Pitchayatheeranart & Phornlaphatrachakorn, 2023) particularly as technological advancements and the expansion of e-commerce have led to both increased financial transaction volumes and corresponding rises in fraudulent activities. These developments have made fraud detection an increasingly important research focus. Recent studies have employed innovative approaches to address these challenges. Hashemi et al., (2023) investigated the use of class weight adjustment hyperparameters to balance fraudulent and legitimate transaction detection. Meiryani (2021) demonstrated the significant impact of both fraud detection and prevention on corporate financial performance, establishing a clear relationship between fraud management and organizational financial health. The field has seen diverse methodological approaches, Ariwa et al. (2012) and hence, the validity of the audit conclusion has often been questioned. This study thus sought to identify the various types of fraud encountered during financial transactions, evaluate the adoption of Computer Aided Audit Tools (CAATs) examined Computer Aided Audit Tools (CAATs), evaluating their effectiveness in fraud detection and organizational performance. Kim et al. (2010) focused on verifying internet-sourced information reliability for forensic accounting. Alhebri (2024) developed an

advanced financial fraud detection system combining interval-valued neutrosophic analytical hierarchy with sparrow search algorithms. Maulidi (2024) contributed a qualitative analysis of organizational fraud prevention, exploring the interplay between internal controls, whistleblowing systems, fraud awareness, and religiosity from internal auditors' perspectives. Their work highlights a significant gap in theoretical understanding of these interconnected factors.

Corporate governance has emerged as a critical research theme in fraud studies, with scholars examining its various dimensions through multiple lenses. Ozili (2020) conducted a comprehensive analysis of forensic accounting literature, highlighting the inherent complexity of fraud and its significant implications for research methodologies in this domain. This complexity necessitates sophisticated approaches to forensic accounting investigations. Auditing and Fraud Detection, Oyerogba (2021) and those associated with forensic auditing, about the knowledge and skills, experience and technique that a forensic auditor should possess to provide high-quality services in fraud detection. The study also shows the impact of forensic auditing tools on fraud detection. Design/methodology/approach: With the use of a self-administered questionnaire, the study adopts a survey design in which 298 respondents participated. Data were subjected to descriptive statistics (ranking, mean and standard deviation) of Nigerian accounting professionals revealed that forensic auditors' knowledge, skills, experience, and techniques serve as significant predictors of fraud detection efficacy in the public sector. These findings underscore the importance of specialized competencies in forensic auditing. Corporate Fraud Consequences, Dong (2018) demonstrated that corporate fraud generates substantial financial losses and erodes investor confidence, with detection posing considerable challenges. Their work established the value of social media financial data as a complement

to traditional fraud detection methods. Organizational Culture and Reporting Violations Liu et al. (2023) identified a counterintuitive relationship between teamwork culture and financial reporting violations, particularly in firms without internal control weaknesses. This suggests that cultural factors may interact with control systems in complex ways. Anti-Fraud Mechanisms Nurhajati et al. (2023) examined public sector applications, finding that while anti-fraud policies directly reduced e-public corruption, their impact on proactive detection was nonsignificant. The study highlighted the mediating role of forensic accounting techniques in corruption reduction. Methodological innovations have also emerged, Cella & Zanolla (2018) applied Benford's Law to assess spending transparency. Albizri (2019) advocated for interdisciplinary approaches to enhance financial reporting fraud detection.

Risk assessment and fraud have a close relationship in the context of risk management and organizational security. Risk detection and fraud assessment involve a variety of steps and methodologies to identify potential fraud, evaluate its impact, and implement mitigation strategies. Previous research examining risk assessments related to fraud was mostly carried out to overcome problems that arise (Odukoya & Samsudin, 2021; Omar & Mohamad Din, 2010; Popoola et al., 2015) efficiency and contribution to national economic growth and development. This study examines the capability and competence of DMB regulators to prevent and detect fraud and, at the same time, develop an effective mechanism to do so. The study employed quantitative methodology. Data was collected using questionnaires administered on 350 forensic accountants and bank examiners working with the Central Bank of Nigeria (CBN). Rani (2014) weekly, yearly etc-reviewed time series databases and the latest research trends in time series mining. Topics discussed included: the influence of computerized accounting

information systems, big data analysis, and internal audit in detecting accounting fraud; studies comparing the skills of LR, DF, and SVM models in determining the likelihood of grant and registration of patents and utility models aided by agencies implementing and promoting technology through predictive analytics; big data analysis and mining. Han (2017) in his research the effectiveness of Data Mining (DM) classification techniques in detecting companies that publish false financial reports (FFS) and relating to the identification of factors related to FFS is explored, investigating the usefulness of Data Mining techniques including Decision Trees, Neural Networks and Bayesian Belief Networks in identifying financial statement fraud. Finally, we compare the three models in terms of their performance. Liu & Zhou (2014) proposed a hybrid knowledge base system for fraud detection, in which ant colony optimization and artificial neural networks are used and combined with expert knowledge to improve fraud detection performance. Gordon & Siegel (2020) research that machine learning is used to detect fraud.

Recent developments in fraud detection research reflect a significant shift toward multidisciplinary approaches that integrate technology, behavioral sciences, and ethical frameworks. These advances have broadened our understanding of fraud mechanisms while offering practical innovations in detection methodologies. Technological progress has played a pivotal role in enhancing fraud detection capabilities. Studies by Dayyabu (2023) & Ajitha (2024) highlight the effectiveness of artificial intelligence (AI) and machine learning algorithms in analyzing audit trails and transactional data to identify fraudulent activity. Complementing this, Rambola et al. (2018) developed domain-specific data mining techniques tailored to fraud detection in the banking sector. Furthermore, financial data analysis remains a critical tool; for example, BenYoussef & Khan, (2017) introduced restatement analysis for detecting ano-

malies, while Arboleda et al. (2018) emphasized the susceptibility of financial systems to manipulation and advocated for historical data analytics as a preventive measure. Beyond technical methods, organizational structures and internal controls significantly affect the efficacy of fraud detection. Hamdan (2017) Institute of Internal Auditor (IIA) found that the success of internal auditors in identifying fraud is highly dependent on the presence of whistleblowing mechanisms – where the effectiveness of fraud experience is only realized when such support systems exist. Rahman & Jie (2024) including 16,063 data of all listed companies in Shanghai and Shenzhen markets for the 2010–2020 period. The authors also use quantitative methods, such as regression analysis, to investigate the relationship between five variables (cover three elements of FTT applied the fraud triangle framework, emphasizing the importance of understanding individual motivations, perceived opportunities, and rationalizations behind fraudulent behavior. A growing body of research explores the intersection of ethics, cognitive traits, and fraud detection practices. Demonstrated that auditors with high levels of ethical idealism combined with strong trait skepticism exhibit enhanced fraud detection performance. Hoffman & Zimbelman (2012) revealed that strategic reasoning and brainstorming can substantially improve auditors' capacity to detect fraud by fostering more critical and anticipatory thinking. Collectively, this body of work makes several critical contributions. It positions technological solutions, such as AI and data analytics as central to modern fraud detection, while acknowledging their limitations without contextual understanding. It also underscores the organizational and psychological dimensions of fraud, offering empirical support for integrating ethical theory into auditing standards. Most notably, it calls for a multidisciplinary paradigm that combines data science, behavioral psychology, and accounting expertise.

Despite these advancements, several gaps remain. There is a pressing need for further research that explicitly integrates ethical theory with detection methodologies to better understand moral decision-making in fraud contexts. Additionally, future studies should explore real-time fraud detection systems that move beyond historical or post-event analysis. Cross-cultural investigations into the efficacy of organizational whistleblowing frameworks would also enrich our understanding of fraud prevention. Lastly, the development of unified frameworks that combine both technological and behavioral approaches is essential to advancing the field of fraud detection research.

Future Research Directions

The future agenda of this research is that bibliometric analysis to find the scope of future research on fraud in accounting. Based on bibliometric and content analysis of 10 recent papers on fraud in accounting, we have identified potential research directions. Suggested future research directions aim to improve our understanding of fraud in accounting. Appendix 2 lists recommendations for the scope of future research.

5. CONCLUSION

Fraud and accounting have emerged as significant research themes globally, driven by the evolving needs of organizations over time. This study conducts a bibliometric analysis of previously published research on fraud within the accounting domain. It examines various categories, including the most influential authors, keywords, and recurring themes in existing literature. Two key segments, research area and context are analyzed to identify gaps in knowledge and propose future research directions.

This study reveals a significant increase in publications on fraud in accounting since 2016. The most prolific researchers in this field include Popoola, Samsudin, Rahman, and Rezaee, with Rezaee having published

three articles. Among academic sources, the *Journal of Financial Reporting and Accounting* has contributed the highest number of publications. Geographically, the majority of citations originate from the United States. Keyword analysis indicates that "fraud detection" and "crime" are the most frequently used terms, highlighting dominant research themes. Notably, Rezaee (2005) including investors, creditors, pensioners, and employees, more than \$500 billion during the past several years. Capital market participants expect vigilant and active corporate governance to ensure the integrity, transparency, and quality of financial information. Financial statement fraud is a serious threat to market participants' confidence in published audited financial statements. Financial statement fraud has recently received considerable attention from the business community, accounting profession, academicians, and regulators. This article (1 study received the highest number of citations (259), underscoring its influence in the field. However, the research also identifies a lack of collaboration among authors, suggesting opportunities for greater academic partnership in future studies.

By evaluating research influence and mapping trends, scholars can discern emerging themes, pivotal topics, and active areas of investigation within a discipline. Such analysis helps assess the significance and relevance of existing findings while gauging their potential to shape future studies and advance scientific knowledge. These insights are critical for understanding the current state of research, pinpointing gaps, and guiding subsequent scholarly efforts. Additionally, this study offers practical value for policymakers and researchers by providing quantitative metrics, such as publication volume, citation counts, and collaboration networks to evaluate research quality and impact. These indicators not only inform evidence-based decision-making but also foster strategic advancements in the field.

This study has several limitations that should be acknowledged. First,

by focusing exclusively on published research, we may have introduced publication bias, as unpublished or non-indexed works - particularly from certain regions or in non-English languages - were excluded from our analysis. Second, while bibliometric analysis provides valuable quantitative insights through publication and citation metrics, these methods may not fully capture the contextual nuances or substantive impact of individual studies. To address these limitations, we recommend that future research; incorporate qualitative assessments and expert evaluations to complement bibliometric data, expand data sources to include gray literature and non-indexed publications where possible, develop strategies to mitigate geographic and linguistic biases in research analysis. Furthermore, we strongly encourage researchers in this field to pursue both local and international collaborations. Such partnerships could enhance research quality, increase methodological diversity, and amplify the practical applications of findings. These collaborative efforts may also help address current gaps in global research representation and impact assessment.

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Appendix 1. Most Cited Authors

Authors	Title	Year	Source title	Cited by
Rezaee Z.	<i>"Causes, consequences, and deterrence of financial statement fraud"</i>	2005	Critical Perspectives on Accounting	259
Hogan et al.	<i>"Financial statement fraud: Insights from the academic literature"</i>	2008	Auditing	211
Wang et al.	<i>"Designing confidentiality-preserving Blockchain-based transaction processing systems"</i>	2018	International Journal of Accounting Information Systems	151
Trumpeter et al.	<i>"A synthesis of fraud-related research"</i>	2013	Auditing	147
Dong et al.	<i>"Leveraging Financial Social Media Data for Corporate Fraud Detection"</i>	2018	Journal of Management Information Systems	137
Purda et al.	<i>"Accounting Variables, Deception, and a Bag of Words: Assessing the Tools of Fraud Detection"</i>	2015	Contemporary Accounting Research	135
Amani et al.	<i>"Data mining applications in accounting: A review of the literature and organizing framework"</i>	2017	International Journal of Accounting Information Systems	112
Seeja et al.	<i>"FraudMiner: A novel credit card fraud detection model based on frequent itemset mining"</i>	2014	Scientific World Journal	111
Johnson et al.	<i>"Detecting deception: Adversarial problem solving in a low base-rate world"</i>	2001	Cognitive Science	109
Dilla et al.	<i>"Interactive data visualization: New directions for accounting information systems research"</i>	2010	Journal of Information Systems	107
Albrecht et al.	<i>Current trends in fraud and its detection</i>	2008	Information Security Journal	88
Chandler et al.	<i>"Changing Perceptions of the Role of the Company Auditor, 1840-1940"</i>	1993	Accounting and Business Research	69
Debreceny et al.	<i>"Data mining journal entries for fraud detection: An exploratory study"</i>	2010	International Journal of Accounting Information Systems	59
Cullinan C.	<i>"Enron as a symptom of audit process breakdown: Can the Sarbanes-Oxley Act cure the disease?"</i>	2004	Critical Perspectives on Accounting	57
Cook J.; Ramadas V.	<i>"When to consult precision-recall curves"</i>	2020	Stata Journal	56

Authors	Title	Year	Source title	Cited by
Sadaf R et al.	"An investigation of the influence of worldwide governance and competitiveness on accounting fraud cases: A cross-country perspective"	2018	Sustainability (Switzerland)	55
Roszkowska P.	"Fintech in financial reporting and audit for fraud prevention and safeguarding equity investments"	2021	Journal of Accounting and Organizational Change	55
Hilas CS	"Designing an expert system for fraud detection in private telecommunications networks"	2009	Expert Systems with Applications	54
Becker et al.	"Fraud detection in telecommunications: History and lessons learned"	2010	Technometrics	54
Cullinan CP; Sutton SG	"Defrauding the public interest: A critical examination of reengineered audit processes and the likelihood of detecting fraud"	2002	Critical Perspectives on Accounting	51

Source: Processed Data

Appendix 2. Future Research Directions

Author	Title	Research gaps	Future research directions
Rahman & Jie, (2024)	<i>"Fraud detection using fraud triangle theory: evidence from China"</i>	<p>Limited to available data from companies listed on stock exchanges</p> <p>Does not include non-financial factors that could influence fraud</p> <p>Limitations of fraud theory</p>	<p>Fraud analysis in various industry sectors, including small and medium-sized companies</p> <p>Consider non-financial factors, such as organizational culture, leadership, and ethics</p> <p>Developing more sophisticated prediction models using machine learning techniques to detect fraud</p>
Rahman & Zhu, (2024)	<i>"Detecting accounting fraud in family firms: Evidence from machine learning approaches"</i>	<p>The results obtained may not be generalizable to international contexts or to countries with different cultures and regulations</p> <p>Uses public financial data that may not cover all aspects relevant to detecting accounting fraud.</p> <p>This research does not explore all possible existing algorithms.</p>	<p>Analyze across different countries or regions to compare levels of accounting fraud in family firms</p> <p>Use more comprehensive data, including non-financial data, to improve the accuracy of fraud detection models</p> <p>Explore newer machine learning algorithms or hybrid techniques that combine multiple approaches to improve fraud detection accuracy.</p>
Shonhadji & Irwandi, (2024)	<i>"Fraud prevention in the Indonesian banking sector using anti-fraud strategy"</i>	<p>The research results do not fully reflect the views of all bank employees.</p> <p>The number of front office staff is limited due to bank management's policy to reduce the number of staff in line with the increasing use of mobile banking</p> <p>Focused on specific banks, so results may not be generalizable</p>	<p>Involving respondents from various types of banks, both private and state-owned</p> <p>Consider adding new variables, such as management conflict and greedy behavior, that could influence fraud prevention.</p> <p>Conduct longitudinal studies to monitor the effectiveness of fraud prevention strategies over time</p> <p>Using qualitative research methods</p>
Maulidi et al., (2024)	<i>"Qualitatively beyond the ledger: unraveling the interplay of organizational control, whistleblowing systems, fraud awareness, and religiosity"</i>	<p>Findings may not be directly applicable to other countries with different social, cultural, and economic contexts.</p> <p>Semi-structured interviews provide flexibility in topic exploration, there is a possibility of bias in the answers given by participants.</p> <p>Rely on the internal auditor's perspective.</p>	<p>Involve more auditors from various institutions and regions to increase external validity and generalizability of findings.</p> <p>Using a mixed approach that combines interviews, surveys, and document analysis can provide a more holistic picture</p> <p>Conduct longitudinal studies to see how changes in organizational control policies or practices affect corruption levels over time</p> <p>Explore other factors that may influence organizational control and awareness of corruption</p>

Author	Title	Research gaps	Future research directions
Munteanu et al., (2024)	"Auditing the Risk of Financial Fraud Using the Red Flags Technique"	<p>Using data from financial statements and sustainability reports published by a particular entity does not cover the entire spectrum of industries or company sizes</p> <p>This research only covers the period 2018-2022</p> <p>The "red flag" methods used to detect fraud can contain subjective elements.</p>	<p>Comparative analysis between different industries or countries to explore how "red flags" indicators function in different contexts.</p> <p>Collect data from a longer period</p> <p>Develop more complex quantitative models to analyze the relationship between financial indicators and fraud risk, using more sophisticated statistical techniques.</p> <p>Explore the effectiveness of education and training programs in recognizing and managing "red flags" among accounting professionals</p>
Bhattacharya & Mickovic, (2024)	"Accounting fraud detection using contextual language learning"	<p>Development of models that integrate text analysis with numerical and visual data to provide a more comprehensive picture of potential fraud.</p> <p>This research touches on how writing styles may change over time, but does not explore how changes in the economic or regulatory context may influence fraud patterns.</p> <p>This research does not discuss how the results of the fraud detection model can be used by various stakeholders, such as investors, auditors, and regulators.</p> <p>Although BERT models show good results, there are concerns about transparency and trust in the use of machine learning models for accounting decisions.</p>	<p>Accounting fraud often involves quantitative and qualitative data, can use mix methods.</p> <p>Further research could explore the relationship between external factors and changes in fraud behavior.</p> <p>Further research could explore how the information generated from these models can be interpreted and applied in real practice.</p> <p>Further research could investigate how to explain model decisions to stakeholders and their impact on trust in accounting systems.</p>
Naz & Khan, (2024)	"Impact of forensic accounting on fraud detection and prevention: a case of firms in Pakistan"	<p>The methodology may not be sufficient to explain the cause-and-effect relationship between forensic accounting techniques and effectiveness in detecting and preventing fraud.</p> <p>The sample is not fully representative of the entire professional population in Pakistan, which may affect the generalizability of the research results</p>	<p>Further research with experimental or quasi-experimental designs could provide deeper insights</p> <p>Explore how new technologies, such as data analytics and artificial intelligence, can be integrated into forensic accounting practices to increase the effectiveness of fraud detection</p> <p>Conduct similar research in other countries to compare the effectiveness of forensic accounting techniques in different contexts</p>

Author	Title	Research gaps	Future research directions
Gabrielli et al., (2024)	"The power of big data affordances to reshape anti-fraud strategies"	<p>Conducted in Italy, which limits the generalizability of the results to other country contexts</p> <p>More emphasis is placed on big data and big data analytics, while other aspects such as the role of humans in the fraud detection process and psychological factors that influence fraudulent behavior are not explored</p> <p>Does not consider rapid changes in technology and data analysis methods that may affect the results and relevance of findings</p>	<p>Conduct similar research in various countries, both developing and developed</p> <p>Using mixed methods combines qualitative and quantitative approaches to gain a more comprehensive understanding</p> <p>Investigate the roles and skills required by auditors and investigators to leverage big data</p> <p>Conduct in-depth case studies on the application of big data in real situations, including cost and benefit analysis</p> <p>Examining the impact of new technologies in improving fraud detection capabilities and investigative efficiency.</p>
Xiang & Zhu, (2023)	"Academic independent directors and corporate fraud: evidence from China"	<p>Research the context of China's stock market, and the different industrial sectors that have different characteristics and regulations compared to other countries.</p> <p>Other factors such as individual characteristics, experience, and social networks of directors are not analyzed in depth.</p> <p>This research focuses more on the relationship between the presence of independent academic directors and the incidence of corporate fraud in the short term.</p>	<p>Research by comparing various countries or various industries the influence of academics in preventing corporate fraud.</p> <p>Explores how these factors interact with academic reputation and educational background to influence fraud monitoring and prevention.</p> <p>Longitudinal research could provide deeper insight into the lasting effects of academics as independent directors.</p>
Alharasis et al., (2023)	"Integrating forensic accounting in education and practices to detect and prevent fraud and misstatement: case study of Jordanian public sector"	<p>It does not use other data collection techniques other than self-report measures, which may reduce the validity of the results.</p> <p>It only focuses on the public sector in Jordan, which limits the generalizability of the findings to other sectors or other countries.</p>	<p>Extending the analysis to the private sector to provide a more comprehensive perspective on forensic accounting practices</p> <p>Comparative studies with other countries, especially those in developing countries</p> <p>Explore the legal and educational barriers identified in the research</p>

Source: Processed Data