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A Bibliometric Analysis of the Financial Fraud Detection Literaturefrom 2004 To 2024

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ABSTRACT: This paper examines the literature on financial fraud detection, using a bibliometric analysis of 386 documents published between 2004 and 2024, utilizing the Bibliometrix R package. The documents were sourced from 218 outlets including books, conferences, and journals, by searching the Scopus database using mesh terms with the Boolean operators “AND” and “OR” to combine and include synonyms of relevant terms. The content analysis identified 1186 author keywords and 530 Keywords Plus. The dataset consists of 842 authors with a collaboration rate of 18.65 and an average citation per document of 15.49. Publication trends show a significant increase in research on financial fraud detection, with key sources including the Journal of Financial Crime and the Journal of Money Laundering Control. Influential authors include Gottschalk P and Naheem MA, with major affiliations such as BI Norwegian Business School and Beijing Normal University. Keyword analysis highlights "financial crime" and "fraud" as main focuses, with technologies like "machine learning" and "artificial intelligence" playing crucial roles in fraud detection. Thematic mapping indicates that advanced technologies complement traditional methods in detecting and preventing fraud, with blockchain and cryptocurrency emerging as promising areas for future research. The United States, China, and the United Kingdom are the leading contributors to this research field.

KEYWORDS: Financial Fraud; Fraud Detection; Fraud Identification; Bibliometric Analysis; R Packages

I. INTRODUCTION

In the dynamic global economy, the phenomenon of fraud is a serious challenge that can disrupt stability and trust in the financial system. From corporate scandals such as Enron and WorldCom in the United States to financial market manipulation such as the LIBOR case, these incidents highlight the need for strict oversight and high integrity in every aspect of financial transactions and reporting. The Enron scandal involved the manipulation of financial statements in which the company hid debts and losses in fictitious entities, making it appear more profitable than it actually was. The WorldCom case, also in the United States, involved accounting fraud in which a company inflated profits by recording operating expenses as investments, thereby reducing reported expenses and increasing profits. The LIBOR scandal, which is global, shows how big banks are involved in manipulating the London Interbank Offered Rate (LIBOR) for their trading profits, influencing interest rates around the world. In Indonesia, the Jiwasraya case is the latest example of a major financial scandal that shook the domestic market, where the insurance company failed to pay policy claims due to poor investment and non-transparent fund management, causing huge losses to customers and investors. The impact of fraudulent practices not only has an impact on the company's finances and investors but also has the potential to cause significant economic losses and reduce public trust in financial institutions and the regulations that regulate them.

According to the ACFE 2022 report, financial statement fraud schemes have the highest velocity with a median loss per month of $32,900, followed by corruption at $12,500, and noncash at $6,500. These findings show that financial statement fraud has a greater severity and impact compared to other fraud schemes such as corruption and noncash.

In an era where technology continues to evolve rapidly, efforts to detect, prevent, and address fraud are increasingly important to ensure fairness and transparency in this complex global economic environment. Fraud detection, prevention, and countermeasures include the use of advanced technologies such as data analysis and artificial intelligence to identify abnormal patterns in financial transactions, the implementation of strict internal controls to reduce risks, and intensive education and training for employees to be more vigilant and able to recognize potential signs of fraudulent behavior.

A Bibliometric Analysis of the Financial Fraud Detection Literature from 2004 To 2024

The use of technology such as data analysis and artificial intelligence is becoming increasingly important in detecting abnormal patterns in financial reporting. Research related to the detection of financial statement fraud has been carried out using various methods by many previous researchers. The methods that have been used include Beneish M-Score, F-Score, Machine Learning, Deep Learning, and Artificial Neural Network (ANN). These approaches make a significant contribution to efforts to prevent and detect financial statement fraud early, thereby reducing potential losses and maintaining the company's financial integrity. These efforts demonstrate that fraud detection, prevention, and countermeasures require a holistic and integrated approach to face the challenges of today's technological era.

Detection uses various methods carried out by leading researchers and has produced various findings. Companies that commit fraud face greater financial pressure, opportunities due to less independent oversight and specialized transactions, and more frequent auditor turnover compared to companies that are not detected committing fraud (Fitri et al., 2019). The ore export banhas hurt the company's financial performance in the mining sub-sector, resulting in losses and signs of manipulation of financial statements identified based on the M Beneish score (Widiastuti et al., 2019). The Beneish M model with eight accounting variables can help find companies that have the potential to commit financial statement fraud by looking at patterns in their financial data (Repousis, 2016). XGBoost has proven to be more effective in detecting cheating than traditional models (Sun et al.,2024). Machine learning methods can help detect and interpret patterns that exist in ongoing accounting misrepresentation (Bertomeu et al., 2021).

The analysis using artificial neural networks successfully predicted financial statement fraud with a success rate of 73.1% in manufacturing companies on the Indonesia Stock Exchange (IDX) for the period 2016-2019, highlighting the significant stressors, opportunities, and rationalization factors in the detection (Suryani & Fajri, 2022). Detection methods using fraud pentagon theory play an important role in identifying potential fraudulent financial statements by considering stressors, opportunities, rationalization, competence, and arrogance (Setiorini et al., 2022). Detection methods such as F-Score Dechow, report readability, and profit management can effectively identify potential fraud in financial statements by highlighting dishonest use in profit management. (Tarjo et al., 2022). Language analysis can help auditors find potentially fraudulent financial statements by looking at different patterns of word and sentence usage (Humpherys et al., 2011). Detection of financial statement fraud can be done by analyzing indicators, financial statements, ratios, and other information (Zack, 2013)

Although various detection methods have been developed and applied, there is still an urgent need for new research focused onimproving the efficiency and accuracy of fraud detection. One approach that can provide more in-depth insights is the use of bibliometric analysis to evaluate and summarize the existing literature. Bibliometric analysis uses tools like VOSviewer to analyze networks and patterns in existing research, identifying trends, research gaps, and influential authors, journals, and institutions.

By understanding the progress of research and the direction taken by previous studies, new research can be designed to addressexisting shortcomings and explore areas that have not been widely discussed. This is especially important in an ever-evolvingfield such as financial fraud detection, where new methods and technologies are constantly emerging and can improve the effectiveness of detection.

The urgency for new research is also driven by the increasing complexity and sophistication of fraud schemes. Fraud is not only getting more sophisticated but also getting harder to detect with traditional methods. Therefore, the integration of abibliometric approach in fraud detection research can help steer research efforts toward a more structured path and focus on relevant innovations. This will not only improve the reliability of fraud detection but also contribute to the development of better policies and practices in preventing and addressing fraud in the financial sector.

The study presents a comprehensive analysis of the various detection methods used in the detection of financial statement fraud, using bibliometric analysis to assess the scope of existing research and its future prospects. The Scopus database is utilized because of its relevant attributes in the social framework. Previous studies (Abbas et al., 2022; Madsen et al., 2023) which use Scopus for bibliometric analysis are mentioned.

This analysis has specific objectives as it is carried out, namely: (1) identifying the most relevant publication trends and sources; (2) determining the most influential authors, articles, and affiliates; and (3) mapping the keywords and countries involvedin the research. This analysis will provide a comprehensive overview and insight into the current state and future direction of financial fraud detection research for academics, policymakers, regulators, and professionals in improving fraud detection capabilities and addressing challenges and opportunities related to fraudulent financial activities.

The structure of this article is as follows: Part 1 offers a brief background on financial fraud detection and summarizes the findings from previous financial fraud detection studies. Part 2 outlines the bibliometric methods and data used for analysis. Section 3 presents the results of citation-based bibliometric analysis, including overall trends and identification of primary sources, documents, authors, and countries. As well as discussing the findings of the study and outlining potential research paths for the future. Part 4 concludes the paper by emphasizing its contribution and reflecting on the limitations of this study.

II. RESEARCH METHOD

This study uses bibliometric analysis as the main method to understand the literature on financial fraud detection. This study answers the research question using PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) through three stages: identification, screening, and inclusion. The Scopus database was chosen because of its wider scope and independentboard that ensures the quality of the articles, compared to the Web of Science (WOS) (Risdiawan & Sudaryono, 2024).

This article uses Boolean operations ("financial fraud" OR "financial crime" OR "financial misconduct" OR "financial deception") AND (Detect* OR Identif* OR "fraud detection" OR "fraud identification" OR "fraudulent activity"). These Boolean operations represent search criteria that include a wide range of financial fraud-related terms and their detection methods. This criterion is broken down into two main groups that are linked by AND operators, which means that the relevant article must meet at least one term from each group.

The first group includes terms related to various forms of financial fraud, including "financial fraud", "financial crime", "financial misconduct", and "financial deception". These terms encompass various aspects of financial fraud that can occur in the financial sector. The second group includes terms related to fraud detection or identification, such as Detect* (which includes words such as detect, detecting, detection), Identif* (which includes words such as identify, identifying, identification), as well as the phrases "fraud detection", "fraud identification", and "fraudulent activity". These terms denote the various methods and activities used to detect or identify fraud. The combination of these two groups allows for a comprehensive search for articles that discuss financial fraud in the context of detecting or identifying it.

This article filters based on the following criteria: (1) Year, (2) subject area, (3) source type, and (4) document type. This article uses documents from 2004 to 2024. Subject areas are limited to only subject areas: Social Sciences; Economics, Econometrics and Finance; Business, Management, and Accounting. This article also limits the type of source and type of document i.e. journals and articles.

This article uses the following boolean operations, ("financial fraud" OR "financial crime" OR "financial misconduct" OR "financial deception") AND (Detect* OR Identif* OR "fraud detection" OR "fraud identification" OR "fraudulent activity") usedin searching for documents and obtained initial data of 1323. Then the established inclusion criteria are applied. (1) in 2004 – 2024, 12 documents were excluded, (2) subject areas: Social Sciences; Economics, Econometrics, and Finance; Business, Management, and Accounting, 743 documents were excluded, (3) source type: journal, 146 documents were excluded, (4) document type: articles, 36 documents were excluded, 386 documents were used in the analysis.

There are a variety of tools that researchers can use to conduct bibliometric studies, including HistCite, Pajek, Gephi, Excel, VOSviewer, BibExcel, and bibliometrics packs in R. Previous studies (Ahmed et al., 2024; Ai et al., 2024; Altarturi et al., 2023; Madsen et al., 2023) that uses the Bibliometrix R package. This paper makes use of Biblioshiny software, a shiny application that provides a web interface for bibliometrics packages, which has been used in many studies from various scientific fields for bibliometric analysis. Biblioshiny facilitated the research by enabling the study to perform reference tracking, reference selection, reference processing, synthesis, content analysis, corpus pre-processing, and representation of study findings (Altarturi et al., 2023). The data collection stage allows the creation of a ".csv" file that will be used in the next stage

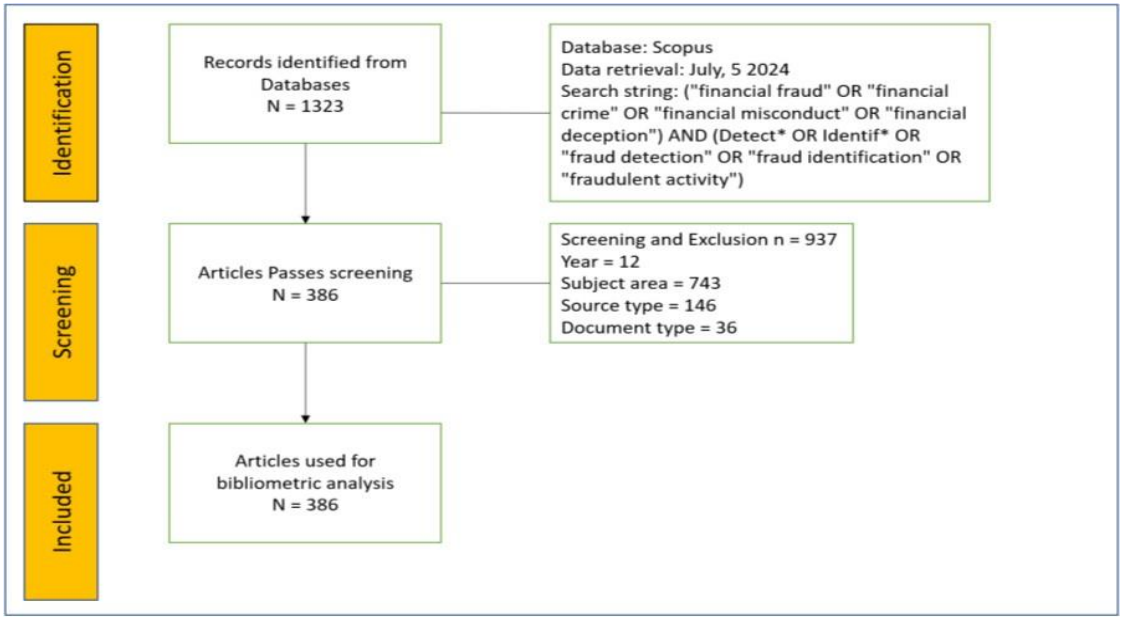

Figure 1. PRISMA compliance overview of data warehouse collection and processing for systematic research

III. RESULT AND DISCUSSION

Descriptive analysis

Descriptive analysis provides basic statistics regarding the collected literature. It is important to provide a comprehensive overview of the data in order to understand the literature review of financial fraud and its detection. Table 1 summarizes the key characteristics of the 386 documents published between 2004 and 2024. The collected documents are published by 218 sources consisting of various books, conferences, and journals. Regarding content analysis, there are 1186 keywords from authors and 530 Keywords Plus. Author keywords are terms that often appear in the document itself, whereas Keywords Plus is calculated based on the terms that appear most often in the title of a literature reference. Regarding author statistics, the dataset contains 842 authors. Only 11.4% of these authors wrote single-author literature. The percentage of single-author documents is more than 30%.The proportion of co-authors per document is 2.45, with a collaboration rate of 18.65. The average citation for documents is
15.49. The total number of references cited from all 386 documents is 17,273.

Table 1 Descriptive analysis of the literature in the analyzed dataset

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2004:2024
Sources (Journals, Books, etc)	218
Documents	386
Average citations per doc	15,49
References	17473
DOCUMENT CONTENTS	
Keywords Plus (ID)	530
Author's Keywords (DE)	1186
AUTHORS	
Authors	842
Authors of single-authored docs	96
AUTHORS COLLABORATION	
Single-authored docs	116
Co-Authors per Doc	2,45
International co-authorships %	18,65

Publication Trends

This section describes the data from a sample of papers and provides a preliminary overview of the literature on financial fraud detection. Figure 2 shows the publication trend over time, from 2004 to 2024. From 2004 to 2017, research related to financial fraud detection fluctuated and increased in 2011 and 2017 with a total of 19 publications. It had declined in 2018 with a total of 17publications. After 2018, the growth rate increased dramatically reaching its peak in 2023, with more than 63 publications per year. As of July 2024, the number of publications is only 41, and its growth is predicted to continue. This shows the increasing interest of academics and industry in the challenges and issues in the field of financial fraud and detection.

The first paper in the sample (Croall, 2004) discusses the comparison between regulation and crime control in the context of financial crime. The study asks the extent to which these two approaches can complement each other, and highlights the importance of effective and balanced regulatory strategies in the application of sanctions to achieve desired moral and instrumental objectives.

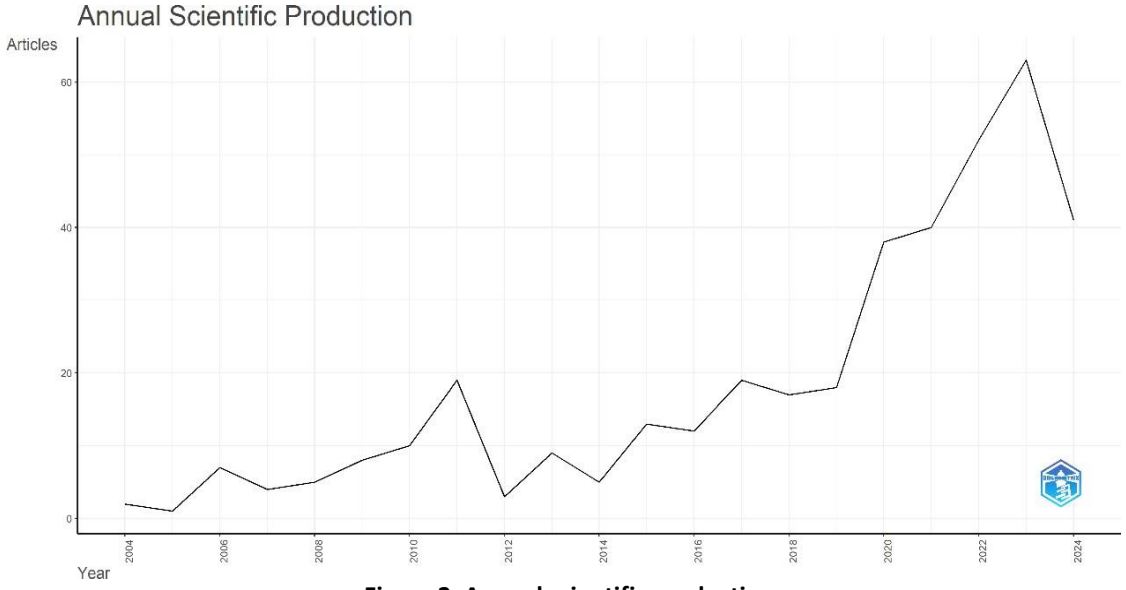

Figure 2. Annual scientific production

Most Relevant Sources

This bibliometric research refers to journals or publications that most often publish papers in the field of financial fraud detection. Analyzing the growth, Figure 3 shows the cumulative growth of documents from the top 8 related sources in thedataset. The growth of publications from the Journal of Financial Crime source is the highest among all sources. The Journal of Money Laundering Control recorded the second-highest growth. The Journal of Financial Crime began publishing documents in 2004. Then followed by the publication of the first document by the Journal of Money Laundering Control in 2006. In 2011, Decision Support Systems also began publishing documents. Five of these sources began publishing after 2016. Table 2 presents the Top 15 Journals that publish documents related to this topic

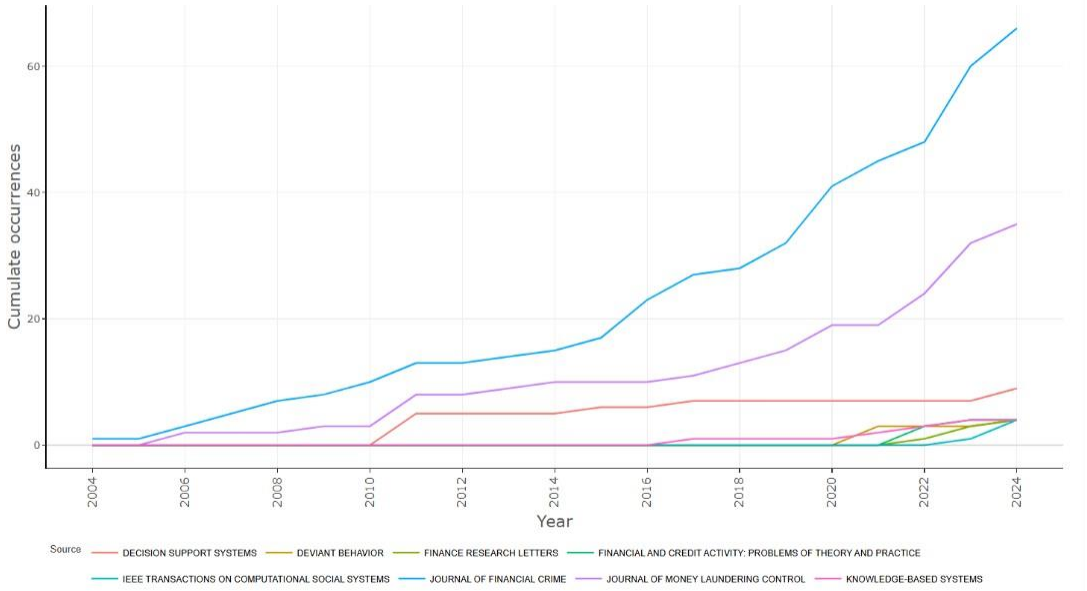

Figure 3. Source growth.

Table 2 Top 15 Relevant Sources

Sources	Articles
Journal Of Financial Crime	66
Journal Of Money Laundering Control	35
Decision Support Systems	9
Deviant Behavior	4
Finance Research Letters	4

Financial And Credit Activity: Problems Of Theory And Practice	4
Ieee Transactions On Computational Social Systems	4
Knowledge-Based Systems	4
Computer Fraud And Security	3
Emerald Emerging Markets Case Studies	3
Journal Of Corporate Finance	3
Journal Of Financial Regulation And Compliance	3
Journal Of Legal, Ethical And Regulatory Issues	3
Journal Of Management	3
Journal Of Operational Risk	3

Most Impactful Documents

Table 3 displays the most cited papers with at least 100 citations from 2004 to 2024. The five most cited papers are 761,435,335,294, and 232 citations, respectively. (Ngai et al., 2011) Examine related reviews and classification schemes for literature on the application of data mining techniques to detect financial fraud. (Karpoff et al., 2008) Examine the consequences faced by managers due to the presentation of misleading financial information. (Ravisankar et al., 2011) Researching the detection of financial statement fraud and the selection of features using data mining techniques. (Karpoff & Lou, 2010) Researching whether Short Sellers detects companies that manipulate financial statements. (Humpherys et al., 2011) Examine the identificationof fraudulent financial statements using linguistic credibility analysis.

Table 3 The Most Cited Papers

Authors	Journal	Year	Total Citations	TC perYear
(Ngai et al., 2011)	Decision Support Systems	2011	761	54,36
(Karpoff et al., 2008)	Journal of Financial Economics	2008	435	25,59
(Ravisankar et al., 2011)	Decision Support Systems	2011	335	23,93
(Karpoff & Lou, 2010)	Journal of Finance	2010	294	19,60
(Humpherys et al., 2011)	Decision Support Systems	2011	232	16,57
(Abbasi et al., 2012)	MIS Quarterly	2012	199	15,31
(Hajek & Henriques, 2017)	Knowledge-Based Systems	2017	173	21,63
(Karpoff et al., 2017)	Accounting Review	2017	151	18,88
(Firth et al., 2011)	Journal of Corporate Finance	2011	145	10,36
(Zhou & Kapoor, 2011)	Decision Support Systems	2011	123	8,79
(Trompeter & Wright, 2010)	Contemporary Accounting Research	2010	107	7,13

Most Impactful Authors

A bibliometric analysis of the most effective authors in the field of financial fraud detection shows the number of articles published by each researcher from 2004 to 2024. Figure 4 shows the frequency and impact of citations from academic papers written by various authors in different years. The figure shows that Gottschalk P has contributed 18 papers used in this study on financial fraud detection between 2008 and 2024, followed by Naheem MA with 5 papers between 2015 and 2020. Then Sun Y with four publications. Furthermore, Bukovnik A, Gupta S, Karpoff JM, Kebe J, Kolenc T, Li J, and Raval V each have three publications. The author with the highest total citations is Karpoff JM who received 880 citations for 3 papers only between 2008 and 2017, followed by Naheem MA who had 92 citations for 5 papers between 2015 and 2020.

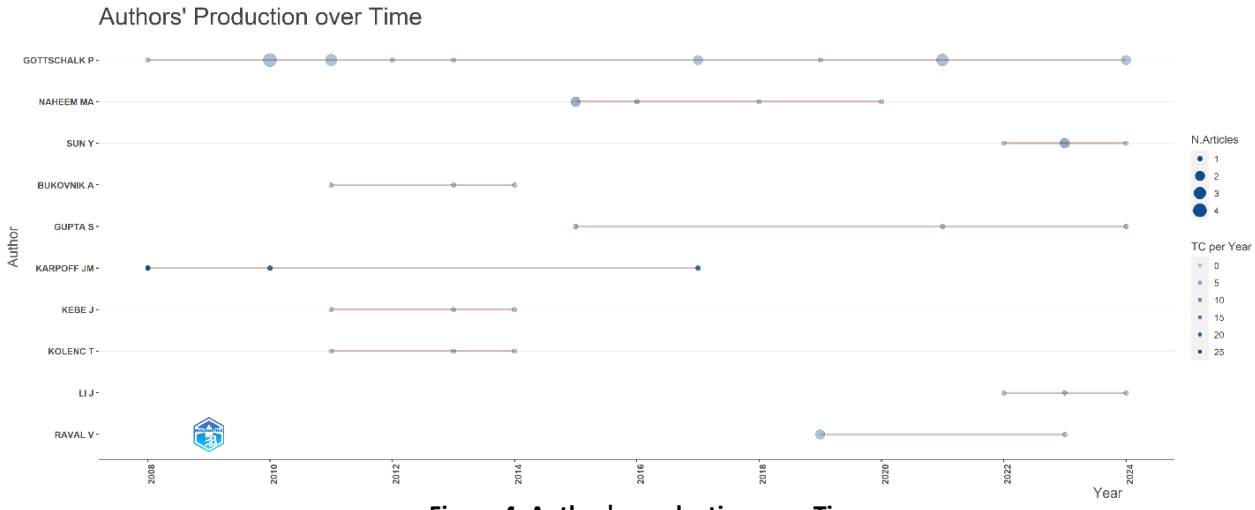

Figure 4. Author's production over Time

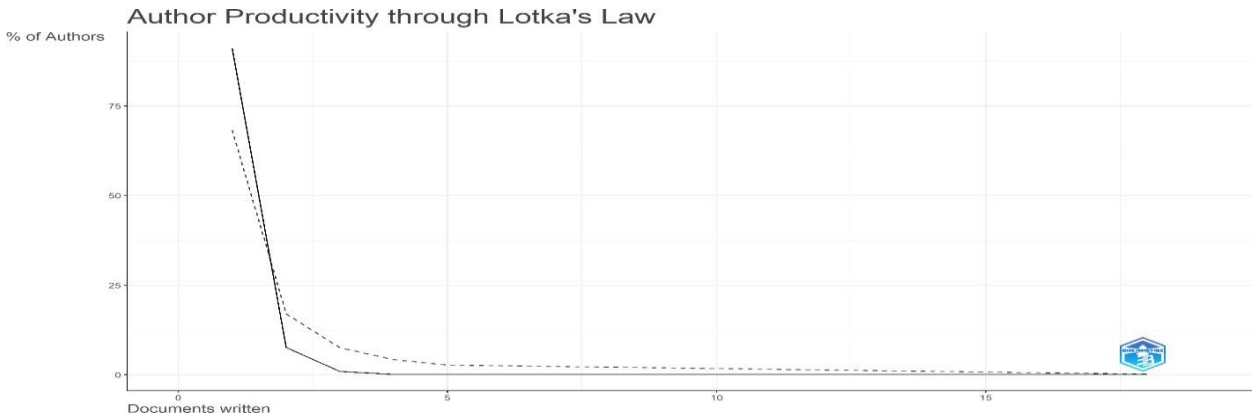

Figure 5. Authors Productivity through Lotka's Law

To identify the most influential authors in financial fraud detection, we use Bibliometrics in R to generate a graph showing the frequency of publications by authors in studying financial fraud detection to explain the productivity of authors using Lotka's Law as shown in Figure 5. Lotka's Law is an application of Zipf's Law that describes the frequency of documents published by authors (Altarturi et al., 2023). This calculates that the faction of authors who publish n papers is 1/n^a times the faction of authors who publish one paper (Ahmed et al., 2024). Data related to the results are reported in Table 4.

Table 4 Authors' productivity through Lotka's Law

Documents written	N. of Authors	Proportion of Authors
1	767	0,911
2	64	0,076
3	8	0,01
4	1	0,001
5	1	0,001
18	1	0,001

This graph shows the distribution pattern of scientific productivity among the authors involved in the study. Specifically, most authors (91.1%) wrote only one document in the period analyzed. The number of authors who write more than one document decreases significantly as the number of documents they write increases. For example, only 7.6% of authors wrote two documents, 1% wrote three documents, and 0.1% of authors wrote four and five documents, respectively. This illustrates that most authors have a limited contribution in the number of publications they produce, while only a few authors are significantly more productive in the period analyzed.

Most Relevant Affiliations

The number of affiliated publications metric measures academic contributions and their impact on the field of financial fraud and detecting research. This is simply a count of the number of literary outputs by academic authors affiliated with academic institutions. Figure 6 depicts the top 10 affiliates and the number of documents published by their academic staff. BI Norwegian Business School of Norway recorded the highest number of publications, followed by Beijing Normal University and Islamic Azad University. The number of these 10 affiliates is part of a total of 374 affiliates who contributed.

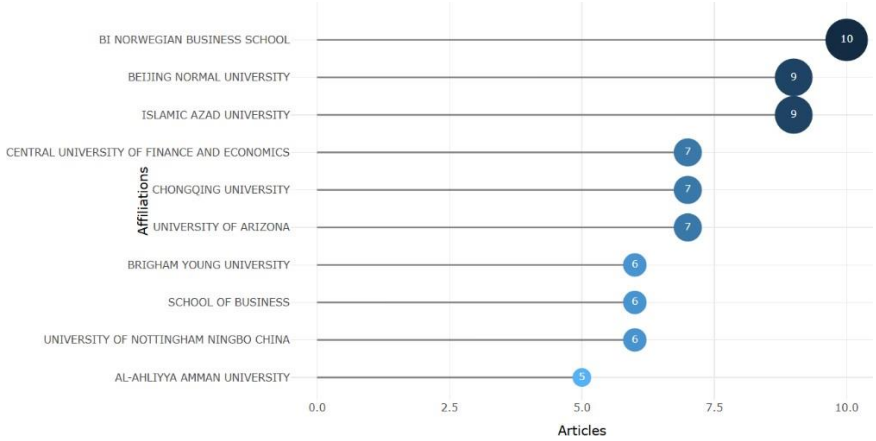

Figure 6. Most Relevant Affiliations

Most Relevant Countries

A country's contribution to bibliometric analysis is important because it reflects how active the country is in producing scientific research in a particular field. This contribution can be measured by the number of papers published by researchers from the country, the number of citations received by the papers, and collaborations between researchers both domestically and internationally.

Figure 7 shows a world map showing countries that have published papers on financial fraud detection. Countries are colored to indicate the frequency of their publications, with dark colors indicating higher frequencies and light colors indicating lower frequencies. In addition, Figure 7 illustrates the frequency of collaboration between researchers from different countries based on the author's collaboration in the research paper. The map shows the relationship between the city or country where the researcher collaborated on the scientific project. The thickness or color of the line indicates the strength or frequency of this collaboration. For example, the USA and China show the highest frequency of collaboration (7), followed by China and Hong Kong (6), and the USA and Australia (10). The USA and China emerged as the most connected countries in terms of scientific collaboration. Table5 shows the frequency of publications numerically in the Top 10 countries. The image highlights the USA as the country with the highest frequency of publications, with 177 papers, followed by China with 130 papers, and the United Kingdom with 68 papers. In addition to emerging as the most connected countries in terms of scientific collaboration, the USA and China are also countries that do a lot of research on this topic.

Table 5 Top 10 Relevant Countries

Country	Frequency
USA	177
CHINA	130
UK	68
INDIA	48
UKRAINE	48
AUSTRALIA	35
MALAYSIA	22
NORWAY	21
SOUTH AFRICA	20
IRAN	19
BRAZIL	18
CANADA	17

ITALY	17
NIGERIA	16
SAUDI ARABIA	16

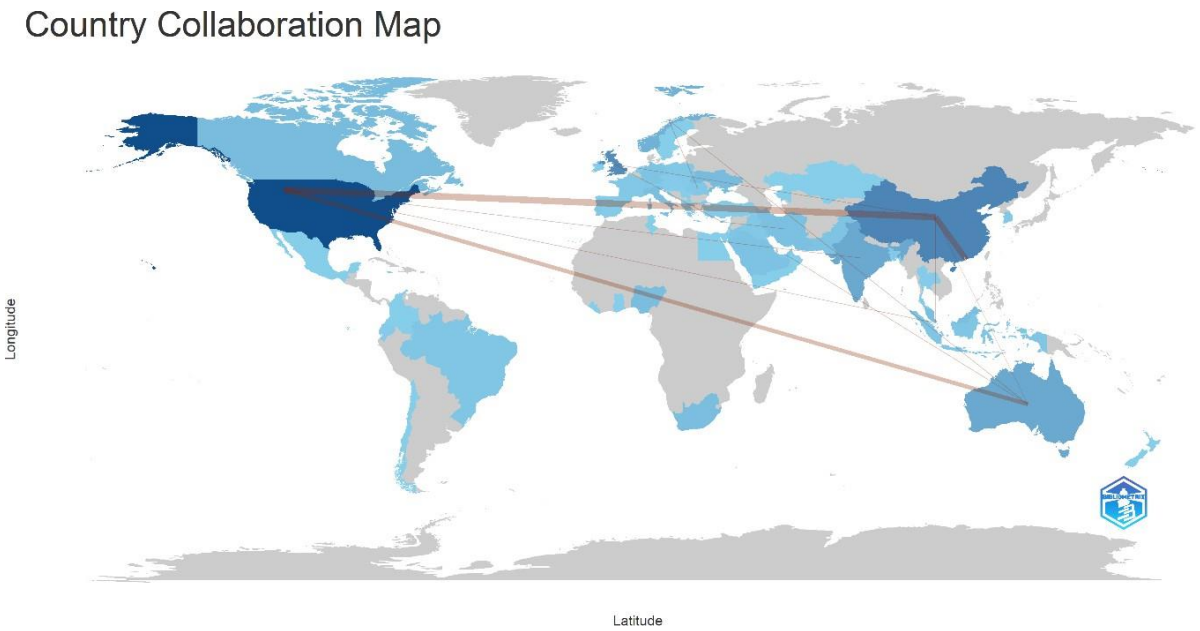

Figure 7. Country Collaboration Map

Author's keywords

Analyzing the content of the item literature based on the author's keywords is important to identify the researchers' focus on a series of research trends in financial fraud detection. Table 6 provides a preliminary overview by listing the top 20 keywords provided by the authors in their literature items and the number of occurrences throughout the documents in the analyzed dataset. The total number of author keywords in the analyzed dataset was 1,186. Visualization of the word cloud in Figure 8. It clearly illustrates that "financial crime" is the most used keyword from the analyzed dataset, with the number of occurrences as many as 59 times. Furthermore, "financial fraud" and "fraud" with the number of occurrences are 50 times and 47 times. Other prominent keywords include "money laundering", "fraud detection", "machine learning", and "corruption".

Figure 9 shows that "crime" and "financial fraud" are the dominant Keywords Plus in the analyzed dataset. Other words that stand out in this visualization include "finance", and "fraud detection". In addition, technologies such as "machine learning" and "artificial intelligence" are also very prominent, signaling the important role of advanced technology in financial crime detection and decision-making. Other words seen in this visualization, such as "data mining", "risk assessment", and "anomaly detection", indicate the techniques used in this field to identify and manage financial risks.

Table 6 Author's keywords

Words	Occurrences
financial crime	59
financial fraud	50
fraud	47
money laundering	44
fraud detection	24
machine learning	19
corruption	17
financial crimes	15
crime	13
white-collar crime	12
corporate governance	10
anti-money laundering	9

forensic accounting	9
artificial intelligence	8
crimes	7
data mining	7
financial fraud detection	7
tax evasion	7
blockchain	6
China	6

Figure 8. Word-cloud of the most 100 frequent Keywords

Figure 9. Word-cloud of the most 100 frequent Keywords Plus

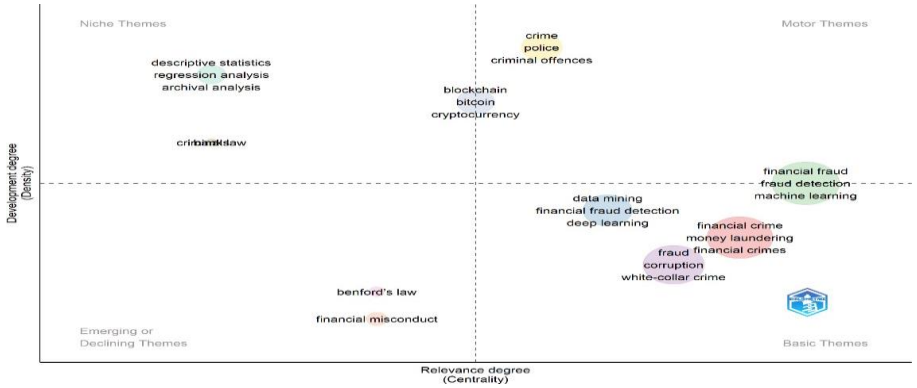

Figure 10. Thematic map of author-keywords

Thematic maps allow visualization of important themes in a research field. This evaluation was inspired by (Cobo et al., 2011). This analysis generates keyword clusters and identifies themes in the research field. This map has two dimensions: centrality (x-axis) and density (y-axis). Centrality refers to how important a particular theme is, while density refers to the development of

that theme (Madsen et al., 2023). The matrix 2 × 2 in the thematic map yields four quadrants, where the size of thebubble refers to the frequency of occurrence of keywords, as shown in Figure 10.

Top right quadrant (Motor Themes): The most discussed main themes, representing keywords with centrality and high density. Topics such as "crime", "police", and "criminal offences" have a high degree of development and relevance. These themes are the main drivers of the research field and are very central to the topic network. Top left quadrant (Niche Themes): Isolated but well-developed niche themes. Topics such as "descriptive statistics", "regression analysis", and "archival analysis" have a high degree of development but low relevance. This theme indicates a highly specialized and isolated area of research, perhaps not widely connected to other topics.

Bottom right quadrant (Basic Themes): Basic and cross-themes that have a low level of development but a high level of centrality and relevance. Topics such as "financial crime", "money laundering", "fraud", "corruption", and "machine learning" have high relevance but low development. These themes are the basic foundation of the research field and are highly relevant, but may be less developed compared to the topics in the upper right quadrant. Bottom left quadrant (Basic Themes): Themes that are emerging or declining. Topics such as "Benford's law" and "financial misconduct" have a low degree of development and relevance. These themes may represent areas that are emerging in research or that are declining in popularity.

DISCUSSION

Publication Trends and Most Relevant Sources

In this study, we analyzed the change in the number of articles in the Scopus database regarding financial fraud detection. Figure 2 shows a significant increase in publications over the past few years, reflecting the increased interest and need for research in this area. We also identified the most relevant sources in research on financial fraud detection. Table 2 presents the top 15 sources. Journals such as the Journal Of Financial Crime, the Journal Of Money Laundering Control, and Decision Support Systems have proven to be the most relevant sources in research on financial fraud detection. The most impactful documents in this field are those that are frequently referenced by other researchers. Table 3 shows that their research made a significant contribution to understanding and developing financial fraud detection techniques.

Most Influential Authors, Articles, and Affiliates

The most well-known authors in the field of financial fraud detection are identified based on the number of publications andthe number of citations received. Figure 4 proves that Gottschalk P and Naheem MA are the main contributors in terms of the number of publications. In addition, Karpoff JM, and Naheem MA are the main contributors based on the number of citations received. The most impactful documents in this field are those that are frequently referenced by other researchers. Table 3 shows that their research made a significant contribution to understanding and developing financial fraud detection techniques. The most relevant affiliations in this study are universities and research institutes that have many international publications and collaborations, such as BI Norwegian Business School, Beijing Normal University, and Islamic Azad University.

Keywords and Countries Involved in the Research

The keyword analysis used in this study shows the relationship between various topics and issues in the detection of financial fraud. Keywords such as "financial crime" and "fraud" are the main focus of the dataset. Technologies such as "machine learning" and "artificial intelligence" play an important role in financial crime detection and decision-making. Other techniques such as "data mining", "risk assessment", and "anomaly detection" are also used to identify and manage financial risks.

The thematic map presented in Figure 10 highlights the significant role of technology, particularly machine learning and data mining, in advancing the detection and analysis of financial crimes. Traditional methods such as descriptive statistics and regression analysis remain important but are less central than newer computational approaches. Blockchain and cryptocurrencies represent emerging applications of the technology in increasingly popular financial crime research and represent a promising area of research in the future. The countries that have the most studies on financial fraud detection are identified based on the numberof publications. The United States, China, and the United Kingdom are the countries with the highest number of studies, reflectingtheir important role in the development of this field.

IV. CONCLUSIONS

This study makes a significant contribution to the understanding and documentation of the literature on the detection of financial fraud using a bibliometric approach. By adopting the bibliometric analysis method and the PRISMA framework, the study successfully identified publication trends, the most relevant sources, leading authors, and important technologies in this domain. The results of the descriptive and content analysis provide in-depth insights into key focuses, international collaborations,and recent developments in financial crime detection techniques.

While it provides rich insights, the study has some limitations. First, limitations in the selection of certain databases such as Scopus can affect the scope of the literature analyzed. Second, certain search criteria may have limited the inclusion of relevant articles. In addition, the focus on a particular language or a particular type of publication may affect the global representation ofthe literature under consideration.

Based on the results of the research carried out, the recommendations for further research in the detection of financial fraud must focus on the development of more sophisticated machine learning algorithms, the integration of blockchain technology, morein-depth data analysis using data mining, and the application of Benford's Law. In addition, the development of an automatic detection system that is integrated with the company's financial system and collaboration with legal institutions for a more effective fraud prevention strategy is also very important. This research will help develop new techniques and strategies that are more effective in detecting and preventing financial fraud.

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