

ACCOUNTING FRAUD - A BIBLIOMETRIC ANALYSIS

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alexandru.anichiti@usm.ro**Abstract**

Accounting fraud is a big problem globally. Countries lose significant amounts of tax money because companies do not show their real profits and investors lose significant amounts of money when companies overstate their financials. New technologies, such as machine learning, artificial intelligence (AI), blockchain and the automation of the accounting process will help governments to prevent and discover accounting fraud more easily. This study is a bibliometric analysis on accounting fraud that can offer insights into how accounting fraud is perceived globally, what countries take it more seriously, and how could accounting fraud be prevented or more easily discovered when it occurs.

Keywords: accounting fraud; bibliometric analysis, fraud detection; economic crime; financial records

JEL Classification: M40

I. INTRODUCTION

Accounting fraud refers to intentional and deceptive manipulation of financial statements or accounting records to create a false or misleading picture of a company's financial health. Accounting fraud is considered an economic crime (Ciubotariu & Racolciuc, 2023). It is a serious ethical and legal violation that undermines the integrity of financial reporting and can have severe consequences for investors, creditors, and the broader financial system. Accounting fraud can take various forms, and perpetrators may include executives, employees, or external parties seeking to gain financial benefits (by tax avoidance) or hide poor performance (mainly for listed companies).

Accounting fraud has been for a long time a significant problem with consequences for countries (Tutino & Merlo, 2019), institutions, companies and investors. There is hope, however, that recent technological developments in the field of accounting (automated accounting, machine learning and artificial intelligence) will make it harder for companies to engage in accounting fraud without being discovered and will reduce the human error that can lead to accounting fraud by mistake.

However, to successfully reduce accounting fraud, there is the need of an in-depth analysis of the phenomenon in question. Therefore, the objective of this bibliometric analysis is to spotlight the factors that have contributed to the proliferation of fraud over the years. Once these factors are identified, it can offer insights into preventing such incidents in the future with the help of technology. Additionally, the paper serves as a foundation for a more comprehensive study on the same subject through empirical analysis.

II. FINANCIAL REPORTING IN ACCOUNTING

Financial reporting serves as a comprehensive system that consolidates data regarding a company's performance and financial standing. The presentation of this data is encapsulated in financial statements, crafted based on financial accounting data. These financial statements, designed to cater to both external users and company management, play an important role for various stakeholders, ensuring a high degree of credibility compared to other sources of information (Dănescu & Stejerean, 2022). They are instrumental for tax authorities in ensuring tax accuracy. Despite being produced under stringent legal requirements, prescribed reporting standards, and undergoing external audits, there exists a possibility for manipulation and fraud in accounting data and financial statements. Such manipulation may be employed to present a desired image of the company for diverse reasons. The detection of fraud and manipulation in financial statements is a focal point in accounting research.

Motives for fraud and manipulation vary depending on the purpose of the information. The majority of fraudulent activities in financial statements are associated with the use of false or misleading information to enhance company figures. This not only erodes the confidence of external users but also adversely affects all management analyses. Fraud detection in financial statements is a significant area of study in accounting.

Fraudulent practices and manipulation in financial statements are often linked to the dissemination of false or misleading information to improve a company's financial metrics. This can lead to detrimental consequences for creditors, current and potential investors, and prospective employees. Notorious cases, such as [Enron \(2001\)](#) involved fraudulent techniques such as overstating company performance by inflating revenue, exaggerating assets, and understating liabilities. The motivation behind these actions, particularly for listed companies, is often driven by a desire to boost accounting earnings, even if it results in higher corporate taxes.

Additionally, corporate income tax evasion has been identified as another reason for manipulating financial statement figures. Considerable research has been conducted on fraud detection and tax evasion by publicly traded corporations, with limited attention given to small and medium-sized companies in Europe, particularly those in transition economies ([Frank et al., 2009](#)).

It is clear that whether it is overstating their financial to draw investors, or understate their financial to pay less tax, the social cost of accounting fraud should be minimized, and governments should develop specific policies that combine responsible corporate governance in companies with the sustainability of their environment ([Ramos Montesdeoca et al., 2019](#)).

III. RESEARCH METHODOLOGY

Built upon the concept that bibliometrics involves statistical processes for the measurement and quantitative analysis of academic literature, scientific publications, and research papers, enabling the identification of influential publications in a specific field, we conducted a bibliometric analysis. Bibliometric tools are used to systematically capture recent contributions/developments in this research area, as well as thematic developments across time frames, without focusing on the reporting and interpretation of scientometric indicators ([Kicsi et al., 2023](#)).

The primary goal is to pinpoint the main research directions explored by scholars concerning the phenomenon of accounting fraud. Through this analysis, we aimed to highlight prevalent themes and keywords in this domain, organizing them into clusters based on their frequency in the literature.

This analysis sought to quantify the current knowledge level about the identified research in existing scientific articles on the Scopus platform. Our findings revealed a substantial body of information, including 348 journals, articles, books, patents, and datasets related to accounting fraud.

The bibliometric analysis involved 4 main steps, as shown in figure 1.

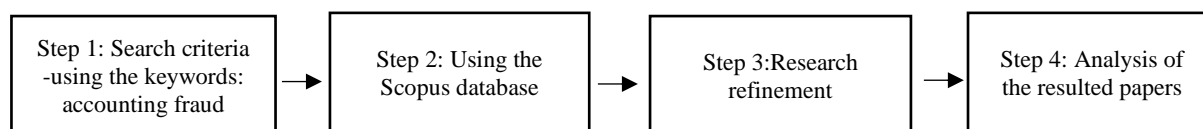


Figure 1. The stages of bibliometric analysis

Source: adapted from [Ruiz-Real et al. \(2018\)](#)

IV. RESULTS AND DISCUSSION

Accounting fraud is a global challenge that has witnessed a growing prevalence in recent years, impacting economies worldwide. Various factors, including economic crises and legislative shifts over time, have exerted pressure on societies and businesses, creating conditions conducive to the thriving of accounting fraud. Scientific research in this domain exhibited fluctuating patterns in the initial stages of the analyzed period but has witnessed a substantial increase more recently. This surge is a reflection of heightened interest in preventing and curbing the detrimental phenomenon of accounting fraud, as evident from the bibliometric analysis conducted through queries on the Web of Science platform.

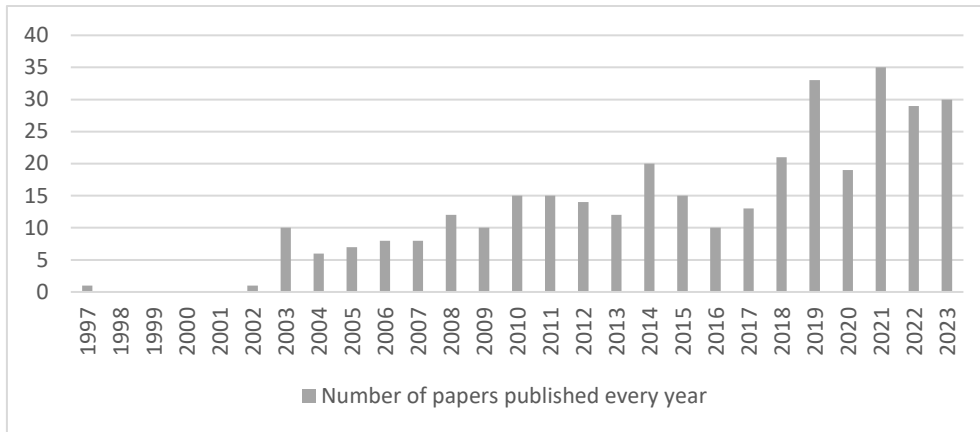


Figure 2. Evolution of the number of papers published between 1997-2023
Source: Own processing based on data extracted from the Scopus database

From the figure 2 above we can see that the number of articles published in the period 1997-2002 was very low, with years 1998, 1999, 2000 and 2001 having 0 papers published. Starting with the year 2003, the number of papers on the topic increased significantly. This may be as a result of the 2000-2001 dotcom bubble and subsequent economic crisis, where a lot of fraudulent internet companies posed as safe, stable businesses to attract investors, but also the Enron scandal of 2001.

After 2003, there was a plateau in the number of papers published, until the year 2010, one year after the financial crisis of 2008-2009, when the interest in the topic has picked up again.

After a period of relative stability, since 2016, the number of papers published on the Scopus platform has increased remarkably, with a pause in the year 2020.

According to the information presented above, there is evidence that the interest in the topic of accounting fraud is a growing one. For this reason, the study also involved a presentation of the geographical distribution of existing works, which facilitated us to obtain a mapping of the trends and preferences of writers for the development of knowledge in the field of accounting fraud according to the regions in which they are located.

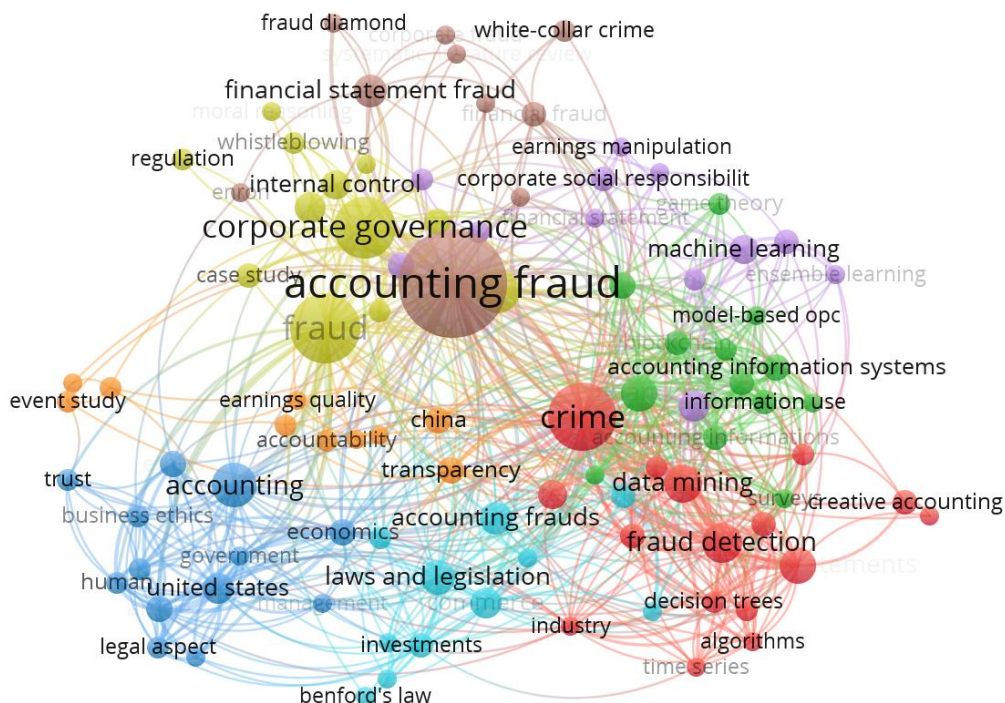


Figure 3. Network of key terms relevant to accounting fraud research
Source: own projection in VOSviewer

The topic of accounting fraud is covered in scientific articles from a wide-ranging number of countries.

However, their distribution is uneven geographically, with most of the publications were written by authors from the United States, China, Singapore, Indonesia, United Kingdom, Germany, Canada, Turkey and France.

Interestingly, there are no authors from Central and Eastern Europe (CEE) countries, which means that there is a much smaller interest in the topic, even though accounting fraud is a big problem in these countries (Semerád et al., 2022). The magnitude of the problem is confirmed by the fact that some of these countries have a substantial shadow economy. Among the European Union countries, the largest size of the shadow economy measured as a percentage of official gross domestic product (GDP) has been registered by Romania (30.14%) and Bulgaria (29.17%) (Popescu et al., 2018). Therefore, the interest in this topic should be higher in these countries.

It is important to mention, however, that the SCOPUS database does not include local publications written in languages other than English (Hashem et al., 2023). Additionally, the SCOPUS database includes journals of high scientific quality, and the authors of the articles in those journals tend to come from prestigious universities, usually located in the more developed countries of Western Europe, United States and East Asia (China, Japan, South Korea).

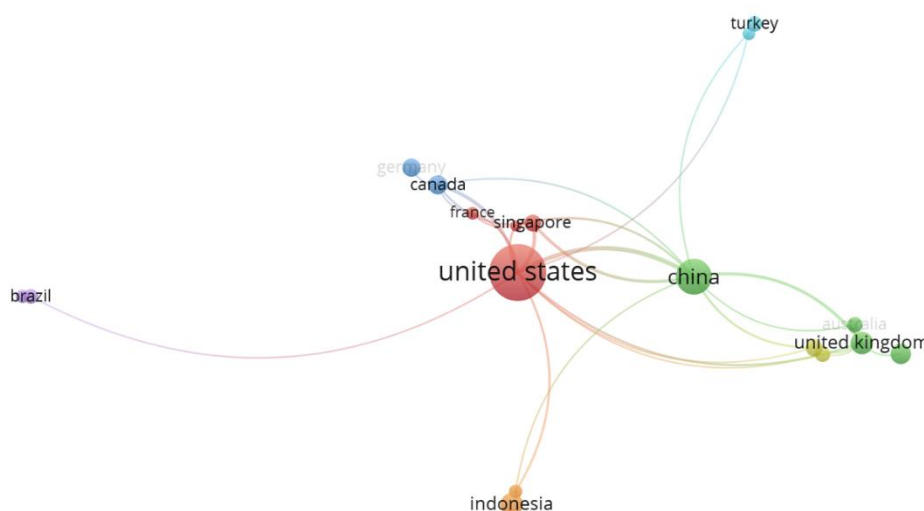


Figure 4. Countries/regions most concerned with the research topic of accounting fraud
Source: Own processing based on data extracted from Web of Science

The bibliometric review of the literature resulted in the frequency network of key terms shown in the figure above, which illustrates the links between the concepts of accounting fraud and other related concepts. Thus, it can be seen that terms such as 'crime' appear quite frequently in the literature (37 times), 'fraud' (with a frequency of 39) and corporate governance (frequency of 30 times) represent the strongest links with accounting fraud.

Other terms that are relevant and appear in the specialized literature are: 'financial fraud', 'white collar crime', 'blockchain', 'corruption', 'information systems', 'computer crime', 'machine learning', 'artificial intelligence' and 'internal control'. Thus, the terms are grouped according to these key terms, which are divided into 8 different clusters, represented in Table 1, which groups the most important terms according to the number of links and the frequency of appearance.

Table 1. List of key terms most frequently used in the literature to describe accounting fraud

Cluster	Keywords associated
Cluster 1 (brown)	Accounting fraud Financial statement fraud Financial fraud Enron Corporate fraud White collar crime
Cluster 2 (red)	Crime Computer crime Data mining Fraud detection Algorithms Time-series
Cluster 3 (green)	Finance Blockchain

	Information systems Accounting information system
Cluster 4 (blue)	Accounting Business ethics Economics Government Trust United States
Cluster 5 (yellow)	Fraud Corporate governance Internal control Regulation
Cluster 6 (purple)	Machine learning Artificial intelligence Accounting fraud detection
Cluster 7 (light blue)	Laws and legislation Commerce Accounting frauds Investments Benford's Law
Cluster 8 (orange)	Accountability Transparency China Earnings quality Auditors

Source: own projection based on VOSview results

In table 1 are presented the most common keywords that appear in relation to the term “accounting fraud”. To be shown in the table, a certain word or phrase has to appear a minimum of 5 times in the specialized literature. The results are filtered with the help of VOSviewer software. The bibliometric analysis shows 8 clusters.

The first cluster, the one that is directly linked to the term “accounting fraud” is related to other terms, such as: financial statement fraud, Enron, corporate fraud and white-collar crime.

The second cluster refers to crime, probably seen as economic crime, and it has related terms such as: computer crime and fraud detection.

The third cluster refers mostly to information systems (also seen as accounting information systems) and is related to the term blockchain. [Chen \(2022\)](#) argues that the blockchain technology would help to prevent and detect accounting fraud. The author identifies three characteristics of the blockchain technology would help with fraud detection and prevention. First, the decentralization (rather than centralized authorization) will largely increase the fraud cost, discouraging fraudulent behavior in financial reporting. Second, the append-only linear form of transactional data (rather than relational database) enhances the tracking of tokenized assets, making the data much more difficult to be modified than the data in a traditional relational database with many data operation possibilities. Third, with smart-contracts serving as automatic controls, the blockchain removes the human factor, thus enhancing the control environment. Given this information, it is understandable why the term blockchain appears near the term accounting information systems.

The fourth cluster refers to business ethics and trust.

The fifth cluster refers to corporate governance and internal control. [Rostami & Rezaei \(2021\)](#) indicate that robust corporate governance significantly reduces companies’ intention toward fraudulent financial reporting. Therefore, it is understandable why those two terms would be related. Internal controls usually have an effect on corporate governance.

The sixth cluster refers to accounting fraud detection, and it is related to the concepts of machine learning and artificial intelligence. As technology and information evolve, significant changes arise, necessitating collaboration with technological advancements such as artificial intelligence. Considering the prevalence of fraud in financial reporting, organizations are compelled to adapt to technological progress, making artificial intelligence-based accounting information systems a requirement.

AI is of particular importance in the future of accounting. the current technological context, it is estimated that most of the tasks assigned to the accountant could be automated, efficiently performed with minimal human intervention ([Brennen et al., 2022](#)). However, it is important to mention that this will not automatically solve the issue of accounting fraud, as AI systems could be programmed with the intent of finding the best ways to break the law and commit accounting fraud.

While there may be additional clusters identified in the bibliometric analysis, their significance for result presentation has been deemed lesser, and they are not discussed in this context. Through the bibliometric analysis,

we have enhanced our comprehension of the phenomenon within scientific study, uncovering and emphasizing significant links and correlations between key concepts related to the topic of accounting fraud.

V. CONCLUSION

By conducting a bibliometric analysis of publications on the topic of accounting fraud, this study provides a fundamental understanding of the evolving landscape of this field of study.

There is clear data that indicates interest in the topic is picking up when there is a scandal involving accounting frauds, such as in the case of Enron scandal and the aftermath of the financial crisis of 2008-2009.

However, the constant increase in the number of publications in the last years is related to the fields of machine learning, artificial intelligence, the blockchain, and other technologies that may help auditors, states, investors and the general public by making it harder to hide fraud.

Simultaneously, this bibliometric analysis also shows that there are not enough papers that study the problem of accounting fraud in the Central and Eastern European countries. There is a need for more research on the topic in a part of the world where the problem of accounting fraud is higher than in Western Europe. Underscores the global dimension of the economic crime problem, necessitating a robust international strategy.

Looking to the future, researchers and policymakers in the legal field will encounter considerable challenges as the problem of accounting fraud is likely to continue. However, there is hope that certain technological developments, such as artificial intelligence, machine learning, big data, blockchain will be able to make accounting fraud more easily discoverable. Strengthening collaboration between, policymakers, and private sector partners is also essential for a coordinated effort to create a comprehensive framework for the analysis and prevention of accounting fraud.

In conclusion, accounting fraud is a problem and will likely continue to be a problem. But, with the help of technology and the cooperation between the public and private sector, the effects of accounting fraud on the society can be minimized, with more prevention.

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