The Evolution of Financial Auditing: How Artificial Intelligence and ChatGPT Facilitate Data Analysis and Irregularity Detection

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Abstract

A documentary review was carried out on the production and publication of research papers related to the study of the Artificial Intelligence and Financial Audit variable. The purpose of the bibliometric analysis proposed in this document was to know the main characteristics of the volume of publications registered in the Scopus database during the period 2017-2022, achieving the identification of 68 publications. The information provided by this platform was organized through graphs and figures, categorizing the information by Year of Publication, Country of Origin, Area of Knowledge and Type of Publication. Once these characteristics have been described, the position of different authors on the proposed topic is referenced through a qualitative analysis. Among the main findings made through this research, it is found that China, with 3 publications, was the country with the highest scientific production registered in the name of authors affiliated with institutions of that nation. The Area of Knowledge that made the greatest contribution to the construction of bibliographic material related to the study of the Artificial Intelligence and Financial Auditing variable was Computer Science with 43 published documents, and the most used Publication Type during the period indicated above were Journal Articles with 47% of the total scientific production.

Keywords: *Financial Auditing, Artificial Intelligence, ChatGPT.*

1. Introduction

The introduction of artificial intelligence and advanced natural language models performed by ChatGPT has marked the beginning of a revolutionary and innovative decade in the field of financial auditing. This lean field marked by great complexities and increasingly extensive, a constant flow of databases and information and greater regulatory scrutiny by state entities, the implementation of these new cutting-edge technologies such as artificial intelligence has emerged as an essential pillar to facilitate and analyze large amounts of data and thus be able to detect irregularities within the field of financial auditing.

The financial audit landscape is inherently multifaceted, which involves a rigorous examination of an organization's financial statements, accounting records, and transactions in order to ensure accuracy, compliance, and regulations imposed by general

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accounting principles. Initially, traditionally, financial auditors carried out their processes manually and used software-based tools to perform these financial tasks. While these traditional models efficiently served their functions, there are many difficulties due to the vast growth of high volumes of information data and data analysis, the challenges of financial structures, and the ever-evolving regulatory frameworks.

The integration of artificial intelligence, which has the functionality of encompassing machine and autonomous learning, natural language processing and data analysis. AI-powered solutions have the inherent ability to not only automate routine and repetitive audit processes, but also to give auditors a huge advantage by improving the ability to uncover subtle financial irregularities. In this context, ChatGPT, an advanced AI model developed by OpenAI, emerges as a remarkable innovation.

AI's influence on financial auditing is broad and multifaceted. AI models like ChatGPT are not mere tools, but companions to auditors, extending their capabilities beyond human limitations. They can process and analyze large data sets in real-time, recognize intricate patterns, and unmask irregularities that could elude the scrutiny of human auditors. Potential applications of AI in this field encompass data mining, anomaly detection, risk assessment, and generating contextual information to provide a comprehensive understanding of the financial landscape.

As you recognize the importance of using these new artificial intelligence technologies in the field of financial auditing, the need to implement ChatGPT in financial supervision will become increasingly evident, as it is not simply a leap forward, but a revolutionary transformation that would reshape the contours of financial accountability and integrity. For this reason, this article seeks to describe the main characteristics of the compendium of publications indexed in the Scopus database related to the variables Artificial Intelligence and Financial Auditing, as well. Such as the description of the position of certain authors affiliated with institutions, during the period between 2017 and 2022.

2. General Objective

To analyze, from a bibliometric and bibliographic perspective, the preparation and publication of research papers in high-impact journals indexed in the Scopus database on the variable variables Artificial Intelligence and Financial Auditing during the period 2017-2022.

3. Methodology

This article is carried out through a research with a mixed orientation that combines the quantitative and qualitative method.

On the one hand, a quantitative analysis of the information selected in Scopus is carried out under a bibliometric approach of the scientific production corresponding to the study of the variable Artificial Intelligence and Financial Audit. On the other hand, examples of some research works published in the area of study mentioned above are analyzed from a qualitative perspective, based on a bibliographic approach that allows describing the position of different authors on the proposed topic. It is important to note that the entire search was carried out through Scopus, managing to establish the parameters referenced in Figure 1.
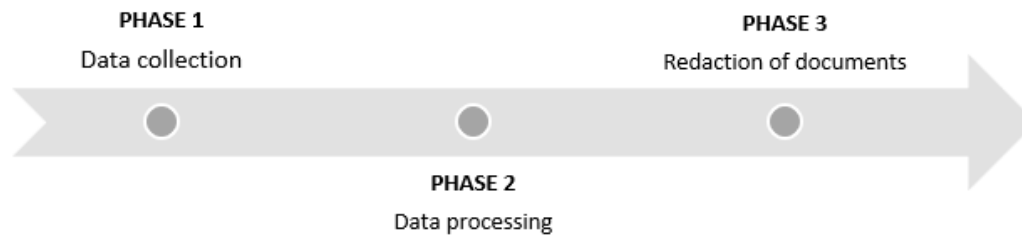
3.1. Methodological design

Figure 1. Methodological design

Source: Authors' own creation

3.1.1 Phase 1: Data collection

Data collection was carried out from the Search tool on the Scopus website, where 68 publications were obtained from the following filters:

TITLE-ABS-KEY (financial AND audit, AND artificial AND intelligence) AND PUBYEAR > 2016 AND PUBYEAR < 2023

☐ Published documents whose study variables are related to the study of variables, Artificial Intelligence variable and Financial Audit.

☐ Limited to the years 2017-2022.

☐ Without distinction of country of origin.

☐ Without distinction of area of knowledge.

☐ No distinction of type of publication.

3.1.2 Phase 2: Construction of analytical material

The information collected in Scopus during the previous phase is organized and then classified by graphs, figures and tables as follows:

☐ Co-occurrence of words.

☐ Year of publication.

☐ Country of origin of the publication.

☐ Area of knowledge.

☐ Type of publication.

3.1.3 Phase 3: Drafting of conclusions and outcome document

In this phase, the results of the previous results are analysed, resulting in the determination of conclusions and, consequently, the obtaining of the final document.

4. Results

4.1 Co-occurrence of words

Figure 2 shows the co-occurrence of keywords found in the publications identified in the Scopus database.
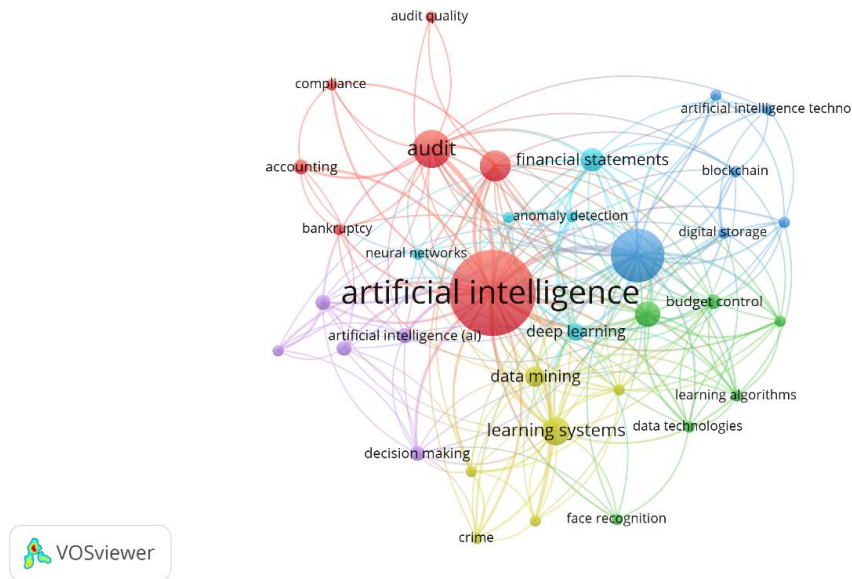
Figure 2. Co-occurrence of words

Source: Authors' own elaboration (2023); based on data exported from Scopus.

Artificial Intelligence was the most frequently used keyword within the studies identified through the execution of Phase 1 of the Methodological Design proposed for the development of this article. Financial Statements are among the most frequently used variables, associated with variables such as Deep Learning, Data Processing, Data Analysis, Budget Control, Digital Storage, Accounting. From the above, it draws attention, in a comprehensive exploration of how AI and ChatGPT facilitate data analysis and the detection of irregularities in financial auditing. We'll delve into the underlying technologies that drive AI-powered financial auditing, elucidating the mechanics of machine learning, natural language processing, and predictive analytics that enable these tools to thrive in the audit ecosystem. In addition, we will examine the tangible and intangible benefits of integrating AI into financial auditing, including increased accuracy, efficiency, cost-effectiveness, and empowering auditors to take a more proactive stance against financial irregularities.

4.2 Distribution of scientific production by year of publication

Figure 3 shows how scientific production is distributed according to the year of publication.
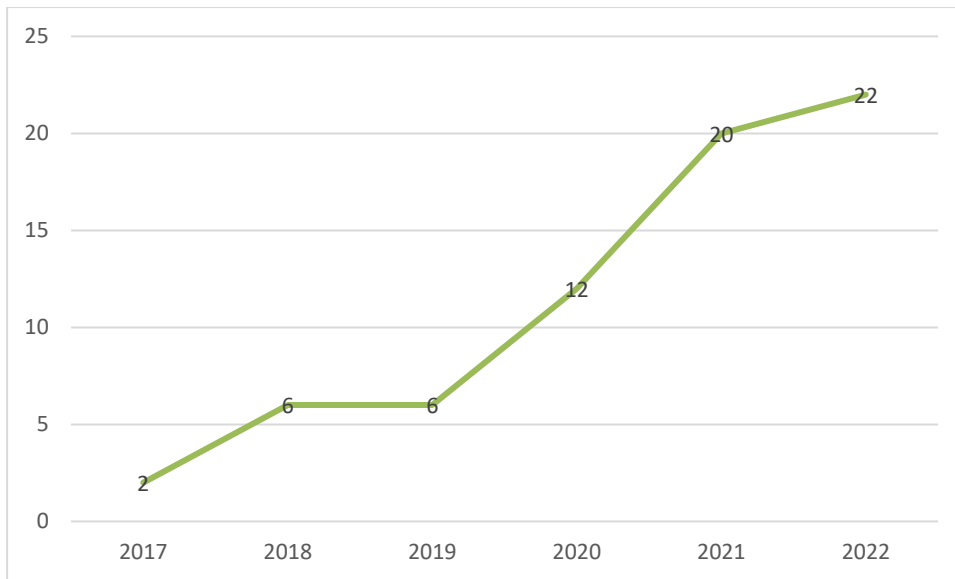
Figure 3. Distribution of scientific production by year of publication.

Source: Authors' own elaboration (2023); based on data exported from Scopus

Among the main characteristics evidenced through the distribution of scientific production by year of publication, the number of publications registered in Scopus was in 2022, reaching a total of 22 documents published in journals indexed on this platform. This can be explained by articles such as the one titled "A Whole Population Audit Method Based on Machine Learning" This study uses empirical methods to propose a whole population audit method based on machine learning. This method can extend the scope of audit application to all samples through machine learning's self-learning feature, which helps address the reliance on auditors' personal expertise and audit risks arising from audit sampling. First, this article demonstrates the feasibility of this method, then selects a large company's financial data for full population testing, and finally summarizes the critical steps of practical applications. The results of the study indicate that machine learning for full-population audits is capable of detecting, in all samples, abnormal businesses whose execution does not conform to existing accounting rules, as well as abnormal businesses with irregular accounting rules, thus improving the efficiency of internal control audits. . By combining the learning capacity of machine learning algorithms and the arithmetic power of computers, the proposed whole-population audit method provides a feasible approach for the intellectual development of future auditing at the application level.(Chen, 2022)

4.3 Distribution of scientific output by country of origin

Figure 4 shows how scientific production is distributed according to the country of origin of the institutions to which the authors are affiliated.
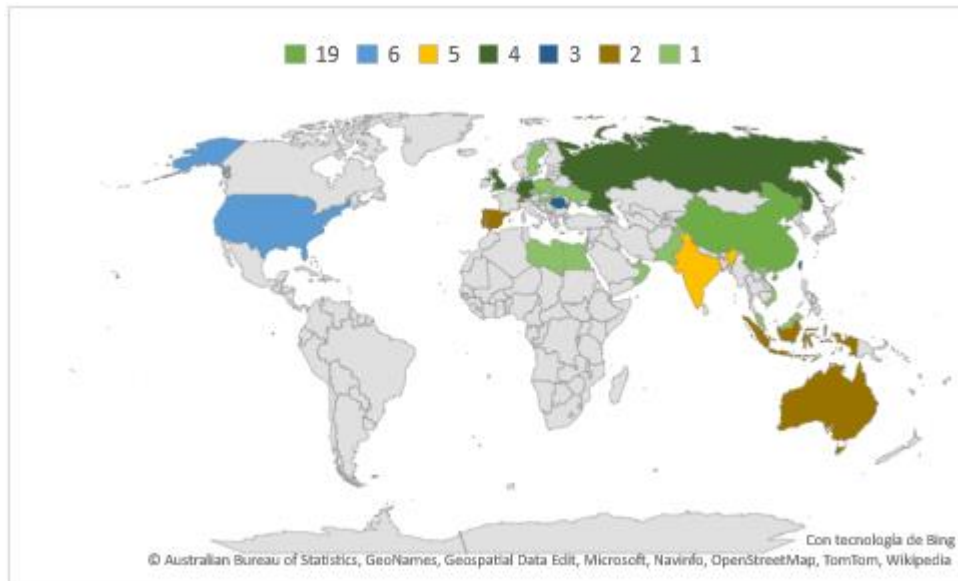
Figure 4. Distribution of scientific production by country of origin.

Source: Authors' own elaboration (2023); based on data provided by Scopus.

Within the distribution of scientific production by country of origin, the registrations from institutions were taken into account, establishing China as the country of this community, with the highest number of publications indexed in Scopus during the period 2017-2022, with a total of 19 publications in total. In second place, the United States with 6 scientific papers, and India occupying the third place presenting to the scientific community, with a total of 5 papers among which is the article entitled "Interaction Design of Financial Insurance Products in the Age of AIoT" This study aims to explore how the insurance business can combine artificial intelligence (AI), Big Data technology and good design under the green background of AIoT to improve the efficiency of double entry in the insurance business and improve the user experience. It is achieved through observation, user interviews, and other methods to explore user needs and pain points, the comprehensive use of image and video analysis, facial recognition, behavioral detection, and other artificial intelligence technologies. The aiCore intelligent dual recording system is proposed, integrating a mobile terminal dual recording application and a behind-the-scenes quality control system. The proposed system achieved the optimization of the design of the entire process of the intelligent dual recording scenario by combining the three functions: "front intelligent dual recording, real-time quality control during the process, and post-AI quality control". Using in-process detection, post-review, and manual final audit, the aiCore intelligent dual recording system has significantly improved the efficiency of dual recording, quality inspection pass rate, and user experience satisfaction.(An, 2022)

4.4 Distribution of scientific production by area of knowledge

Figure 5 shows the distribution of the elaboration of scientific publications based on the area of knowledge through which the different research methodologies are implemented.
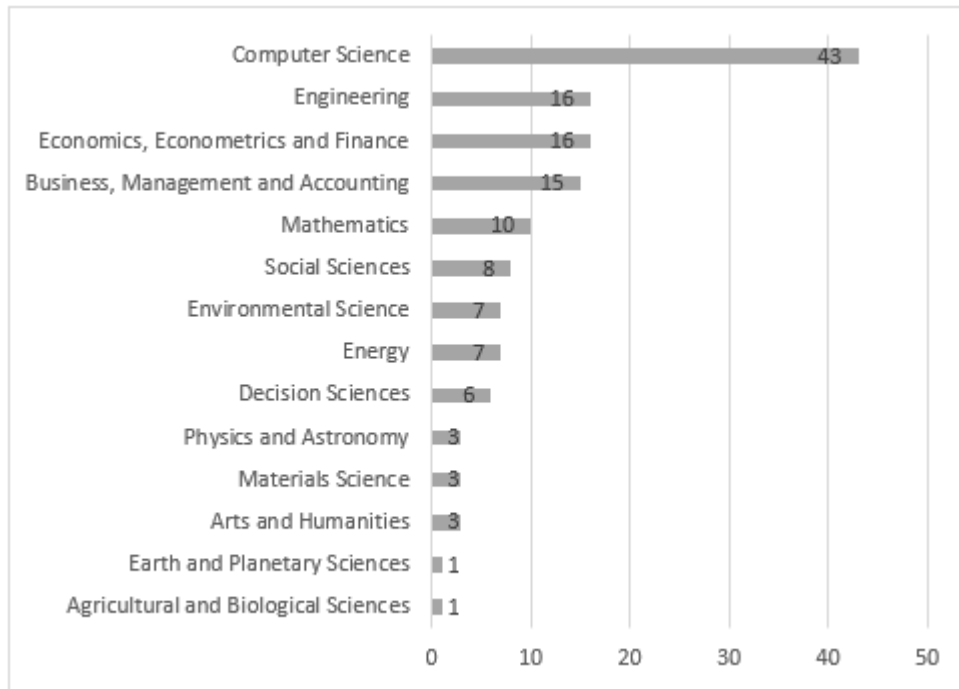
Figure 5. Distribution of scientific production by area of knowledge.

Source: Authors' own elaboration (2023); based on data provided by Scopus

Computer Science was the area of knowledge with the highest number of publications registered in Scopus, with a total of 43 documents that have been based on its variable methodologies: Artificial Intelligence and Financial Auditing. In second place, Engineering with 16 articles and Economics, Econometrics and Finance in third place with 16. The above can be explained thanks to the contribution and study of different branches, the article with the greatest impact was registered by the area of Computer Science entitled "A fuzzy comprehensive evaluation and a random forest model for early warning of audit of financial accounts" in this study a financial early warning model is proposed. First, financial early warning indicators are built and existing financial indicators are used to establish an early warning indicator system that can detect and identify the company's financial risks. Then, the financial early warning model based on the fuzzy comprehensive assessment model and the random forest algorithm for fuzzy comprehensive assessment is built using the advantages and noise resistance of the integrated model of the fuzzy comprehensive assessment model and the random forest algorithm. The financial dataset is used to verify the model built in this study. The experimental results show that the model of this study is not only beneficial for firms to control financial crises but also plays a financial early warning role.(Zhu, 2022)

4.5 Type of publication

In the following graph, you will see the distribution of the bibliographic finding according to the type of publication made by each of the authors found in Scopus.
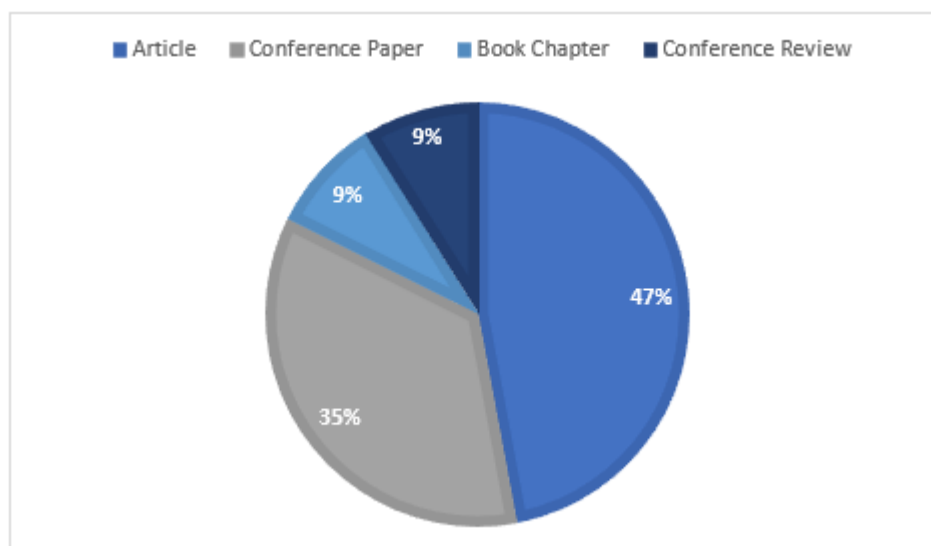
Figure 6. Type of publication.

Source: Authors' own elaboration (2023); based on data provided by Scopus.

The type of publication most frequently used by the researchers referenced in the body of this document was the one entitled Journal Articles with 47% of the total production identified for analysis, followed by Session Paper with 35%. Chapter of the Book are part of this classification, representing 9% of the research papers published during the period 2017-2022, in journals indexed in Scopus. In the latter category, the one titled "How the size of the audit firm moderates the effect of the toe context towards the adoption of machine learning by the auditor" stands out. The purpose of this study was to determine the auditor's acceptance of the use of machine learning to face industry 4.0 to assist them in the audit of the client's financial statements. This research instrument refers to the Technology Organization Environment (TOE) approach and the size of the audit firm. This research is a quantitative investigation that uses primary data in the form of questionnaires distributed to the research objects, which are the auditors who work in the offices of public accountants. This study examines hypotheses between variables using path analysis, partial least squares structural equation modeling (SEM PLS), while the independent variables in this study are technological context, organizational context, and environmental context, while firm size becomes a moderating variable and the dependent variable is auditor adoption. of machine learning. The results of this study are to understand the adoption of auditors in information technology in their work processes. It is expected to provide an overview of the auditor's expectations on the use of information technology, so that it can provide an improvement in the quality of work to make it more effective and efficient, especially in terms of time and energy. The results of this study are expected to provide an overview of technology adoption by financial auditors in professional audit firms.(Handoko, 2021)

5. Conclusions

Through the bibliometric analysis carried out in this research work, it was possible to establish that China was the country with the highest number of records published in the Artificial Intelligence and Financial Audit variables. with a total of 19 publications in the Scopus database. In the same way, it was possible to establish that the application of theories framed in the area of Computer Science, were used more frequently in the implementation of artificial intelligence in the field of financial auditing since it has emerged as a revolutionary force that offers professionals unprecedented opportunities. to improve efficiency and accurately manage potential financial risks and regulatory

bodies. This new technology has the potential to transform the way financial audits are being conducted, providing significant benefits for auditors and business organizations in improving their services. One of the main advantages in the integration of ChatGPT in financial auditing is the ability of natural language, which allows them to analyze and process large amounts of data automatically and quickly, minimizing the probability of human error and thus improving the quality provided in audits. The extensive field of algorithms presented by ChatGPT aims to analyze financial transactions, detect anomalies in advance and identify future frauds faster than traditional paradigms, thus enabling financial auditors to provide unprecedented information in a valuable way and allocating their time and expertise more efficiently. In addition, one of the characteristics offered by AI is its ability to adapt and learn from historical data, which allows auditors to develop alternative predictive methods for the purpose of identifying future risks. This quality provided by AI is essential to solve problems in a proactive way and thus offer different recommendations to future customers, which ultimately contributes to more efficient financial decision-making.

However, the adoption of AI in financial auditing is not without its challenges. Ensuring data privacy, ethical considerations, and the need for human oversight are important factors that need to be addressed. In addition, auditors and financial professionals must continuously update their skills to effectively work alongside AI systems and interpret their results accurately. As technology continues to evolve, it is essential for auditors to embrace AI as a valuable tool that complements their expertise and ultimately benefits organizations, investors, and other stakeholders. The synergy between human auditors and AI promises a future where financial audits will not only be more reliable but also more insightful and forward-looking.

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