

A BIBLIOMETRIC REVIEW OF SCIENTIFIC PUBLICATIONS ON ARTIFICIAL INTELLIGENCE IN ACCOUNTING AND AUDITING

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Abstract

Specifically, this study seeks to map the body of scientific knowledge at the crossroads of artificial intelligence (AI), accounting, and auditing by using bibliometric methods. In this regard, 880 academic publications from the Web of Science Core Collection database were obtained and analyzed. VOSviewer (v1.6.20) for bibliometric network analysis and visualization was used, including keyword co-occurrence analysis; co-authorship analysis of author- and country-level, citation, and co-citation analyses. Network mappings were obtained by the association strength counting approach alongside the LinLog/modularity layout algorithm (attractive = 2, repulsive = -1) and a modularity-based clustering method.

Initial data entry, which included the identification of duplicate terms, data cleaning, and the creation of a thesaurus file, was performed in Python 3.11. Annual citation summaries and Field-Weighted Citation Impact (FWCI) tables were generated in Microsoft Excel 365.

Keyword analysis reveals that existing literature, though not limited to digital transformation and advanced analytics in auditing, includes increasingly governance and society aspects such as ESG, sustainability reporting, ethics, fairness, algorithmic bias, trust, etc. This trend could indicate that AI in accounting and auditing has transitioned from merely a technical instrument to a pivotal influence in the area of corporate social responsibility, transparency in decision-making, and in the trust of stakeholders.

Analysis by author indicates that the amount of authorship within the domain is relatively concentrated on a limited number of high-profile scholars. Key actors Miklos A. Vasarhelyi, Steve G. Sutton, and Vicky Arnold are of special attention in the domain of collaboration networks and citation relationships. For the countries studied at the country-level, data has led the way toward the United States having the largest place in these findings across literature, with the United Kingdom, Germany, and Australia with strong connectivity. Türkiye, in comparison, is a smaller font and has a lower level of publication output and less integration into international co-authorship and citation networks.

A comprehensive overview of the thematic diversity in the AI and accounting literature, the evolution of governance-oriented concepts, and global contexts for scientific interaction is covered in this study.

Keywords: Accounting, Auditing, Artificial Intelligence, Bibliometric Analysis, VOSviewer

JEL Codes: M40, M41, M42

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INTRODUCTION

With every new revolution that has come into play, all societies have undergone radical changes in structure, mode of production, and profession. While steam power emerged in the eighteenth century and catalyzed the Industrial Revolution by converting human muscle power into mechanical power, modern artificial intelligence (AI) technology is paving the way for a similar transformation by approximating human cognition (Garg, 2021, p. 3; Munoko et al., 2020, p. 209). This time, however, the alteration is more than literal labor: it involves mental processes alongside decision-making processes and—more critically—the essential character of professional occupations itself (Munoko et al., 2020, p. 209). Accounting, which can be considered the “language of business” and auditing as its major assurance instrument, is among the areas most profoundly affected (Carnegie et al., 2021, p. 69).

In line with the growing pace of economic development of societies, the accounting profession has adapted through each passing epoch. From the double-entry bookkeeping system used by Venetian merchants (Sangster, 2021), to cost accounting post-industrial revolution (Fleischman & Tyson, 1993; McKendrick, 1970), through enterprise resource planning systems in today’s digital age (Katu, 2020), it is these different facets of the profession which point to an unbound and ever-evolving capacity for renewal. However, the changes we are witnessing today suggest that there is a different dimension to the transformation undergone earlier each and every time. AI, then, is not just a tool. It is a driving force transforming accounting processes, auditing procedures, and even what the roles of accountant and auditor are (Anica-Popa et al., 2024).

There is much current academic interest in the major changes due to AI in accounting and auditing field. In the last couple of years there has been the significant increase in scientific publications since 2019 which both proves the theoretical and the practical importance of the topic and reflects a unique multidisciplinary research sub-domain that is about to emerge as well. Against this backdrop of growth and diversification there is a fundamental requirement to systematically comprehend the intellectual nature of the field of research and its major actors, dominant research themes and future research directions. However, some researchers claim the current literature on AI as a tool and its future utility in accounting and auditing is neither complete nor comprehensive (Silva et al., 2022).

Within this broader context, the current study seeks to conduct a bibliometric analysis of 880 academic publications available in the Web of Science database to map scientific production in the domains of AI, accounting, and auditing. In particular, it aims to highlight key authors, collaboration networks amongst scholars, popular keywords, and leading sources of publications as well as prominent countries

engaged within the domain. Furthermore, this study aims to offer a holistic view of the present situation and future development prospects of AI in accounting and auditing, as it addresses potential research gaps for academics as well as practitioners and regulatory experts.

Bibliometric analysis provides a structured approach for discovery of authorship that appears to be critical to research, and mapping patterns of academic collaboration in a given research area. Furthermore, by identifying new research topics, the technique can help researchers track new trends and steer their research interests to new avenues of possibility. Bibliometrics in general (and research methods in particular) have become increasingly popular in recent years due to improvement of bibliometric programs and greater availability of scientific databases like Scopus and Web of Science (Atabay, 2024, p. 71).

CONCEPTUAL FRAMEWORK

Although artificial intelligence (AI) is a concept that has been emerging massively in recent years and whose importance is profound, its origin is in fact very old. Turing (1950) – widely regarded as the father of computer science – in 1950 established both philosophical and theoretical foundations for AI by asking, “Can machines think?” (Turing, 1950, p. 433). This seminal work kicked off a debate about whether machines could have human-like cognitive capacities, and defined the direction for later research. The Dartmouth Conference (1956) was the event that initiated AI as a science, when the first use of the term “artificial intelligence” was introduced by John McCarthy (Moor, 2006, p. 87).

The field of AI offers various definitions and outlooks in the literature. The most abstract definition for the term AI is the process of humans mimicking human-like thinking and behavior (Garg, 2021, p. 3). More explicitly, AI is described as a cognitive technology category comprising cognitive technologies that automate various tasks including computation and analytics, which ultimately represents fundamental changes in human decision-making processes (Sarker, 2022, p. 2).

Munoko et al. (2020: 209) describe AI as a new technology aimed at mimicking human cognitive capabilities and judgment. Hassani et al. (2020: 145) provide a more comprehensive definition, stating that AI is a computer system that reproduces human cognition, makes decisions, and learns from emerging patterns using data from various sources and systems. According to Askary et al. (2018:316), AI is a software and hardware hybrid that enables the solution of complex business problems by using reasoning, learning, explaining, and pattern recognition capabilities similar to human intelligence.

All these definitions indicate that AI lies in its capability of programmable systems to do tasks of operation usually expected from a human brain. The basic aim of AI systems is to reproduce those which

humans perceive and perform with us in terms of understanding and then further develop that capability to surpass human performance (Coman et al., 2002, p. 7).

Accordingly, AI must be seen as a type of system that can convert human knowledge and human intelligence into productive things with the aid of technology. Just as the implementation of machines in the Industrial Revolution transformed jobs that previously relied on physical human labour into processes with a higher mechanical impact (enhancing productivity), AI enhances productivity by automating the mechanical processes associated with cognitive and intellectual work using computers, hardware, and software.

However, it has also critical perspectives asking whether AI can fully reflect or replicate human intelligence (Weber, 2023). Proponents of this type of critique maintain that human consciousness and intelligence are the result of a complex and prolonged evolutionary process, raising philosophical concerns about the potential for machines ever truly acquiring consciousness or forming intelligent thoughts. Indeed, it is claimed that AI may remain insufficient in replicating uniquely human capabilities such as creativity, intuitive judgment, or emotional intelligence (Hasan, 2022, p. 462).

Notwithstanding these disputes, there is no dispute that AI has been widely adopted and achieved great success in the realm of modern practice automating a multitude of repetitive and structured tasks in most data fields.

LITERATURE REVIEW

Demand and supply-side factors both have been key drivers of the fast and consistent growth of artificial intelligence (AI), in recent years. On the demand side, the development of an increasingly complex business environment and the need to process large quantities of data within very short periods to enable decision making is the main driving force. Globalization and digitalization require organizations to go on the basis of real-time assessment and quick decision-making. On the supply side, it may be argued that open and accessible datasets, the diffusion of cloud computing infrastructures, an exponential improvement in hardware capacity -especially in GPU technology- and improvements in software development are salient factors (Kokina & Davenport, 2017, p. 115). Disaggregated within this supply-demand context, AI technologies represents a strategic weapon that offers firms a competitive edge.

As an organizational function, accounting contributes to the management of funds, strategic decisions, tax compliance and budgeting, performance measurement, and governance (Carnegie et al., 2021, p. 69). Commonly acclaimed as the “universal language of business” accounting serves to systematically

measure, record, classify and communicate economically relevant activities to information users. Accounting is not just bookkeeping, it is not just reporting, it is the strategic function of creating organizations in order to gain sustainable competitive advantage in this rapidly evolving and competitive environment. Now more than ever, accountants are being challenged to not only deliver traditional financial reporting, but now even more in conjunction with clients, accountants are required to also offer up-to-date financial analysis, customized advisory services, predictive analytics and forward-looking advice on business. These heightened expectations compel innovative accountants to have interdisciplinary skillsets and technological know-how, as well as their own strong strategic thinking skills (Peng et al., 2023, p. 2). However, with extremely high workloads, these varied expectations have become increasingly impossible to fulfill through traditional accounting processes and systems only, thus making it virtually impossible, when faced with the challenge of achieving multifaceted targets.

Deep changes in the accounting and auditing professions were driven by some recent developments in AI technology. A study by Zhang et al. (2020) shows that four of the largest accounting firms-Deloitte, PricewaterhouseCoopers (PwC), Ernst & Young (EY) and KPMG-have achieved substantial improvement in the efficiency of their operations by automating various accounting functions. Such companies want to mitigate the time dedicated to repetitive accounting tasks through robots RPA and intelligent software, and move human resources in quality control and value-adding activities.

According to Chukwuani & Egiyi (2020), accountants' adaptability to these AI technologies is imperative for their long-term professional survival. They contend that accounting professionals who cannot adopt technological change will face growing employment dangers. AI applications are increasingly being implemented into accounting systems to promote more integrated, intelligent, and predictive structures.

Because the main purpose of accounting is providing transparent and timely financial information to empower stakeholders to make informed and effective decisions, leveraging AI in generating quality information became a strategic imperative (Askary et al., 2018, p. 316). Accounting and auditing tasks, in general, are structured, repeatable and rule-based processes that can be automated (Kokina & Davenport, 2017, p. 115), implying that they can be ideal domains for AI technologies to be applied.

It automates automated repetitive processes of data entry, reconciliations, invoice processing, and standardized financial reporting, allowing accountants to devote their time to strategic planning, client advisory services, and value creation activities. In a recent empirical study on accountants' adaptability to technology, Kumar Doshi et al. (2020) describe the "paradoxical effect" of AI, contending that, in addition to being a great opportunity, it brings dangers to the future of the profession.

The benefits of AI adoption in accounting and auditing can be summarized as follows (Chukwuani & Egiyi, 2020; Mohammad et al., 2020; Silva et al., 2022):

- **Operational effectiveness and time savings:** AI has the potential to help reduce routine and repetitive processes typically performed manually by automating those structured procedures, which can save time and manpower and provide accountants with the space for higher-end, higher purpose work while increasing efficiency.
- **Quality improvement and error reduction:** AI is helping in quality and error reduction of accounting information, enabling better precision in detecting fraud, improving the quality and reliability of accounting information, and reforming the traditional accounting/audit process. The AI systems increase the accuracy of financial reporting by reducing human error.
- **Data can be helpful for cost-saving and for customer satisfaction:** In addition to saving money, AI can enhance customer satisfaction by making fast and better client service delivery a possibility.

As per International Auditing Standards, the auditors need to gather sufficient, appropriate, and reliable audit evidence to support their auditing opinion (Durmuş et al., 2018, p. 68). Sufficiency means the amount and quality of evidence needed by an auditor to carry out an audit, to allow reasonable assurance and to arrive at a credible audit opinion and the appropriate evidence will concern the audit structure, risk level and vulnerability to material misstatements. Reliability is about collecting audit evidence (İkvan & Demirkol, 2021, p. 56) in the manner and the extent.

AI tools automating the audit processes and improving analytical procedures drastically improves the sufficiency, appropriateness, and reliability of the audit evidence. However, as business processes have rapidly expanded and transaction volumes have significantly increased in recent years, a tremendous amount of information, documents and data has grown exponentially within organizations, thus, the time constraints and efficiency issues in audit processes have grown considerably.

AI systems play a crucial role in automatically identifying mistakes, fraud, suspicious transactions, anomalies and inconsistencies in large volumes of information and data and in facilitating systematic risk assessments. Because manual processes are inexorably inaccurate and prone to error, the biggest benefit of the utilization of AI in auditing is the saving of time during the prep work and in common tasks hence the time and resources are saved for the areas that need professional judgment and strategic assessment by the auditors.

AI in auditing can systematically refine the quality of audits and improve the level of audit assurance by eliminating the time, effort, and labor of detailed auditing of financial statements, for the benefit of the clients.

The widespread use of AI in accounting and auditing not only improves efficiency, but also creates multiple dimensional jobs risks that relate to employment, ethics, security, and evolution in a professional role. The most mentioned risks in the literature are listed as follows (Zemánková, 2019; Petkov, 2020; Silva et al., 2022):

- **Job security and employment concerns:** Automation will reduce routine accounting and auditing duties, which is particularly worrying for low and mid-level roles.
- **Data security and privacy:** AI systems have the potential to process large volumes of sensitive financial data, leading to major concerns for cybersecurity and data privacy.
- **High initial costs:** In creating AI infrastructure, systems and staff training setup and program integration, artificial intelligence infrastructure, and training investment require substantial initial investments.
- **Ethical and legal issues:** Algorithms present ethical problems when it comes to transparency, accountability and bias.

As accounting profession takes on more strategic, analytical and advisory roles, accounting professionals are called upon to play an increasingly strategic role as companies undergo digital transformation. Moreover, accounting professionals will need to acquire essential skills in the field of information technologies (IT), data science (DS), business analytics (BA), and AI that are integrated into this process (Tavares et al., 2023).

In order to successfully adapt to AI-led change, twenty-first-century accountants should gain a variety of skills and competences including professional expertise, managerial skills, technological competence, technology acceptance, analytical skills, decision-making capabilities and the capability to anticipate and monitor future changes and challenges (Chukwuani & Egiyi, 2020).

Hence, it is important for universities, and for all institutions offering accounting education, to systematically include AI-supported technology and applications in their curricula so that they are poised to equip future accounting professionals. However, Elo et al. (2024) found that the largest extent of the expectation–performance gaps among accounting students are in the fields of AI and robotics, suggesting a persistent and substantial skills deficit.

Because the accounting profession is constantly evolving and requiring new innovations and changes, it is a given for accounting practitioners to adopt the lifelong learning habits and make ongoing commitments during their professional life.

Several recent years have resulted in a surge of bibliometric research focusing on the effect of AI in the context of accounting and audit. These studies aim to chart out scientific production, detect research trends, and suggest directions forward for future work.

Agustí & Orta-Pérez (2023) carried out a systematic bibliometric exploration of Big Data and AI impacts on accounting and auditing. The study used co-word analysis and bibliographic coupling techniques to find out different research fronts relevant to this new subject, chart where publication flow has developed and who in general are probably best represented in terms of authors or journals. The results point up the increasing importance of machine learning, deep learning, and blockchain technologies in accounting and auditing.

Sallem et al. (2024) carried out a bibliometric investigation of the AI revolution in accounting and auditing. Based on analysis of 105 articles from the Scopus database using VOSviewer, the authors reported a surge in AI-related publications from 2020 to 2023. Based on the main findings, the keywords that used most are Artificial Intelligence, Accounting, Auditing, Blockchain and Machine Learning, which are the main thematic clusters. The top contributing countries were the United States, China, the United Kingdom and Saudi Arabia.

Chávez-Díaz et al. (2024) looked at articles published between 2020 and 2023 in the Scopus database and found that Scopus holds more rich contents on AI-related accounting research compared to Web of Science. This study contributes the best output journals, authors, institutions and countries, the ethical dimension of relationship between accountant and algorithm and the impact about AI on accounting and auditing research.

Through the Scopus database, Stoykova (2024) bibliometric data showed a significant increase of AI-accounting research publications from 2019 to 2023 with 72 publications in 2023 and 66 publications by the middle of 2024. A co-occurrence analysis of author keywords reveals that AI is the main topic – heavily associated with topics including accounting, machine learning and big data. The most prominent U.S. was recognized to be this area.

Abu Huson et al. (2024) conducted a bibliometric review of information technologies, AI, and blockchain as information technology tools in auditing. In this paper, they analyzed 328 studies published

from 2017 to 2022 in Web of Science's database. The authors used VOSviewer, identified four independent research streams namely (1) determinants of independence and audit quality in information technology environments; (2) the major challenges facing accounting and auditing professionals with blockchain implementation; (3) research technology using accounting data of AI-based systems for evaluating accounting data; (4) the impact of current technology systems on future auditors' work productivity.

De Melo et al. (2024) performed a bibliometric analysis on the effects of AI on accounting through the Web of Science, finding 71 documents by querying the keywords artificial intelligence and accounting in article titles. This reveals a growing trend at the convergence of accounting with new technologies (AI, big data, and blockchain) where the diverse applications span from accounting education and practice to auditing and digital transformation.

Biju et al. (2024) analyzed the literature of machine learning, AI and deep learning tools in finance using bibliometric methods. Their research provides evidence for positive tendencies of the overall publication activity with US and China as the largest source of institution contributions and together contribute the most to the AI and machine learning activity in finance.

Kassar & Jizi (2025) performed a systematic review on AI and robotic process automation (RPA) in accounting and audit practice applied in accounting and audit firms from 2016 to 2022 using the systematic review framework of Tranfield et al. The research organizes the benefits of AI and RPA into four categories: financial benefits; reporting quality benefits; operational benefits; and customer relationship benefits. Finally, the authors also detailed the adoption obstacles and drivers of these technologies in further more articles.

In general, we see that research for AI in accounting and auditing is emerging and expanding rapidly and that the literature review concludes that bibliometric literature studies are rapidly growing fields currently under investigation. Nonetheless, the small number of comprehensive bibliometric studies specifically for a Turkish based analysis that are based on the Web of Science database adds to the value and originality of the current work.

PURPOSE AND METHODOLOGY

Research Topic and Purpose

Such an understanding of the impact of artificial intelligence (AI) in accounting and auditing is critical for appraising the status of the academic literature and informing future research directions. According to

the literature review, although bibliometric studies pertaining to these topics have proliferated in recent years, extensive reports focusing on the Turkish language based specifically on Web of Science are few and far between.

The purpose of this study is mainly to help develop a scientific framework of production in fields such as AI, accounting and auditing. In this spirit, 880 academic publications from the Web of Science Core Collection database are reviewed to answer the subsequent questions:

- **RQ1:** What has been the historical development of AI-related publications in accounting and auditing?
- **RQ2:** What accounts for the most impactful publication sources in AI research in accounting and auditing?
- **RQ3:** What is the most commonly used keywords in AI-related accounting and auditing literature?
- **RQ4:** Which author(s) dominate AI accounting and auditing publications? Who are the authors that have the most major impact in terms of the impact of AI-related accounting and auditing publications?
 - **RQ4a:** Who are the most influential authors for the number of publications?
 - **RQ4b:** The authors whose citation linkage is most important?
- **RQ5:** Which countries influence AI accounting and auditing writing on accounting/auditing?
- **RQ5a:** With regard to number of publications in AI-related publications, which have the strongest influence in publication counts? Which countries are the most influential in terms of publication volumes?
- **RQ5b:** Which countries are the most influential when it comes to citation counts?
- **RQ5c:** What is Türkiye's position in AI-related accounting and auditing publications?

The current study traces a systematic review of scientific accumulation in AI, accounting, and auditing from 1991 (when the first records are available in the database) until 10 January 2026 by offering accounting and auditing professionals, academics, educators, and policymakers a holistic view of the status of the literature and the prospects for future developments. Furthermore, these results will contribute to future developments and help highlight what is still unknown in the literature.

Research Material and Method

This study does not attempt to explore the technical range of AI in detail. Instead, it discusses bibliometric analysis of academic essays in which terms relevant to AI and accounting and auditing are

present together in a literature of the papers where accounting and auditing terms are used in tandem; to the following description. Thus, the research is not intended to explore AI through the lens of technocratic/technological sub-components, but rather a map of knowledge production domain where these terms are collocated in the literature. As a result AI related concepts (e.g., robotic process automation – RPA– and data analytics) that are found to be pertinent but excluded in the search query were purposefully omitted. It centers on academic trends generated between terms in text and publications and not from a technical classification of AI. The material collection of scientific data was done systematically to ensure methodological transparency and replicability for transparent comparison.

Data Collection Process

Data collection is one of the first steps, which is one of the most vital steps in bibliometric research, of the selection of a data source for analysis. In particular academic sources that are available are (*Scopus, Google Scholar, Dimensions*). Web of Science (WoS) Core Collection is used as data source in this study. The first reason this is a particularly useful approach is that WoS is known to be one of the most reliable and highly significant sources for systematic literature reviews and bibliometric studies (Zupic & Čater, 2015). The database indexes journals with very high impact factors and stringent quality-control criteria. The second reason is that WoS in most of the studies uses standardized and formatted bibliographic information needed for all bibliometric analyses (e.g., *author, institution, country, citation information, keywords*). Another explanation being that compared to many databases, WoS provides data over a greater span of time leading to more comprehensible historical picture in the development of a research area (Norris & Oppenheim, 2007).

The search syntax applied WoS TOPIC field (*Title, Abstract, Keywords*) to capture a comprehensive mapping of the topic. The search covers publications from 1991 (*the earliest suitable records*) until 10 January 2026.

According to the process of search, the following Boolean expressions indicated the studies at the intersection of artificial intelligence plus accounting and auditing:

$$TS = ((\text{"artificial intelligence"} \text{ OR } \text{"AI"}) \text{ AND } (\text{"accounting"})) \text{ OR } ((\text{"artificial intelligence"}) \text{ AND } (\text{"audit"})) \text{ OR } ((\text{"artificial intelligence"}) \text{ AND } (\text{"auditing"})) \text{ OR } ((\text{"artificial intelligence"}) \text{ AND } (\text{"financial accounting"})) \text{ OR } ((\text{"artificial intelligence"}) \text{ AND } (\text{"management accounting"}))$$

This query yielded 3.495 documents and no language restriction or filtering was applied in the search stage. However, many retrieved records pertained to areas that are not explicitly related to accounting and

auditing (e.g., *Engineering Electrical & Electronic, Medical Informatics, Clinical Psychology, Biomedical Engineering*). These were excluded by discipline-based filtering. The following WoS categories were retained as the study scope when filtering: Business Finance, Management, Business, Social Sciences Interdisciplinary, Economics, Multidisciplinary Sciences, Law, Operations Research & Management Science, and Education & Educational Research. Upon filtering by disciplinary means 1.004 documents remained. Of those records, 124 documents (*80 early access information items, 27 editorial materials, 16 book chapters and 1 book review*) were dropped at the eligibility stage because they failed to satisfy methodological and/or content requirements and/or were only available as abstracts. Consequently, 880 papers formed the overall dataset of the study. The process of material collection is summarized in Table 1.

Table 1: Material collection process

Process	Description	Result
Identification	Initial search results retrieved from the Web of Science database	3.495
Screening	Exclusion of publications from out-of-scope disciplines	988
Eligibility	Exclusion following content-based assessment	108
Included	Final publications included in the analysis	880

At the end of the material collection process, the distribution of the 880 documents included in the analysis by document type is presented in Table 2.

Table 2: Types of documents included in the analysis

Document Type	Count
Article	724
Proceedings Paper	99
Review Article	55
Book	2
Total	880

Data Management and Analysis Tools

This study has used VOSviewer (*Version 1.6.20*), Python 3.11, and Microsoft Excel 365. Material management, data cleaning, normalization, and visualization processes are presented in Table 3.

Table 3: Material management, data cleaning, normalization, and visualization

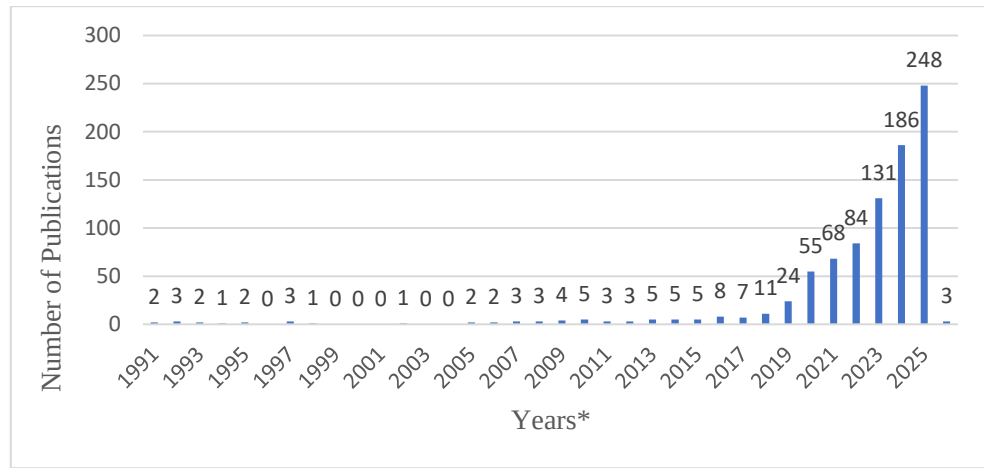
Software / Tool	Purpose of Use	Operations and Analyses Performed
VOSviewer (v1.6.20)	Bibliometric network analysis and visualization	Keyword co-occurrence, author co-authorship, author citation, co-citation, and country citation analyses were conducted. The LinLog/modularity layout algorithm, association strength counting method, and modularity-based clustering technique were applied. Parameters: attractive = 2, repulsive = -1, resolution = 1.0.
Python 3.11	Data preprocessing and normalization	Supporting procedures were performed on raw data exported from Web of Science, including preliminary data checks, identification of duplicate terms, review of stop-word lists, and construction of a thesaurus file.
Microsoft Excel 365	Validation and visualization of quantitative analyses	Using data generated via Python, year-based average citation calculations were performed, Field-Weighted Citation Impact (FWCI) values were tabulated, and tables and figures were visualized.

FINDINGS

Search Results by Year

Looking at the temporal evolution of papers examined in this study, there is a significant growth, especially after 2019. Between 1991 and 2019, only 105 studies were published, but there has been a rapid increase in published studies from 2020 onwards. Differences in publication counts over time are summarized in Figure 1.

Figure 1: Yearly changes in publication counts



* Data for the year 2026 are current as of 10 January 2026.

Based on the temporal progression of the published literature examined in this study, the upward tendency is likely to be observed to persist in 2026 and beyond.

Sources of Publications

The publications that we explored in the scope of this study were found in 436 different sources. Table 4 lists the top ten sources with the most publications. Thus, the Journal of Emerging Technologies in Accounting has the highest number of publications in this field at 28 publications and a total of 863 citations, ranked as the most prolific journal.

Table 4: Top ten sources by number of publications

Source	Number of Publications	Number of Citations	Total Link Strenght
Journal of Emerging Technologies in Accounting / (Q2)	28	863	251
International Journal of Accounting Information	27	1.016	184
Cogent Business & Management / (Q2)	22	102	33
Expert Systems with Applications / (Q1)	17	580	32
Financial and Credit Activity-Problems of Theory and	14	33	17
Meditari Accountancy Research / (Q1)	11	218	47
Technological Forecasting and Social Change / (Q1)	11	583	21
Journal of Financial Reporting and Accounting / (Q1)	10	142	52
Issues in Accounting Education / (Q3)	8	130	41
Accounting Auditing & Accountability Journal / (Q1)	7	254	67

Keyword Analysis (Co-occurrence of All Keywords)

Keywords are basic components to improve the visibility and accessibility of scientific papers in search engines (Dhamija & Bag, 2020). We used the co-occurrence method and the association strength counting method for this analysis. It assesses the relationships between keywords based on not only the frequency of co-occurrence, but also how strongly they are correlated in context.

To help preserve both the unity of terms and the coherence of concepts, a specific thesaurus file was created. In this file, the tags “ai”, “AI”, “artificial intelligence” and “artificial intelligence (ai)” were joined under the standardized term “artificial intelligence”. In keyword analysis, a minimum occurrence threshold was defined as five and LinLog/modularity layout method was used to create the network. We took the LinLog/modularity algorithm with attractive=2 and repulsive=-1 for the map layout to be able to put very similar concepts in closer proximity, weakly related concepts in a bigger distance. The modularity-based clustering method was applied for clustering, with the resolution parameter taken as 1.0, ensuring clusters cluster together at a satisfactory level of detail while preserving their conceptual coherence.

Before analysis, stop word cleaning and lemmatization was performed, and irrelevant keywords are removed for the purpose of the study (e.g., “m41,” “m42,” “o30,” “o33”).

“Artificial intelligence” (402 occurrences), “accounting” (80 occurrences), “machine learning” (58 occurrences), “auditing” (51 occurrences), “blockchain” (33 occurrences), and “ChatGPT” (38 occurrences) were the most frequently used keywords listed in the review publications that were analyzed in the scope of this research.

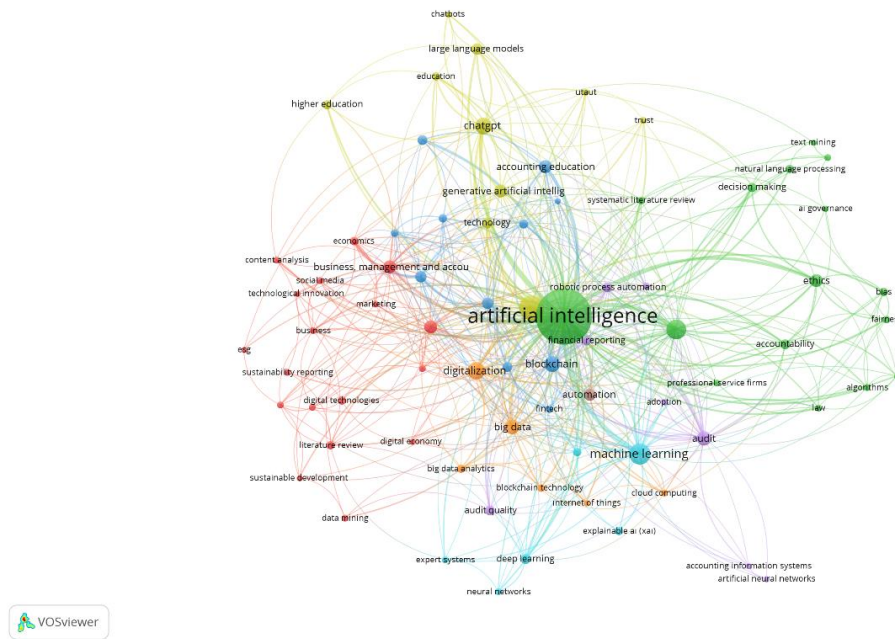
In VOSviewer, clusters correspond to groups of interrelated concepts that are mapped as nodes (*keywords*) grouped along the map (Kumar et al., 2024). Keyword linkages will serve as a key analytical mechanism, helping to show both how frequently concepts are grouped together in literature as well as how strong the structural relationships between the concepts are. This allows visualization of patterns, where common items and common keywords can be organized into nodes (*keywords*) on the respective map. A total of 76 keywords, 8 clusters, 542 links, and a total link strength of 1,330 had been identified from the combined analysis conducted per keyword with at least 5 appearances. The clusters and their constituent keywords are presented in Table 5; the linking points are shown in Figure 2.



Tablo 5: Keyword cluster

Cluster	Number of Items	Keywords
1	18	business; business, management and accounting; content analysis; data mining; digital economy; digital technologies; digital transformation; economics; ESG; innovation; literature review; management; marketing; social media; sustainability; sustainability reporting; sustainable development; technological innovation
2	16	accountability; ai governance; algorithms; artificial intelligence; auditing; automated decision making; bias; decision making; ethics; fairness; law; natural language processing; professional service firms; risk management; systematic literature review, text mining
3	11	accounting education, accounting profession; bibliometric; bibliometric analysis; blockchain; data analytics; digital accounting; emerging technologies; finance; fintech; information technology
4	10	accounting; chatbots; chatgpt; education; generative artificial intelligence; higher education; large language models; technology; trust; utaut
5	8	accounting information; adoption; artificial neural networks; audit; audit quality; financial reporting; robotic process automation; technology acceptance model;
6	6	deep learning; expert systems; explainable ai (XAI); machine learning; management accounting; neural networks
7	6	big data; big data analytics; blockchain technology; cloud computing; digitalization; internet of things
8	1	automation

Figure 2: Most frequently used keyword linkages



According to the clustering, the thematic areas can be summarized as follows:

Cluster 1 (18 items): This cluster is macro-level impact of AI-enhanced digital transformation in business, management and accounting. Grounded in themes of digital economy, sustainability, ESG, technological innovation and sustainability reporting, they suggest that artificial intelligence is influencing the way accounting and business transactions function on a business and management levels, not only the operational, but also from the strategic, and sustainability viewpoint.

Cluster 2 (16 items): This category encompasses relevant ethical, legal and governance contexts brought up by artificial intelligence based issues of the use of artificial intelligence in practice in auditing, decision making, and professional services. Themes such as algorithms, automated decision-making, bias, fairness, ethics, AI governance, and accountability drive the work of this literature review in particular, while demonstrating the need for transparency and accountability processes, especially in auditing and professional services firms.

Cluster 3 (11 items): This cluster deals with the digitalisation of the accounting work, the integration of new technologies into the professional work and bibliometric analysis of scientific evolution of the accounting work. Accounting education, digital accounting, fintech, and blockchain show that this profession is also being reimagined in both practical and academic terms.

Cluster 4 (10 items): The fourth cluster focuses on application of ChatGPT, chatbots, large language models and generative AI for accounting and higher education. The clustering in terms of trust, technology acceptance (UTAUT), and education indicates that it is individual perceptions along with behavior that largely determine the adoption of the AI applications.

Cluster 5 (8 items): This cluster explores the application of AI and automation technology in auditing in the field of accounting information systems and financial reporting. Key themes in (audit quality, artificial neural networks, robotic process automation, technology acceptance models) show that AI is being framed as a solution that improves auditing, and accounting process.

Cluster 6 (6 items): In this thematic category, ideas such as deep learning, machine learning, neural networks and explainable artificial intelligence (XAI) inform research. Cluster studies in support of transparent, reliable, and traceable AI decision support systems in accounting and management accounting applications are included.

Cluster 7 (6 items): This cluster concerns the transformative impact of infrastructural technology (big data, blockchain technology, cloud computing and Internet of Things) on accounting and finance. Digitalisation and data-driven digital-based initiatives emerge in the sense of these key factors accelerating, broadening and even integrating accounting process and its level of use for automation.

Cluster 8 (1 item): This cluster has a relatively small number of words, but it shows that automation within accounting and auditing is a growing theme in accountancy and auditing. The theme of automation is a conceptual and practical basis, as it is connected to each of the other clusters. It also forms an auxiliary element that together forms the basis for AI-enabled accounting application software tools.

All in conclusion, the keyword analysis gives the conclusion that the literature is not only geared towards technological applications but is also concerned with normative and institutional qualities: this includes ethics, fairness, trust, sustainability and governance.

Author Analysis

Table 6 presents high-impact authors who contributed significantly to artificial intelligence and accounting with citation metrics normalized at field scale and year scale against the publications investigated in the scope of this study. The author analysis was not limited to raw publication and citation counts; instead, field-weighted citation impact (FWCI), the proportion of publications within the top 10% most-cited segment, and fractional (*contribution-weighted*) authorship scores were jointly evaluated. Taking in both a

quantitative volume of work and qualitative impact, this comprehensive approach provides a balanced assessment of the authors' scientific output.

Table 6: High-impact authors with field- and year-normalized citation metrics

Author	Number of Publications	Number of Citations	Total Link Strength	FWCI	Share of Publications in Top 10% (%)	Fractional Contribution Score
Vasarhelyi, Miklos	8	489	20	2,41	33,3	0,87
Arnold, Vicky	4	202	11	2,65	50,0	0,84
Sutton, Steve G.	5	212	12	2,08	40,0	0,82
Rodgers, Waymond	4	160	11	1,60	25,0	0,74
Hsu, Ming-Fu	5	73	12	1,12	16,7	0,78
Deliu, Delia	4	82	10	1,05	25,0	0,76
Hansen, James V.	4	56	8	0,92	25,0	0,71
Rahman, Jahidur M.	4	58	5	0,85	0,0	0,70

The results from Table 6 show that Vasarhelyi, Miklos A. is a leading authority on the topic of this subject area, possessing more publications (8) with citations (489) and with a field-weighted citation impact (FWCI) of 2.41. An FWCI value above 1.0 shows that this author's publications have a citation impact that is far higher than the literature average. In this regard, Arnold, Vicky (FWCI = 2.65) and Sutton, Steve G. (FWCI = 2.08) similarly rank with high FWCI values and large percentages of articles published at the top percentile in relation to their number of publications, which further indicates these authors are productive in the scope of research and also generate research at high impact category.

However, a comparison of the fraction of publications that exist in the top 10% most-cited category also shows that Arnold, Vicky (50%) and Sutton, Steve G. (40%) are prominent among the top 10% most cited publications. This indicates that the works were a significant benchmark in the global reference literature, and help form a theoretical perspective while developing a methodological perspective towards an area's scope.

Authors like Hansen, James V. (FWCI = 0.92) and Rahman, Jahidur M. (FWCI = 0.85), whose FWCI is below the field average, seem to retain less of a citation impact. This finding points to a possible direction for improving the international visibility and impact of the research.

A fractional (*contribution weighted*) authorship analysis, wherein co-authorship structures are included in this measure to assess the authors actual contributions to publications, reveals that Vasarhelyi, Miklos A. (0.87) has the highest fractional contribution score. While this score falls between 0.70 and 0.84

for other high-impact authors. These findings suggest a collaborative style of knowledge production in the fields of artificial intelligence and accounting and a collective model of scientific production.

FWCI at the author level is shown in Figure 3, and fractional contribution scores are shown in Figure 4.

Figure 3: Author-level FWCI values

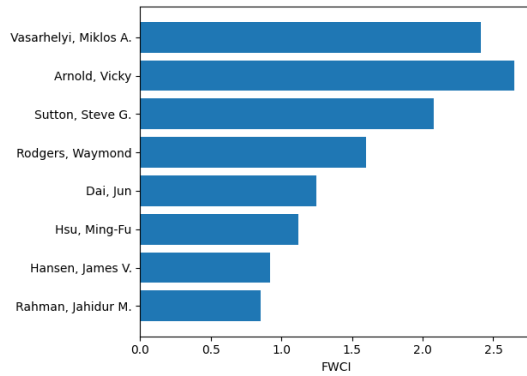
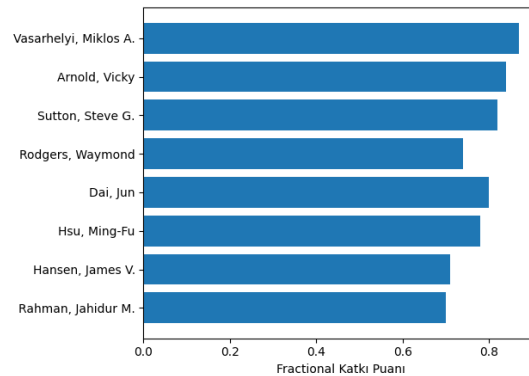
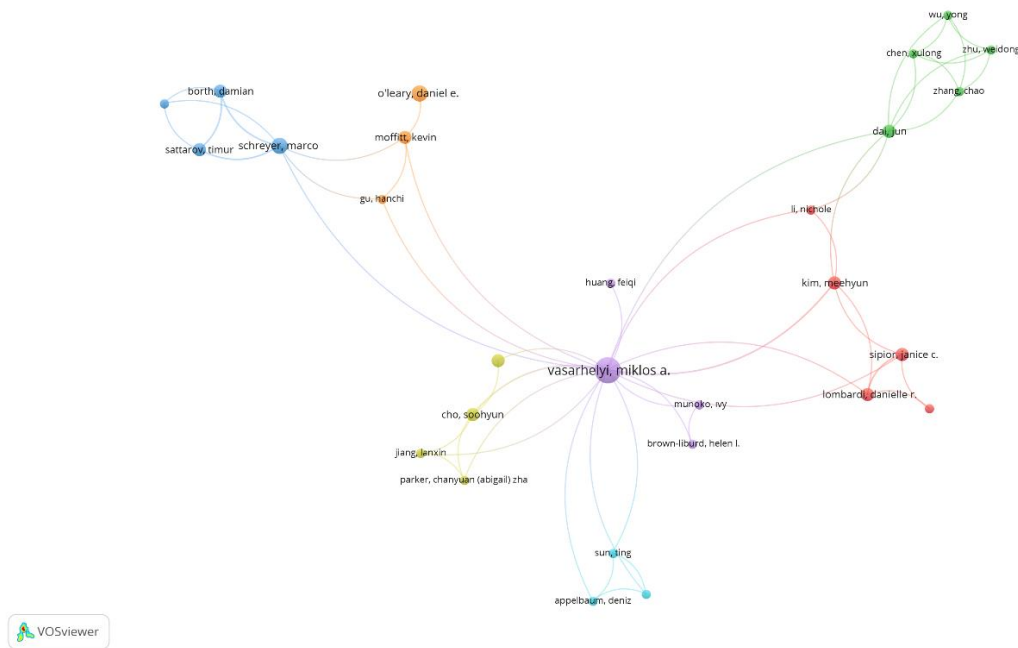


Figure 4: Author-level fractional scores



Authors identified with the highest level of linkage and collaboration among the publications included in this study were analyzed with co-authorship analysis employing minimum thresholds of at least one publication and one citation. From the co-authorship of authors analysis, a total of 28 authors, 7 clusters, 54 links, and a total link strength of 60 were identified. The linkages of the authors with the highest levels of collaboration are shown in Figure 5. Consequently, Vasarhelyi, Miklos A. was observed as the author with the largest node size, a position indicating him to be one of the most central and influential contributors in this field.

Figure 5: Co-authorship network with the strongest collaboration links



Bibliometric Analysis allows for a study from within a field to be identified as a high-value study by the examination of citation relationships between scientific publications. In this method researchers break down cited studies in published papers so that researchers can develop the essential knowledge base for a specific research area. The articles often cited signify the general endorsement of researchers and provide the general definitions of these fundamental concepts, methods, and ideas of the field (Shiau et al., 2023).

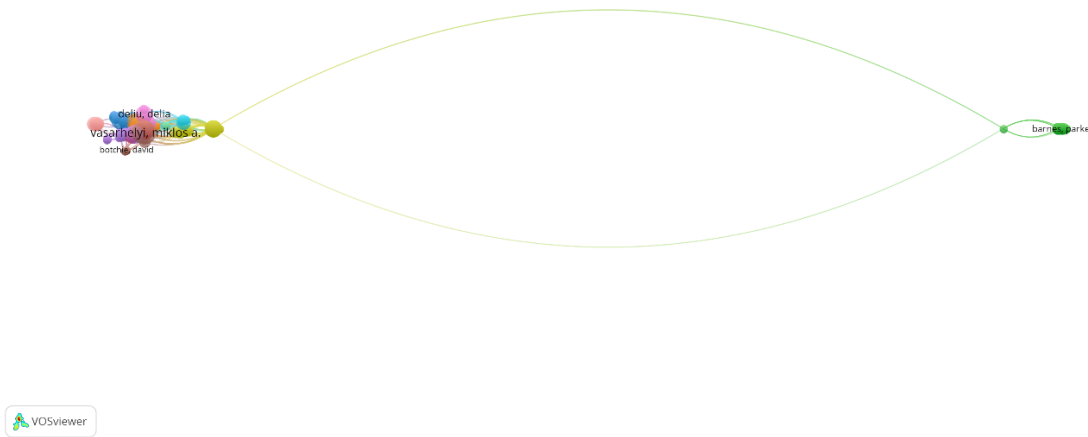
Citation analysis assumes that when multiple research papers cite each other, are frequently co-cited, or share a substantial number of common references, together, they reflect an underlying literature theme (Zhao & Strotmann, 2015).

An author citation analysis (citation of authors) was carried out, which applied minimal thresholds of a minimum of one publication and minimum of 50 citations, for this study which produced an analysis of 140 authors (units of observation). It returned 11 clusters, 932 links, and total link strength of 1,170. The author linkages in citations are shown in Figure 6.

Barners, P., Hutchinson, B., Mitchell, M., and Smart, A., also received the number of the most citations in this area with 635 citations to each of the authors. Vasarhelyi, Miklos A., has also received 489 citations. The results of citation analysis suggested that knowledge production in the field is dominated by

a few high-impact authors. This means the works of these authors are core references to AI and accounting researchers, practitioners, and policymakers for the field.

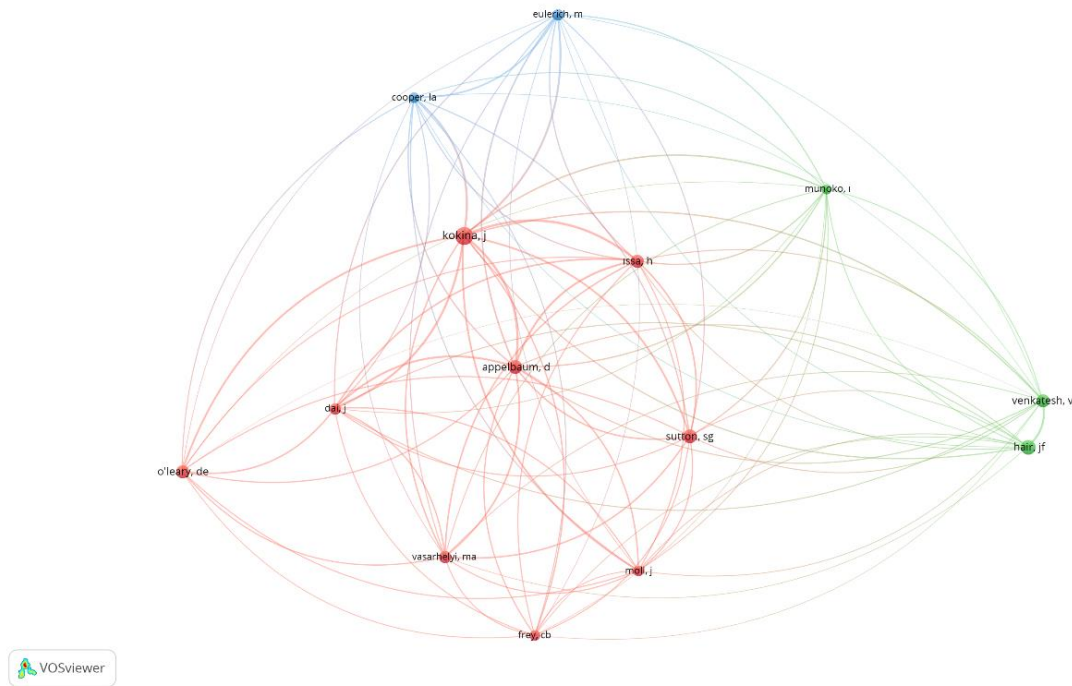
Figure 6: Citation linkages among authors



Co-citation is defined as the frequency with which two publications are cited together by a third publication (Dwivedi et al., 2023). Often, co-citation analysis is used to determine the intellectual structure of a scientific field (Song et al., 2023). This strategy relies on the notion that two publications cited together with high frequency are closely associated (White & Griffith, 1981) and should therefore be more similar in the clustered configuration of a visualization map (Mas-Tur et al., 2021).

Specifically, within the boundaries of this study, co-citation analysis of authors (co-citation of co-authors) using a minimum threshold of at least 50 citations per author was applied, leading to an analysis of 14 authors (units of observation). There were 3 clusters, 90 links, and a total link strength of 2,098 identified by analysis. The most co-cited authors were Kokina, J. (154 citations), Hair, J. F. (102 citations), Appelbaum, D. (94 citations), and Sutton, S. G. (92 citations). These results imply that the intellectual organization of the field largely concentrates around a few major authors central to the development of its theoretical and methodological frameworks. Figure 7 illustrates the linkages between co-citations.

Figure 7: Co-citation links among authors



Country Analysis

Today, the advancement of artificial intelligence (AI) is causing global effects in accounting (*as in many other industries*). The incorporation of such AI-based applications into accounting, auditing, and financial reporting is now becoming an important comparability measure for the evaluation of countries' scientific production capabilities and impact in this area. In this sense it is essential in this regard to have academic studies authored by authors at the crossroads between AI and accounting in various countries in the field to comprehend the structure of global knowledge production networks.

For this study, the country-level analysis was performed using VOSviewer (v1.6.20) and Microsoft Excel 365. Co-authorship (*international collaboration*) and citation (*cross-country citation relationships*) analyses were conducted within the VOSviewer environment. Network analysis was performed by the association strength counting method, LinLog/modularity layout algorithm (attractive = 2, repulsive = -1). Moreover, year-based normalization and calculations for Field-Weighted Citation Impact (FWCI) in Excel were completed to present a balanced analysis of countries' impact levels in both quantitative and qualitative terms.



The top 10 countries according to number of publications under full counting of productivity and impact are presented in Table 7 and top ten countries according to citation counts and FWCI values are in Table 8 within a total of the studies reviewed.

Table 7: Top ten countries by number of publications and average FWCI values

Rank	Country	Full-Count Number of Publications	Average FWCI
1	United States	199	1,95
2	People's Republic of China	96	1,12
3	United Kingdom	68	1,62
4	Australia	50	1,48
5	Germany	47	1,38
6	Canada	40	1,41
7	Romania	36	0,77
8	Spain	35	1,11
9	Italy	31	1,27
10	Saudi Arabia	29	0,84

Table 8: Top ten countries by number of citations

Rank	Country	Number of Citations
1	United States	4.793
2	United Kingdom	2.821
3	Germany	1.581
4	Australia	1.322
5	People's Republic of China	874
6	Taiwan	641
7	Finland	595
8	France	591
9	Italy	586
10	Netherlands	491

Table 7 shows the top ten most productive countries in artificial intelligence (AI) and accounting according to publications, along with their average Field-Weighted Citation Impact (FWCI) figures. The conclusion of this table shows the lead in both quantitative and qualitative outcomes in which the states lead, with 199 publications reported with a mean field-weighted citation impact (FWCI) of 1.95 for each country. Such an item suggests that publications from within the U.S. have to generate some two times the global average impact in that field across the globe.

The UK (FWCI=1.62), Australia (1.48), Canada (1.41) and Germany (1.38) displayed high impact scientific production profiles with FWCI > 5% in the field though they are smaller than the United States in the published publications. Such evidence shows that Anglo-Saxon and Western European research ecosystems are particularly influential in generating high quality knowledge at the AI/accounting intersection.

The People's Republic of China is the second most productive among all member states (96 publications), however the value of the average FWCI of 1.12 indicates that publication intensity is not equal to the proportional impact it has on citations. Countries like Romania (FWCI = 0.77) and Saudi Arabia (0.84) show below-average impact levels despite relative increases in publications output. This evidence suggests that only publication number is not necessarily enough to explain the science impact, while indicating that qualitative evaluation metrics are needed.

Table 8 gives a ranking of countries in AI and accounting in terms of their total citation numbers. By examining the results of literature, the United States comes out with the highest visibility at 4,793 citations followed by United Kingdom (2,821) and Germany at 1,581 citations. The citation volumes of Australia and the People's Republic of China also make it evident that these countries are important entities in the global model of knowledge production networks.

Though citation counts represent a key indicator of countries' visibility in a given body of literature and where we feel recognized, they also vary according to structure across disciplines and years of publication. Thus, the citation findings expressed in Table 8 are discussed in conjunction with the FWCI results as reported in Table 7. This comprehensive approach means that there is a more balanced analysis of countries that includes not only number of citation in total but also field and year-normalizing impact.

Türkiye ranks 23 with 16 publications and 184 citations. This finding indicates that Türkiye is comparatively restricted in the international prominence of AI-based accounting research. The literature suggests that the extent of AI research performance of countries is conditioned by individual academic productivity as well as institutional infrastructure, digital maturity, and interaction capacity of research ecosystem (Eren et al., 2024).

Last but not least, country citation analysis (*citation of countries*) was performed by setting minimum thresholds to at least one publication and one citation, yielding an analysis of 91 countries (*units of observation*). Data from the analysis yielded 13 clusters, 352 links, and 567 link strength for the total study. The citation linkages of countries are shown in Figure 8, the United States, China and the United Kingdom

(US, China and UK) being the countries with the largest node sizes, demonstrating their central location in the global citation network.

Figure 8: Citation linkages among countries

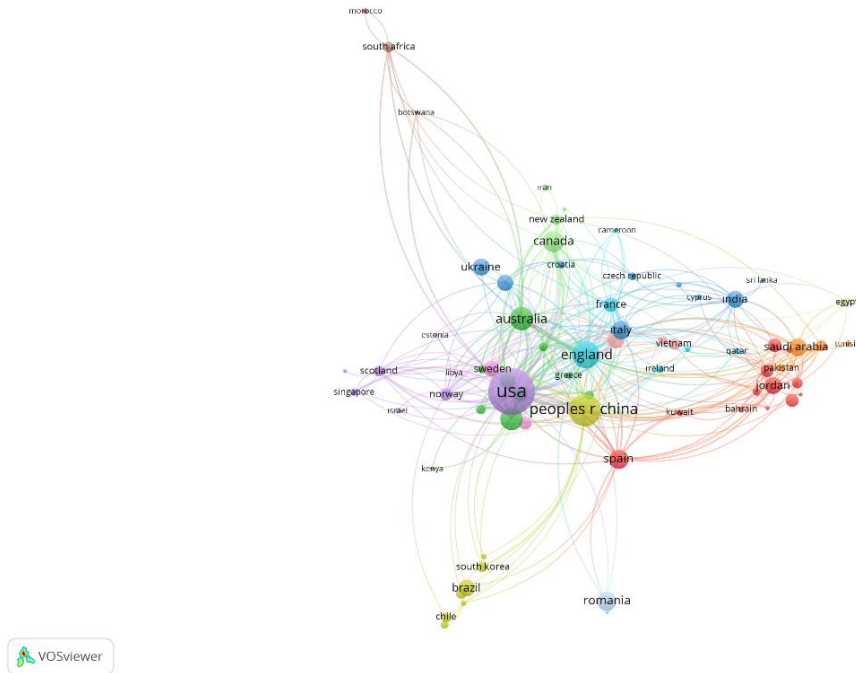
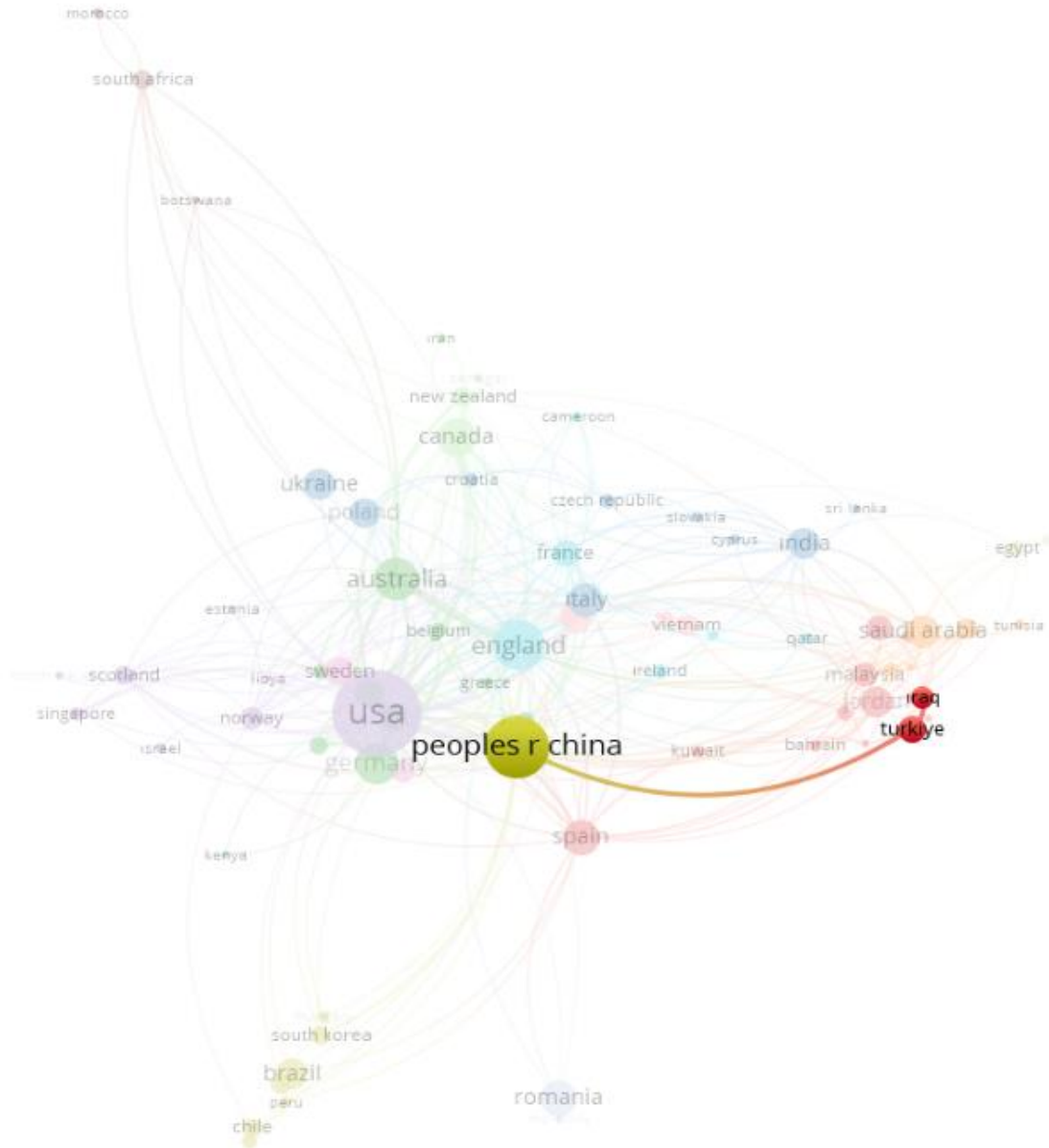


Figure 9 indicates Türkiye's citation linkages. Based on the studies that took place in Türkiye, it can be noted that the sources with citation ties mainly to the United States, the United Kingdom, Germany, and Australia are among the prominent countries. This finding indicates that stronger integration of researchers in Türkiye into international co-authorship networks is critical for enhancing the visibility and citation impact of their publications.

Figure 9: Citation linkages of Türkiye



CONCLUSION

With bibliometric methods in hand, the research extensively analyses the scientific output in the fields of artificial intelligence (AI), accounting, and auditing, and maps the thematic structure, central authors, sources of publication, and cross-national relationship dynamics. The analyses with relevant academic work on 880 publications from the Web of Science Core Collection indicate that AI is considered in accounting

not just as a technology of productivity and automation, but as a multi-dimensional transformative phenomenon that lies at the forefront of governance, ethics, and sustainability discussions.

The time series of the articles reviewed reveals a considerable rise in academic interest in AI applications among accounting and auditing institutions in recent years. While the number of published studies in general from 1991 to 2019 were only 105, there has been an accelerated increase of publications as of 2020. There are several factors that seem to drive this trend. The rise of big data analytics, machine learning and generative AI technologies have, for one, increased AI's usability in accounting and auditing capabilities. Simultaneously, as a result of digitalization, remote auditing becoming more crucial, and automation requirements arising as a consequence of the COVID-19 crisis, there have been heightened scholarly interest in this area. Academic interest has been further fostered by the development and deployment of AI-based solutions by the Big Four accounting firms (Deloitte, PwC, EY, and KPMG). In addition, the growing prominence of the realms of ESG, sustainability reporting, ethics, algorithmic bias, and trust in the accounting literature has significantly contributed to both the quantitative and thematic depth of research at the intersection between AI and accounting.

The analyzed publications are sourced from 436 different sources, demonstrating the interdisciplinary character of AI-related research in accounting and auditing as well as the diversity of perspectives offered by professionals in this area. With a total of 28 publications and 863 citations, the Journal of Emerging Technologies in Accounting stands out at the top in terms of how they place their work in the context of accounting, representing a critical outlet of work around these technical developments.

Keyword analysis shows that themes such as ESG, sustainability, ethics, fairness, algorithmic bias and trust are increasingly visible in the literature. The thematic focus suggests that AI-enabled accounting and auditing practices are addressed not only focusing on financial integrity and efficiency, but also normative dimensions such as corporate accountability, stakeholder confidence, and equity in decisions. In particular, the combined focus on the ethical and bias issues relating to audit quality, automated decision-making, and algorithmic governance hints toward a mounting awareness in the literature of the significant societal and regulatory implications of AI.

Author results show that knowledge production in the area is mainly focused on a small group of prominent scholars. Academicians like Vasarhelyi, Miklos A., Sutton, Steve G., and Arnold, Vicky are central to co-authorship and citation networks and thus become central players in defining the intellectual terrain of the literature. The fractional (contribution-weighted) results of authorship also point to a strong

collaborative-based scientific production approach as prominent in AI and accounting, indicating the centrality of a collective knowledge production model.

Country-level analyses have illustrated that the U.S. leads the literature based on publication volume and network centrality, while the UK, Germany and Australia have relatively deep connections and visibility. Meanwhile, publication volume for Türkiye is not high in the area of AI and accounting and it does not have strong interaction on international co-authorship and citation networking systems. That references in publications created in Türkiye are kept mainly by a few major countries is an indication of a deep deficit with respect to integration into global research networks. This should be judged not merely as a quantitative shortfall but also according to the research infrastructure, international collaboration capabilities, and the academic orientation toward the ethical, sustainability, and governance dimensions of AI.

This study, like all scientific studies, has certain limitations to be borne in mind when interpreting the results. The first limitation pertains to data source: the study was based entirely on the Web of Science Core Collection. As other databases such as Scopus and Google Scholar were not included, some relevant publications may have been omitted. However, given Web of Science's quality control standards and suitability for bibliometric analysis, this choice is methodologically sound. The second limitation relates to language, since Web of Science predominantly indexes English-language publications, and as such we may miss the influential reports that were published in other languages. Thirdly the limitation also relates to the choice of keywords; our search strategy was pre-defined, and different combinations of search terms could have produced different results but the terms selected are deemed enough to cover the field. The fourth limitation relates to the cross-sectional nature of the analyses (published up to 10 January 2026); studies that are published after this date are excluded due to a rapid development of the field. The fifth limitation of the bibliometric method is the inherent limitation, that it can only give quantitative indices that do not reflect the quality of the publications. Furthermore, because more recent papers may not yet provide sufficient time for the accumulation of citations, citation counts should not be considered the only quality measurement.

More specific, it is recommended that future studies draw on data from more than one database and use more diverse target terms in order to have a more integrated view of the community. It is hoped that more attention would be given to research approach that is interdisciplinary, collaborative and cross-specialty. The findings demonstrate that ESG, sustainability, ethics, fairness, algorithmic bias and trust play significant roles on these themes and indicate that future studies can expand further into them and in

accounting and auditing domains. There is a great need of empirical studies to analyse which factors affect the adoption of AI in accounting and auditing organizations as well as resistance mechanisms including success in implementing AI, its methodology and successful strategies. Moreover, further research is needed to understand the needs of integrating AI in accounting education, learning requirements and pedagogy. The study of specific cases examining how educational institutions respond to this transformation must be especially fruitful.

Ultimately, this study therefore provides a holistic framing for academia, practitioners, and policy makers by revealing the technical, ethical, sustainability, and trust dimensions of AI-related transformation dynamics that are shaping this dynamic for both technical analysis on accounting and ethical, sustainable, and trust-focused considerations in shaping the field.

AUTHOR STATEMENT

The author declares that all contributions to this manuscript were made solely by the author. The author also declares that there are no conflicts of interest.

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