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The Evolution of Performance Audit Research: A 50-year Bibliometric Analysis

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Abstract

This study examines the global evolution of performance audit research over the past five decades by identifying publication trends, influential contributors and dominant thematic developments. A bibliometric methodology was employed using 800 publications indexed in the Scopus database from 1975 to 2025. Performance analysis and science-mapping techniques were conducted using Harzing's Publish or Perish and VOSviewer to analyse citation patterns, co-authorship networks and keyword co-occurrence relationships. The findings reveal substantial growth in performance audit scholarship, particularly after 2010, with the United States, United Kingdom and Australia emerging as dominant contributors. The literature remains strongly centred on public-sector governance, accountability and managerial reform, while themes related to ESG reporting, digital governance, AI-assisted auditing, sustainability evaluation and cross-sector applications remain comparatively underdeveloped. Citation patterns further indicate that influential studies primarily emphasise performance measurement and organisational control rather than broader public value and societal outcomes. Theoretically, the study demonstrates that performance audit research has evolved operationally but remains institutionally driven and conceptually fragmented, highlighting the need for more integrative and outcome-oriented frameworks. Practically, the findings provide insights for policymakers, Supreme Audit Institutions and statutory bodies, including zakat institutions, to strengthen performance auditing as a mechanism for organisational learning, governance improvement and outcome-oriented accountability. The originality of this study lies in providing one of the earliest comprehensive bibliometric syntheses of global performance audit scholarship, offering a structured understanding of its intellectual development, thematic gaps and future research directions.

Keywords: Accountability, Bibliometric, Effectiveness, Performance Audit, Public Sector, Zakat.

Introduction

Performance audit has become an important instrument in both public and private sectors for assessing how organisations utilise resources and achieve intended outcomes. It is generally defined as a systematic evaluation of activities, programmes and operations to determine whether resources are used efficiently, effectively and economically while enhancing transparency, accountability and organisational performance (1, 2). Unlike traditional financial auditing, which focuses mainly on compliance and the accuracy of financial statements, performance auditing extends to programme evaluation, organisational analysis and policy assessment, enabling broader evaluation of institutional effectiveness and governance outcomes (3). The concept is grounded in the principles of economy, efficiency and effectiveness, which respectively emphasise cost minimisation, optimal use of resources and achievement of intended objectives (3, 4). In practice, performance audits assist public-sector institutions in identifying ineffective spending, strengthening budget management and supporting evidence-based governance reforms (2, 5). In the private sector, often referred to as operational audits, they contribute to improving organisational processes and managerial performance (6). However, implementation remains challenging because effective performance auditing requires strong legislative frameworks, institutional capacity and methodological consistency (1). These challenges are particularly evident in developing countries such as China and Indonesia, where regulatory and institutional

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limitations continue to constrain effectiveness despite increasing policy interest (5, 7). Nevertheless, empirical evidence demonstrates that performance auditing can generate measurable organisational and financial improvements, as shown in studies from Lithuania and Australia (8).

Performance auditing initially developed as an extension of traditional financial auditing, with early practices concentrating on verifying performance information and assessing operational outputs rather than broader societal outcomes (9). Its modern development was strongly influenced by New Public Management (NPM), which promoted efficiency, effectiveness and accountability as central principles of public-sector governance (10, 11). This reform movement encouraged many countries to strengthen Supreme Audit Institutions (SAIs) and institutionalise performance auditing as a mechanism for evaluating policy implementation and managerial performance (6). International standards developed by the International Organization of Supreme Audit Institutions (INTOSAI) further contributed to the global diffusion and standardisation of performance audit practices, including reforms implemented in countries such as Turkey between 1996 and 2010 (12).

In recent years, performance auditing has evolved into a more structured and forward-looking practice characterised by risk-based approaches, quality assurance mechanisms and real-time auditing systems (13, 14). Digitalisation and emerging technologies are also reshaping audit methodologies by expanding analytical capabilities while introducing new operational and governance challenges (15). Comparative evidence further shows that performance audit practices differ across national contexts depending on institutional structures, governance priorities and stakeholder expectations (10, 15).

Despite the growing body of literature, several important gaps remain. Existing bibliometric studies in auditing have primarily focused on broader themes such as financial auditing, audit quality, fraud auditing and audit structures, with comparatively limited attention given to performance audit as a distinct evaluative and governance-oriented domain. Unlike conventional financial auditing, performance auditing plays a critical role in assessing whether government programmes, public policies and institutional interventions achieve their intended outcomes and generate broader public value. However, the implications of digitalisation, data analytics and artificial intelligence for audit methodologies and accountability structures remain insufficiently understood, particularly in developing countries where technological adoption varies significantly (15-20). Sector-specific applications such as environmental and healthcare auditing also remain fragmented within the literature (21-23). In addition, persistent implementation challenges including limited organisational capacity, weak monitoring systems and inconsistent adoption of audit recommendations have not been systematically examined in relation to long-term governance and organisational effectiveness (24, 25).

Comparative and cross-national studies also remain limited, particularly in underexplored regions such as Latin America, resulting in an incomplete understanding of how institutional contexts shape performance audit practices globally (26, 27). More importantly, the literature lacks an integrative synthesis capable of mapping the intellectual structure, thematic evolution and collaboration patterns of the field over time (28-30). A preliminary search of Scopus and Web of Science using terms such as "performance audit," "public sector audit," and "bibliometric" identified no dedicated bibliometric study that systematically maps the longitudinal development of performance audit research.

Hence, this study aims to map the global development of performance audit research through bibliometric analysis by identifying publication trends, dominant themes, influential contributors and international collaboration patterns. The study further examines the conceptual and methodological evolution of the field while highlighting underexplored areas such as digital transformation, sustainability, sector-specific applications and comparative governance perspectives.

The originality of this study lies in providing a quantitative and evidence-based synthesis of performance audit scholarship rather than relying solely on conventional narrative reviews. The study contributes by consolidating fragmented literature into a clearer understanding of the field's intellectual development and by identifying emerging research directions and unresolved gaps.

For policymakers and audit institutions, the findings provide useful insights for benchmarking practices, strengthening accountability systems and supporting more adaptive and context-responsive performance audit approaches.

This study is further informed by Institutional Theory, which explains how performance audit practices evolve in response to changing regulatory pressures, governance norms, technological developments and societal expectations. The theory is particularly relevant in explaining the continued dominance of compliance-oriented auditing, the gradual emergence of ESG and digital audit practices and the uneven development of performance audit research across different institutional and governance contexts.

Methodology

Bibliometric analysis has gained prominence as a methodological tool in modern research because it allows scholars to systematically analyse patterns in citations, author collaborations and keyword networks to understand how knowledge in a field develops over time (31). This approach requires researchers to clearly define their data sources and analytical steps, which enhances the transparency, consistency and reproducibility of the review process (32). Numerous bibliometric studies have been conducted in the auditing field, focusing on areas such as Arab audit research, the transformation of overall audit scholarship, the adoption of big data analytics in financial auditing, fraud-related audit research, digital transformation in internal auditing and human resource auditing (33-36). Existing bibliometric studies in auditing have primarily concentrated on broader themes such as audit quality, fraud auditing, internal auditing, digital transformation and big data analytics (33–36). Although some of these studies briefly mention performance audit within wider audit discussions, performance audit has generally been treated as a peripheral subtheme rather than a distinct and specialised research domain. Consequently, previous studies do not provide a dedicated synthesis of the intellectual structure, thematic evolution, collaboration patterns and emerging research directions specific to performance audit scholarship. This limitation creates an incomplete understanding of how performance audit research has evolved over time across governance, accountability and evaluation contexts. However, no bibliometric study has specifically examined performance audit as a distinct research domain. To address this gap, the present study conducts a comprehensive bibliometric analysis of global performance audit publications following a four-stage procedure (31), as illustrated in Figure 1.

Stage 1: Defining the Research Objectives

Drawing on bibliographic data collected from the Scopus database and processed using Harzing's Publish or Perish and VOSviewer, this study provides a systematic review of the global literature on performance auditing. The analysis explores trends in publication over time, types of documents produced, key authors and institutions, contributing countries and major publication sources. It also highlights the most cited studies and reveals the main thematic areas influencing the evolution of performance audit research. Based on these objectives, the study seeks to answer the following research questions:

RQ1. How has performance audit research developed globally and what do current publication patterns reveal about its landscape?

RQ2. Which authors, institutions and journals contribute most actively to the body of performance audit research?

RQ3. Which studies have the strongest influence on performance audit scholarship as indicated by citation impact?

RQ4. What main themes and knowledge relationships can be identified through keyword co-occurrence analysis in performance audit research?

Stage 2: Selection of Bibliometric Analysis Methods

This study applies two complementary bibliometric approaches to examine the global literature on performance auditing. The first is performance analysis, which provides a quantitative overview of the field. By analysing publication and citation counts, this method identifies productivity patterns and indicates the degree of academic attention given to specific topics or contributors (31).

The second approach is science mapping, which explores how different elements of the literature are interconnected and enables the visualisation of knowledge development patterns (37). In this study, science mapping is implemented through four analytical techniques. Document and citation analysis identify the studies that have had the greatest influence in the field. Co-authorship analysis reveals collaboration networks among researchers and institutions (31). Bibliographic coupling connects articles that reference similar sources, helping to detect emerging or converging research areas (31). Finally, co-word analysis examines author keywords and their co-occurrence to track dominant themes and shifts in the conceptual focus of performance auditing research (31). Together, these methods offer a comprehensive bibliometric evaluation of the development, structure and future direction of global performance audit scholarship.

Stage 3: Data Collection

This study collected its data from Scopus, an Elsevier-managed database that is widely recognised as one of the largest sources of peer-reviewed publications and citation information. Covering a broad range of academic disciplines, Scopus is frequently used in bibliometric research because it allows detailed analysis of publication trends, citation performance and patterns of scholarly influence across fields (38). Its structured indexing system and compatibility with widely used bibliometric tools make it suitable for conducting systematic and comprehensive literature analyses (39).

The search was conducted on 9 January 2026 using a carefully structured query to retrieve studies specifically related to performance auditing. The search was performed using the Scopus advanced search interface with the command TITLE-ABS-KEY ("performance audit"). This ensured that only publications explicitly referring to performance auditing in the title, abstract, or keywords were included. Using a focused search string is consistent with recommended bibliometric practices for narrowly defined topics, as it improves dataset accuracy and minimises the inclusion of irrelevant records (31, 40).

A total of 857 documents were initially identified. The screening and filtering procedures were conducted using a PRISMA-style protocol to improve transparency and methodological reproducibility, as shown in Figure 2 (41). After applying the screening criteria, which limited the publication period to 1975 to 2025 and included only English-language documents, the final dataset comprised 800 articles for analysis. Specifically, two publications were excluded because they fell outside the selected publication period, while 55 non-English publications were removed to ensure language consistency and comparability across the dataset. The period 1975–2025 was selected because 1975 represents the earliest publication indexed in the Scopus database based on the search criteria used in this study. In addition, the fifty-year timeframe enables a comprehensive examination of the historical development, thematic evolution and changing research trends in performance audit scholarship across different governance and institutional contexts. The screening process also involved checking document relevance, publication consistency and completeness of bibliographic information before finalising the dataset for analysis.

Stage 4: Conducting the Bibliometric Analysis and Interpretation of Results

Publication and citation patterns were initially examined using the Analyze Results feature in Scopus, which provided an overview of document characteristics, publication sources, leading authors, affiliated institutions and journal distribution. The records were then exported in RIS and CSV formats for further analysis using Harzing's Publish or Perish (version 8) and VOSviewer (version 1.6.20). Prior to conducting the bibliometric network analysis, the dataset underwent a data cleansing process to improve consistency and accuracy. This process involved checking duplicate records, standardising author names and institutional affiliations and merging keyword variants and synonymous terms to minimise inconsistencies within the dataset. Variations in spelling, abbreviations and singular–plural forms were manually reviewed and harmonised before importing the data into VOSviewer. These procedures were undertaken to enhance the reliability and interpretability of the co-authorship and keyword co-occurrence networks. Publish or Perish was used to calculate citation indicators. In addition to total citation counts, citations per year were also considered to reduce temporal bias favouring older publications and to provide a more balanced assessment of scholarly influence across different publication periods. VOSviewer generated visual network maps based on keyword co-occurrence. These widely used bibliometric tools enabled both quantitative assessment and visualisation of global research activity on performance auditing (42). The Discussion section interprets these outputs to highlight thematic developments, influential studies and shifts in research focus, while the Conclusion summarises the key findings, acknowledges methodological limitations and outlines directions for future research.

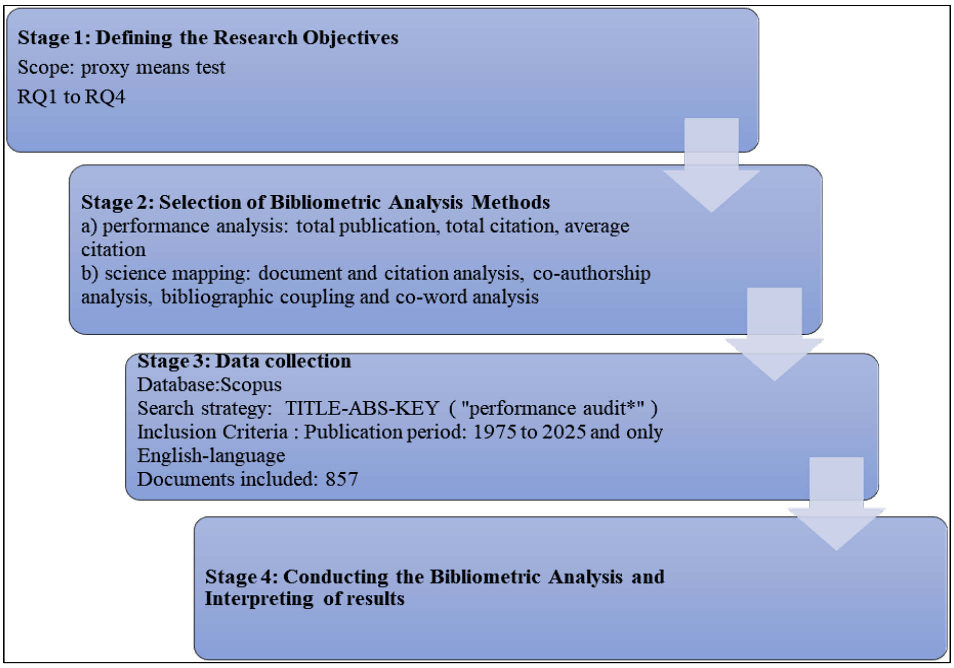

Figure 1: Steps for Conducting Bibliometric Analysis

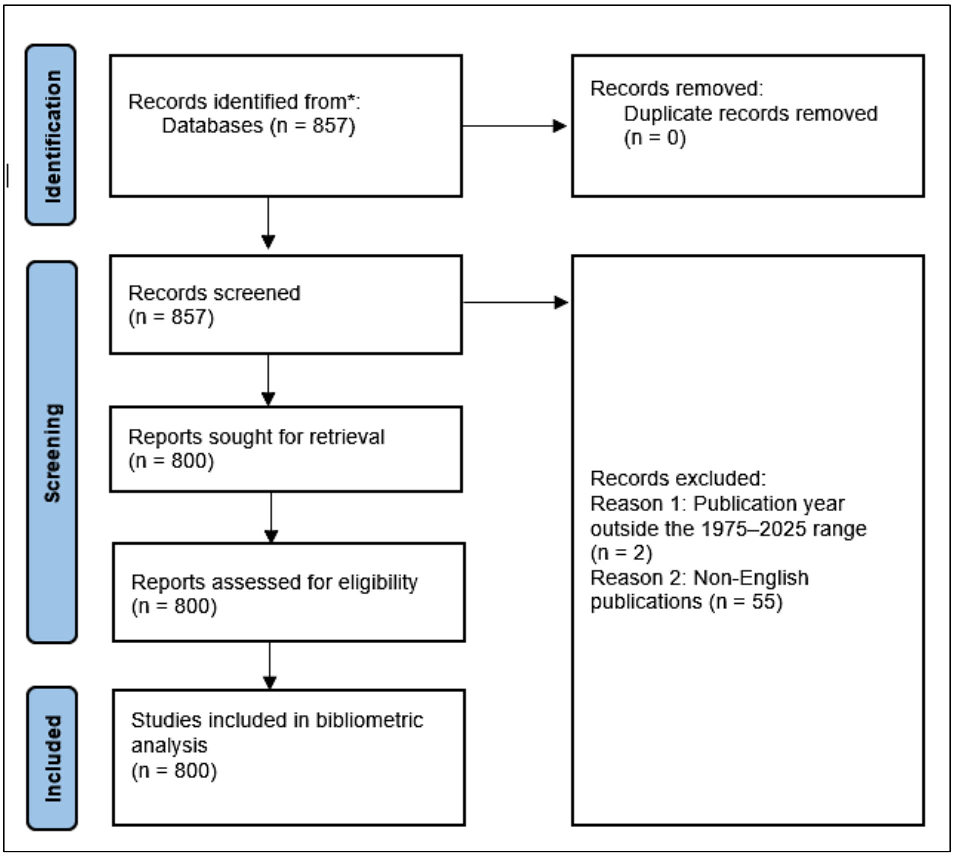

Figure 2: PRISMA 2020 Flow Diagram

Results

Beyond describing publication patterns, the bibliometric results provide insight into how performance auditing has developed as an academic domain. The distribution of publications, citation structures and thematic clusters reflects not merely research productivity but the gradual institutionalisation of performance audit as a field positioned between accounting, public administration and policy evaluation.

Trends and Patterns in Global Performance Audit Study (1975–2025)

Over the 50-year period from 1975 to 2025, performance audit publications show a clear upward quantitative trend, rising from only 1 publication per year in the mid-1970s to 47 publications in 2025, the highest level recorded. During the foundational phase (1975–1994), output remained very low and stable, typically between 1 and 7 publications annually, reflecting the early conceptual development of performance audit research focused mainly on accountability and administrative efficiency. The expansion phase (1995–2009) marked gradual growth alongside global public-sector reforms and the increasing influence of governance and New Public Management discourse. A more visible escalation occurred after 2010, signalling the beginning of the diversification phase (2010–2025), where publication output increased substantially with growing attention towards sustainability, ESG reporting, digital governance and AI-assisted auditing, although these themes remain comparatively underdeveloped within the broader literature.

The most significant expansion is observed in the last decade (2016–2025), where output remained consistently high, fluctuating between 27 and 47 publications annually. Peak years include 2019 (42 publications), 2023 (46 publications) and 2025 (47 publications), demonstrating the strongest concentration of research activity within the dataset. In contrast to the earlier decades characterised by sporadic production, the recent period shows both higher volume and greater year-to-year stability. Overall, the findings indicate a sustained long-term increase in publication output across successive decades, as shown in Figure 3.

This trajectory suggests a phased evolution of the field. Early contributions (1970s–1990s) were largely conceptual, focusing on performance measurement and administrative accountability. The 2000s marked expansion alongside global public-sector reforms, embedding performance auditing within governance discourse. More recent years show diversification into specialised applications, though without a corresponding consolidation of theoretical frameworks, indicating a maturing yet still structurally diffuse research domain.

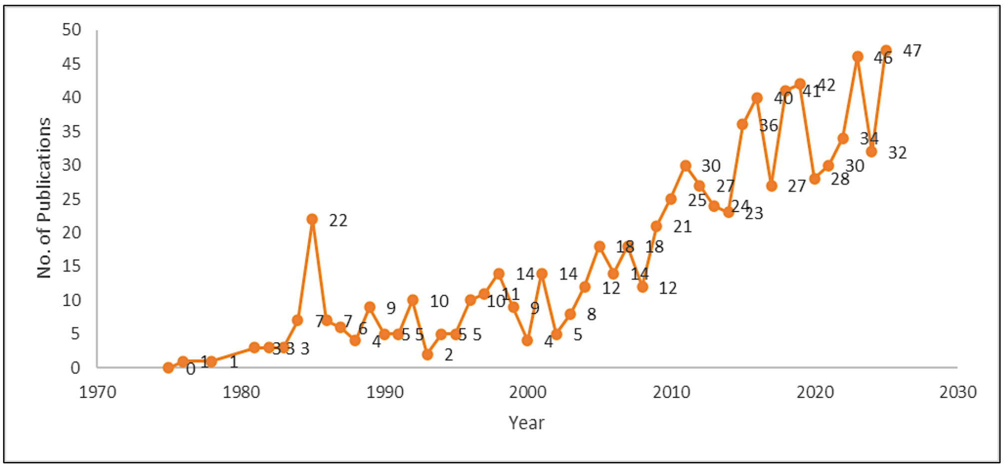

Figure 3: Trend of Publications on Performance Audit from 1975 to 2025

The dataset shows a highly uneven geographical distribution of performance audit publications, with output concentrated in a small number of countries as shown in Figure 4. The United States leads significantly with 180 publications, followed by the United Kingdom [93] and Australia [68]. China [67] and Canada [53] form the next tier, indicating that the field is largely dominated by a cluster of major research-producing nations. A notable entry is "Undefined" [94], which suggests a substantial number of records without clear country attribution, but even excluding this category, the dominance of a few countries remains evident. After the top six contributors, publication counts drop sharply, with most countries producing fewer than 30 studies.

Across the remaining countries, output becomes increasingly fragmented. European nations such as the Netherlands [28], Norway [26], Germany [21], Sweden [20] and Denmark [18] show moderate but consistent contributions. Many other countries including those in Asia, the Middle East, Africa and Latin America record single-digit outputs and more than 25 countries have only one publication each, representing the lowest level of contribution. This indicates a long-tail distribution where participation is widespread geographically but shallow in volume.

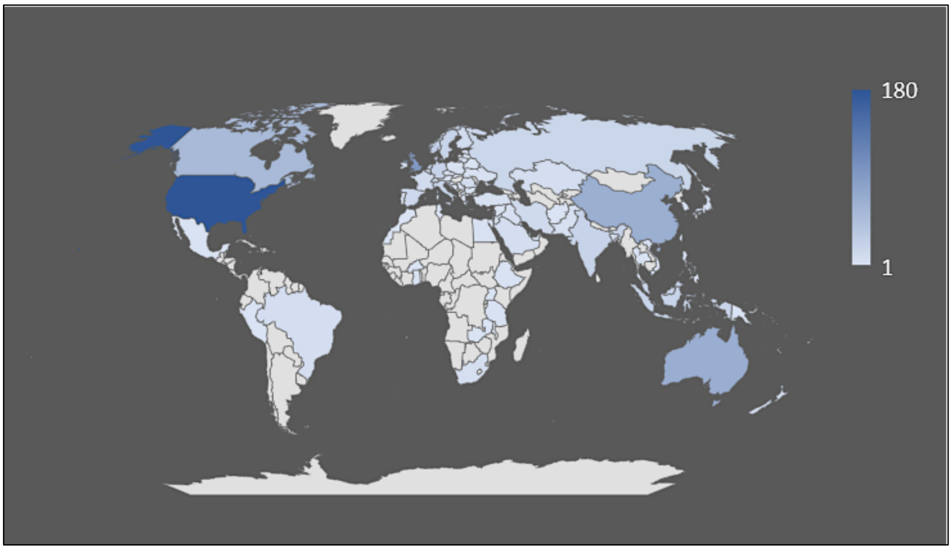

Figure 4: Trends in Performance Audit Publications by Country

The development of performance audit research from 1975 to 2025 shows a clear shift from early concentration in a few leading countries to a more globally distributed field as shown in Figure 5. During the foundational phase (1975–1999), research activity was dominated by the United States and the United Kingdom, indicating their foundational role in shaping the field. The expansion phase (2000–2009) reflected broader participation from Australia, Canada and several Western European countries, strengthening international collaboration. In the global diffusion phase (2010–2025), emerging economies including China, India, Indonesia, Malaysia and South Africa became increasingly visible, reflecting wider geographical participation and growing international collaboration in performance audit research.

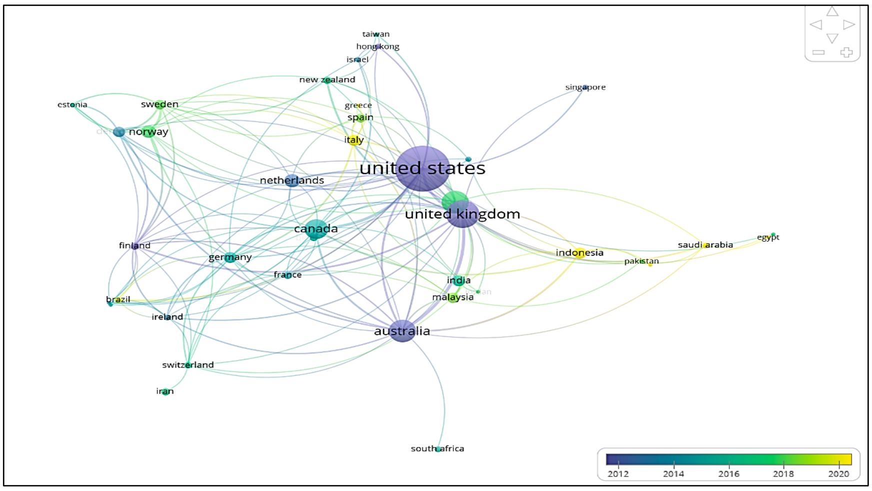

Figure 5: Global Collaboration Network in Performance Audit Research

The subject area distribution indicates that performance audit research is strongly anchored in the management and governance-oriented disciplines, with Business, Management and Accounting (259 publications; 21.71%) and Social Sciences (257 publications; 21.54%) forming the two dominant fields. Together, these areas account for more than two-fifths of the total output, demonstrating that performance auditing is primarily examined as a mechanism of organisational accountability, public administration and policy evaluation. The next tier are Economics, Econometrics and Finance (12.91%) and Engineering (12.66%). It shows that the field extends beyond governance into efficiency analysis, resource allocation and technical performance assessment, reflecting its application in evaluating infrastructure, systems and financial effectiveness.

A second layer of disciplinary engagement is visible in applied and impact-oriented domains such as Medicine (9.30%) and Environmental Science (7.04%), indicating the growing use of performance audit frameworks in assessing service delivery, sustainability and programme outcomes. Emerging contributions from Computer Science (6.04%) suggest increasing interest in data-driven auditing, digital governance and analytical tools, while smaller shares in Decision Sciences, Arts and Humanities and Energy (each below 4%) reflect specialised or contextual applications rather than core theoretical development. Overall, the pattern reveals that performance audit is an inherently interdisciplinary field, but one whose intellectual centre of gravity remains within management, public sector governance and socio-economic evaluation as shown in Table 1.

Table 1: Top 10 Performance Audit Publications by Subject Area

Subject Area	Total	Percentage (%)
Business, Management and Accounting	259	21.71
Social Sciences	257	21.54
Economics, Econometrics and Finance	154	12.91
Engineering	151	12.66
Medicine	111	9.30
Environmental Science	84	7.04
Computer Science	72	6.04
Decision Sciences	39	3.27
Arts and Humanities	34	2.85
Energy	32	2.68

The distribution of publications by document type shows a strong dominance of journal articles, which account for 523 publications and represent by far the largest share of the dataset. This is followed by conference papers [141] and book chapters [65], while other formats such as reviews [40] and books [14] contribute more modestly. The remaining categories including conference reviews and notes (5 each), editorials [3], retracted papers [2] and both letters and short surveys [1 each] represent only a very small proportion of total output. The highest concentration in journal articles indicates that performance audit research is primarily disseminated through peer-reviewed academic channels, reflecting the field's emphasis on validated empirical and theoretical contributions.

In contrast, the lowest-frequency formats (letter and short survey, with only one publication each) suggest that brief or preliminary communications are rarely used in this area, highlighting a preference for full-length analytical studies. The overall pattern shows a clear hierarchy in scholarly communication: journal articles serve as the principal medium, conference papers function as a secondary platform for emerging findings and book-related outputs provide supplementary conceptual discussions. On average, the distribution is highly skewed toward formal academic publications, indicating that performance audit research is largely institutionalised within established scholarly publishing systems rather than exploratory or informal dissemination formats as shown in Figure 6.

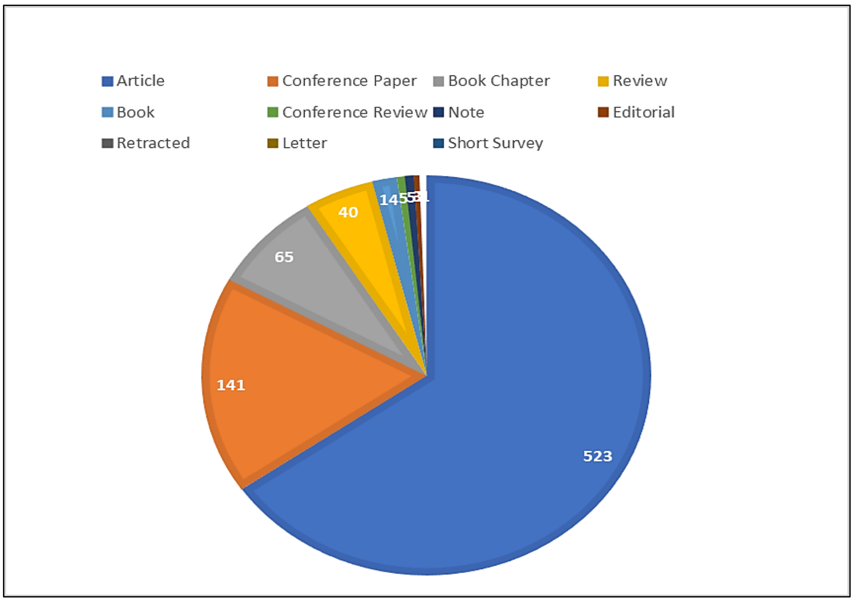

Figure 6: Distribution of Publication types in Performance Audit Research

The funding landscape shows a moderately dispersed pattern without a single dominant sponsor, indicating that performance audit research is supported by a wide range of governmental, public research councils and international programmes rather than concentrated private funding. The highest contribution comes from the U.S. Environmental Protection Agency [7 funded publications], followed by several major national funding bodies with similar levels of support, including the European Commission, National Natural Science Foundation of China, U.S. National Science Foundation and the Research Council of Norway [each with 6 publications]. This clustering suggests that performance audit research is primarily financed by public-sector institutions with mandates related to governance, accountability and policy evaluation.

Mid-level contributors, such as the Economic and Social Research Council [4 publications] and several agencies with three funded outputs including Horizon 2020, National Institutes of Health, National Cancer Institute and Universiti Teknologi MARA, indicate sustained but not dominant engagement. A large proportion of sponsors fall into the lower range, with many organisations funding only two or one publications, representing the lowest level of contribution. This creates a long-tail funding structure in which participation is broad but shallow. On average, the number of publications per sponsor is relatively low, reflecting project-based or thematic funding rather than continuous dedicated funding stream as shown in Figure 7.

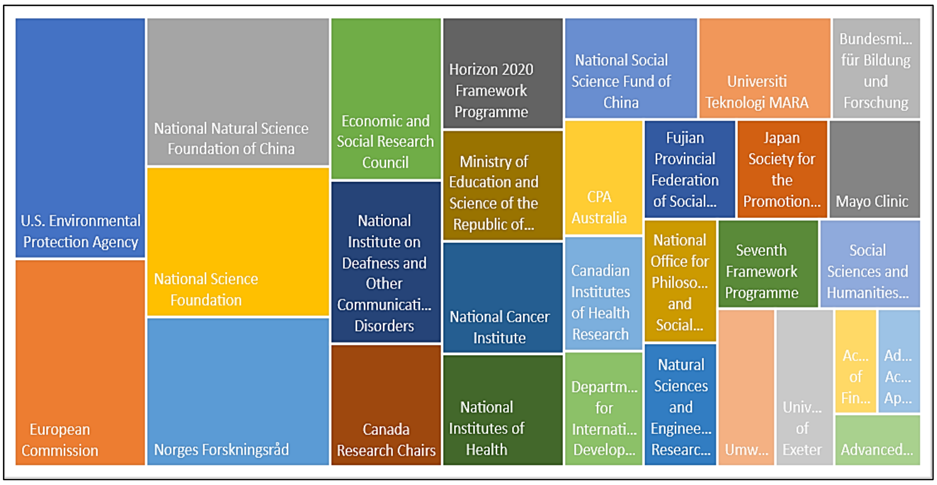

Figure 7: Major Funding Sponsors Supporting Performance Audit Research

Key Contributors in Global Performance Audit Research: Authors, Institutions and Sources

The publication counts among the top 10 authors range from 6 to 10 documents, the highest number is 10, followed by 9 and 8. The remaining authors each contribute between 6 and 8 publications, indicating a relatively narrow productivity spread. This suggests that no single author overwhelmingly dominates the field within this dataset; instead, research output is shared among several recurring contributors as shown in Figure 8.

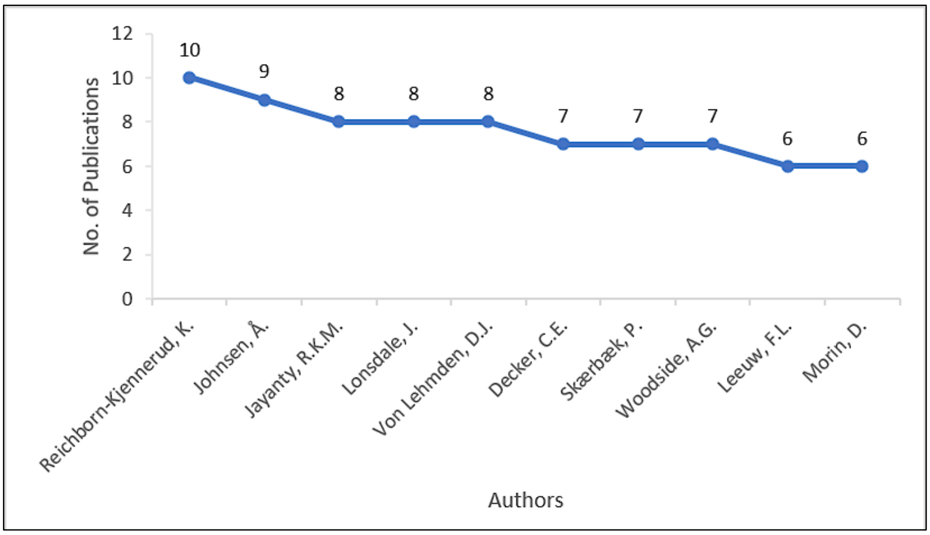

Figure 8: Top 10 Most Productive Authors in Performance Audit Research

The institutional distribution of publications indicates that performance audit research is led by a combination of government agencies, policy research organisations and universities, reflecting the applied and policy-oriented nature of the field as shown in Figure 9. The United States Environmental Protection Agency [24] emerges as the most productive affiliation, significantly ahead of others, highlighting the strong involvement of public-sector audit and evaluation bodies in generating research outputs. This is followed by RTI International [14] and Copenhagen Business School [13], demonstrating the important role of independent research institutes and business schools in advancing methodological and governance-related studies.

A second tier of contributors includes OsloMet – StorbyUniversitetet [10] and several universities across different regions—HEC Montréal and UNSW Sydney [8 each], along with The Australian National University, University of Wollongong, Financial University under the Government of the Russian Federation and Nanjing Audit University (7 each). The presence of institutions from North America, Europe, Asia and Oceania indicates that while research leadership is concentrated in a few highly productive organisations, institutional participation is geographically diverse. Overall, the pattern suggests that performance audit scholarship is strongly anchored in institutions connected to public governance, policy evaluation and applied administrative research, rather than being dominated solely by traditional accounting faculties.

The distribution of publications across source titles indicates a clear concentration in a small number of specialised journals, with Financial Accountability and Management emerging as the leading outlet (33 publications; 30.84%). This journal alone accounts for nearly one-third of the output among the top sources, highlighting its central role as a primary platform for scholarly discussion on public sector accountability and performance auditing. The second-ranked journal, Public Money and Management (16 publications; 14.95%), further reinforces the dominance of public governance and public financial management outlets in shaping the discourse.

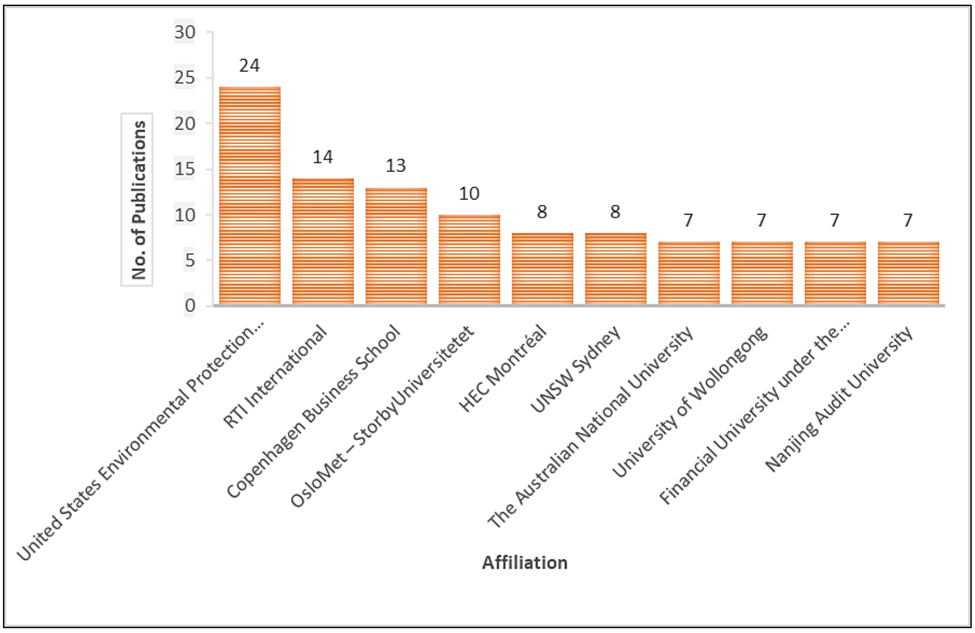

Figure 9: Leading Institutional Affiliations in Performance Audit Publications

Table 2: Top 10 Performance Audit Publications by Source Title

Source Title	Publisher	No. of Documents	Percentage (%)
Financial Accountability and Management	John Wiley and Sons Inc	33	30.84
Public Money and Management	Routledge	16	14.95
Sustainability Switzerland	Multidisciplinary Digital Publishing Institute (MDPI)	9	8.41
Advanced Materials Research	Southeast University, China	8	7.48
Managerial Auditing Journal	Emerald Group Publishing Ltd.	8	7.48
Critical Perspectives on Accounting	Elsevier	7	6.54
Evaluation	Sage	7	6.54
Journal of the Air Pollution Control Association	Taylor and Francis	7	6.54
ASTM Special Technical Publication	ASTM International	6	5.61
Medizinrecht	Springer	6	5.61

The remaining sources contribute smaller yet meaningful shares, reflecting the interdisciplinary reach of performance audit research. Journals such as Managerial Auditing Journal and Critical Perspectives on Accounting emphasise accounting and auditing scholarship, while Evaluation represents the policy and programme assessment perspective. Other outlets including Sustainability, Advanced Materials Research and the Journal of the Air Pollution Control Association illustrate the application of performance audit concepts in environmental, technical and regulatory contexts. The relatively even distribution among these mid-tier sources (6–9 publications each) suggests that, beyond the core governance journals, research is dispersed across diverse applied domains. Overall, the pattern reveals a field anchored in public sector accountability journals but extending into interdisciplinary platforms where performance evaluation intersects with sustainability, regulation and technical performance assessment. This concentration of publications within governance and accountability-oriented journals suggests that performance audit research remains strongly anchored in public-sector administrative reform and institutional accountability discourse shown in Table 2.

Highly Cited Publications in Performance Audit Study

Citation analysis of the top 10 most frequently cited publications highlights the works that have exerted the greatest influence within the performance audit literature. The most highly cited publication recorded 472 citations (15.73 citations per year), reflecting a foundational contribution to innovation auditing and organisational assessment (42). Another highly influential publication recorded 290 citations and the highest annual citation rate [16.11], indicating strong and sustained theoretical impact on governance-oriented interpretations of audit practices (43). Earlier studies continue to attract citations, demonstrating the enduring relevance of performance measurement and institutional governance perspectives (44, 45). Several mid-period studies also demonstrated continued influence through applied evaluations in national and sector-specific contexts (46, 47), while increasing attention has been given to implementation and performance-based interventions (48). The literature further indicates interdisciplinary borrowing of evaluation concepts from healthcare and behavioural domains (49-51). Overall, the citation pattern among these highly cited publications suggests that influential contributions to performance audit research have largely centred on performance measurement, organisational control and governance-oriented evaluation, with comparatively less emphasis on outcome-based societal assessment. This pattern further indicates that influential performance audit scholarship continues to prioritise governance control and organisational performance measurement over broader public value and societal impact evaluation, shown in Table 3.

Table 3: Top 10 Most Frequently Cited Publications

Year	Title	Age	No. of Citations	Citations/ Year	Reference
1996	Development of a technical innovation audit	30	472	15.73	(51)
2008	Audit cultures: Neoliberal governmentality, socialist legacy, or technologies of governing?	18	290	16.11	(42)
2009	Drivers' misjudgement of vigilance state during prolonged monotonous daytime driving	17	218	12.82	(48)
2001	Governing the borderlands: Decoding the power of aid	25	191	7.64	(44)
1993	Outcome related Performance Indicators and Organizational Control in the Public Sector	33	184	5.58	(43)
2003	The development of internal audit in Saudi Arabia: An institutional theory perspective	23	161	7	(45)
1998	Evaluating water supply services in Japan with RAM: A range-adjusted measure of inefficiency	28	150	5.36	(46)
2011	Inattention, working memory and academic achievement in adolescents referred for attention deficit/hyperactivity disorder (ADHD)	15	128	8.53	(49)
1996	Identifying adverse events caused by medical care: Degree of physician agreement in a retrospective chart review	30	128	4.27	(50)
2012	Why performance-based contracting failed in Uganda - An " open-box" evaluation of a complex health system intervention	14	105	7.5	(47)

Keyword Co-occurrence Analysis

As shown in Figures 10-12, depict VOSviewer-generated visualisations that map the thematic configuration of performance audit research through keyword co-occurrence analysis. These visualisations reveal the most strongly connected concepts and show how keywords relate to one another within the wider academic network (52). Of the 800 publications examined, 238 author-provided keywords were initially identified. Implementing a minimum occurrence threshold of twenty refined the dataset to 143 keywords that met the inclusion criteria and were subsequently categorised into four thematic clusters. This higher threshold was applied to prioritise frequently recurring and substantively significant terms while filtering out less prevalent keywords with limited analytical contribution. The resulting clusters and their associated terms are detailed in Table 4.

Keyword co-occurrence was examined using three VOSviewer visualisation modes: network, overlay and density maps. In the network visualisation, node size reflects the frequency of a keyword's occurrence, whereas shorter and thicker connecting lines signify stronger relationships between terms. Distinct colour groupings denote clusters of conceptually related keywords and within each cluster, the most prominent keyword is displayed with the largest and most visible label (53).

Table 4: Number and List of Keywords Across Four Clusters

Cluster	No. of keywords	Keywords
1 (red)	75	Account, accountability, accounting, action, administration, article, audit quality, auditee, auditing, auditor, auditor general, Australia, author, authority, book, Canada, chapter, China, concept, content, context, country, court, design methodology, economy, extent, firm, goal, governance, government, implication, independence, Indonesia, influence, insight, institution, interest, literature, local government, Malaysia, ministry, money, new public management, office, originality value, parliament, perception, performance audit report, performance auditing, performance measure, place, policy, practical implication, practitioner, public administration, public sector, public sector audit, public sector auditing, public sector auditor, recommendation, reform, relation, research limitations, respondent, role, sai, sais, sdgs, supreme audit institution, theme, transparency, understanding, value, work, world.
2 (green)	50	Accuracy, agency, benefit, care, comparison, compliance, compound, condition, cost, difference, feedback, group, hospital, industry, intervention, laboratory, maintenance, measure, measurement, monitoring, number, observation, operation, outcome, part, participant, patient, performance audits, physician, precision, present study, procedure, program, quality assurance, reliability, risk, safety, sample, site, subject, survey, task, technique, test, time, training, trial, use, user, woman.
3 (blue)	10	Application, audit committee, company, construction, dimension, effect, optimization, performance, sustainability, technology.
4 (yellow)	8	Building, criterium, India, indicator, questionnaire, regulation, requirement, set.
Total	143	

The network visualisation reveals four colour-coded clusters representing the principal thematic domains within performance audit research, as shown in Figure 10. The red cluster, the largest with 75 keywords, forms the intellectual core of the field and centres on the institutional, governance and public-sector foundations of performance auditing. Frequently occurring terms such as accountability, governance, auditor, supreme audit institution (SAI), public sector, policy, transparency and new public management indicate that much of the literature examines performance auditing as a mechanism of public financial oversight and administrative reform. The presence of geographically linked terms such as Malaysia, China, Indonesia, Australia and Canada suggests strong cross-national applications of performance audit research. Keywords such as performance audit report, audit quality and recommendation further indicate a strong emphasis on audit practices, standards and accountability outcomes related to government effectiveness and the SDGs.

The green cluster comprising 50 keywords shifts attention toward the operationalisation and evaluation of performance audits, highlighting measurement, implementation and evidence-based assessment. Terms such as measurement, monitoring, outcome, intervention, program, reliability, risk, quality assurance and training indicate a methodological and practice-oriented stream concerned with how audits assess service delivery performance in applied settings, particularly in sectors like healthcare and industry (e.g., hospital, patient, laboratory). This cluster underscores the growing role of performance audits as evaluative tools for operational efficiency and service quality rather than solely financial compliance.

The blue cluster, comprising 10 keywords, represents a management and organisational performance perspective. Keywords such as company, audit committee, technology, sustainability, optimization and effect show the extension of performance auditing concepts into corporate governance, construction and technologically enabled environments. This indicates an emerging intersection between traditional public-sector auditing and private-sector performance management, including sustainability and innovation-driven accountability.

The yellow cluster, the smallest with 8 keywords, captures technical and methodological structuring elements of performance audit studies. Terms such as indicator, questionnaire, regulation, requirement, criterium and set suggest a focus on developing audit frameworks, evaluation criteria and measurement instruments. Its relatively peripheral size implies that, while methodological refinement is present, it functions mainly as a supporting strand that underpins the broader governance and evaluation discussions.

Collectively, these clusters depict a multidimensional yet interconnected performance audit research landscape. Performance audit scholarship is anchored in public-sector accountability and institutional reform (red cluster), increasingly complemented by applied evaluation and measurement practices (green cluster), with emerging contributions from organisational, technological and sustainability perspectives (blue cluster) and supported by developing methodological tools and regulatory frameworks (yellow cluster). This structure reflects the evolution of performance auditing from a control-oriented function toward a comprehensive instrument for performance evaluation, governance improvement and evidence-based policy management.

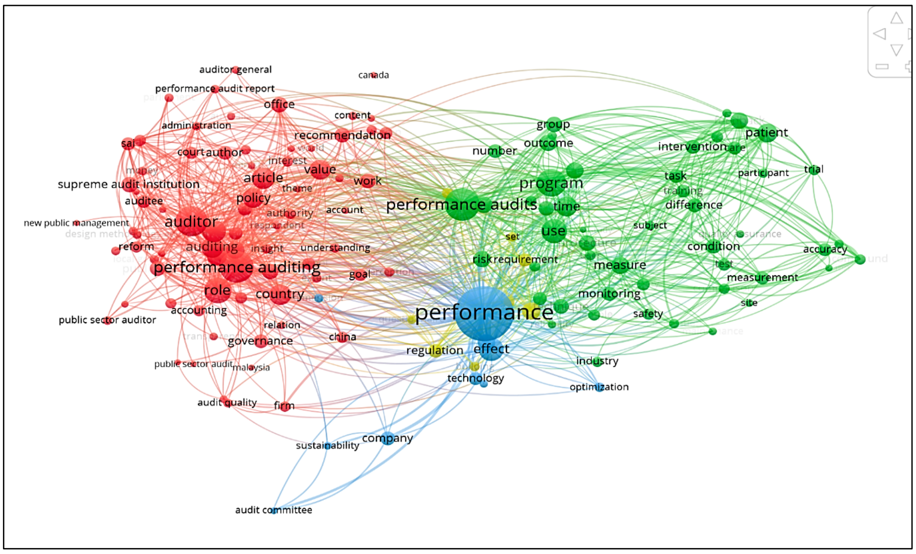

Figure 10: Thematic Structure of Performance Audit Literature Based on Keyword Co-occurrence

In the overlay visualisation, colours represent the average publication year of keywords within the dataset. Darker tones (blue to purple) indicate terms that appeared earlier in the literature and reflect established research foundations, while lighter tones (green to yellow) denote more recent keywords, signalling emerging directions and evolving scholarly attention in performance audit research.

The map illustrates the temporal development of the field by showing that earlier studies concentrated on foundational governance and audit-related themes. Keywords displayed in darker shades such as performance audits, measurement, condition, accuracy and other evaluation-oriented terms—cluster around the technical and procedural aspects of auditing. These terms represent the formative stage of the literature, where research primarily focused on defining audit practices, establishing assessment criteria and ensuring reliability in performance evaluation. Keywords appearing in green tones mark a transitional phase characterised by expansion into public-sector governance and administrative application. Terms such as performance auditing, auditor, governance, policy, country and regulation suggest a growing interest in how performance audits function as accountability mechanisms within government systems and across national contexts. This stage reflects the consolidation of performance auditing as a tool of public management and reform.

The most recent contributions, highlighted in lighter green to yellow shades, point to emerging and practice-oriented themes. These include terms such as sustainability, technology, company, industry and optimization, indicating a shift toward integrating performance auditing with organisational performance, digitalisation and sustainability-related evaluation. The appearance of these keywords suggests that the field is broadening beyond traditional public-sector oversight to address contemporary challenges linked to innovation, efficiency and cross-sector applications.

Overall, the colour gradient demonstrates a progression from methodological and measurement-focused origins, to governance and accountability applications and more recently toward technology-enabled, sustainability-oriented and organisational performance perspectives, signalling an increasingly interdisciplinary and practice-driven evolution of performance audit scholarship as shown in Figure 11.

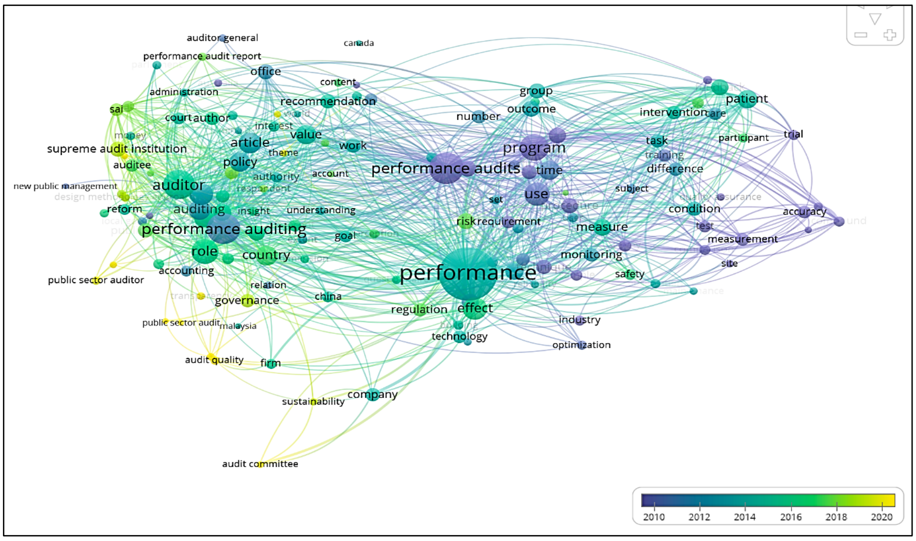

Figure 11: Keyword Overlay Map Showing the Development of Performance Audit Research Over Time

In the density visualisation, colour intensity represents the frequency and concentration of keyword occurrences within the dataset. Brighter yellow regions indicate terms that appear most often and occupy a central position in the literature, whereas green and blue areas denote less frequent keywords with a more peripheral role (54). The density map shows the strongest concentration around the keyword's performance, performance auditing, auditor and performance audits, confirming these as the core concepts underpinning performance audit scholarship. These highly dense areas highlight the field's primary concern with evaluating organisational and governmental performance through audit mechanisms.

Surrounding this central zone are moderately dense regions associated with governance and public-sector oversight, including policy, governance, supreme audit institution, public sector and accountability. This pattern reflects sustained scholarly attention to the role of performance auditing in enhancing transparency, administrative reform and public management effectiveness. Additional clusters of moderate intensity appear around applied evaluation and measurement themes such as program, monitoring, measurement, outcome, risk and quality assurance. These terms indicate a strong operational stream focused on assessing service delivery, programme implementation and evidence-based performance assessment. In contrast, lower-density areas at the periphery include terms such as technology, sustainability, company, optimization and questionnaire, suggesting emerging or specialised topics that extend performance auditing into technological, corporate and methodological domains but remain less developed in comparison to the traditional governance-focused literature. Overall, the density map reinforces the dominance of accountability and performance evaluation as the foundation of the field while signalling gradual diversification into applied assessment practices and newer interdisciplinary areas such as sustainability and technology-enabled auditing as shown in Figure 12.

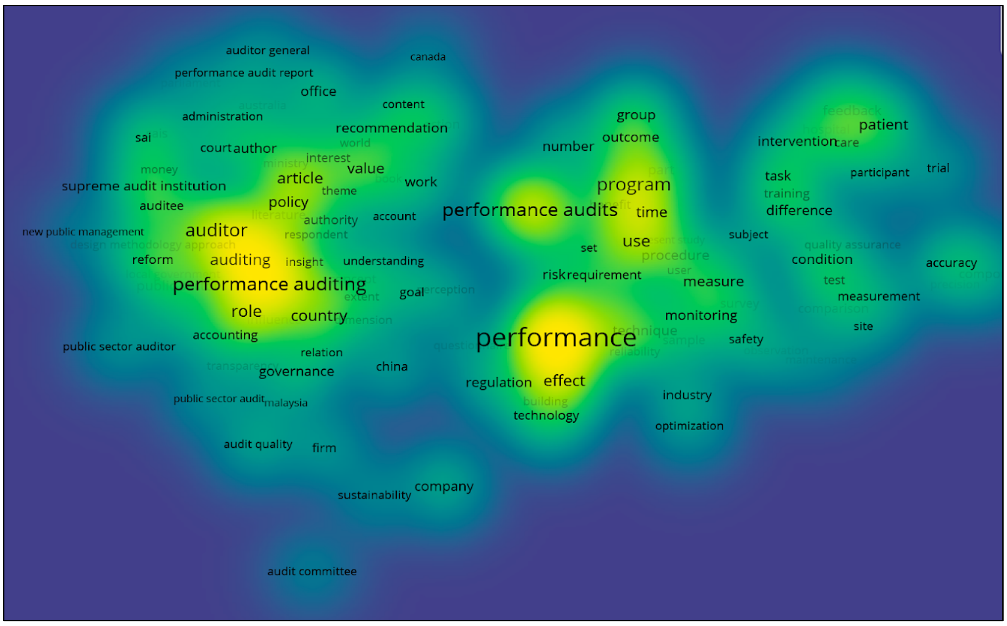

Figure 12: Keyword Density Map of Performance Audit Research

Discussion

The structural patterns identified through citation networks, keyword clustering and thematic distribution reveal not only what has been studied, but also what has remained peripheral or conceptually underdeveloped. The findings indicate that performance audit scholarship remains largely rooted in a conventional public-sector governance paradigm. Existing studies continue to emphasise accountability, transparency and administrative reform. Dominant themes centre on institutional oversight and audit practices, suggesting that the field continues to prioritise procedural effectiveness over broader socio-economic outcomes. While this has reinforced performance auditing as a mechanism of managerial accountability, it has limited its application in assessing public value and developmental impact.

Empirical evidence indicates that performance audits of budget investments in Kazakhstan primarily verify fund disbursement and technical efficiency rather than broader societal value (55). The research highlights that audits focus on whether resources were spent as planned, with insufficient attention to their contribution to regional development or citizens' well-being, reflecting a methodological bias toward economy and efficiency measures. It further notes that existing frameworks lack appropriate effectiveness indicators, reinforcing a control-oriented audit culture, while tools such as Data Envelopment Analysis are mainly used to estimate input–output efficiency rather than explain causal change (55). These findings point to a persistent gap between auditing for accountability and auditing for demonstrable public value. Future research should therefore move beyond compliance-based assessments by incorporating outcome-oriented indicators and evaluative approaches that capture organisational learning, policy impact and performance improvement.

A further imbalance emerges in the operational dimension of the literature. Although some studies address measurement, monitoring and programme evaluation, these themes occupy a secondary position relative to governance-focused discussions, suggesting that empirical assessments of how performance audits influence organisational behaviour and administrative practices remain limited. Evidence from Norway provides an important illustration of how such change may occur in practice. A survey of 353 civil servants found that nearly half reported substantial organisational changes following performance audit reports, while a majority indicated that the reports were actively used to improve internal operations (56). The changes most frequently involved strengthening documentation, revising strategies and planning systems and improving internal control and risk management procedures. These findings suggest that performance audits can function as an external stimulus for organisational learning by prompting agencies to reassess existing routines and governance structures.

At the same time, the Norwegian case shows that audit impacts are often procedural rather than transformational, with most changes involving improvements to control systems and reporting practices rather than fundamental shifts in service delivery or organisational goals. This reflects "single-loop learning," where organisations adjust practices to meet expectations without rethinking underlying assumptions, while resistance from audited entities can further limit the depth of change (56). In response, future research should adopt a Theory of Change perspective to clarify how performance audits generate meaningful results. Under this approach, performance audits serve as the input, producing outputs such as recommendations, revised procedures and strengthened controls, which should then be evaluated in terms of outcomes like improved organisational effectiveness and decision-making. Integrating Theory of Change can strengthen evaluation by establishing clearer indicators and metrics to assess the impact of audit recommendations (57).

Another key gap identified through the bibliometric analysis is the marginal position of technology- and sustainability-related themes within the performance audit literature. The cluster containing keywords such as technology, sustainability and optimization is relatively small and has only emerged in recent years, indicating that these topics remain peripheral rather than central to the field. This suggests that digital auditing, data-driven accountability and sustainability-oriented evaluation are still under-theorised and lack an established conceptual framework. Existing studies are largely exploratory and fragmented, showing that the integration of technological and sustainability dimensions has yet to be fully institutionalised within mainstream performance audit research.

Despite increasing government emphasis on ESG reporting, AI-assisted audits and digital governance, these themes remain underdeveloped within the performance audit literature. One possible explanation is that many public-sector audit institutions continue to rely on conventional compliance-oriented audit frameworks, limiting the integration of advanced analytical technologies and sustainability-oriented evaluation approaches. In addition, the shortage of digital competencies among auditors, inconsistent regulatory standards and uneven technological infrastructure across countries constrain the adoption of AI-enabled and data-driven audit practices. These challenges are particularly evident in developing economies where digital transformation within public-sector governance remains at varying stages of maturity.

Recent literature further highlights a range of digital technology gaps that continue to constrain the effective integration of digital tools into performance auditing. A key issue is the shortage of auditor expertise and training in emerging technologies, with many auditors reporting only moderate familiarity with tools such as cloud computing and automated analytics, underscoring the need for systematic competence development (58). Technological and infrastructure limitations, including inadequate IT systems and restricted digital access, also hinder adoption, particularly in resource-constrained environments (59). In addition, implementation challenges such as organisational resistance to change, platform complexity and scalability concerns often compounded by cybersecurity risks and uncertain returns on investment—slow the transition toward digitally enabled audits. Regulatory and policy environments remain insufficiently adaptive, with weak standardisation and governance frameworks further impeding innovation (60). Financial constraints, data quality issues and fragmented information systems likewise reduce the effectiveness of digital audit practices and limit the use of open data for risk-based analysis (61).

Addressing these challenges requires coordinated institutional responses. The literature recommends targeted training programmes to strengthen digital competencies, sustained investment in IT infrastructure and clearer regulatory frameworks to guide technology adoption (58-60). Equally important are organisational change initiatives that encourage innovation, alongside financial and technical support to offset implementation costs and improve data management systems. Collectively, these measures are necessary to move digital performance auditing from a fragmented, exploratory stage toward a more standardised and operationalised practice.

The analysis also reveals a notable absence of engagement with faith-based redistribution systems, particularly Islamic social finance. Despite the formalised and institutional nature of zakat administration in many Muslim-majority countries, related themes do not appear within the dominant bibliometric structures, indicating a significant conceptual gap. Islamic social finance represents a major structured welfare mechanism, operating through legally mandated institutions and regulated governance frameworks. In OIC countries such as Malaysia, zakat institutions function as statutory bodies within the public financial system and are subject to performance audits by the National Audit Department, managing substantial public-trust funds through organised assistance programmes (62). However, the lack of integration between performance audit scholarship and Islamic social finance contexts suggests that existing research has yet to explore how audit frameworks can evaluate value-based redistribution systems grounded in religious norms.

Accordingly, future research particularly within Islamic accounting and public sector accountability should extend performance audit frameworks to examine faith-based financial institutions as formal governance entities rather than treating them solely as charitable mechanisms. This would involve developing context-sensitive evaluation models and indicators that capture not only financial stewardship but also socio-economic value and institutional effectiveness, thereby broadening the scope of performance auditing to reflect diverse governance environments.

Conclusion

This study systematically examined the evolution of global performance audit research from 1975 to 2025 through bibliometric analysis of publications indexed in the Scopus database. The findings demonstrate a substantial expansion of performance audit scholarship over the past five decades, particularly after 2010, reflecting the growing importance of accountability, governance reform and performance evaluation within public-sector administration. The analysis further reveals that the field remains heavily concentrated within governance and institutional accountability paradigms, while emerging themes such as ESG reporting, digital governance, AI-assisted auditing, sustainability evaluation and cross-sector applications remain comparatively underdeveloped.

This study contributes to the literature by providing one of the earliest systematic bibliometric mappings of performance audit research over a fifty-year period. The analysis reveals the field's intellectual structure, dominant paradigms and areas of conceptual fragmentation. By situating performance audit within broader knowledge-evolution dynamics, the study demonstrates that the field has advanced operationally but remains theoretically fragmented and institutionally concentrated. The findings offer an important foundation for future research to move beyond descriptive accountability studies toward more integrative, outcome-oriented and interdisciplinary frameworks that better reflect the increasingly complex evaluative role of performance auditing in contemporary governance environments.

For policymakers and public-sector institutions, the findings suggest that performance auditing should move beyond procedural verification toward evaluating whether public programmes generate intended outcomes and long-term public value. Governments and statutory bodies, including entities managing public-trust funds such as zakat institutions, can utilise performance audits not only as accountability mechanisms but also as instruments for organisational learning, policy refinement and performance improvement. Strengthening evaluation indicators, digital capabilities and follow-up mechanisms may further enhance evidence-based decision-making and governance effectiveness.

For auditors and Supreme Audit Institutions (SAIs), the study highlights the need to recalibrate audit methodologies toward outcome-oriented assessment, integration of digital analytics and adaptive evaluation approaches. The profession must invest in new competencies, technological infrastructure and methodological innovation. These capabilities are necessary to address emerging governance challenges, including sustainability oversight and increasingly complex institutional environments. By embracing these developments, performance auditing can evolve from a predominantly control-oriented function into a strategic instrument supporting organisational transformation, public value creation and responsive governance.

Several limitations should nevertheless be acknowledged. First, the study relies exclusively on bibliometric techniques and does not include empirical investigation of actual performance audit practices. Although bibliometric analysis enables systematic mapping of research trends, themes and intellectual structures, it does not assess how performance auditing is implemented or experienced within organisational settings. Second, the dataset was limited to publications indexed in the Scopus database. While Scopus is widely recognised for its broad coverage of peer-reviewed literature, reliance on a single database may have excluded relevant studies indexed elsewhere, potentially limiting the comprehensiveness of the dataset.

Future research should therefore complement bibliometric findings with empirical investigations examining how performance audits influence organisational behaviour, policy outcomes and governance effectiveness in practice.

Qualitative case studies, surveys of audited entities and mixed-method evaluations may provide deeper insight into how audit recommendations are implemented and translated into measurable organisational change. Expanding future datasets to include databases such as Web of Science and regional indexing platforms could also support broader comparative analyses and a more inclusive representation of global scholarship. Further studies are particularly encouraged to explore emerging areas identified in this study, including digital auditing, sustainability evaluation, ESG governance and alternative governance contexts, to advance performance audit research toward more integrated and impact-oriented evaluative frameworks.

Abbreviations

AI: Artificial Intelligence, ESG: Environmental, Social and Governance, INTOSAI: International Organization of Supreme Audit Institutions, NPM: New Public Management, RIS: Research Information Systems, SAI: Supreme Audit Institution, SDGs: Sustainable Development Goals, UK: United Kingdom, US: United States, VOSviewer: Visualization of Similarities Viewer.

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Author Contributions

Mohd Suffian Mohamed Esa: Conceptualization, Methodology, Software, Data Curation, Formal Analysis, Resources, Writing-Original Draft Preparation, Visualization, Hairunnizam Wahid: Methodology, Supervision, Funding Acquisition, Validation, Writing- Review, Editing, Salmy Edawati Yaacob: Methodology, Writing- Review, Editing, Validation.

Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declaration of Artificial Intelligence (AI) Assistance

The authors declare that the generative artificial intelligence (AI) tool ChatGPT 4.0 was used exclusively for language editing and/or grammatical improvement. The use of AI did not influence the scientific content, study design, data analysis, data interpretation, results, or conclusions of the manuscript. Full responsibility for the content remains with the authors.

Ethics Approval

Ethical approval was not required for this study as it does not involve human participants, animal subjects, or primary data collection.

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