Audit Quality Review: An Analysis Projecting the Past, Present, and Future

Niva Kalita[*]**, Reshma K. Tiwari**[**]

Abstract: Literature on audit quality remains plenteous, with researchers contemplating the area for 'forever and a day'. The present study proposes synthesising the existing literature on audit quality, discerning the prominent themes and providing future research avenues. This paper attempts to analyse and synthesise the dynamics of audit quality research by employing the diminuendos of systematic literature review with bibliometric and content analysis. Scopus database has been gleaned to systematically retrieve the literature on audit quality from 1981-2022. Analysing the 1101 relevant articles under review makes the USA the highest contributor. It is, however, enthralling to note that developing countries have also registered increased interest in the topic. Apart from the other documented findings, the study concluded that research has witnessed impeccable growth over the years under various lenses, which have been precisely synthesised into six clusters. While various reviews have been conducted using innumerable qualitative methods, this study attempts to employ quantitative methods to synthesise the extant literature, which is a rarity.

Keywords: audit quality; auditor; bibliometric analysis; content analysis; systematic review.

JEL classification: M420.

[*] Department of Commerce, School of Management Sciences, Tezpur University, Tezpur, Assam, India; e-mail: niva1234.nk@gmail.com (corresponding author).

[**] Department of Commerce, School of Management Sciences, Tezpur University, Tezpur, Assam, India; e-mail: reshma@tezu.ernet.in.

1. INTRODUCTION

Dwelling on the agency theory of corporate governance (CG), audit quality (AQ) plays an indispensable role in mitigating information asymmetries (Matoke & Omwenga, 2016) and encourages strong CG functioning (Chow, 1982). The stakeholders' confidence level traces a favourable and significant link with AQ (Al-Qatamin & Salleh, 2020). A high AQ boosts the accuracy of financial reports and promotes informed investment decisions and financial stability. AQ proportionately influences firm performance (Ani & Mohammed, 2015). However, the extant literature on AQ remains plenteous, with diverse definitions that are more generic than specific (Tritschler, 2013). Knechel and Sharma (2012) metaphorically refer to the Hindu apologue of four blind men defining an elephant as an exemplar of the conundrum in the existing literature defining AQ. The seminal definition of AQ by DeAngelo (1981) is the probability that an auditor will discover and report material misstatements. In Simunic (1984), AQ is the probability that when an auditor gives an unqualified opinion on a firm's financial position, the results are presented without prejudice. Again, the practitioner literature houses manifold definitions of AQ. While some believe that adherence to auditing standards is the yardstick of AQ (J. Krishnan & Schauer, 2001), others believe that the greater the detection of errors, the greater the AQ (Chang et al., 2009).

Even with these, others attest AQ to the number of audit assignments undertaken by the audit firm (Carcello et al., 2002). The UK's Financial Reporting Council (FRC) made a maiden attempt in this regard. In the FRC framework, five cardinal attributes that sum up AQ were outlined, as shown in Figure no. 1.
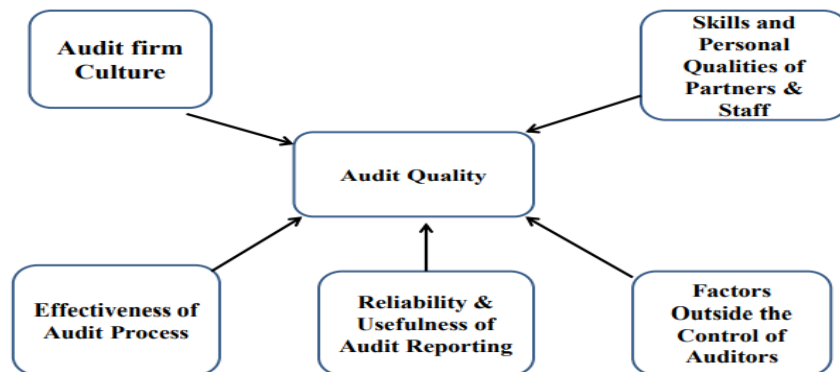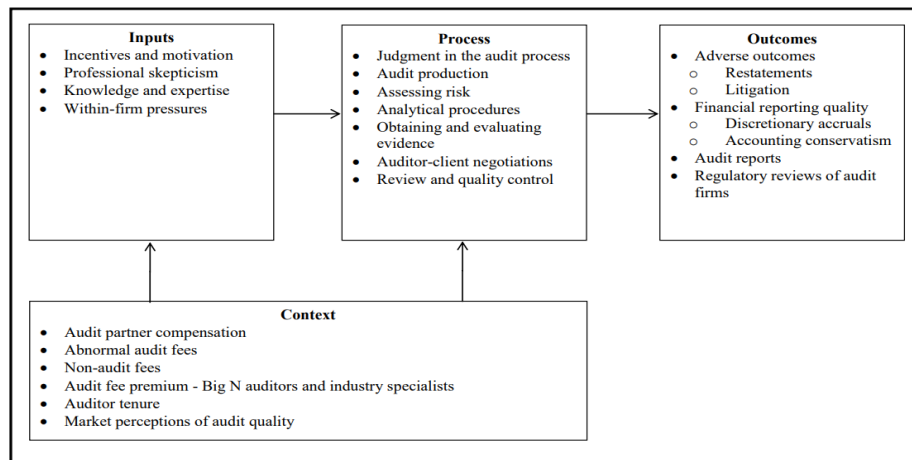

Figure no. 1 – UK's Financial Reporting Council: Audit Quality Framework
Source: Financial Reporting (2008)

Knechel and Sharma (2012), in their attempt at synthesising AQ literature, categorised them into four divisions to facilitate a better understanding of these idiosyncrasies.

Figure no. 2 – Audit Quality Indicators
Source: adopted from Knechel and Sharma (2012)

Extant literature on AQ has, albeit not limited, primarily contemplated the aspects of AQ as depicted under the four broad categories in Figure no. 2: input, process, outcome and context. These numerous aspects of AQ have variegated impacts similar to the prismatic nature of AQ itself. In the case of inputs, while a higher level of professional scepticism and expertise results in a higher quality of audit, the pressure exerted by clients and lucrative incentives offered may hinder the objectiveness of the auditor, thereby exhibiting a negative impact on AQ (Liu *et al.*, 2016).

Despite being widely cerebrated, AQ as an area remains nebulous. In order to provide comprehensive documentation of the multifaceted area of AQ, the authors aim to address the following research questions (RQ) through this study:

RQ1: What is the trend of publication of audit quality research?
RQ2: Which are the most underpinning studies on audit quality?
RQ3: What is the status quo of collaboration concerning audit quality research?
RQ4: Who are the prominent authors in the area of audit quality?
RQ5: Which are the most researched themes of audit quality?
RQ6: What is the intellectual structure of research concerning audit quality?
RQ7: What are the avenues for future research in audit quality?

This paper contributes to the existing literature in several ways. First, as far as our knowledge transcends, this is the first literature review to employ an admixture of systematic literature review (SLR) with bibliometric analysis and content analysis for furnishing panoramic information on AQ research. Previous studies (Ciger, 2020; Taqi, 2021) have limited their methodology to bibliometric analysis alone. Table no. 1 elaborately highlights the differences between the present study and previous studies on AQ review. Secondly, previous studies conducted in similar footings have left the intellectual structure of AQ unexplored. The analysis of intellectual structure can reveal research links, such as reciprocal citations and shared methodology. This information helps identify leading AQ research concepts and theories and track their evolution. The present study elaborates on addressing the same using a co-citation analysis. Thirdly, a primary objective of this study is to contribute

to future scholarly research on the topic of AQ by identifying and examining the most prospective avenues for further investigation. Hence, the examination of the RQs mentioned above can generate substantial benefits for future researchers in the field of auditing. Fourth, the results of this study may provide policymakers with valuable insights for developing effective audit practices that might enhance stakeholder confidence.

Table no. 1 – Comparison of the present study and recent review papers on AQ

Basis of comparison	Review Studies						
	Behrend and Eulerich (2019)	Ciger (2020)	Cruceana (2021)	Fallatah *et al.* (2021)	Taqi (2021)	Maggiorani (2022)	Present study
Period Search string	1926-2016 Not specified	1981- 2020 Limited to "Audit Quality"	2001-2020 Limited to "Audit Quality"	2005-2019 Not specified	1981-2020 Limited to "Audit Quality"	1991-2021 Not specified	1981-2022 Extensive and carefully constructed string of keywords related to AQ.
Focus area	Internal audit	All aspects of AQ	All aspects of AQ	IFRS adoption and AQ	All aspects of AQ	Audit Quality in the public sector	All aspects of AQ
Methodology	Bibliometric analysis	Bibliometric analysis	Bibliometric analysis	Bibliometric analysis	Bibliometric analysis	SLR and Bibliometric analysis	SLR, Bibliometric analysis and Content analysis

Source: authors' compilation

The remainder of the study is divided into sections that address the literature review, research methodology and data statistics, data analysis, discussion, and conclusion.

2. LITERATURE REVIEW

AQ is a Daedalian concept subjected to myriad gradations over the decades Francis (2011). The fact that corporate scandals burst into flames in the already enkindling area cannot be considered a hyperbole (Francis, 2004). Rapid advancements in information and communication technologies, the capacity of organisations to compete more readily, their sustainability, and the rise in stakeholder expectations have enhanced the relevance of the idea of AQ. The literature synthesis from previous decades reveals that AQ is characterised by ongoing evolution, as persistent research endeavours contribute to acquiring novel insights. The primary focus of scholarly investigations has been on the comprehensive examination of many factors that have the potential to influence the quality of audits (Taqi, 2021).

While auditors' independence is the radar under which AQ has been predominantly scrutinised (Tepalagul & Lin, 2015), analysing the contextual factors affecting AQ is yet another domain that remains centrifugal (Salehi *et al.*, 2019). Studies embarking on this area return several factors influencing the quality of audits. While (Leventis & Caramanis, 2005) establish the auditor's size and reputation as the factors that significantly influence the AQ, Hoitash *et al.* (2007) refute this by positing that the economic bonding shared by the auditor

and auditee captures the highest ascendancy among the determinants of AQ. Kusumawati and Syamsuddin (2018) further catalogue professional scepticism as another intrinsic factor of AQ. Nevertheless, numerous auditor-auditee characteristics undeniably influence the AQ (Caramanis & Spathis, 2006). Amongst these attributes, auditors' professional scepticism, however, forms the building block upon which the rationale of all auditor decisions rests (Chiang, 2016). Ignoring this idiosyncrasy will land anyone into the 'what you see is all there is" fallacy by the Nobel laureate Daniel Kahneman. Auditors are often denounced for ignoring their scepticism and uninhibitedly relying on the management for information, which obliviously impairs the auditor's independence (Mardijuwono & Subianto, 2018).

While the debate concerning the cardinal factors influencing AQ continues, in the absence of any consensus on the definition of AQ, measuring the same has also been onerous. According to M. DeFond and Zhang (2014), the quality of an audit can be mapped using either input-based or output-based standards. The audit's tools and procedures are the primary focus of input-based criteria. In comparison, the audit results are the mainstay of output-based criteria. In their review, Montenegro and Brás (2018) noted that most of the studies using 'input-based' criteria in AQ focused on audit fee, auditor brand name and auditor industry experience as AQ proxy since the 2000s.

Moreover, even when AQ was treated as an 'outcome', studies employing auditor litigation actions to reflect AQ are negligible. Thus, brand name, audit firm size, audit fee, auditor reputation, audit hour, auditor opinion, auditor tenure and auditor experience remain the most common proxies developed and employed by researchers across the continuum. Lennox (1999) in his study asserted that auditor size is the most appropriate proxy of AQ from the vantage of both the 'reputation hypothesis' (DeAngelo, 1981) and the 'deep pockets hypothesis' (Dye, 1993). However, over the last decade, regulatory agencies, audit companies, and scientists have been prompted to assess AQ using novel metrics (Ciger, 2020). As a result, it is necessary to explore the context and applicability of certain indicators to understand AQ thoroughly. Employing these measures of AQ, several researchers have also tried to assess the linkage between AQ and CG. According to the agency theory of CG, AQ serves as an apparatus for reducing information asymmetry and bolstering stakeholder trust (Matoke & Omwenga, 2016). As the foundation of an efficient stock market, high-quality audits naturally promote effective corporate governance (Chow, 1982), affecting the firm performance (Ani & Mohammed, 2015).

Moreover, many scholarly investigations have also explored various strategies to enhance the quality of audits, including the utilisation of technology and the adoption of novel auditing standards (Maggiorani, 2022). However, despite scores of advancements, the area of AQ remains obscure and demands further orchestration. This study aims to draw a comprehensive picture of research in AQ, diagnose its trends and highlight the areas of eminence in the field.

3. DATA STATISTICS AND METHODOLOGY

Following Donthu et al. (2021), this study employs a four-pronged review procedure. It begins with documenting the aims and scope of the study in the form of research questions. In the second step, the techniques for analysis are highlighted, followed by collecting the data and concluded by documenting the findings. The present study employs an SLR approach, utilising bibliometric analysis clubbed with content analysis, to understand the current

research trends on AQ. As a component of SLR, bibliometric analysis is a quantitative technique employed to ascertain, examine, and evaluate patterns and trends within published literature on a certain subject (Roemer & Borchardt, 2015). Initially, SLR is employed as a methodological approach to systematically and methodically seek, categorise, and locate relevant articles to conduct critical analysis and objective evaluation of the literature (Queiroz et al., 2020). The process involves the establishment of criteria for inclusion and extraction, the identification of pertinent research papers, and selecting the most appropriate studies for inclusion in the analysis. Following this, bibliometric analysis is applied to the selected research papers to help discern the publication trends, highlight the field's intellectual structure, and map the cumulative scientific knowledge (Kent Baker et al., 2020; Donthu et al., 2021). Finally, content analysis is conducted to cluster the data into relevant groups.

3.1 Techniques of analysis

The elemental structure of any scientific field can be discerned by its research activities (Ronda-Pupo, 2017). Drawing upon Kent Baker et al. (2020), a performance analysis is conducted on the review corpus using citation and co-citation analysis, keyword analysis, PageRank and co-authorship analysis. While citation analysis is the study of an article's effect and presumed analysis and evaluation of how often it works and others have cited authors, co-citation remains a citation relationship-based semantic similarity metric for documents that envisages the delimitation of 'foundational knowledge' of an area and allows the springing of intellectual connections (Goodell et al., 2021). Further, keyword co-occurrence happens when two keywords appear in the same article, showing that the two concepts have a link (Comerio & Strozzi, 2019).

The modularity of network nodes based on the Louvain method enables performing the abovementioned analyses (Blondel et al., 2008). Modularity is a scalar value between -1 and 1 representing the density of linkages inside a community versus links between communities. Defined mathematically as:

$$Q = \frac{1}{2m} \sum_{ij} \left(A_{ij} - \frac{k_i k_j}{2m} \right) \delta C_i C_j$$

where A_{ij} represents the weight of the edge (link) between i and j; $k_i = \sum_j A_{ij}$ is the total of weights of the edges attached to vertex I; c_i implies the class or community to which vertex i is assigned; δ function $\delta(u,v)$ is assigned '1' if u = v and '0' otherwise; and $m = \frac{1}{2} \sum_j A_{ij}$.

Further, PageRank has also been employed as a technique of bibliometric analysis. The rationale behind employing PageRank analysis is that the influence of research publications can be calculated using PageRank (Brin & Page, 1998). In other words, PageRank analysis is a way to determine an article's reputation, which improves when other highly cited articles mention the article in question. The formula for calculating the same is:

$$PR(A) = (1-d) + d \left(PR(T_1)/C(T_1) + \dots + PR(T_n)/C(T_n) \right)$$

where,
A is the article cited by $T_1, T_2,\dots, T_n$

$C(T_1)$ denotes the number of citations for article T_1,
PR(T1) denotes its PageRank,
d denotes a damping factor, and
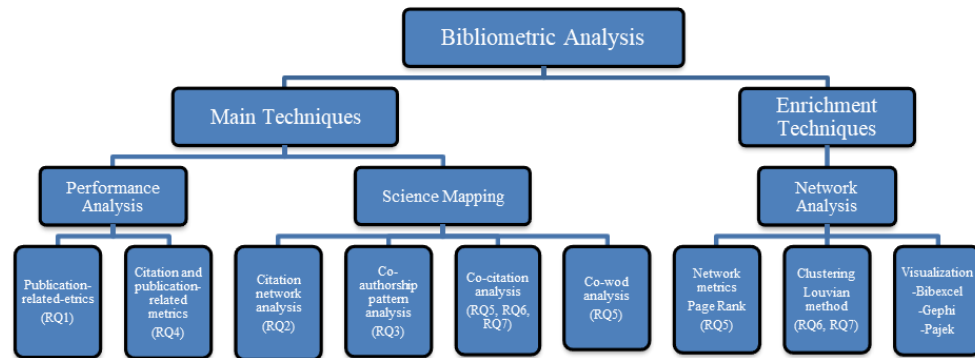the network's size is denoted by the letter N.

Figure no. 3 – Bibliometric analysis techniques applied
Source: Adopted from Donthu *et al.* (2021)

While various techniques are available for conducting a bibliometric analysis, the techniques resorted to for the present study have been picturesquely manifested in Figure no. 3.

3.2 Data collection

Following Goodell *et al.* (2021), Scopus is the data source because it provides the most comprehensive coverage of business-related peer-reviewed research compared to other databases such as the Web of Science (Valtakoski, 2019). Tracing the footsteps of Frost and Choo (2017) and Widmann *et al.* (2021), a broad-spectrum search string has been devised, which returned a final corpus of 1101, as exhibited in Table no. 2. In addition to the concepts of "audit quality" and "quality of audit," the search terms "audit efficiency" and "audit effectiveness" were also utilised. The lack of agreement over the precise definition of AQ has made quantifying it challenging. Hence, some scholars have occasionally employed the terms "audit effectiveness" (Joe & Vandervelde, 2007; Knechel & Sharma, 2012; Kasper & Alm, 2022) and "audit efficiency" (Knechel *et al.*, 2009; Haapamäki & Sihvonen, 2019; Knechel *et al.*, 2020) interchangeably with AQ. Therefore, we utilise these terms as our search criteria to mitigate discrepancies. Moreover, considering the extensive body of literature in this field, following the study conducted by Kent Baker *et al.* (2020), we searched for articles using 'title' as the only criterion to identify the most pertinent publications.

Table no. 2 – Search strategy and data selection criteria

Research Protocol	Details	Result
Research database	Scopus	
Publication type	Peer-reviewed journals	
Search period	1981- June, 2022	
Search term	(audit AND quality*) OR (quality AND of AND audit*) OR (audit AND effectiveness*) OR (audit AND efficiency*)	
Search field	Title	
Total results		3791
	First stage filters	
Language	English	
Subject area	"Business, management and accounting", "Economics, econometrics and finance" and "Social sciences"	
Source Type	Journal	
Total		1528
	Second stage filters	
Document type	Article	1425
Content screening (Exclusion of articles irrelevant to the scope of the topic)		324
FINAL CORPUS		**1101**

Source: authors' compilation

4. DATA ANALYSIS AND FINDINGS

4.1 Publication activity

The publication trend of AQ was scrutinised using total publications by year, nation, journal, and contributing author to answer RQ 1 (*What is the trend of publication of audit quality research*?).

4.1.1 Country-wise publication

The pre-ponderous literature on audit extends its tentacles to as far as 80 nations, spreading across the six habituated continents of the globe. The distribution of the studies limited by the threshold of at least ten publications has been exhibited in Table no. 2. The USA has emerged as the most prolific nation, contributing 319 studies, followed by Australia and Indonesia, which have documented 111 and 88 studies, respectively. The benefaction of the USA to the field can be attributed to the revolutionary Sarbanes (2002), the pre and post-implementation and speculation engulfing which converted the USA as the epicentre of research concerning AQ and its various facets and idiosyncrasies. Moreover, regarding annual publication trends, the leading three nations outlined in Table no. 3, namely the United States, Australia, and Indonesia, generate an average of around 8, 3, and 2 articles, respectively.

Table no. 3 – Country-wise publications

Rank	Countries	Publications	Rank	Countries	Publications
1	USA	319	13	Taiwan	32
2	Australia	119	14	New Zealand	31
3	Indonesia	88	15	Jordan	26
4	Malaysia	80	16	Iran, Singapore	25
5	China	81	17	France, Germany	23
6	Hong Kong	60	18	Netherlands	18
7	UK	58	19	Italy	16
8	South Korea	50	20	Egypt, Finland, Vietnam	15
9	Canada	47	21	Iran, Sweden	14
10	Spain	37	22	South Africa, UAE	13
11	Saudi Arabia	35	23	India, Thailand	11
12	Tunisia	34	24	Belgium, Greece, Norway, Yemen	10

Source: Scopus database and authors' compilation

It is evident that despite the rise in publication volume, there continues to be a significant concentration of publications within a few industrialised nations. Although developing nations have contributed to the literature in recent decades, there is still a noticeable gap. In the current study, eleven developed countries alone constitute approximately 65 per cent (724) of the literature.

Table no. 4 – Publications based on the development status of countries

Status	Countries	Publications
Developed	Australia, Canada, France, Germany, Italy, Netherlands, South Korea, Spain, Sweden, United Kingdom, United States	724
Emerging	Argentina, Brazil, China, Egypt, India, Indonesia, Iran, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Russia, Saudi Arabia, South Africa, Thailand, Turkey, Vietnam	585

Source: Scopus database and authors' compilation

Furthermore, upon screening the publications categorised by continent, it becomes apparent that Asian nations account for around 48 per cent (530) of the overall corpus, placing them at the forefront regarding continent-wise publications. In that order, North America (366) and Europe (199) succeeded Asia.

Table no. 5 – Continent-wise publications

Continents	Countries	Publications
Asia	China, Hong Kong, Indonesia, Malaysia, Singapore, South Korea, Taiwan, Vietnam, Iran, Jordan, Saudi Arabia, United Arab Emirates	530
Australia/Oceania	Australia, New Zealand	150
Europe	Belgium, France, Germany, Italy, Netherlands, Spain, Sweden, United Kingdom	199
North America	Canada, United States	366
Africa	Egypt, Finland, Morocco, Tunisia	64

Source: Scopus database and authors' compilation

4.1.2 Year-wise publication trend

The publication trend of literature on AQ from 1981-2022 has been arrayed in Figure no. 4. Skyrocketing of studies since the early 2000s with occasional nosedives of minuscule nature till 2010 can be witnessed. The spark kindled by the Sarbanes Oxley Act 2002 was further fuelled heavily by the reforms brought into the audit regime in the aftermath of the Global Financial Crisis 2008 and, hence, the upswing in literature (Kend & Basioudis, 2018). The increase in research over the past decade may be ascribed to the convergence of new auditing regulations, developments in technology, and the internationalisation of the audit industry. In light of the release of many auditing standards (including ISA 260, 315, and 330) by the International Auditing and Assurance Standards Board (IAASB) in December 2020, scholars have shown a keen interest in evaluating the influence of these advancements on audit quality (AQ). The year 2021, which recorded the highest number of publications, provides empirical support for this claim. Given the current advancements, ongoing research in the domain of AQ is poised to make significant progress.
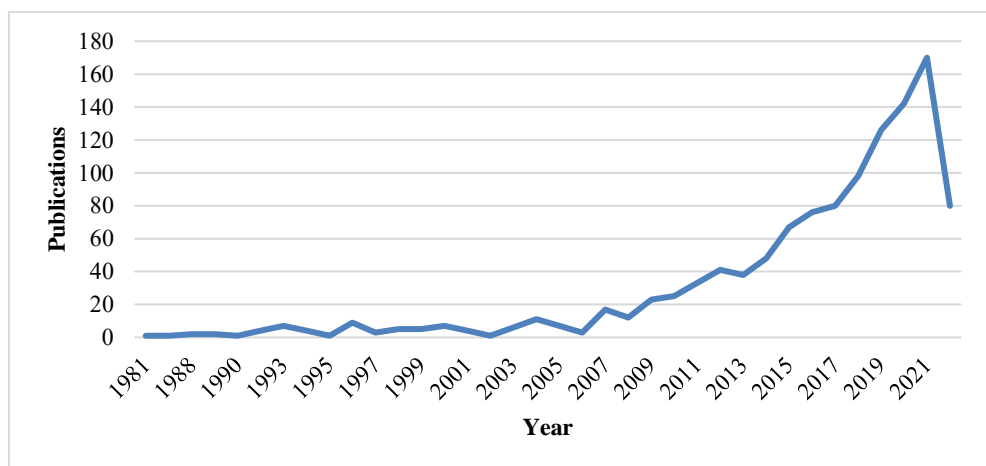

Figure no. 4 – Year-wise publication trend
Source: Scopus database and authors' compilation

4.1.3 Publication activity by journal

The final corpus of 1101 articles spread across 319 journals, with Auditing, Managerial Auditing Journal and Contemporary Accounting Research occupying the first, second and third most-publishing journals on AQ. Effectuating a minimum of 15 publications threshold, Table no. 6 demonstrates the top journals in the area. Approximately 30 per cent of the documented journals have an ABDC rating of A and B, which serves as a testimony that AQ has garnered the patronage of impactful and premier journals across the globe, attracting the interest of numerous researchers.

Table no. 6 – Journal-wise publication trend

No. of articles	Journal name	Publisher	ABDC ranking
85	Auditing	Auckland University Law Students' Society	C
69	Managerial Auditing Journal	Industry Qualifications	C
55	Contemporary Accounting Research	Conference on Consumer Finance Law	C
41	Accounting Review	American Accounting Association	N.R.
37	International Journal of Auditing	Management International	B
33	European Accounting Review	European Accounting Association	N.R.
32	Journal of Accounting and Public Policy	Elsevier	A
31	Academy of Accounting and Financial Studies Journal	Wiley-Blackwell Publishing	A
22	Asian Review of Accounting	Phillippine e-Journals	C
21	Journal of Accounting, Auditing and Finance	Elsevier	A
17	Corporate Ownership and Control	Emerald Group Publishing	C
16	Accounting and Business Research	Association for Accountancy & Business Affairs	B
16	Journal of Asian Finance, Economics and Business	Taylor & Francis Online	C
16	International Journal of Applied Business and Economic Research	Taylor & Francis Online	A
16	International Journal of Economic Research	Serials *Publications* Pvt. Ltd.	N.R.
15	Journal of Accounting and Economics	Association of International Certified Professional Accountants	C
15	Accounting Horizons	Sage Publications	B
15	Asia-Pacific Journal of Accounting and Economics	Emerald Group Publishing	B
15	Quality Progress	American Society for quality	N.R.

Source: Scopus database and authors' compilation

4.2 Citation network analysis

According to Ding and Cronin (2011), although there are various approaches for determining the influence of a research paper, the most common is citation analysis. The number of citations is used to determine the effect of a publication (Kent Baker *et al.*, 2020). To address the RQ2 (*Which are the most underpinning studies on audit quality?*), Gephi and BibExcel were employed. Table no. 7 accounts for the ten most-cited works in the literature on AQ.

Table no. 7 – Top-cited authors with their articles

Author(s)	Title	Year	Citations
DeAngelo, L.E.	Auditor size and audit quality	1981	2129
Becker, C.L., Defond, M.L., Jiambalvo, J., Subramanyam, K.R.	The effect of audit quality on earnings management	1998	1504
Francis, J.R.	What do we know about audit quality?	2004	544
Francis, J.R., Yu, M.D.	Big 4 office size and audit quality	2009	462
Lawrence, A., Minutti-Meza, M., Zhang, P.	Can big 4 versus non-big 4 differences in audit-quality proxies be attributed to client characteristics?	2011	449
Reichelt, K.J., Wang, D.	National and office-specific measures of auditor industry expertise and effects on audit quality	2010	436

Author(s)	Title	Year	Citations
Gul, F.A., Kim, J.-B., Qiu, A.A.	Ownership concentration, foreign shareholding, audit quality, and stock price synchronicity: Evidence from China	2010	435
Ghosh, A., Moon, D.	Auditor tenure and perceptions of audit quality	2005	334
Francis, J.R.	A framework for understanding and researching audit quality	2011	326
Behn, B.K., Choi, J.-H., Rang, T.	Audit quality and properties of analyst earnings forecasts	2008	273

Source: authors' compilation

Table no. 7 exhibits that the most influential article remains the pioneering work of DeAngelo (1981), with a citation count of 2129. Following the revolutionising work, Becker *et al.* (1998) and Francis (2004) occupy the position of the second and third most coveted articles with a citation count of 1504 and 544, respectively. Furthermore, the research demonstrates that a cumulative sum of 37 publications exceeds the threshold of 100 citations. Moreover, out of the remaining publications, 600 have been cited at least once, emphasising the significance of the investigated issue.

Figure no. 5, created on the Gephi software with the top 50 cited references, exhibits the citation network of articles on AQ.
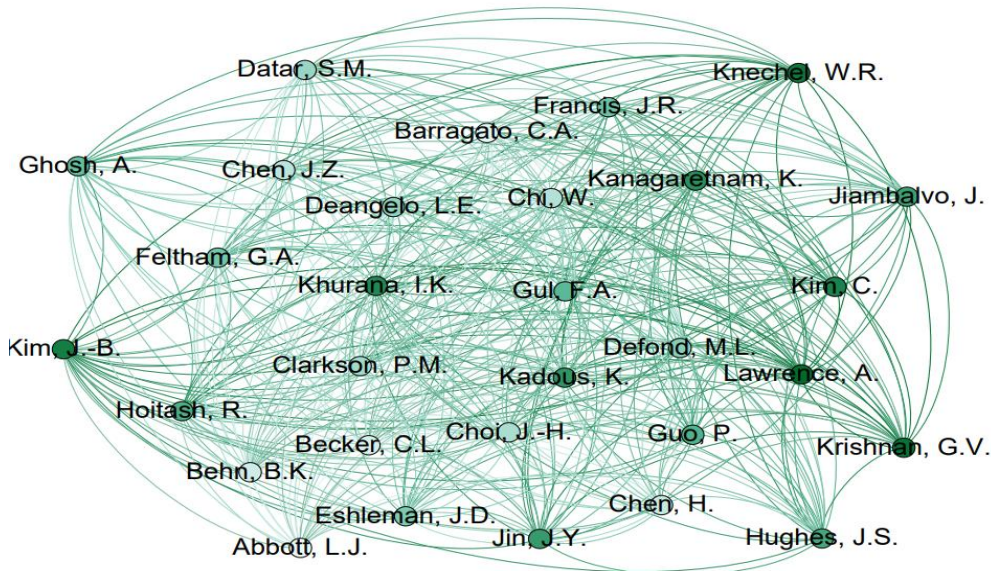

Figure no. 5 – Citation Network
Source: authors' compilation

Table no. 7 presents a comprehensive compilation of highly cited writers in the domain of audit quality, along with the names of their most often referenced publications. In alignment, Figure no. 5 visually illustrates the interconnectedness of these papers with other scholarly works inside the network. It implies that the articles mentioned above are significant and influence the discipline. An exemplar in auditing is the seminal work conducted by DeAngelo (1981), which investigates the relationship between auditor size and audit quality. The abovementioned publication has received over 2,000 citations, indicating its significant impact

on the academic community. Furthermore, it is interconnected with several other scholarly works inside the network. The research by Francis (2004) investigates the relationship between auditor tenure and AQ. This study is referenced by 12 other studies within the network and is connected to several others over multiple lines, indicating its significance as a key work. Moreover, M. DeFond and Zhang (2014) and Becker *et al.* (1998) emerge as other noteworthy contributors to the network. Furthermore, the network demonstrates a multitude of disparate scientific discoveries. This observation implies that there exist several pathways for investigation within the domain of research on audit quality.

4.3 Co-authorship pattern analysis

An analysis of the co-authorship pattern has been undertaken to address the third research question (*What is the status quo of collaboration concerning audit quality research?*). Palacios-Callender and Roberts (2018) argue that global collaboration networks enable emerging countries to participate in the knowledge generation process historically spearheaded by affluent countries.
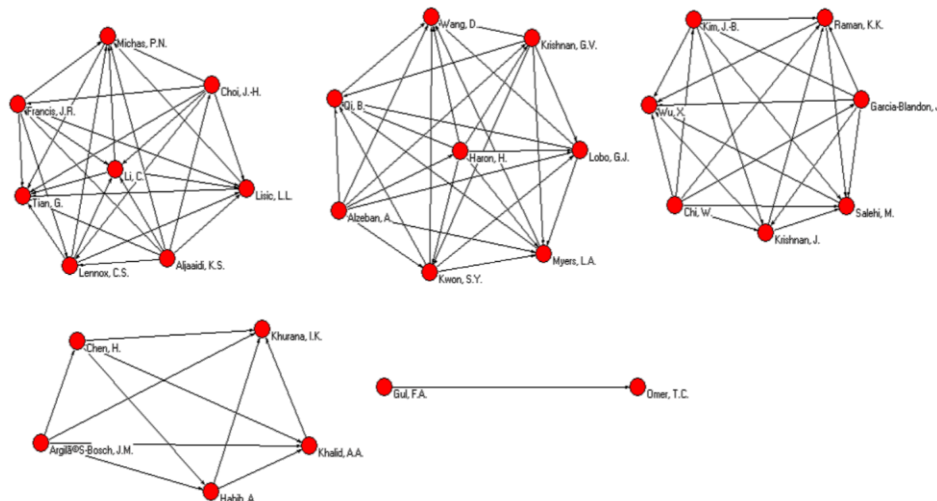

Figure no. 6 – Co-authorship network
Source: authors' compilation

Figure no. 6 demonstrates the status quo of collaboration among the field's most dominant and prolific authors. The clustering exhibited by the figure denotes that collaboration has remained limited to closely-knit circles of a select few authors, chiefly sharing nationalities of developed economies. It highlights the need for more cross-country collaborative work, especially in developing and underdeveloped economies.

4.4 Author-wise publications analysis

Table no. 8 demonstrates the top authors based on the quantum of their publications with a threshold of a minimum of five publications in the field of AQ. With 12 publications, T. C. Omer garners the top position, followed by F. A. Gul with ten publications to the author's credit. The third position is occupied by G.J. Lobo, K.K. Raman, J. Krishnan, X. Wu, M. Salehi, J. Garcia-Blandon, H. Haron, B.J. Kim and K.S. Aljaaidi with eight publications to the credit of each.

Table no. 8 – Author-wise publications

Rank	Authors	No. of publications by each author
1	Omer, T.C.	12
2	Gul, F.A.	10
3	Lobo, G.J.; Raman, K.K.; Krishnan, J.; Wu, X.; Salehi, M.; Garcia-Blandon, J.; Haron, H.; Kim, J.B.; Alijaaidi, K.S.	8
4	Alzeban, A.; Chi, W.; Qi, B.; Francis, J.R.; Kwon, S.Y.; Myers, L.A.; Krishnan, G.V.	7
5	Wang, D.; Choi, J.H.; Tian, G.; Li, C.; Lisic, L.L.; Michas, P.N.; Zhou, J.; Knechel, W.R.; Lennox, C.S.	6
6	Tan, H.T.; Khalid, A.A.; Zhang, J.; Chen, H.; Ravenda, D.; Kamardin, H.; Zang, Y.; Lim, C.Y.; Wang, Y.; Willborn, W.; Vanstraelen, A.; Chang, H.; Yu, Y.; Sun, J.; Zhang, Y.; Habib, A.; Khurana, I.K.; Mo, P.L.L.; Mayhew, B.W.; Monroe, G.S.	5

Source: authors' compilation

Table no. 8 provides a comprehensive record of authors who have achieved the greatest publishing rates, while Table no. 9 presents data on the frequency of publications concerning the number of authors involved. The data reveals that the collaboration of three authors has the highest number of publications, totalling 408.

Table no. 9 – Authors and Publications

Number of authors	Publications
1	237
2	445
3	480
4	208
5	46
6	3
7	2
8	9
10	1
12	1

Source: authors' compilation

Table no. 10 outlines the top contributing authors of the field based on their h-index (Bornmann & Daniel, 2007). It is a metric that evaluates the effect of a single scientist rather than a publication. With an h-index of 9, F. A. Gul emerges as the most prolific author in the field of AQ, followed by T. C. Omer at the second position with an h-index of 8 and J. Krishnan and J. B. Kim occupying the third place with seven as their h-index.

Table no. 10 – Top contributing authors concerning h-index

h-index	Unit	Citation sums within h-core	All citations	All articles
9	Gul, F.A.	1279	1283	10
8	Omer, T.C.	880	897	12
7	Krishnan, J.	346	1348	8
7	Kim, J.-B.	970	971	8
6	Haron, H.	208	209	8
6	Knechel, W.R.	360	360	6
6	Myers, L.A.	807	812	7
6	Lisic, L.L.	266	266	6
6	Raman, K.K.	274	277	8
6	Francis, J.R.	2079	2082	7

Source: authors' compilation

Table no. 11 arches the influence of authors' work employing PageRank analysis.

Table no. 11 – Top articles according to PageRank

Authors	PageRanks
Lawrence (1997)	0.205868
G. V. Krishnan (2003)	0.111299
Knechel (2016)	0.078117
Kim and Yi (2009)	0.060878
Choi *et al.* (2010)	0.050214
Khurana and Raman (2004)	0.042921
Kanagaretnam *et al.* (2011)	0.037596
Kadous (2000)	0.033526
Jin *et al.* (2011)	0.030307
Becker *et al.* (1998)	0.027692
Datar *et al.* (1991)	0.025522
Hoitash *et al.* (2007)	0.023691
Eshleman and Guo (2014)	0.022124
Gul *et al.* (2010)	0.020766
Ghosh and Moon (2005)	0.019577
Francis (2004)	0.018526
Datar *et al.* (1991)	0.017591
Eshleman and Guo (2014)	0.016753
M. L. DeFond and Lennox (2011)	0.015997
DeAngelo (1981)	0.015312

Source: authors' compilation

The table documents that the articles by Lawrence (1997), G. V. Krishnan (2003) and Knechel (2016) occupy the position of the most coveted articles as per the PageRank analysis. According to Baker *et al.* (2023), an article's prestige is not always determined by the number of citations it receives; it might also be determined by how many times it contributes to other high-quality research. The results exhibited in the above table demonstrate affinity to the same.

4.5 Keyword analysis

Keywords act as the door to the original content. It portrays a fair idea about the research article beforehand. To identify the pattern of keywords prevalent in AQ research and to address the fifth research question *(Which are the most researched themes of audit quality?),* an analysis of the keywords of the final corpus of articles has been conducted.

Table no. 12 – Range of Keywords

No. of articles	No. of keywords
1	12
1	14
3	11
5	10
10	9
20	8
68	7
166	3
172	6
321	4
334	5

Source: Author's compilation

Table no. 12, prepared with the aid of Bibexcel software, provides that the range of keywords used lies between 3 to 14, with 5 being the highest number. It can be witnessed that a total of 334 articles have resorted to using five keywords, followed by four keywords employed by 321 articles and six keywords by 172 articles.

The Bibexcel software was further employed to glean the most frequently used keywords as they help discern the most researched themes in the area. An analysis of the current corpus returns the following ten keywords in Table no. 13 as the keywords with the highest frequency. AQ fetches the top position in the table. It is justifiable as keywords form the most integral element of any search. They are also fundamental in garnering citations for any research; hence, the area appears in the first place. Following the same, the audit committee (AC) and CG clinch the second and third positions, respectively.

Table no. 13 – Highest frequency keywords

Frequency of keyword	Keyword
564	Audit Quality
158	Audit Committee
109	Corporate Governance
97	Earnings Management
82	Audit Fees
76	Financial Reporting Quality
72	Auditor Independence
65	Auditing
63	Discretionary Accruals
52	Earnings Quality

Source: authors' compilation

Furthermore, Baker *et al.* (2023) assert that keyword co-occurrence is another pivotal part of keyword analysis. They posit that keyword co-occurrence happens when two keywords occur in an article, thereby substantiating the presence of any association between them. Nevertheless, Figure no. 7, developed using the Pajek software, depicts the co-occurrence network of the highest occurring keywords.

Figure no. 7 – Keyword co-occurrence network
Source: authors' compilation

The figure shows that the concept of AQ is multifaceted and characterised by many interdependencies. Several variables influence AQ, such as the length of time an auditor has served, the level of independence of the audit function, and the effectiveness of the internal audit function. The audit committee and earnings management co-occur for the maximum time. The justifiability of this assertion is supported by a substantial body of research investigating the influence of AQ and audit committee effectiveness on earnings management practices. The presence of an efficient AQ and an effective audit committee can contribute to the oversight and mitigation of earnings management practices (Mardessi, 2021). Subsequently, auditors and independence are identified as the second most often occurring terms. The topic of auditors' independence has been a subject of much debate since the influential study conducted by DeAngelo (1981), and it continues to attract the attention of scholars in contemporary times.

4.6 Literature classification and analysis

RQ6 and RQ7 *are* addressed using co-citation analysis. Co-citation helps create data clusters to discern the intellectual structure of the research area with a modularity index (Xu *et al.*, 2018). Employing the default Lovian algorithm of Gephi, the 945 nodes co-citation network was filtered to group the data into six clusters. These clusters have been discussed in the following section.

4.7 Content analysis

This section tabulates accounts of all six clusters on AQ carved by the modularity index. Table no. 14 synthesises the current research revolving around each cluster while simultaneously highlighting the opportunities for future research. The cluster label and the current research column highlight the intellectual structure of research in AQ (RQ6). Further, RQ7 is addressed through Table no. 14's future research avenues column.

Table no. 14 – **Data clusters and their description**

Cluster label	Current research	Future research avenues
1. AC characteristics and AQ Yassin and Nelson (2012); Inaam and Khamoussi (2016); Zgarni *et al.* (2016); Ghafran and O'Sullivan (2017); He *et al.* (2017); Sulaiman (2017); Asiriuwa *et al.* (2018); Kao *et al.* (2021); Mardessi (2021); Al-Ahdal and Hashim (2022)	Two philosophies exist regarding AC and audit fee- one frame believes stronger AC demands superior quality audit, which in turn inflates the fees charged; the other deems that effectiveness exercised by AC reduces the required audit efforts and audit fees.	• The impact of AC features on earnings quality accounting for the influence of ownership concentration. • Attributes such as gender or specific nature of expertise demand attention.
2. CG and AQ K. Y. Chen *et al.* (2005); Gul *et al.* (2006); Abbott *et al.* (2007); Chang *et al.* (2009); Lin and Hwang (2010); Francis (2011); Farouk and Hassan (2014); Sayyar *et al.* (2015); AlQadasi and Abidin (2018); Kaawaase *et al.* (2021)	AQ is perceived as an external monitoring mechanism of CG. Numerous attributes of CG significantly affect the AQ and, ultimately, the performance of the firms. The magnitude of this influence, however, differs across economies.	• Studies employing cross-country longitudinal data to examine the impact of AQ on the firm performance. • Extensive testing of CG attributes against AQ.
3. Regulatory norms and AQ Arruñada (2000); Andrew *et al.* (2008); Kim and Yi (2009); Jamal and Sunder (2011); Arruñada (2013); Boone and White (2015); Cahan and Sun (2015); Knechel (2016); Jadiyappa *et al.* (2021)	Mandatory audit rotation, IFRS, PCAOB norms and related regulations conjointly form this cluster. Mandatory audit rotation remains a contentious issue. IFRS adoption/ convergence tested against AQ in domains such as lower discretionary accruals, better analyst prediction accuracy, and other factors continue to return debatable results.	• Impact of mandatory audit rotation considering variance in culture, geo-political and economic settings, and the post-implementation review. • Longitudinal studies assessing the impact of IFRS over periods of the financial crisis.
4. Earnings management (EM) and AQ Becker *et al.* (1998); K. Y. Chen *et al.* (2005); Abbott *et al.* (2007); Behn *et al.* (2008); Van Tendeloo and Vanstraelen (2008); S. Chen *et al.* (2010); Chi *et al.* (2011); Rusmin *et al.* (2014); Alzoubi (2016); Inaam and Khamoussi (2016); Astami *et al.* (2017)	EM has been established as a yardstick of financial reporting quality. While Some studies establish a significantly positive association between EM and AQ, others trace no or insignificant relation.	• Effects of the board of directors, AC, and CEO duality on earnings management. • Studies to assess the audit risk of clients having complex ownership structures.

Cluster label	Current research	Future research avenues
5. Non-audit services (NAS) and AQ DeAngelo (1981); Lennox (1999); Gul *et al.* (2006); Lim and Tan (2008); Knechel and Sharma (2012); Arruñada (2013); Svanström (2013); Bell *et al.* (2015); Bhattacharya and Banerjee (2019); Hohenfels and Quick (2020)	Two schools of thought are prevalent- one believes in the doctrine that joint provision of audit and NAS does not impair the independence of the incumbent auditor and thereby AQ; the other believes in the antithesis. Literature on both maxims being tantamount, the debate continues to flourish.	• Evaluating auditor independence by assessing the NAS provision at the audit office level. • NAS and AQ on private and financial companies.
6. Auditor-client relationship and AQ Lawrence (1997); Ghosh and Moon (2005); S. Chen *et al.* (2010); Reichelt and Wang (2010); Jamal and Sunder (2011); Svanberg and Öhman (2014); Bhattacharya and Banerjee (2019); Gunn *et al.* (2019); Van Raak *et al.* (2020)	Presumably considered a threat to auditor independence, it remains contentious. Some studies assert that a long-term association benefits the audit; however, the proclivity lies towards the negative assertion. It is a mainstream belief that it impairs an auditor's independence.	• Studies addressing the disparities in professional identity between Big 4 and non-Big 4. • Reasons for the tight auditor-client connection.

Source: Author's compilation

5. CONCLUSION

AQ is a multifarious area housing under its umbrella numerous dimensions pliable for research. This study attempted to harbinger the colossal research on AQ, synthesise and analyse its intellectual structure to harness encyclopaedic knowledge of the prismatic field and provide directions for future research. The ever-escalating trend projected by the number of publications undoubtedly extrapolates the signification of the domain. The 1101 pertinent articles under consideration reveal that the USA is the primary contributor to AQ. The current study reveals that most of the literature is contributed by industrialised nations. Nevertheless, it is crucial to emphasise that developing economies also have a growing inclination for the subject matter.

Moreover, in corroboration with the previous reviews of Ciger (2020), Cruceana (2021) and Taqi (2021) the study found that while the area has witnessed the expansion of its tentacles to the widest regions across the globe, collaboration among authors in the field, however, is yet to witness a more dynamic nature. Hence, more diverse and widespread collaboration in AQ is highly desired. Nevertheless, a cursory look at the extant literature provides that AC characteristics, CG, financial reporting quality and auditor's independence are the prominent themes of the area. The keyword and cluster analysis have corroborated the same. Overall, this research's findings can potentially yield advantages for a diverse range of individuals and entities, such as investors, creditors, government regulators, auditors, accounting instructors, and academics. The regulators may utilise the findings to make well-informed investment decisions, while future researchers can benefit from them in their comprehension of the elements influencing audit quality. It may further inspire them to pursue novel studies aimed at enhancing audit quality through innovative approaches.

To conclude, while the utmost care has been taken to draft this study, it has certain limitations. Firstly, articles only published in the English language were considered. Articles of significant importance may have been omitted because of the language barrier. Secondly,

while many bibliometric analysis techniques exist, not all could be covered in this study. Finally, albeit the keyword search was extensive, comprehensiveness cannot be guaranteed as other keywords may also be available.

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