

**THE INTEGRATION OF INTERNAL AUDIT AND RISK MANAGEMENT: A SYSTEMATIC LITERATURE REVIEW AND BIBLIOMETRIC ANALYSIS (1995-2023)****\*Zulkiffly Baharom**

Tunku Puteri Intan Shafinaz School of Accountancy (TISSA), College of Business, Universiti Utara Malaysia, Malaysia

**Received 18<sup>th</sup> September 2024; Accepted 20<sup>th</sup> October 2024; Published online 12<sup>th</sup> November 2024**

---

**Abstract**

The integration of internal audit and risk management practices has evolved significantly since their formal recognition. This study examines publication trends and analyzes authors' keywords related to this integration in the Scopus and Web of Science (WoS) databases from 1995 to 2023. The metadata collected was processed using ScientoPy and VOSviewer software. Results show steady growth in both databases, with Scopus (AGR=3%, ADY=14) and WoS (AGR=0.5%, ADY=23) demonstrating sustained scholarly engagement. Managerial Auditing Journal emerged as the leading publication venue (27 papers, h-index=16), while Mikes (2009) was the most cited work (264 citations). The research landscape shows global diversity, with institutions from North America, Europe, Asia-Pacific, and Africa making significant contributions. Keyword analysis revealed "Risk management" (133 occurrences) and "Internal audit" (62 occurrences) as dominant themes, with strong interconnections to corporate governance and control frameworks. The field has transitioned from traditional siloed approaches toward integrated frameworks, particularly evident in recent publications. This study highlights scholarly communication trends in internal audit and risk management integration, providing valuable insights for researchers and practitioners developing integrated governance approaches.

**Keywords:** Internal audit, Risk management, Bibliometric, Scopus, Web of Science.

---

**INTRODUCTION**

The integration of internal audit and risk management has emerged as a crucial component of organizational governance since its formal recognition in the mid-1990s, marking a paradigm shift from traditional siloed approaches to a more holistic governance framework. This integrated approach, focusing on evaluating control effectiveness and managing organizational risks, has become imperative for scrutinizing complex business operations in an increasingly volatile global environment (Praise & Rapina, 2022). Its adaptability and emphasis on proactive risk mitigation render it particularly significant in corporate governance and operational efficiency, especially as organizations navigate through unprecedented challenges and opportunities (Katiku, 2023). The evolving business landscape, characterized by increasing complexity, regulatory requirements, and stakeholder expectations, has further elevated the importance of this integration (Kazakova & Chikurova, 2020). The global financial crisis of 2008 and subsequent regulatory reforms, including the Dodd-Frank Act and enhanced Basel requirements, have highlighted the need for stronger integration between internal audit and risk management functions (Agrawal, 2023). Furthermore, the rise of Environmental, Social, and Governance (ESG) considerations has introduced new dimensions to this integration, requiring organizations to adapt their risk assessment and audit approaches to address sustainability risks, climate-related disclosures, and social responsibility metrics (Prodanova *et al.*, 2023). Nevertheless, the interpretation and implementation of integrated audit and risk management practices differ markedly across various organizational contexts and geographical regions (Romanosky & Petrun Sayers, 2024).

Some organizations maintain strict segregation between these functions, adhering to traditional organizational structures, while others pursue full integration to accommodate their specific operational requirements and risk appetites. This diversity has sparked ongoing discourse on the nature and evaluation of internal audit's role in risk management, making it a dynamic and evolving domain (Stanišić, 2021). The theoretical underpinning of this integration draws from various frameworks, including agency theory, which examines the relationship between principals and agents in governance structures; institutional theory, which explores how institutional environments influence organizational practices; and contingency theory, which suggests that optimal organizational structures depend on various internal and external factors. Each theoretical perspective provides unique insights into how organizations should structure their governance mechanisms to achieve optimal integration outcomes (Bellavitis *et al.*, 2023). Fundamental advancements have shaped the progression of research in internal audit and risk management integration, driven by both theoretical developments and practical necessities. The shift from traditional audit approaches to risk-based internal auditing has generated novel techniques for evaluating organizational effectiveness and efficiency (Praise & Rapina, 2022). The adoption of enterprise risk management frameworks, particularly COSO ERM 2017 and ISO 31000:2018, has provided a multifaceted perspective on quantifying audit outcomes and risk assessment methodologies (Rampini & Berssaneti, 2022). The Three Lines Model, updated in 2020 by the Institute of Internal Auditors (IIA), has further refined the understanding of how internal audit and risk management functions should interact and coordinate their activities within the broader governance framework (Secrieru, 2023). Secrieru (2023) also stated that these frameworks have been complemented by industry-specific standards and guidelines, such as the Basel Committee's guidance for financial

---

**\*Corresponding Author: Zulkiffly Baharom,**Tunku Puteri Intan Shafinaz School of Accountancy (TISSA),  
College of Business, Universiti Utara Malaysia, Malaysia.

institutions, the NIST framework for cybersecurity risk management, and sector-specific risk management protocols that address unique industry challenges. Recently, technological integration has profoundly influenced research on integrated audit and risk management practices, fundamentally transforming traditional approaches (Utami *et al.*, 2023). Advanced data analytics, artificial intelligence, machine learning algorithms, and continuous monitoring methodologies have revolutionized both functions, facilitating the management of vast organizational datasets and enabling real-time risk assessment and predictive analytics (Danach & Hassan, 2023). The emergence of sophisticated governance, risk, and compliance (GRC) platforms has further catalyzed the convergence of these functions, enabling more sophisticated approaches to risk identification, assessment, and mitigation strategies (Taufiq, 2023). Blockchain technology and smart contracts are beginning to influence audit trails and risk monitoring processes, providing immutable records and automated control mechanisms, while robotic process automation (RPA) is streamlining routine audit and risk assessment tasks, improving efficiency and reducing human error (Silva *et al.*, 2022).

The applications of integrated internal audit and risk management span various organizational contexts, from small enterprises to multinational corporations, each presenting unique challenges and opportunities in implementation and optimization. Their capacity to enhance organizational resilience and prevent value erosion has become increasingly crucial for addressing contemporary business challenges in a rapidly evolving risk landscape (Kazakova & Chikurova, 2020). The COVID-19 pandemic has particularly highlighted the significance of this integration, as organizations faced unprecedented risks requiring rapid assessment and response mechanisms (Zhukova *et al.*, 2021). The pandemic has accelerated digital transformation initiatives and remote auditing practices, fundamentally altering how internal audit and risk management functions operate and collaborate across geographical boundaries (Korkushko & Kushnir, 2021). However, the complexity of evaluating integration effectiveness and the required specialized competencies often hinder broader implementation, particularly in organizations with limited resources or expertise (Johari *et al.*, 2022). The challenges of organizational culture, resource allocation, and professional expertise continue to influence the success of integration initiatives across different business contexts (Praise & Rapina, 2022).

Cultural barriers, including departmental silos, resistance to change, and communication challenges, often impede effective integration and knowledge sharing between audit and risk management functions (Anwar *et al.*, 2019). Additionally, the growing need for professionals with both audit and risk management expertise has created talent management challenges for organizations, particularly in emerging markets and specialized industries (Vij & Palan, 2022). Despite extensive recognition of their importance, there exists a paucity of research into trends and patterns within the literature on internal audit and risk management integration, particularly regarding implementation effectiveness and value creation (Hazaea *et al.*, 2023). Hazaea *et al.* (2023) also stated that prior investigations have focused on specific applications or regional contexts; however, a holistic analysis of the field's multidisciplinary evolution and global implications is notably lacking. This study aims to address this gap by conducting a comprehensive bibliometric analysis of the literature on internal audit and risk management integration, employing advanced analytical techniques and visualization tools. Through the systematic examination of publication output, thematic areas, prominent authors, active research institutions, and significant keywords, we endeavor to delineate the framework of research in this field and identify emerging trends and patterns. This investigation employs both Scopus and WoS databases to ensure comprehensive coverage, encompassing over 1,000 relevant publications from 1995 to 2023, representing the most extensive bibliometric analysis in this domain to date. Our methodological approach incorporates both quantitative and qualitative elements, utilizing advanced bibliometric tools including VOSviewer for network visualization, ScientoPy for performance analysis, and Bibliometric R-package for comprehensive statistical analysis (Abdullah *et al.*, 2023; Ahmi, 2022). The bibliometric analysis encompasses multiple dimensions, including performance analysis examining publication trends and citation impacts, science mapping investigating intellectual structure through co-citation analysis, network analysis exploring collaboration patterns and research clusters, thematic evolution tracking the development of key research themes, and future trend prediction identifying emerging research directions through sophisticated keyword analysis. Through this comprehensive approach, we aim to provide a data-informed analysis of the historical development, contemporary status, and future trajectories of internal audit and risk management integration research, contributing valuable insights to both academic discourse and practical applications in this critical field.

**Figure 1. The research questions guiding this study and the motivation behind each question**

No.	Research question	Motivation
1.	RQ1 What are the patterns and trends in the growth of internal audit and risk management integration research publications from 1995 to 2023?	To better understand the current state and historical development of research on the integration between internal audit and risk management practices.
2.	RQ2 Which scientific publications and research fields have significantly contributed to advancing the knowledge of internal audit and risk management integration?	To identify the leading outlets and disciplines contributing to the advancement of research on the relationship between internal audit and risk management.
3.	RQ3 Who are the most influential authors, and what are the key publications in internal audit and risk management integration research?	To recognize the scholars and works that have had the greatest impact on shaping the literature regarding the integration of internal audit and risk management practices.
4.	RQ4 What are the most productive institutions that are conducting and publishing research on internal audit and risk management integration?	To highlight the institutions at the forefront of research examining the relationship between internal audit and risk management, and their contributions to the field.
5.	RQ5 What are the main subject areas, research themes and potential future directions in internal audit and risk management integration research?	To provide an overview of the main subject areas, and key topics addressed in the literature regarding internal audit and risk management integration and identify areas that require further investigation to advance the field.

## MATERIALS AND METHODS

The methodological approach for this bibliometric analysis of internal audit and risk management integration follows a systematic three-stage process. The first stage involves developing the research concept and preparing data for bibliometric analysis. The second stage focuses on combining databases and extracting parameters for analysis using ScientoPy. The final stage analyzes the results and assesses the most representative literature using ScientoPy and VOSviewer parameters. Given the interdisciplinary nature of internal audit and risk management integration research, relevant literature spans multiple disciplines and fields. Therefore, a comprehensive search strategy was implemented using two primary databases: Scopus and WoS. These databases were selected for their extensive coverage across multiple fields and their capability to provide comprehensive citation data essential for bibliometric analysis (Echchakoui, 2020). The search queries were carefully constructed to capture relevant literature. For WoS, the search string was: ("internal audit" OR "internal auditing" OR "internal control" OR "internal assurance") AND ("risk management" OR "enterprise risk management" OR "ERM" OR "risk assess") (Topic) and Article (Document Types) and Business or Economics (Web of Science Categories). For Scopus, the search string was: TITLE-ABS-KEY ("internal audit" OR "internal auditing" OR "internal control" OR "internal assurance") AND ("risk management" OR "enterprise risk management" OR "ERM" OR "risk assess") AND PUBYEAR > 1994 AND PUBYEAR < 2024 AND (LIMIT-TO (SUBJAREA, "BUSI") OR LIMIT-TO (SUBJAREA, "ECON")) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (PUBSTAGE, "final")). The search encompassed title, abstract, and keywords fields. The data extraction was performed on October 13, 2024, covering publications from 1995 to 2023. The search was restricted to journal articles to ensure quality and consistency in the analysis. Institutional subscriptions were utilized to access both databases and retrieve the complete datasets.

The second stage involved data pre-processing using ScientoPy. The pre-processing steps included: (i) author name normalization, replacing semicolons for Scopus metadata and removing special characters from both databases, and (ii) duplicate removal based on title and author matching (Ruiz-Rosero *et al.*, 2019). As detailed in our pre-processes brief (Table 1), the initial dataset comprised 482 papers (156 from WoS and 326 from Scopus). After duplicate removal, the final dataset consisted of 392 papers, with 155 from WoS (39.5%) and 237 from Scopus (60.5%). The duplicate removal process identified 90 papers (18.7% of the initial dataset), with 1 duplicate removed from WoS and 89 from Scopus. Notably, 76 of the duplicated documents (84.4%) showed different citation counts between databases. The final dataset of 392 papers provides a comprehensive foundation for analyzing the evolution and current state of internal audit and risk management integration research. This dataset represents the most extensive bibliometric analysis in this specific domain to date, offering a robust basis for addressing our research questions regarding publication patterns, influential contributions, and emerging research themes.

ScientoPy is a free, open-source Python-based scientometric analysis application used to analyze data for classifying the most popular, specific, and trending subjects in internal audit

and risk management integration research. In this study, VOSviewer is another software used to map the co-occurrence of authors' keywords. VOSviewer is a software application that assists in constructing and visualizing bibliometric networks (Abdullah *et al.*, 2023). Finally, the dataset of 392 articles was analyzed, and the necessary statistical reports, graphs, and tables were generated using bibliometric data visualization tools, namely, ScientoPy and VOSviewer. This methodological approach ensures a comprehensive analysis of the current state and trends in internal audit and risk management integration research, providing valuable insights for both academics and practitioners in the field.

**Table 1. Information on Initial Data Analysis**

Information	Number	Percentage (%)
Original data:		
Loaded papers	482	
Omitted papers by document type	0	0.00%
Total papers after omitted papers removed:	482	
Loaded papers from WoS	156	32.40%
Loaded papers from Scopus	326	67.60%
Duplicated removal results:		
Duplicated papers found:	90	18.70%
Removed duplicated papers from WoS	1	0.60%
Removed duplicated papers from Scopus	89	27.30%
Duplicated documents with different cites by	76	84.40%
Total papers after removal duplication:	392	
Papers from WoS	155	39.50%
Papers from Scopus	237	60.50%

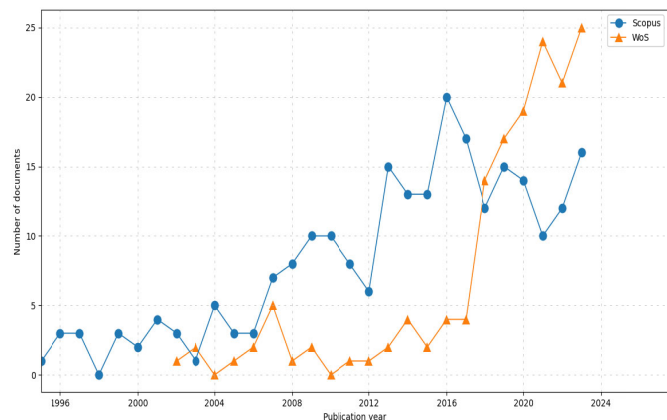
Source: Author's figure (Generated using ScientoPy)

## RESULTS AND DISCUSSION

### Publication Growth Trends

In our study, "The Integration of Internal Audit and Risk Management: A Systematic Literature Review and Bibliometric Analysis (1995-2023)," we comprehensively examined publication trends in the field of internal audit and risk management integration. Our analysis of 392 articles from WoS and Scopus databases provides valuable insights into the evolution and impact of research in this domain (Figure 2 and Table 2). The bibliometric evaluation reveals significant developments in the integration of internal audit and risk management research. Our dataset, comprising 155 articles from WoS and 237 from Scopus, offers a robust foundation for analyzing research patterns and trends. The Average Growth Rate (AGR) indicates varying patterns in research output, with WoS showing a lower growth rate of 0.5% compared to Scopus's 3%. This difference suggests a more consistent publication pattern in Scopus-indexed journals focusing on internal audit and risk management integration. The field's productivity is reflected in the Average Documents per Year (ADY) metric, with WoS showing 23 documents per year compared to Scopus's 14, indicating sustained scholarly engagement across both databases. A notable portion of the total publications has emerged in recent years, particularly evident in the WoS database. The Percentage of Documents in Last Years (PDLY) metric shows that 30.3% of WoS documents were published recently, compared to 11.8% in Scopus. This trend suggests an increasing focus on internal audit and risk management integration in WoS-indexed journals. The h-index values of 28 for WoS and 34 for Scopus underscore the substantial academic impact and visibility of research in this field. These metrics collectively illustrate a dynamic and increasingly influential research domain, highlighting the growing importance of internal audit and risk

management integration studies. The overall publication trends demonstrate a consistent increase in cumulative publications over time, with annual publication figures showing variability but an overall upward trajectory in recent years. This growth pattern emphasizes the ongoing relevance and evolving nature of research examining the integration between internal audit and risk management functions.



Source: Author's figure (Generated using SciencioPy)

**Figure 2. Publication growth trends in the Scopus and WoS databases**

**Table 2. Total publication in Scopus and WoS databases by AGR, ADY, PDLY, and h-index**

Rank	Data Base	Total	AGR	ADY	PDLY	h-Index
1	Scopus	237	3	14	11.8	34
2	WoS	155	0.5	23	30.3	28

Source: Author's figure (Generated using SciencioPy)

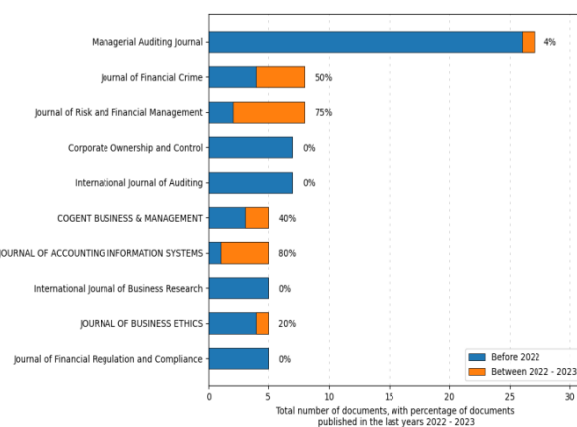
AGR=Average growth rate, ADY=Average documents per year, PDLY=Percentage of documents in last years, h-index=standard scholarly metric in which the number of published papers, and the number of times their author is cited, is put into relation

**Notable scientific publications**

Our bibliometric analysis identifies prominent journals in internal audit and risk management integration research. The leading journals exhibit varied publication trends and impact metrics across the field. As shown in Figure 2 and Table 3, Managerial Auditing Journal emerges as the primary venue for research in this domain, with 27 publications and an h-index of 16. Despite its leadership position, it shows moderate recent activity with an Average Documents per Year (ADY) of 0.5 and a Percentage of Documents in Last Years (PDLY) of 3.7%. The Journal of Financial Crime and Journal of Risk and Financial Management, both ranking second with 8 publications each, demonstrate different impact patterns. While the Journal of Financial Crime maintains an h-index of 6 with a moderate AGR of 0.5, the Journal of Risk and Financial Management shows more recent dynamism with a higher AGR of 2.5 and a notable PDLY of 75%. Interestingly, some journals with fewer total publications show significant recent activity in this field. For instance, the International Journal of Accounting Information Systems, with 5 publications, demonstrates strong recent growth with a PDLY of 80% and an AGR of 0.5. This indicates an increasing focus on internal audit and risk management integration in specialized accounting information system contexts. Corporate Ownership and Control and the International Journal of Auditing, both with 7 publications, show contrasting trends. While Corporate

Ownership and Control shows no recent growth (AGR, ADY, and PDLY all at 0), the International Journal of Auditing maintains a solid presence with an h-index of 7, despite a slight decline in recent publications (AGR of -0.5).

The analysis reveals diverse publication venues for internal audit and risk management integration research, emphasizing the field's multidisciplinary nature. The presence of journals spanning auditing, risk management, business ethics, and information systems highlights the broad implications of this research area. Notably, specialized auditing journals coexist with broader business and management journals, indicating the wide-ranging relevance of internal audit and risk management integration research across different organizational contexts. The varying growth patterns and impact metrics among these journals suggest an evolving research landscape with emerging opportunities for scholarly contributions in both specialized and general management venues.



Source: Author's figure (Generated using SciencioPy)

**Figure 3. The top ten scientific journals**

**Highly cited publication**

The ten most cited publications in internal audit and risk management integration research indicate substantial theoretical and practical contributions to the discipline (Table 4). Citation frequency serves as a quantitative measure of a publication's academic significance, often correlating with its overall impact on the field. Mikes (2009) leads with 264 citations, reflecting the seminal influence of their work on risk management and calculative cultures in Management Accounting Research. This research has profoundly shaped the understanding of how organizations implement and integrate risk management practices. Solomon et al. (2000) follow with 169 citations, contributing significant insights into corporate risk disclosure frameworks emerging from governance reform agendas. Their work in the British Accounting Review emphasizes the crucial link between risk management and corporate governance. Hallikas et al. (2002) rank third with 168 citations, examining risk analysis and assessment in network environments through a dyadic case study approach in the International Journal of Production Economics. Their research highlights the importance of considering organizational networks in risk management practices. Knechel (2007), with 165 citations in Accounting, Organizations and Society, provides fundamental insights into the business risk audit approach, exploring its origins, obstacles, and opportunities for integration with risk management practices.

**Table 3. Top ten scientific journals by AGR, ADY, PDLY, and h-index**

Rank	Source Title	Total	AGR	ADY	PDLY	h-Index
1	Managerial Auditing Journal	27	0	0.5	3.7	16
2	Journal of Financial Crime	8	0.5	2	50	6
3	Journal of Risk and Financial Management	8	2.5	3	75	3
4	Corporate Ownership and Control	7	0	0	0	4
5	International Journal of Auditing	7	-0.5	0	0	7
6	Cogent Business & Management	5	0.5	1	40	4
7	International Journal of Accounting Information Systems	5	0.5	2	80	5
8	International Journal of Business Research	5	0	0	0	2
9	Journal of Business Ethics	5	0	0.5	20	4
10	Journal of Financial Regulation and Compliance	5	0	0	0	3

Source: Author's figure (Generated using ScientoPy)

**Table 4. List of top ten highly cited publications**

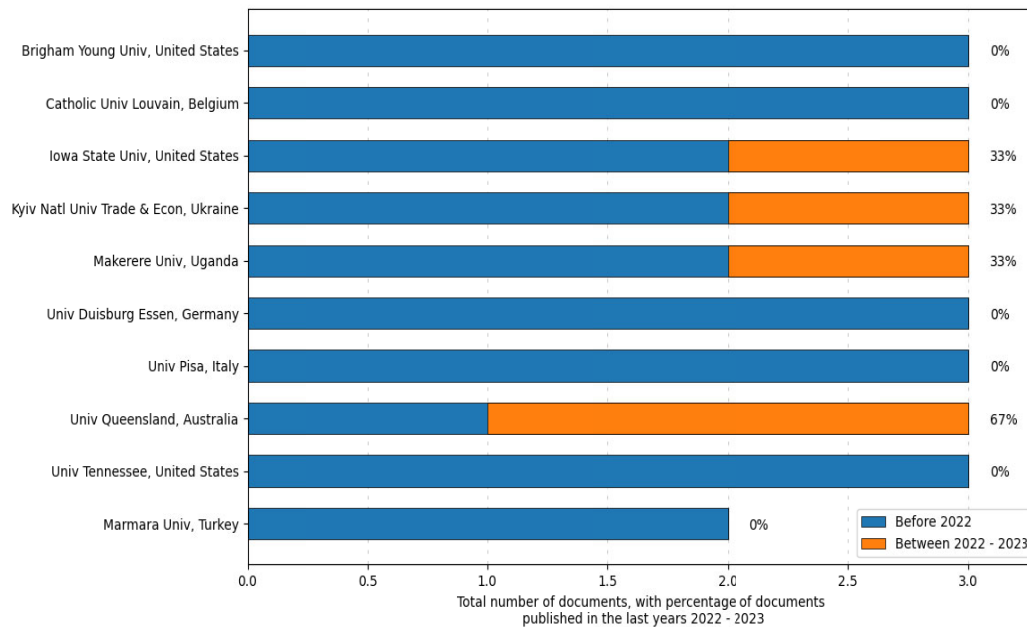
Rank	Authors	Title	Source title	Cited by	Document Type	Source
1.	Mikes (2009)	Risk management and calculative cultures	Management Accounting Research	264	Article	WoS
2.	Solomon et al. (2000)	A conceptual framework for corporate risk disclosure emerging from the agenda for corporate governance reform	British Accounting Review	169	Article	Scopus
3.	Hallikas et al. (2002)	Risk analysis and assessment in network environments: A dyadic case study	International Journal of Production Economics	168	Article	Scopus
4.	Knechel (2007)	The business risk audit: Origins, obstacles and opportunities	Accounting, Organizations and Society	165	Article	Scopus
5.	Woods (2009)	A contingency theory perspective on the risk management control system within Birmingham City Council	Management Accounting Research	161	Article	WoS
6.	Deumes and Knechel (2008)	Economic incentives for voluntary reporting on internal risk management and control systems	Auditing	143	Article	Scopus
7.	Richardson et al. (2013)	The impact of board of director oversight characteristics on corporate tax aggressiveness: An empirical analysis	Journal of Accounting and Public Policy	132	Article	WoS
8.	Goodwin-Stewart and Kent (2006)	The use of internal audit by Australian companies	Managerial Auditing Journal	128	Article	Scopus
9.	Rae and Subramaniam (2008)	Quality of internal control procedures: Antecedents and moderating effect on organisational justice and employee fraud	Managerial Auditing Journal	124	Article	Scopus
10.	Sarens et al. (2009)	Internal audit: A comfort provider to the audit committee	British Accounting Review	118	Article	Scopus

Source: Author's figure (Generated using ScientoPy)

The compilation reflects both theoretical developments (e.g., Woods, 2009; Solomon *et al.*, 2000) and empirical research (e.g., Deumes and Knechel, 2008; Richardson *et al.*, 2013), illustrating the variety of approaches in internal audit and risk management integration studies. These publications encompass diverse contexts, from specific organizational case studies (Woods, 2009) to broader theoretical frameworks (Mikes, 2009), showcasing the wide applicability of this research. Notably, all top-cited works are articles published in prestigious accounting and management journals, highlighting the critical role of high-quality publications in advancing research on internal audit and risk management integration. The range of journals represented, spanning management accounting, auditing, and business ethics, emphasizes the interdisciplinary impact of these studies. This diversity underscores the multifaceted nature of internal audit and risk management integration and its relevance across various organizational contexts and research paradigms. Recent works, such as Richardson *et al.* (2013) and Sarens *et al.* (2009), demonstrate the ongoing importance of governance oversight and the comfort-providing role of internal audit, which has significant implications for integrated risk management approaches. Additionally, works like Goodwin-Stewart and Kent (2006) contribute to understanding the practical implementation of internal audit functions, providing valuable insights for organizations seeking to enhance their risk management capabilities through integrated approaches.

### Institutional research output

Research output at the institutional level is crucial for assessing contributions to the body of knowledge regarding internal audit and risk management integration. This analysis delineates the top 10 institutions based on their research productivity and impact in this domain (Figure 4 and Table 5). Brigham Young University in the United States emerges as one of the leading institutions with 3 publications, though showing stable rather than growing output (AGR=0, ADY=0, PDLY=0) with an h-index of 2. This suggests historical contributions to the field rather than recent intensive activity. The Université Catholique de Louvain also contributes 3 publications, though showing a slight decline in recent activity (AGR=-0.5) while maintaining a strong h-index of 3, indicating a significant impact of their research. Several institutions demonstrate varying patterns of recent engagement in this research area. Iowa State University and Kyiv National University of Trade and Economics each contribute 3 publications, showing moderate recent activity (ADY=0.5, PDLY=33.3%). However, their impact differs, with Iowa State achieving an h-index of 3 compared to Kyiv's h-index of 1. The University of Queensland, Australia, despite having the same total publication count (3), shows the most dynamic recent activity with a positive AGR of 0.5, higher ADY of 1, and the highest PDLY of 66.7% among all institutions.



Source: Author's figure (Generated using ScientoPy)

**Figure 4. The top ten productive institutions**

**Table 5. Top ten highly productive institutions by AGR, ADY, PDLY and h-index**

Rank	Institution With Country	Total	AGR	ADY	PDLY	h-Index
1	Brigham Young University, United States	3	0	0	0	2
2	Université Catholique de Louvain	3	-0.5	0	0	3
3	Iowa State University, United States	3	0	0.5	33.3	3
4	Kyiv National University of Trade and Economics, Ukraine	3	0	0.5	33.3	1
5	Makerere University, Uganda	3	0.5	0.5	33.3	3
6	University of Duisburg-Essen, Germany	3	-0.5	0	0	3
7	University of Pisa, Italy	3	-0.5	0	0	3
8	University of Queensland, Australia	3	0.5	1	66.7	3
9	University of Tennessee, United States	3	-0.5	0	0	3
10	Marmara University, Turkey	2	0	0	0	2

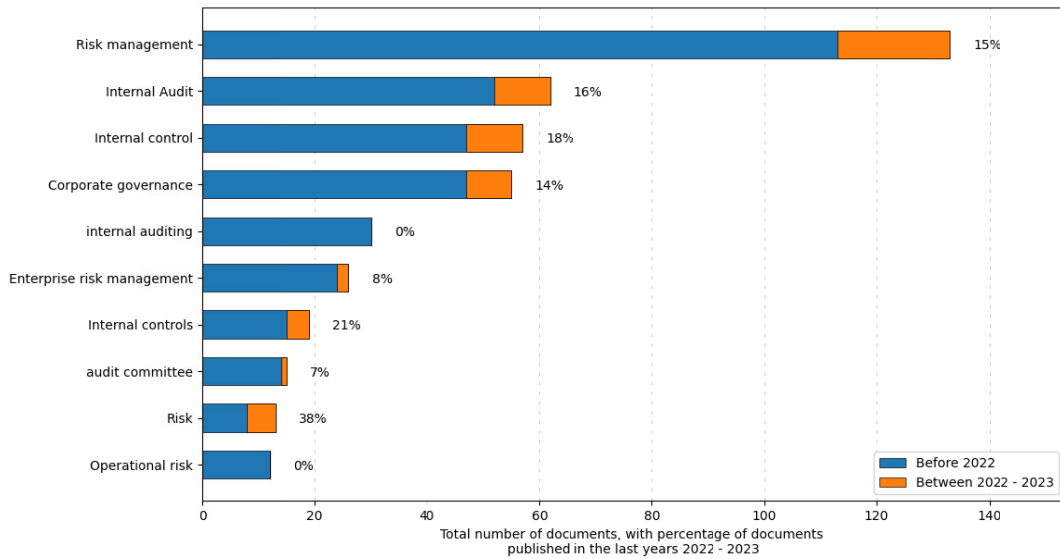
Source: Author's generated table

AGR=Avarage growth rate, ADY=Average documents per year, PDLY=Percentage of documents in last years, h-index=standard scholarly metric in which the number of published papers, and the number of times their author is cited, is put into relation

The institutional landscape shows geographical diversity, spanning North America, Europe, Asia-Pacific, and Africa. Makerere University in Uganda demonstrates consistent engagement (AGR=0.5, ADY=0.5, PDLY=33.3%) with an h-index of 3, while European institutions like the University of Duisburg-Essen (Germany) and University of Pisa (Italy) show declining recent activity (AGR=-0.5) despite maintaining solid h-indices of 3. This international framework signifies a comprehensive examination of internal audit and risk management integration across various organizational and cultural contexts. The University of Tennessee maintains historical significance with an h-index of 3, though showing decreased recent activity (AGR=-0.5), while Marmara University in Turkey shows stable but limited output (2 publications, h-index=2). The varying metrics among institutions indicate different stages of research maturity and focus within the global landscape of internal audit and risk management integration research. While some institutions display recent advancement and heightened activity, others maintain consistent historical output, highlighting diverse research approaches and priorities. These institutions continue to foster research environments that emphasize the importance of internal audit and risk management integration across various organizational contexts, with their contributions remaining fundamental to the field's development and practical applications.

### Highly dominant authors keywords

Our bibliometric analysis of keywords reveals distinct patterns and emerging trends in internal audit and risk management integration research (Figure 5 and Table 6).. "Risk management" emerges as the dominant theme with 133 occurrences, maintaining a steady presence (AGR=0) with substantial yearly contribution (ADY=10), while its commanding h-index of 27 underscores its foundational role in the field. This is complemented by audit-related keywords, with "Internal audit" (62 occurrences) showing consistent presence (AGR=0, ADY=5) and moderate recent activity (PDLY=16.1%), while "Internal control" (57 occurrences) demonstrates slight growth (AGR=0.5) with similar yearly output (ADY=5). Governance-related terminology forms another significant cluster, with "Corporate governance" (55 occurrences) exhibiting the strongest growth trend (AGR=2) among top keywords and maintaining solid impact (h-index=20). The specialized term "Enterprise risk management" (26 occurrences) shows a stable presence but lower recent activity (PDLY=7.7%), while maintaining a respectable impact (h-index=11). "Internal auditing" (30 occurrences) shows declining trends (AGR=-1, PDLY=0) despite its strong historical impact (h-index=16). Notably, specific risk-related terms demonstrate varying patterns.



Source: Author's figure (generated via ScientoPy)

Figure 5. The keywords of the top ten authors

Table 8. Top ten authors' keywords by AGR, ADY, PDLY, and h-index

Rank	Author Keywords	Total	AGR	ADY	PDLY	h-Index
1	Risk management	133	0	10	15	27
2	Internal audit	62	0	5	16.1	17
3	Internal control	57	0.5	5	17.5	14
4	Corporate governance	55	2	4	14.5	20
5	Internal auditing	30	-1	0	0	16
6	Enterprise risk management	26	0	1	7.7	11
7	Internal controls	19	-1	2	21.1	8
8	Audit committee	15	0.5	0.5	6.7	10
9	Risk	13	0.5	2.5	38.5	5
10	Operational risk	12	-1.5	0	0	5

Source: Author's generated table

AGR=Avarage growth rate, ADY=Average documents per year, PDLY=Percentage of documents in recent years, h-index=standard scholarly metric in which the number of published papers, and the number of times their author is cited, are related

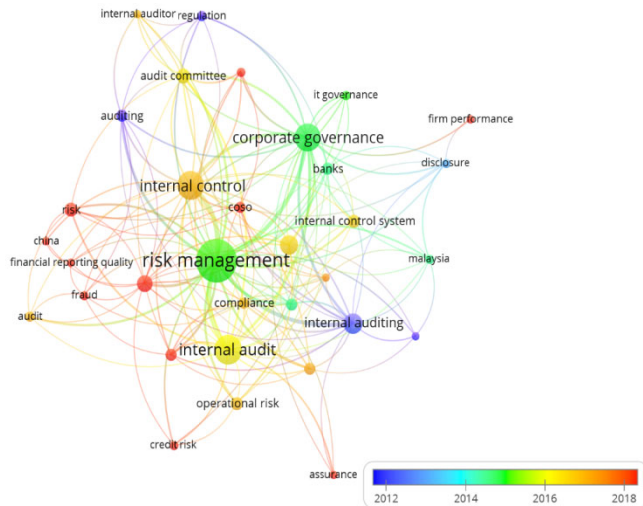
"Risk" as a standalone keyword (13 occurrences) shows positive momentum (AGR=0.5) with the highest recent activity (PDLY=38.5%), while "Operational risk" (12 occurrences) demonstrates the most significant decline (AGR=-1.5, PDLY=0). The presence of "Internal controls" (19 occurrences) with declining growth (AGR=-1) but moderate recent activity (PDLY=21.1%) suggests a shift from traditional control frameworks toward integrated risk management approaches. This keyword analysis illuminates several research opportunities, including the integration of risk management with governance mechanisms, the development of comprehensive internal control frameworks, and the enhancement of audit committee effectiveness (15 occurrences, AGR=0.5). The evolving keyword trends demonstrate the field's transition from traditional audit approaches toward more integrated risk management strategies, while identifying potential areas for future research development in the intersection of internal audit and risk management practices.

**Keyword co-occurrence network analysis**

Figure 6 illustrates the co-occurrence network of keywords in internal audit and risk management integration research, revealing the intricate relationships between key concepts in this field. "Risk management" emerges as the central node with the strongest network connections, demonstrating its

This visualization effectively identifies the core terminology and conceptual framework associated with the integration of internal audit and risk management practices. The network structure shows distinct clusters, with risk management forming strong connections to both "internal audit" and "internal control," emphasizing the interrelated nature of these concepts in organizational oversight mechanisms. The co-occurrence map reveals significant thematic clusters, with "corporate governance" and "enterprise risk management" forming a distinct group that connects closely to "internal controls" and "audit committee" nodes. This clustering pattern reflects the comprehensive nature of governance mechanisms within organizations. The density of connections between "risk management" and "internal audit" nodes indicates the operational synergies between these functions, while the strong linkages to "internal control" suggest the practical implementation aspects of integration. The network visualization also highlights the evolution of the field, illustrated by the presence of both traditional audit terminology and contemporary risk management concepts. "Operational risk" appears as a specialized node with connections to both risk management and internal audit clusters, suggesting its role as a bridge between these domains. The positioning of "risk" as a standalone concept with multiple connections indicates its pervasive influence across different aspects of the integration framework. This network analysis provides valuable insights into the conceptual structure of internal audit and risk management integration research, highlighting both established

relationships and emerging connections between key concepts. The visualization suggests future research directions, particularly in strengthening the links between traditional audit practices and evolving risk management strategies, while also indicating potential areas for investigation in the relationship between governance mechanisms and integration effectiveness. The co-occurrence patterns demonstrate the field's evolution toward comprehensive approaches that combine audit expertise with sophisticated risk management frameworks in organizational contexts.



Source: Author's figure (generated via VOSviewer)

**Figure 6. Visualization of the author's keywords**

## Conclusion

This bibliometric examination elucidates a marked escalation in scholarly engagement concerning internal audit and risk management integration. The inquiry delineates pivotal journals, domains, notable publications, and institutions that enhance methodologies for integrating risk management with internal audit practices. Our analysis reveals that while risk management and internal control remain central themes, research approaches have evolved from traditional siloed methodologies to more comprehensive integrated frameworks. The findings demonstrate significant growth in this research field, particularly evident in Scopus publications (AGR=3%, ADY=14) compared to WoS (AGR=0.5%, ADY=23). This trend indicates increasing academic interest in integrated approaches to internal audit and risk management. Managerial Auditing Journal emerges as the leading publication venue, while highly cited works such as Mikes (2009) and Solomon et al. (2000) have fundamentally shaped the understanding of risk management integration with internal audit practices. Institutionally, the research landscape shows global diversity, with significant contributions from North American, European, Asian-Pacific, and African institutions. The University of Queensland demonstrates strong recent productivity (PDLY=66.7%), while contributions from institutions across different regions highlight the field's expanding geographical scope. Keyword analysis reveals the evolution from traditional audit terminology toward integrated risk management frameworks, with "risk management" (133 occurrences) and "internal audit" (62 occurrences) emerging as dominant themes. However, this study's scope is limited to identifying overarching themes in internal audit and risk management integration research, rather than examining specific implementation contexts. Future research should incorporate

systematic literature reviews or meta-analyses to explore the effectiveness of different integration strategies across various organizational contexts. Scholars should examine how internal audit and risk management practices adapt to emerging technologies and evolving business risks. Additionally, investigating the applicability of integration strategies across different organizational structures and industry sectors may yield valuable insights into their effectiveness in various business contexts. Future studies should also address the integration of emerging technologies in risk assessment and the development of more sophisticated frameworks for combining internal audit and risk management functions. This bibliometric analysis provides a comprehensive foundation for understanding the evolution and current state of internal audit and risk management integration research, offering valuable insights for academics, practitioners, and organizations working to enhance governance and risk oversight through integrated approaches.

**Conflict of Interest:** The author declared no conflict of interest.

**Funding:** This research did not receive any financial support.

## REFERENCES

- Abdullah, K. H., Roslan, M. F., Ishak, N. S., Ilias, M., & Dani, R. (2023). Unearthing hidden research opportunities through bibliometric analysis: A review. *Asian Journal of Research in Education and Social Sciences*, 5(1), 251-262. <https://doi.org/10.55057/ajress.2023.5.1.23>
- Agrawal, S. (2023). Global financial crisis: Exploring its origins and formulating preventive measures. *International Journal of Foreign Trade and International Business*, 5(1), 48-53. <https://doi.org/10.33545/26633140.2023.v5.i1a.90>
- Ahmi, A. (2022). *Bibliometric Analysis for Beginners*. UUM Press.
- Anwar, R., Rehman, M., Wang, K. S., & Hashmani, M. A. (2019). Systematic literature review of knowledge sharing barriers and facilitators in global software development organizations using concept maps. *IEEE Access: Practical Innovations, Open Solutions*, 7, 24231-24247. <https://doi.org/10.1109/access.2019.2895690>
- Bellavitis, C., Deloof, M., Filatotchev, I., Hermes, N., & Paeleman, I. (2023). Do old theories fit new contexts? New perspectives on corporate governance in entrepreneurial firms. *Venture Capital*, 25(2), 117-133. <https://doi.org/10.1080/13691066.2023.2178365>
- Danach, K., & Hassan, J. A.-H. (2023). Elevating organizational competitiveness: Deconstruction of Information System management models and concepts using machine learning. *Journal of Scientific Research and Reports*, 29(10), 104-112. <https://doi.org/10.9734/jsrr/2023/v29i101802>
- Echchakoui, S. (2020). Why and how to merge Scopus and Web of Science during bibliometric analysis: the case of sales force literature from 1912 to 2019. *Journal of Marketing Analytics*, 8(3), 165-184. <https://doi.org/10.1057/s41270-020-00081-9>
- Hazaea, S. A., Zhu, J., Khatib, S. F. A., & Elamer, A. A. (2023). Mapping the literature of internal auditing in Europe: A systematic review and agenda for future research. *Meditari Accountancy Research*, 31(6), 1675-1706. <https://doi.org/10.1108/medar-01-2022-1584>



- Johari, R. J., Mohd Razali, F., & Hashim, A. (2022). Enterprise risk management: Internal auditor's role perspective. *International Journal of Academic Research in Accounting Finance and Management Sciences*, 12(1). <https://doi.org/10.6007/ijarafms/v12-i1/11413>
- Katiku, S. M. (2023). Quality internal auditing and management decision-making in Kenya. *African Journal of Commercial Studies*, 3(2), 96–100. <https://doi.org/10.59413/ajocs/v3.i2.2>
- Kazakova, N., & Chikurova, S. (2020). Control and management of business risks using internal audit methods. *Russian Journal of Management*, 8(1), 86–90. <https://doi.org/10.29039/2409-6024-2020-8-1-86-90>
- Korkushko, O., & Kushnir, L. (2021). Internal audit in a pandemic. *Eastern Europe: Economy, Business and Management*, 3(30). <https://doi.org/10.32782/easterneurope.30-15>
- Praise, I., & Rapina, R. (2022). The role of internal audit, leadership effectiveness, and organizational culture in risk management effectiveness. *European Journal of Management Issues*, 30(2), 83–91. <https://doi.org/10.15421/192208>
- Prodanova, N., Tarasova, O., & Sotnikova, L. (2023). ESG audit and its fundamental concepts. *E3S Web of Conferences*, 402, 13025. <https://doi.org/10.1051/e3sconf/202340213025>
- Rampini, G. H. S., & Berrsaneti, F. T. (2022). Similarities and differences between COSO ERM and ISO 31000 - descriptive and content analyzes. *Anais Do Encontro Nacional de Engenharia de Produção*. <https://doi.org/10.1016/j.promfg.2020.01.400>
- Romanosky, S., & Petrun Sayers, E. L. (2024). Enterprise risk management: How do firms integrate cyber risk? *Management Research Review*, 47(1), 1–17. <https://doi.org/10.1108/mrr-10-2021-0774>
- Ruiz-Rosero, J., Ramirez-Gonzalez, G., & Viveros-Delgado, J. (2019). Software survey: ScientoPy, a scientometric tool for topics trend analysis in scientific publications. *Scientometrics*, 121(2), 1165–1188. <https://doi.org/10.1007/s11192-019-03213-w>
- Secrieru, V. (2023). Functionality of the Three Lines of Defence model in the case of public financial audit in the Republic of Moldova. *Economica*, 2(124), 80–92. <https://doi.org/10.53486/econ.2023.124.080>
- Stanišić, M. (2021). Responsibility of internal auditors in the management of fraud risks. *Revizor*, 24(93), 79–94. <https://doi.org/10.5937/rev2193079s>
- Taufiq, M. (2023). Literacy study on Governance, Risk and Compliance (GCR) and performance. *International Journal of Management, Economic and Accounting*, 1(2), 248–262. <https://doi.org/10.61306/ijmea.v1i2.29>
- Silva, R., Inácio, H., & Marques, R. (2022). Blockchain implications for auditing: a systematic literature review and bibliometric analysis. *The International Journal of Digital Accounting Research*, 163–192. [https://doi.org/10.4192/1577-8517-v22\\_6](https://doi.org/10.4192/1577-8517-v22_6)
- Utami, B., Widjayanti, W., Sukmawati, K., & Mulatsih. (2023). Technology-based financial risk management strategy: Overview of recent developments. *Endless: International Journal of Future Studies*, 6(2), 316–328. <https://doi.org/10.54783/endlessjournal.v6i2.180>
- Vij, M., & Palan, J. (2022). Emerging roles and responsibilities of auditors and CFOs in the light of transforming risk landscape. *GLIMS Journal of Management Review and Transformation*, 1(1), 64–76. <https://doi.org/10.1177/jmrt.22.1023231>
- Zhukova, T., Baranova, K., & Plikus, I. (2021). Internal audit as an efficient corporate control tool under the conditions of the Covid-19 pandemic. *Visnik Sums'kogo derzavnogouniversitetu*, 2021(4), 29–35. <https://doi.org/10.21272/1817-9215.2021.4-4>

\*\*\*\*\*