



Print ISSN: 1738-3110 / Online ISSN 2093-7717
JDS website: <http://www.jds.or.kr/>
<http://dx.doi.org/10.15722/jds.21.11.202311.1>

Trend Mapping: A Bibliometric Analysis of Management Accounting and Distribution

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Received: February 21, 2023. Revised: May 30, 2023. Accepted: November 05, 2023.

Abstract

Purpose: Management accounting knowledge has been researched and disseminated through various channels, particularly academic journals. This paper examines the journals that publish research on management accounting. **Research design, data, and methodology:** The bibliometric method was applied using Scopus citation data. The limits of management accounting are quantitatively investigated by analysing 1,554 articles from 2016 to 2022 from each database. **Results:** The findings indicate a rapid increase in management accounting publications in recent years, with the highest number of articles published in 2021. The articles appeared in various scholarly journals, including those devoted to psychology, agriculture and biological sciences, and computer science. Keyword analysis reveals that management accounting is the most commonly used term in the field. In addition, the findings indicate that most scholarly authors are from Germany, the United Kingdom, and the United States. **Conclusion:** This paper contributes to the current body of knowledge in management accounting research by providing an overview of the mapping of management accounting research in the world of research publications and potential future management accounting research from the lens of costs, expenses and competitive prices, which can benefit marketing and distribution efforts.

Keywords: Management Accounting, Marketing, Distribution, Bibliometric analysis, VOS viewer

JEL Classification Code: M41

1. Introduction

Management accounting research has grown steadily over the past four decades and has evolved from cost and control-related research to encompass performance measurement and evaluation-related topics.

In particular, the emergence of hierarchical organisations as a result of the Industrial Revolution in the 19th century necessitated the development of techniques for measuring conversion costs using management accounting.

The process generated summary measures, including cost per hour or pound produced for each process and employee (Johnson & Kaplan, 1987). The research scope has shifted from cost estimation to customer value creation (Ahmed Mohamed Ghandour, 2021). The dynamic growth of organisations adopting management accounting practices is crucial for addressing the overwhelming challenges and competition in the business environment. Beyond numbers, management accounting research is also concerned with how people make decisions (Shields, 2018).

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Management accounting is defined as "processes and techniques that focus on the effective and efficient use of organisational resources to assist managers in their tasks of increasing both customer and shareholder value" (adapted from the International Federation of Accountants, 2002, cited in Langfield-Smith et al. (2019)). The definition emphasises the significance of management accounting information and the use of sophisticated information systems for decision-making by managers of various divisions within an organisation.

Managers use various management accounting techniques to make decisions regarding a business's day-to-day operations and future planning. Innovators of management accounting techniques face numerous obstacles when developing viable and effective methods.

Effective cost management using management accounting practices can give businesses a competitive advantage by enabling them to offer their products at competitive prices. It is a crucial aspect of business operations as it directly impacts the business's financial performance (Malmi & Brown, 2008). Management accounting practices enhance management's understanding of the costs and identify areas to reduce expenses without compromising product or service quality.

For example, managers can use cost accounting techniques to analyse production processes, identify inefficiencies, and optimise them to reduce costs (Shank et al., 1993). This has also garnered the interest of management accounting researchers who have spent decades studying management accounting and control practices globally.

Additionally, businesses can implement effective cost-management practices to offer competitive prices and improve marketing and distribution efforts. Competitive pricing can help businesses attract price-sensitive customers looking for value for money.

It can also help businesses retain existing customers by providing the best possible product price. (Kim et al., 2004)

Furthermore, effective cost management can enable businesses to invest in other supply chain aspects, such as marketing and distribution. Businesses can reduce costs to free up resources that can be invested in marketing campaigns or distribution channels that can help them reach their target markets more effectively. (Datar & Rajan, 2018)

Accordingly, businesses that effectively manage their costs using management accounting practices can improve overall financial performance and achieve sustainable growth (Hilton et al., 2006; Anthony et al., 2012; Cokins, 2009).

As a sub-discipline of accounting's broad body of knowledge (Merigo & Yang, 2017), management accounting has been studied and disseminated through various channels, particularly academic journals. Moreover, management accounting research articles are published in journals from

various disciplines, including the social and natural sciences. Thus, it is intriguing to examine how management accounting is mapped in the world of academic publications.

This paper presents a bibliometric analysis of management accounting research published in journals indexed by Scopus. It provides an overview of the most significant research findings and trends in management accounting. This study describes the characteristics of the management accounting literature, including the number of articles and citations, research subject categories, highly cited articles, active authors, and institutions. Nonetheless, this study aims to suggest future research directions concerning management accounting and control. This study contributes to the current body of knowledge because it provides potential insights into the evolution of management accounting research publications over the past six years. In addition, it offers management accounting scholars a foundational understanding of this research profile.

To fulfil the aforementioned research goals, this paper is organised as follows: This section describes the context and justification for conducting the bibliometric analysis. The second section provides an overview of research and bibliometric analysis in management accounting. The third section describes the study methodology. The penultimate section discusses the study findings. The conclusion and limitations of the analysis are presented in the final section.

2. Literature Review

2.1. Management Accounting

The CIMA defines management accounting as "the process of identifying, measuring, accumulating, analysing, preparing, interpreting, and communicating information used by management to plan, evaluate, and control an entity and ensure the appropriate use of its resources". Academics have shown increased interest in management accounting over the past two decades. Due to the unpredictability of the business environment and the rapid evolution of technology, management accounting practices must adapt to the changes that have influenced their evolution and the expansion of management accounting research. The International Federation of Accountants (IFAC) framework describes the four stages of management accounting development: cost determination and financial control (stage 1), information generation for planning and control (stage 2), cost reduction (stage 3) and value creation (stage 4). Since the early 1980s, management accounting research has expanded due to the emergence of new research topics (Kaplan, 1993; Young & Selto, 1991), the introduction of new journals devoted solely to publishing management accounting research, and the calls to examine management accounting phenomena from multidisciplinary perspectives (Baiman, 1990; Covaeski et

al., 1996; Macintosh & Scapens, 1990). Although previous studies provide evidence of the trend and development of management accounting research, studies such as Nain et al. (2022) are restricted to quantitative management accounting research utilising a summary graphic of presentation (maps). Consequently, a bibliometric analysis of management accounting research can enhance the information provided by domain-specific articles.

2.2. Bibliometric Analysis

There are numerous definitions of bibliometrics. Ye et al. (2012) assert that bibliometrics investigates research outcomes, such as topics, methodologies, and samples. Zupic and Cater (2015) define bibliometrics as a method for analysing disciplines' intellectual, social, and conceptual evolution. According to Merigó and Yang (2017), bibliometric analysis quantitatively studies and categorises bibliographic content. In a nutshell, bibliometric analysis analyses books, articles, and other publications using statistical methods. It uses quantitative techniques such as content analysis, citation, and co-citation analysis to cluster and map particular scientific publications (Renaud & Maucuer, 2018).

Scholars use bibliometric analysis for various purposes, such as discovering emerging trends in article and journal performance, collaboration patterns, and research constituents, and investigating the intellectual structure of a specific domain in the existing literature (Donthu et al., 2021a, 2021b; Verma & Gustafsson, 2020). Bibliometric analysis typically uses massive (hundreds or thousands) objective data points (e.g., *the number of citations and publications, occurrences of keywords and topics), but its interpretations frequently rely on objective (e.g., performance analysis) and subjective (e.g., thematic analysis) evaluations established through informed techniques and procedures. In other words, bibliometric analysis helps decipher and map the accumulated scientific knowledge and evolutionary nuances of well-established fields by systematically condensing useful information from large volumes of unstructured data.

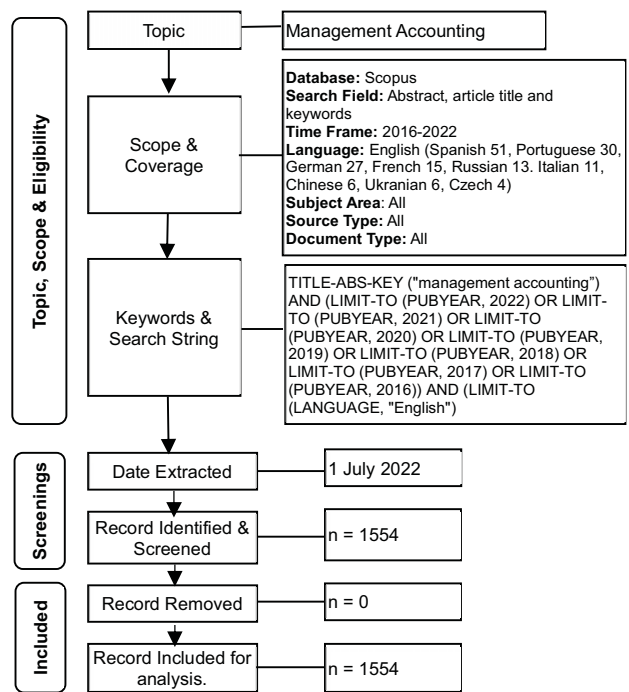
Therefore, well-executed bibliometric studies can provide the groundwork for advancing a field in novel and significant ways. For instance, it enables and empowers scholars to (1) obtain a comprehensive overview, (2) identify knowledge gaps, (3) generate novel research ideas, and (4) position their intended contributions to the research area (Donthu et al., 2021a).

3. Methodology

This research uses the Scopus database to collect data, which aligns with previous bibliometric studies such as Nain

et al. (2022). Scopus is the largest multidisciplinary database of peer-reviewed literature in social science research, and it provides a variety of data formats compatible with bibliometric software for further processing.

The database provides publication-specific details, such as access type, year, author name, subject area, text type, source title, keyword, affiliation, country, source type, and language (Nain et al., 2022). The keyword management accounting appears in the abstract, the title, and the list of keywords. The evaluation period was set as articles published between 2016 and July 1, 2021. As a result, 1,706 articles were gathered. They were filtered based on the two dominant subject areas of management accounting and English, leaving 1,554 articles as the final sample. The final set consists of empirical and theoretical research on conceptual discussions. The sample was analysed using Microsoft® Excel, Harzing® Publish or Perish, and VOSviewer software.



Source: Own

Figure 1: Diagram of the research flow.

4. Results and Discussion

4.1. Subject Area

There are a variety of research fields in management accounting, and numerous research groups around the world are involved in various areas. The subject area analysis

demonstrated that Management Accounting studies primarily concern business, management, and accounting (1,090 articles). Other subject areas consist of economics, econometrics, and finance (539 articles), social sciences (294 articles), decision sciences (214 articles), and computer science (204 articles). Nonetheless, management accounting is a multidisciplinary field having arts and humanities (24 articles) as a subfield.

Table 1: Subject Area

Subject Area	Total Document	Percentage (%)
Business, Management and Accounting	1,090	35.6
Economics, Econometrics and Finance	539	17.6
Social Sciences	294	9.6
Decision Sciences	214	7.0
Computer Science	204	6.7
Engineering	180	5.9
Environmental Science	158	5.2
Energy	109	3.6
Arts and humanities	42	1.4
Mathematics	35	1.1
Others	184	6.5

4.2. Year of Publication

Table 4.8 and Figure 2 shows that the publication years of the collected articles on management accounting ranged from 2016 to 2022. At 296, 2021 had the maximum number of publications, followed by 274 in 2020. The remaining years have fewer than 250 publications. Even though most countries worldwide were on lockdown in 2020 and 2021, most articles were published during these two years. It could be attributed to increased research opportunities and concentration during the lockdown period. The global lockdown likely reduced collaboration, leading to research conducted by many individual contributors.

Table 3: The 10 Most Active Journals

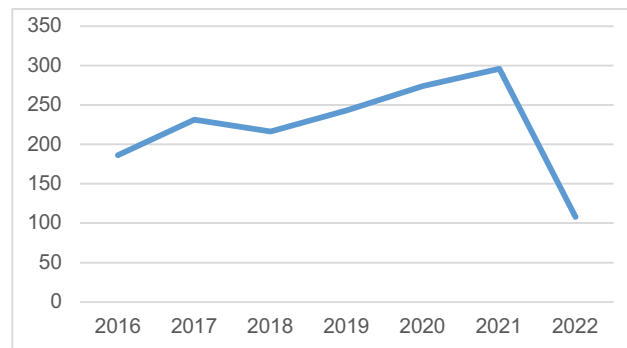
Source Title	TP	%	Publisher	Cite Score	SJR	SNI
Journal Of Accounting and Organizational Change	48	3.09%	Emerald	2.3	0.455	1.008
Accounting Auditing and Accountability Journal	38	2.45%	Emerald	6.8	1.465	1.980
Journal of Management Accounting Research	35	2.25%	American Accounting Association	2.9	0.768	0.970
Management Accounting Research	34	2.19%	Elsevier	4.8	1.068	1.777
Qualitative Research in Accounting and Management	34	2.19%	Emerald	2.4	0.482	0.931
Journal Of Management Control	28	1.80%	Springer Nature	3.6	0.671	1.286
Sustainability Switzerland	28	1.80%	Multidisciplinary Digital Publishing Institute	5.0	0.664	1.310
ACM International Conference Proceedings	24	1.54%	ACM	1.0	0.232	0.310
Journal of Cleaner Production	23	1.48%	Elsevier	15.8	1.921	2.444
Academy of Accounting & Financial Studies Journal	20	1.29%	Allied Business Academies	1.4	0.200	0.529

Note: *Cite score, SJR, SNI is up until 2021.

Table 2: Year of Publication

Year	TP	%	NCP	TC	C/P	C/CP	h	g
2016	186	11.97	158	2765	14.87	17.50	26	45
2017	231	14.86	182	2124	9.19	11.67	23	36
2018	216	13.90	173	1714	7.94	9.91	20	31
2019	243	15.64	168	1191	4.90	7.09	17	23
2020	274	17.63	183	862	3.15	4.71	13	18
2021	296	19.05	107	325	1.10	3.04	7	10
2022	108	6.95	23	37	0.34	1.61	3	3
Total	1,554	100	994	9018	41.49	55.53	109	166

Notes: TP=total number of publications; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; and g=g-index



Source: Own

Figure 2: Publication trends.

4.3. The 10 Most Active Journals

This study also analysed the most active management accounting publications in journals. The findings revealed that four publishers control the ten most popular journals (Table 3). Emerald Group Publishing has published the top two most active journals. The Journal of Accounting and Organisational Change (48) had the most articles, followed by the Accounting Auditing and Accountability Journal (38), The Journal of Management Accounting Research (35), Management Accounting Research (34), and Qualitative Research in Accounting and Management (34).

According to the 2021 CiteScore report, three journals had a CiteScore of 5 or higher. Even though the Journal of Cleaner Production is ranked ninth in Scopus with 23 papers, its Cite Score of 15.8 is significantly higher than the other journals. The study acknowledged that the selection process of CiteScore in matching authors' most innovative and influential work would influence the choice of journal for publication by some authors. CiteScore, the Elsevier-Scopus alternative to the Clarivate Analytics Impact Factor, is a journal evaluation metric based on Scopus database citation results. However, the researchers disagree that CiteScore should be the only metric. In addition to CiteScore, authors should consider whether the journal can reach the intended audience and contribute to advancing the field.

4.4. The 15 Most Active Authors

The 15 most prominent authors in Management Accounting Research are listed in Table 4. Australia, the

United Kingdom, and Germany had three authors each, followed by two authors from Indonesia and one each from Finland, the United States, Italy, and Malaysia.

From 2016 to 2022, Schaltegger authored a record number of 15 articles, achieved an h-index of 7, and received 377 citations. The authors in second and third place, Quinn and Hiebl, are affiliated with the Queen's Management School and the University of Siegen, respectively. It is interesting to note that although Quinn is listed as the second most active author, he has only 51 citations. Schaltegger's research primarily focuses on corporate sustainability, whereas Hiebl's research focuses on management accounting and control, strategic management, risk management, and small and family-owned businesses.

Table 4: The 15 Most Active Authors

Author Name	TP	%	Affiliation	Country	NCP	TC	C/P	C/CP	h	g
Schaltegger, S.	15	0.97%	Leuphana Universitat, Luneburg	Germany	14	377	25.13	26.93	7	15
Quinn, M.	11	0.71%	Queen's Management School	UK	9	51	4.64	5.67	4	7
Hiebl, M.R.W.	10	0.64%	Johannes Kepler University	Austria	9	132	13.20	14.67	7	10
Oyewo, B.	10	0.64%	University of Southampton	UK	8	26	2.60	3.25	3	4
Laine, T.	9	0.58%	Tampere University	Finland	6	39	4.33	6.50	5	6
Alsharari, N.M.	7	0.45%	Jackson State University	USA	7	71	10.14	10.14	7	7
Asiaei, K.	7	0.45%	Monash University Malaysia	Malaysia	7	88	12.57	12.57	5	7
Cinquini, L.	7	0.45%	Sant' Anna Scuola Universitaria Superiore Pisa, Pisa	Italy	5	50	7.14	10.00	3	7
Mitchell, F.	7	0.45%	The University of Edinburgh	UK	6	46	6.57	7.67	4	6
Napitupulu, I. H.	7	0.45%	Politeknik Negeri Medan	Indonesia	5	26	3.71	5.20	3	5
Susanto, A.	7	0.45%	Universitas Padjadjaran, Bandung	Indonesia	5	26	3.71	5.20	3	5
Trapp, R.	7	0.45%	Universitat Ulm	Germany	7	41	5.86	5.86	4	6
Tucker, B.P.	7	0.45%	UniSA Business	Australia	6	58	8.29	9.67	5	7
Baird, K.	6	0.39%	Macquarie University	Australia	4	44	7.33	11.00	4	6
Burritt, R. L.	6	0.39%	The Fenner School of Environment and Society	Australia	6	110	18.33	18.33	5	6

Notes: TP=total number of publications; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; and g=g-index

4.5. The Most Active Institutions

As shown in Table 5, Universitas Padjadjaran, Indonesia, with 22 publications, is the most active institution among those with 15 or more publications in management accounting. Universiti Teknologi MARA, Malaysia, is second with 18 publications during the studied years. In comparison, The Leuphana University in Germany, The Tampere University in Finland, and The Prague University of Economics and Business in the Czech Republic produced 16 to 17 publications.

Table 5: The Most Active Institutions with 15 or More Publications.

Institution	TP	%	Country
Universitas Padjadjaran, Bandung	22	1.42	Indonesia
Universiti Teknologi MARA	18	1.16	Malaysia
Leuphana Universitat	17	1.09	Germany
Tampere University	16	1.03	Finland
Prague University of Economics and Business	16	1.03	Czech Republic

4.6. Authorship and Citation Analysis

Table 6 shows the 20 most-cited articles on management accounting from the 1,554 papers collected for this study. The most cited article received 233 citations, while the least cited article received 56 citations. Eight of these 20 articles were published in 2016, with another eight published in 2017, representing the highest number of publications in any year during this study's timeline.

An article on Contingency Theory received the most citations. This theory is one of the foundational theories in management accounting research. The top two papers are concept papers discussing related theories and methodologies. Papers relating to the Digital Era, which is defined by technology that increases the speed and breadth of knowledge turnover within the economy and society, are also among the most cited. In 2016 and 2017, researchers identified studies on management accounting and its relationship with digitalisation, big data, business intelligence & analytics, sustainability, and climate change.

Table 6: The 20 Most Cited Articles

o.	Authors	Title	Year	Cites	Cites per Year
1	Otley, D.	The contingency theory of management accounting and control: 1980-2014	2016	233	38.83
2	Nitzl, C.	The use of partial least squares structural equation modelling (PLS-SEM) in management accounting research: Directions for future theory development	2016	200	33.33
3	Maas, K., Schaltegger, S., Crutzen, N.	Integrating corporate sustainability assessment, management accounting, control, and reporting	2016	156	26
4	Latan, H., Chiappetta, C. J., Jabbour, Lopes de Sousa Jabbour, A. B., Wamba, S. F., Shahbaz, M.	Effects of environmental strategy, environmental uncertainty and top management's commitment on corporate environmental performance: The role of environmental management accounting	2018	151	37.75
5	Liu, X.	Corruption culture and corporate misconduct	2016	130	21.67
6	Guthrie, J., Manes-Rossi, F., Orelli, R. L.	Integrated reporting and integrated thinking in Italian public sector organizations	2017	114	22.8
7	Kornberger, M., Pflueger, D., Mouritsen, J.	Evaluative infrastructures: Accounting for platform organization	2017	99	19.8
8	Rikhardsson, P., Yigitbasioglu, O.	Business intelligence & analytics in management accounting research: Status and future focus	2018	81	20.25
9	van Helden, J., Uddin, S.	Public sector management accounting in emerging economies: A literature review	2016	81	13.5
10	Quattrone, P.	Management accounting goes digital: Will the move make it wiser?	2016	81	13.5
11	Richins, G., Stapleton, A., Stratopoulos, T. C., Wong, C.	Big data analytics: Opportunity or threat for the accounting profession?	2017	78	15.6
12	Guenther, E., Endrikat, J., Guenther, T. W.	Environmental management control systems: a conceptualization and a review of the empirical evidence	2016	75	12.5
13	Jordao, R. V. D., Novas, J. C.	Knowledge management and intellectual capital in networks of small- and medium-sized enterprises	2017	68	13.6
14	Jordao, R. V. D., de Almeida, V. R.	Performance measurement, intellectual capital and financial sustainability	2017	63	12.6
15	Spekle, R. F., Widener, S. K.	Challenging issues in survey research: Discussion and suggestions	2018	61	15.25
16	Aznar-Sanchez, J. A., Garcia-Gomez, J. J., Velasco-Munoz, J. F., Carretero-Gomez, A.	Mining waste and its sustainable management: Advances in worldwide research	2018	60	15
17	Solovida, G. T., Latan, H.	Linking environmental strategy to environmental performance: Mediation role of environmental management accounting	2017	60	12
18	Bui, B., de Villiers, C.	Business strategies and management accounting in response to climate change risk exposure and regulatory uncertainty	2017	58	11.6
19	Cooper, D. J., Ezzamel, M., Qu, S. Q.	Popularizing a Management Accounting Idea: The Case of the Balanced Scorecard	2017	56	11.2
20	Messner, M.	Does industry matter? How industry context shapes management accounting practice	2016	56	9.33

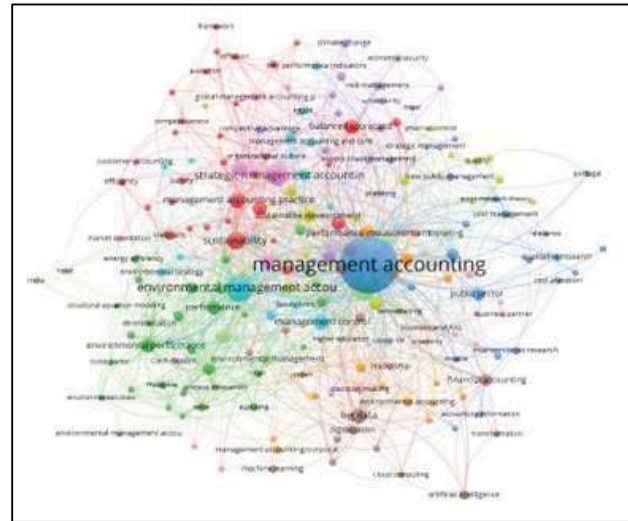
4.7. Keywords Analysis

The keyword co-occurrence analysis is commonly used in bibliometric studies (Grueso-Gala & Zornoza, 2022). Table 7 shows the most frequently used keywords in management accounting research, including management accounting (494 publications), information management (87 publications), environmental management accounting (84 publications), and environmental management (70 publications). The authors' keywords were also mapped using the VOS viewer, a software tool for creating and visualising bibliometric networks. Figure 3 reflects these findings. It displays a network visualisation of the authors' keywords, with larger fonts indicating the words used most frequently in previous studies.

Meanwhile, the lines represent the connections between different keywords. It is interesting to see the emergence of the environmental element in management accounting research, given that the 2030 Agenda concerning sustainable development outlined by the Sustainable Development Goals (SDG) is currently a hot topic being researched and discussed by many authors.

Table 7: The 20 Most Used Keywords

Keywords	TP	%
Management Accounting	494	31.79%
Information Management	87	5.60%
Environmental Management Accounting	84	5.41%
Environmental Management	70	4.50%
Accounting	65	4.18%
Decision Making	61	3.93%
Sustainable Development	60	3.86%
Strategic Management Accounting	59	3.80%
Sustainability	54	3.47%
Cost Accounting	46	2.96%
Big Data	45	2.90%
Finance	41	2.64%
Management Accounting Systems	40	2.57%
Costs	39	2.51%
Financial Accounting	36	2.32%
Economics	34	2.19%
Information Systems	31	1.99%
Environmental Performance	29	1.87%
Management	29	1.87%
Management Accounting Practices	29	1.87%



Source: Own

Figure 3: Network visualisation map of keywords most frequently used by authors.

Based on keyword co-occurrence in the Figure 3 VOSviewer map file, the following clusters can be identified:

Cluster 1: Management Accounting, Strategic Management Accounting, and Management Accounting Systems and Management Accounting Practices. This cluster represents the core focus of the analysis, with management accounting being the most frequently occurring keyword. The other keywords in this cluster represent different aspects of management accounting, such as strategic management and accounting practices.

Cluster 2: Environmental Management Accounting, Environmental Management, Sustainable Development, Sustainability and Environmental Performance. This cluster represents the environmental aspect of management accounting, focusing on sustainable development and environmental performance. Environmental Management Accounting is the most frequently occurring keyword in this cluster, indicating that it is a significant concern in management accounting research.

Cluster 3: Information Management and Information Systems. This cluster represents the role of information management and information systems in management accounting. Information management is the most frequently occurring keyword in this cluster, indicating that it is a crucial aspect of management accounting research.

Cluster 4: Accounting, Cost Accounting, Financial Accounting and Costs. This cluster represents the basic accounting principles, focusing on cost and financial

accounting. Accounting is the most frequently occurring keyword in this cluster, indicating that it is a fundamental aspect of management accounting research.

Cluster 5: Decision Making. This cluster represents the decision-making aspect of Management Accounting. Decision-making is the most frequently occurring keyword in this cluster, indicating that it is an essential concern in management accounting research.

Cluster 6: Big Data. This cluster represents the growing interest in using big data in management accounting research. Big data is the most frequently occurring keyword in this cluster, showing that it is an emerging area of research.

Cluster 7: Finance, Economics and Management. This cluster represents the broader context of management accounting, focusing on finance, economics, and management. Finance is the most frequently occurring keyword in this cluster, indicating that it is a crucial aspect of management accounting research.

Overall, the VOS viewer map file suggests that management accounting research covers various topics, including environmental management, information management, decision-making, and big data. The most frequently occurring keywords in each cluster reflect the researchers' primary concerns in each area.

Based on the identified clusters and corresponding keywords, the following potential future research directions are suggested:

1. Management Accounting and Sustainability: Cluster analysis indicates a growing interest in integrating sustainability into management accounting practices. Future research could focus on exploring the impact of environmental management accounting on sustainability performance, the role of management accounting systems in promoting sustainability, and adopting sustainable development practices in management accounting.
2. Information Management: It is identified as a critical aspect of management accounting research. Future research could explore the use of information systems in decision-making, the role of information management in promoting organisational efficiency, and the impact of information management on organisational performance.
3. Big Data and Management Accounting: Cluster analysis suggests that big data is an emerging area of research in management accounting. Future research could focus on the potential of big data in predicting

financial performance, the use of big data in cost accounting and management control, and the impact of big data on decision-making.

4. Management Accounting and Finance: Cluster analysis indicates that finance is crucial to management accounting research. Future research could focus on exploring the role of management accounting in financial analysis and forecasting, the impact of financial performance on decision-making, and the integration of financial and non-financial performance measures in management accounting.
5. Decision-Making in Management Accounting: Decision-making is essential in management accounting research. Future research could focus on exploring the factors that influence decision-making in management accounting, the role of decision-making frameworks in management control, and the impact of decision-making biases on organisational performance.

Overall, the identified clusters suggest that management accounting research is diverse and covers various topics. Future research could explore the interactions among these domains and their impact on organisational performance.

The clusters identified in the VOSviewer map file indicated no direct relationship between management accounting and marketing, specifically distribution. The clusters primarily focus on different aspects of management accounting research, including environmental management, information management, decision-making, big data, finance, and economics.

However, management accounting is essential for businesses to manage their costs, profits, and financial performance, which can impact marketing and distribution. For instance, effective cost management through management accounting can help businesses offer competitive product prices, improving marketing and distribution effectiveness.

Similarly, management accounting systems can provide businesses real-time sales and inventory data, enabling informed decisions concerning distribution channels and supply chain management. Businesses can use this data to optimise their distribution strategies to improve their overall marketing efforts and reach their target markets more effectively.

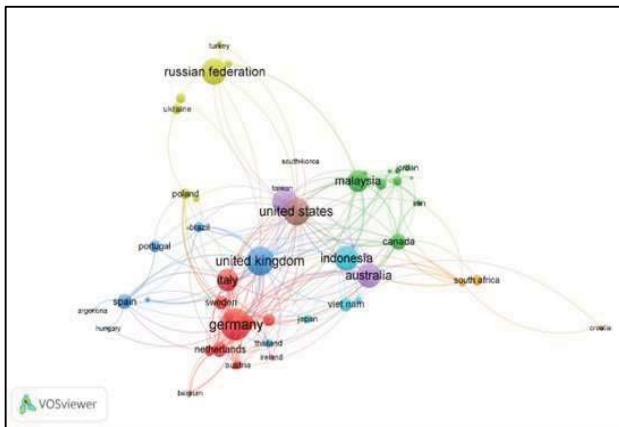
Therefore, despite no direct relationship between the identified clusters and marketing, management accounting is critical in managing business costs, financial performance, and supply chain management, which can significantly impact marketing and distribution.

4.8. Co-Authorship Network Visualisation Map

The visualisation map depicts the collaboration between researchers from various countries (Figure 4). It shows clusters of researchers working together in different regions. The stronger and more significant the connection between the two countries, the closer they are in the visualisation map. Higher collaboration frequency corresponds to larger nodes.

Based on the total link strength, Germany most frequently co-authors management accounting-related research with researchers from Sweden, Italy, and the Netherlands. There were papers where German researchers collaborated with Asian researchers. It is worth noting, however, that researchers from Asian countries tend to collaborate with researchers from the same region. Malaysian researchers, for example, frequently collaborate with researchers from Indonesia and Australia.

South Korean researchers, on the other hand, frequently collaborate with US researchers. These findings provide insights into future research collaborations; for example, Malaysian researchers may consider co-authoring with their counterparts from Japan, Thailand, Korea, and Europe.



Source: Own

Figure 4: Network visualisation map of the most frequent co-authorships.

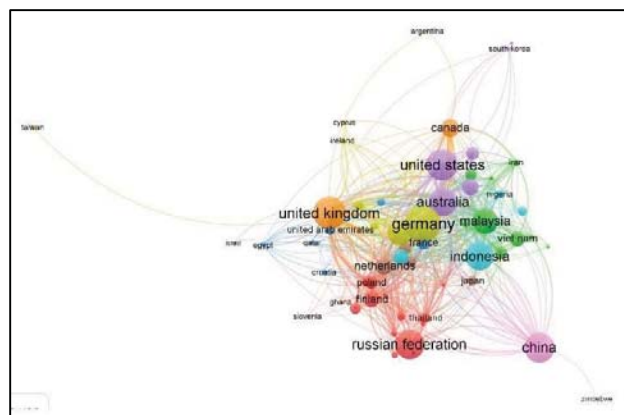
4.9. Geographical Distribution of Publications

The analysis continues with the nations that have contributed most to management accounting research. The retrieved documents were published with the assistance of researchers from 86 nations. A country relates to an institution that publishes a paper rather than considering the authors' nationality. The top 15 countries contributing to management accounting publications are listed in Table 8 and Figure 5. With 136 documents, Germany ranks the highest, followed by the United Kingdom (119 documents) and the United States (112 documents). China (105

documents) and Russia (103 documents) are ranked fourth and fifth, respectively. Several developing nations, including Indonesia (99 documents) and Malaysia (81 documents), are among the top 10 countries actively contributing to management accounting research. The purpose of examining this information is to determine the number of publications in the most influential journals, which indicates a nation's standing in the field.

Table 8: The 15 Countries with the Highest Number of Publications.

Country	TP	%
Germany	136	8.75%
United Kingdom	119	7.66%
United States	112	7.21%
China	105	6.76%
Russian Federation	103	6.63%
Indonesia	99	6.37%
Australia	95	6.11%
Italy	82	5.28%
Malaysia	81	5.21%
Canada	52	3.35%
Netherlands	48	3.09%
Spain	46	2.96%
Finland	43	2.77%
Sweden	42	2.70%
Vietnam	39	2.51%

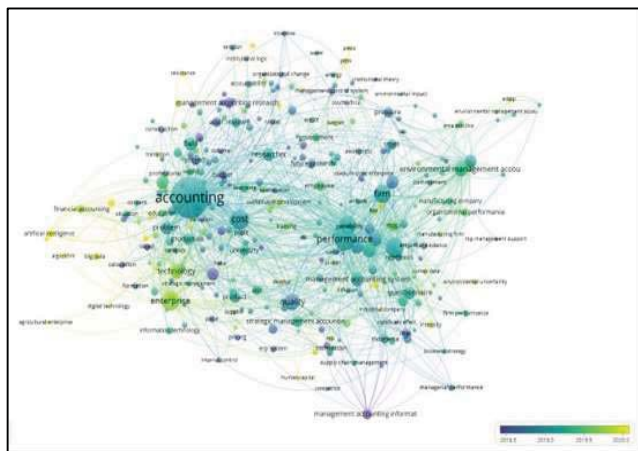


Source: Own

Figure 5: Network visualisation map of citations by countries.

4.10. Potential Future Research Areas

This research also demonstrates the co-occurrence of words. A term is a word or expression with a specific meaning in certain contexts. Figure 6 depicts the terms used in article titles, abstracts, and citations.



Source: Own

Figure 6: Network visualisation of co-occurring term in titles and abstracts.

Figure 6 shows various nodes, each representing a term. There are different sizes and colours. The size of a node determines the importance of a term used in articles; a larger size indicates that the term is used frequently. Blue colours represent older and dominant studies. There are two significant term clusters. The first cluster is the term "accounting," which appears in the majority of studies, followed by "performance" as the second cluster. Financial terms such as "cost," "profit," and "budget" are related to studies in the "Accounting" cluster. Our research on management accounting articles can also be considered part of the "accounting" cluster. The green colour represents recent and less significant studies. We see terms like "enterprise," "technology," and "environmental management accounting."

Yellow nodes represent current or trending terms that researchers are currently investigating. These yellow nodes can also be used to suggest directions for future research. The terms in this category allude to more profound technological concepts, such as "artificial intelligence," "algorithm," "big data," and "digital technology," all of which appear related to the accounting cluster. These terms are used in articles by Jasim and Raewf (2020), Qasim and Kharbat (2020), and Lohapan (2021). One of the research lines in the "performance" cluster is "management accounting system," depicted by a yellow node. It demonstrates that some articles, such as those by Kesumawati, Putri and Dwirandra (2019) and Fuadah et al. (2020), are about management accounting systems and their relationship with managerial performance. The terms "technology", "digital technology", and "agriculture enterprise" are also connected. It suggests potential future research contexts, such as studies by Farooq et al. (2020)

and Groher et al. (2020), which used agriculture enterprises as their research context.

5. Conclusion

Management accounting practices significantly contribute to business operations and processes, improving organisational performance. Most previous studies focused on traditional management accounting and control methods. However, organisations have recognised the importance of adopting strategic management accounting practices and effectively managing costs considering rapid changes in the business environment, intense business competition, survival, and diverse business contexts. Management accounting practices enable decision-makers to make informed decisions on distribution channels and supply chain management. Therefore, despite a direct relationship between the identified clusters and product/service distributions, management accounting is critical for managing business costs, financial performance, and supply chain management, which can significantly impact product and service distributions.

Consequently, increasing research trends in management accounting have drawn the researchers' attention to the present study topic. Management accounting manuscripts have been published in a variety of journals with varying contexts and contributions. The Scopus database gathered all relevant literature on management accounting, yielding 1,554 documents based on keyword search results.

This study used bibliometric analysis to map and structure management accounting literature. Management accounting research's ongoing relevance must not be denied. It is reflected in the increase in the articles published in the last two years despite ongoing research for over four decades. It highlights researchers' interest and the growing importance of the research area.

Management accounting studies dominated research in business, management, and accounting. According to several published articles, the top journals in this field are the Journal of Accounting and Organisational Change. Given the current trend in environmental research, management accounting research has also been published in the Journal of Cleaner Production with a cite score of 15.8. Schaltegger is the most active author with 15 management accounting publications; however, Otley's management accounting article has been cited most frequently.

Regarding country co-authorship relationships, the findings show that Germany is the leading contributor, followed by the United Kingdom and the United States of America. While author collaboration across borders is common in many developed countries, two ASEAN

countries, Malaysia and Indonesia, collaborate with other European countries, such as Canada and Australia. The disparity in research patterns between developed and developing countries could be attributed to differences in resource availability. Nonetheless, the emerging research patterns in developing countries should be recognised. It is also worth noting that many international collaborations occur within the same cultural cluster (Gupta Hanges & Dorfman, 2002). According to Hofstede (1994), avoiding cultural bias requires a single dominant researcher's culture. Another point worth mentioning in this study is China, where the total number of management accounting publications is enormous. Future research can be suggested based on the findings of the bibliometric analysis. New studies in management accounting may incorporate technologies such as artificial intelligence, big data, and digital technology in tandem with current technological development. Surprisingly, a new research context was discovered: agricultural enterprise accounting practices.

The findings and conclusions of bibliometric analysis can be helpful in various ways. Through bibliometric data, the findings provide an insightful overview of management accounting research. Hence, some key indicators, such as the number of papers, citations, and the h-index, are highlighted. Furthermore, the findings can be used to identify potential future research projects: research concepts, contexts, and global collaborative research.

Limitations

This study has several limitations. There are inherent database concerns considering that the study uses only the Scopus database. As a result, despite Scopus being one of the largest databases, it is important to note several journals remain unindexed; hence, publications in such journals might not have been reported. Furthermore, based on the paper title, this analysis was limited to management accounting.

As a result, other articles about accounting methods in management that did not include the term explicitly were ignored. A perfect search query is unlikely, leading to positive and negative results. Future research could broaden the search query to include other available databases, such as Web of Science, Google Scholar, and Dimensions. In the long run, integrating these databases will result in more intriguing and valuable outcomes (Nain et al., 2022).

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