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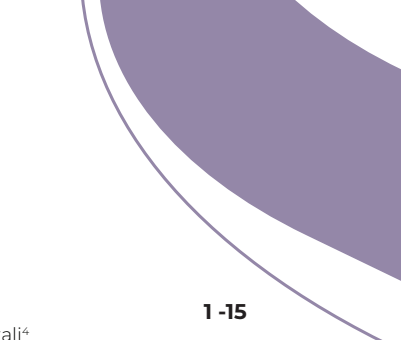


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A BIBLIOMETRIC ANALYSIS ON WORKING CAPITAL MANAGEMENT IN SME

Nor Razuana Amram^{1*}, Noor Hidayah Zainudin², Nazihah Wan Azman³ & Nuur Atikah Ghazali⁴

*¹ Faculty of Business and Management,
Universiti Teknologi MARA (UiTM), Kedah Branch, Kedah, Malaysia*

*^{2,3,4} Faculty of Management & Information Technology,
Universiti Sultan Azlan Shah, Bukit Chandan Kuala Kangsar,
Perak, Malaysia*

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Corresponding Author:
razuana@uitm.edu.my

ABSTRACT

Bibliometrics involves combining, analyzing, and examining bibliographic information from scientific publications. This study aims to analyze the clusters of Working Capital Management (WCM) in Small and Medium-sized Enterprises (SMEs) using VOSviewer software. The study reviewed articles on WCM in SMEs published from 2007 to May 2024 in the Scopus database, applying well-established bibliometric techniques and analyzing the data using VOSviewer software. Consequently, 21 articles published in the past decade were evaluated by analyzing trends in publications, authors, affiliated organizations, countries, cited articles, and popular themes to understand the research topics researchers have focused on in recent years. Surprisingly, this study's results reveal minimal collaboration between authors, universities, and countries working on the topic of WCM. In conclusion, bibliographic analysis can provide fundamental insights into research on WCM in SMEs. By applying bibliographic analysis to WCM in SMEs, this study helps contribute to scientific journals, academics, and institutions in understanding and promoting research on this topic in the field of education.

1. Introduction

Working Capital Management (WCM) refers to the activities of a business that ensure it has sufficient resources for daily current expenses while maintaining invested resources profitably and sustainably (Ross et al., 2019). This study identified that the importance of WCM toward business achievement was a traditional concept highlighted in all standard corporate finance textbooks. Notably, effective WCM remains crucial for Small and Medium-sized Enterprises (SMEs) in this context, as it directly influences their profitability and overall financial health (Amram et al., 2023).

Efficient WCM ensures smooth business operations by covering short-term expenses, such as purchasing raw materials, paying salaries, and meeting overhead costs (Sensini, 2020). Furthermore, it enhances solvency by allowing businesses to meet immediate financial obligations, maintain goodwill with employees, suppliers, and distributors, and ensure a continuous supply of raw materials. Additionally, WCM helps SMEs effectively face financial emergencies and improves their ability to navigate crises without jeopardizing operations.

WCM has gained significant interest among businesses for funding operations, yet challenges remain due to restrictions in obtaining operational funds. The issues that lead to funding in WCM are based on the critical area of business short-term asset management. Based on the blueprint published by the Institute for Capital Market Research (ICMR) by Krishnan and Rani (2024), 64% of SMEs seek external financing to meet working capital needs. Moreover, important funding ensures that the production cycle and capital expenditures are maintained or expanded for current operations (Ross et al., 2019). However, the problem of working capital has received considerable critical attention in the business community, and no business can survive without sufficient funds for working capital (Hernandez et al., 2021).

On the other hand, Ahmeti and Elshani (2024) illustrated that efficient WCM increases the profitability of SMEs by lowering the level of inventories, reducing accounts receivable days, and speeding up the Cash Conversion Cycle (CCC). By streamlining these functions, SME managers can generate business value and increase profitability. This indicates the need to manage accounts payable and accounts receivable and ensure a smooth CCC. SMEs require effective WCM to ensure financial stability, operational efficiency, the capacity to exploit growth opportunities, and financial risk reduction. Building on this, by proactively controlling leading items such as accounts payable, accounts receivable, and inventory, SMEs can enhance profitability along with long-term viability.

2. Literature Review

The ongoing changes in recent years have led to an enthusiastic shift in the use of efficient WCM, which has also led to a significant increase in the business performance of SMEs (Mang'ana et al., 2024). Consequently, Hernandez et al. (2021) noted that most companies constantly adopt WCM strategies, i.e., great WCM practices used in SMEs for day-to-day operations. This study focuses more on the general trends in WCM in SME research by analyzing publications across various industries and firm sizes in the Scopus database.

The focus on WCM in SMEs is evident through studies from various countries such as Australia (Bhattacharyya et al., 2023; Wong et al., 2018; Tran et al., 2017; Mazzarol, 2014), India (Iqbal et al., 2023; Panda et al., 2020; Baker et al., 2018), Malaysia (Panda et al., 2020; Sabki et al., 2019), Nigeria (Gorondutse et al., 2017; Samson et al., 2012), Spain (Rey-Ares et al., 2021; García-Teruel & Martínez-Solano, 2007), Bahrain (Kumaraswamy, 2020), Brazil (Rasoto, 2016), China (Ikram & Su, 2015), Germany (Tratt, 2021), North Macedonia (Ahmeti & Balaj, 2023; Ahmeti et al., 2022), Oman (Iqbal

et al., 2023), Poland (Czerwonka & Jaworski, 2023), Portugal (Sardo & Serrasqueiro, 2021), Rwanda (Ismael & Muhamed, 2013), Somalia (Gorondutse et al., 2017), Tanzania (Mang'ana et al., 2023), Thailand (Potjanajaruwit, 2021), United Kingdom (Afrifa & Tingbani, 2018), United States (Baker et al., 2018). The results of the Scopus database revealed a lack of research focusing on SMEs, especially in developing countries. Therefore, this study helps reveal the latest trends in WCM research in SMEs.

Several studies have been conducted on how WCM affects the performance of SMEs. As such, WCM is a crucial financial management that deals with the management of a company's short-term assets, such as cash, accounts receivables, and inventory, and its short-term liabilities, such as accounts payables and short-term debt (Ahmeti & Balaj, 2023; Zheng et al., 2022). The success of WCM is that it can balance liquidity and profitability in a way that companies are provided with sufficient cash flow to finance their operational needs without having surplus capital tied up in idle assets (Ahmeti et al., 2022; Braimah et al., 2021).

Successful WCM enables SMEs to perform day-to-day activities without liquidity shortages, which is particularly crucial considering that they have limited access to external finance compared to large firms (Chalmers et al., 2020; Panda et al., 2020). Note that poor WCM practices, such as high inventory holding or delayed collection of receivables, can lead to cash flow problems and financial distress. Conversely, well-managed WCM can enhance firm performance by maximizing CCCs, reducing financial costs, and promoting business growth (Baker et al., 2019; Afrifa & Tingbani, 2018).

Some of the most critical aspects of WCM have been examined in prior research, such as the impact of accounts receivable policy, inventory policy, and payment terms on SME performance. These studies highlight that SMEs adopting proactive WCM practices are bound to experience increased financial stability, operational efficiency, and overall business sustainability (Ahmeti & Balaj, 2023; Zheng et al., 2022; Ahmeti et al., 2022; Braimah et al., 2021; Chalmers et al., 2020; Panda et al., 2020; Baker et al., 2019; Afrifa & Tingbani, 2018).

There are some techniques and knowledge related to WCM. The first is cash flow forecasting, which involves predicting cash inflows and outflows to make informed decisions, maximize efficiency, and minimize cash flow risks (Afrifa & Tingbani, 2018). Meanwhile, the second is inventory management, and techniques like just-in-time (JIT) inventory and demand forecasting that help optimize inventory turnover, reduce carrying costs, and ensure products are available to meet customer demand (Muchaendepi et al., 2024; Panigrahi et al., 2024). Moreover, the third is receivable management, and its practices involve boosting cash inflow, strengthening financial liquidity, and optimizing overall working capital (Tran et al., 2017).

The fourth is payable management and strategies like early payment discounts, reminder letters, and effective communication to help manage payables efficiently and improve cash flow (Ahmeti & Balaj, 2023; Ahmeti et al., 2022; Panda et al., 2020). Finally, the last is the CCC, a critical metric measuring how effectively a company can convert investments into cash flow (Ross et al., 2019). A higher CCC indicates efficient cash flow management and better utilization of working capital (Ahmeti & Balaj, 2023; Ahmeti et al., 2022; Afrifa & Tingbani, 2018). Correspondingly, most scholarly articles indicate that managing working capital effectively can boost the understanding of SME practitioners and drive them to enhance their business performance, as suggested by Ahmeti and Balaj (2023) and Ahmeti et al. (2022).

There are ongoing debates regarding the potential over-reliance on WCM in SMEs, cautioning that it can sometimes lead to a focus on short-term financial gains at the expense of long-term strategic

goals (Ahkam et al., 2024). Therefore, it is essential for SME practitioners to understand the significance of WCM for their financial health and performance. Effective WCM can help SMEs maintain solvency, improve liquidity, and enhance profitability. Thus, to address the concern of over-reliance on WCM, SMEs should balance short-term financial management and long-term strategic goals. In addition, this balance can be achieved by implementing efficient WCM techniques while also considering the broader business environment and the company's strategic objectives.

The motivation for this study derives from the prevailing debates on the possibility of over-emphasis on WCM by SMEs. Although working capital is widely perceived as one of the most important determinants of financial performance, there is a growing debate on whether its management is over-emphasized at the expense of long-term strategic goals. Therefore, this study contributes to the knowledge base by examining the impact of effective WCM on the financial well-being and overall performance of SMEs. Additionally, focusing on the interaction between short-term financial management and long-term strategic planning, this study offers hands-on knowledge regarding how SMEs can optimize their working capital practices for sustainable development.

The study presents a general classification that helps broaden SMEs' understanding of WCM initiatives. Thus, this study aims to analyze the clusters of WCM in SMEs using VOSviewer software. The study helps contribute to the literature on WCM and extends the work of Nobanee et al. (2021) and Nayak and Paluri (2022) by going beyond a systematic literature review of WCM. In this context, this study addresses the following research question. First, what is the trend in WCM publications by year? Second, who and how much has been published in this area in terms of authors, their organizational affiliations, and countries of origin? Third, what are the most cited articles? Lastly, what are the commonly used keywords for theme analysis in this study?

The rest of the paper is organized as follows: Section 1 discusses the introduction of WCM in SMEs, and Section 2 provides an overview of the relevant research. Section 3 covers the methodology, Section 4 presents the results, Section 5 includes the discussion, and Section 6 highlights the conclusion.

3. Methodology

According to Verbeek et al. (2002), bibliometrics is defined as combining, managing, and examining bibliographic information from scientific publications. This also includes complex techniques, such as the analysis of co-citations of documents and general descriptive statistics, such as publishers' journals, years of publication, and main authors (Martinho, 2021). Moreover, Khan and Gupta (2021) described the process as a repetitive sequence involving the selection of suitable keywords, conducting a literature search, performing analyses crucial for an efficient literature review, creating a bibliography, and ensuring accurate outcomes.

On the other hand, Donthu et al. (2021) applied bibliometric analysis techniques to compare high-impact articles based on citation and co-citation analysis. They employed this technique since it enables researchers to build, visualize, and analyze bibliometric networks. Accordingly, networks depict relationships between various elements, such as publication patterns, authors, collaborating organizations, countries, cited articles, and trending topics (Van Eck & Waltman, 2014). Based on the analysis of bibliographic data, the authors revealed emerging topics and future trends in the field.

This study used the Scopus database since it is a globally recognized research platform that provides discovery, analysis, and publication of science, social sciences, humanities, and arts knowledge. Scopus also raises the rate of efficiency and effectiveness in carrying out research

(Elsevier, 2022). Scopus was selected for application in this study due to its coverage of leading journals in the business sector and the provision of reliable data for application in bibliometric analysis. The database was utilized to find studies associated with this study by extensively searching various keywords. Moreover, an internet search was conducted on the Scopus website using the keywords 'working capital management' and 'SME.' Some limitations, such as language filters, were also applied.

This study employed a screening sequence to determine the search terms for article retrieval. The search was initiated by querying the Scopus database with the following online search string: TITLE-ABS-KEY ("working capital management" AND "sme") AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (PUBSTAGE, "final")), which assembled 124 articles. This process produced 21 results, which were additionally reviewed to include only research articles in English, excluding article reviews. The final refinement of the search string included 21 articles used for the bibliometric analysis in May 2024, and all these articles from the Scopus database were included in the study. For this study, publication years from 2007 to May 2024 were selected to account for the currency of data published in selected articles.

The selection of publication years between 2007 and May 2024 ensures that the study captures the most relevant and up-to-date studies on WCM while mitigating the lack of studies in the Scopus database. As there are only 21 articles out of a total of 124 articles on this topic in Scopus, a broader time was required to obtain as many relevant papers as possible. This approach allows for a wider bibliometric analysis by identifying key trends, top authors, and research development over time. Additionally, financial management practice evolves due to economic changes, regulatory changes, and technological advances. Therefore, research from 2007 onwards provides a balanced perspective, with initial core research and recent developments. In addition, by expanding the time, the study ensures a sufficient dataset for meaningful analysis despite the low number of publications.

Records containing the year of publication, the title of the publication, the author's name, the journal, the citation, and the keyword in PlainText format were acquired from the Scopus database for the period from 2007 to May 2024. They were analysed using the VOSviewer software, version 1.6.15. The software utilized VOS clustering and mapping techniques to analyze and generate maps. Note that VOSviewer was introduced as a substitute for Multidimensional Scaling (MDS) by Van Eck and Waltman (2010), and it pursues a comparable goal. Like MDS, its aim is to position elements within a reduced-dimensional space to accurately represent their relationships and similarities, as highlighted by Hou et al. (2018). In contrast to MDS, which focuses on calculating similarity measures such as Jaccard indices and cosines, VOS implements a more appropriate technique for normalizing the frequency of co-occurrence (Van Eck & Waltman, 2010), namely association strength (AS_{ij}), which is calculated as follows:

$$AS_{ij} = \frac{C_{ij}}{w_i w_j}$$

This is proportional to the ratio between the observed number of matches of i and j on the one hand and the expected number of matches of i and j under the assumption that the matches of i and j are statistically independent of the other (Van Eck & Waltman, 2010). The association strength index utilized by VOSviewer facilitates the arrangement of elements into a map by minimizing the weighted sum of squared distances between pairs of elements. Simultaneously, a LinLog/modularity normalization method, as outlined by Hou et al. (2018), was adopted. Additionally, through visualization techniques in VOSviewer, patterns rooted in mathematical

relationships were unveiled from the dataset, enabling analyses such as keyword co-occurrence, citation analysis, and co-citation analysis to be conducted.

Keyword co-occurrence analysis has been used to study the evolution of research fields (Zhao, 2017) and identify popular topics across different disciplines (Li et al., 2016). On the other hand, citation analysis is a valuable tool for identifying important research themes, trends, and techniques and examining the historical relevance of a discipline's focus (Allahverdiyev & Yucesoy, 2017). Co-citation analysis of documents is one of the most employed bibliometric methods (Harsanto & Firmansyah, 2023; Khan & Gupta, 2021; Hou et al., 2018), and its outcome depends on the network theory to identify the relevant structure of data (Harsanto & Firmansyah, 2023).

4. Results

This section highlights the detailed results of the bibliometric review. The following figures provide an overview of scholarly publications on WCM in SMEs, as indexed in the Scopus database.

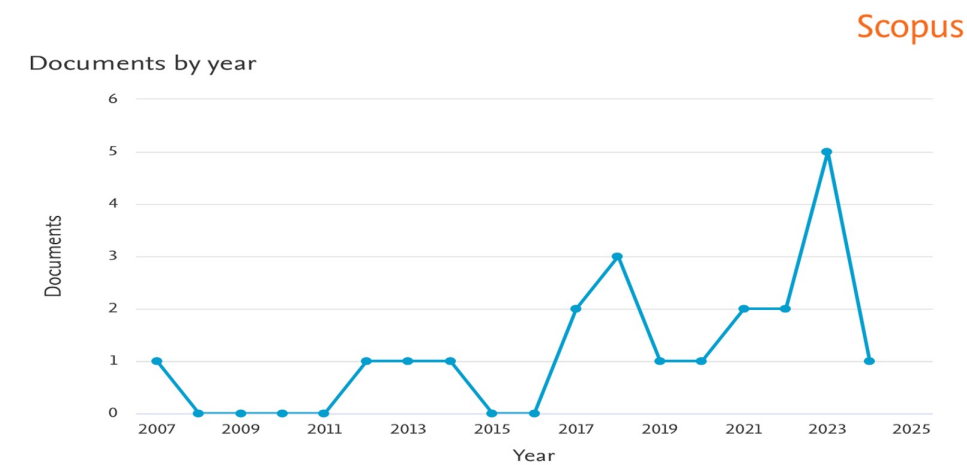


Figure 1. Trend of research in working capital management by years

Figure 1 displays the number of WCM publications published each year between 2007 and May 2024. The figure indicates that research on WCM is significant and relatively stable, with the number of publications ranging from two in 2022 to five in 2023. Meanwhile, only one article was published in 2024 and two publications in 2021, representing 9.52% of the total. Additionally, there was one publication each in 2007, 2012, 2013, and 2014, with no publications in 2008, 2009, 2010, 2011, 2015, and 2016. Consequently, there was an increase in the number of articles published at the end of 2024.

Scopus

Documents by author

Compare the document counts for up to 15 authors.

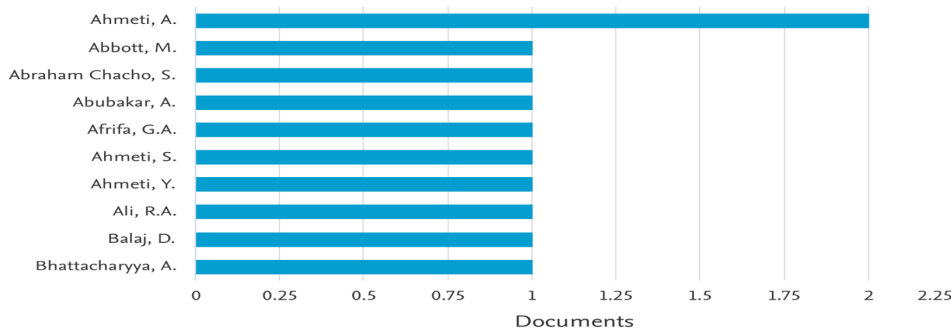


Figure 2. Top 10 authors in working capital management publications

Figure 2 illustrates the top ten authors of WCM publications, indicating Ahmeti, who published two publications (9.52%), and Abbot, Abraham, Abubakar, Afrifa, Ahmeti, Ahmeti, Ali, Balaj, and Bhattacharyya publishing one publication.

Documents by affiliation

Compare the document counts for up to 15 affiliations.

Scopus

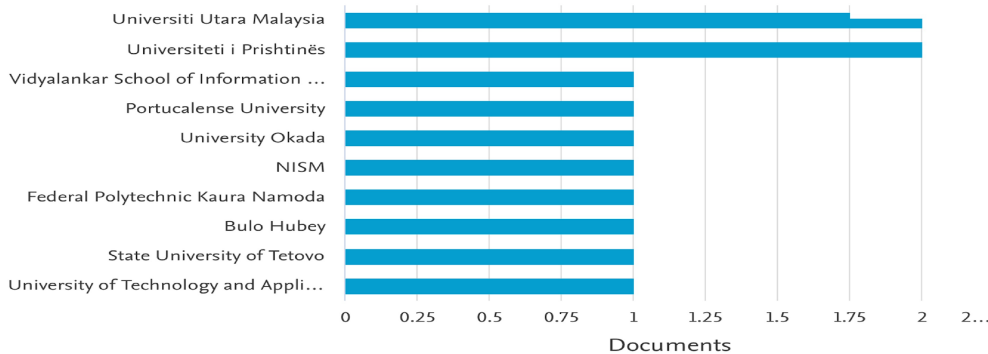


Figure 3. Top 10 active organizations in working capital management publications

Figure 3 presents the top ten organizations with the most publications on WCM in SMEs. The two most prolific organizations are Universiti Utara Malaysia and Universiteti i Prishtinës, each with two publications (9.52% of the total). The remaining organizations, including Vidyalankar School of Information Technology, Portucalense University, University Okada, NISM, Federal Polytechnic Kaura Namoda, Bulo Hubey, State University of Tetovo, and University of Technology and Applied Sciences, have contributed one publication each (4.76% of the total).

Documents by country or territory

Compare the document counts for up to 15 countries/territories.

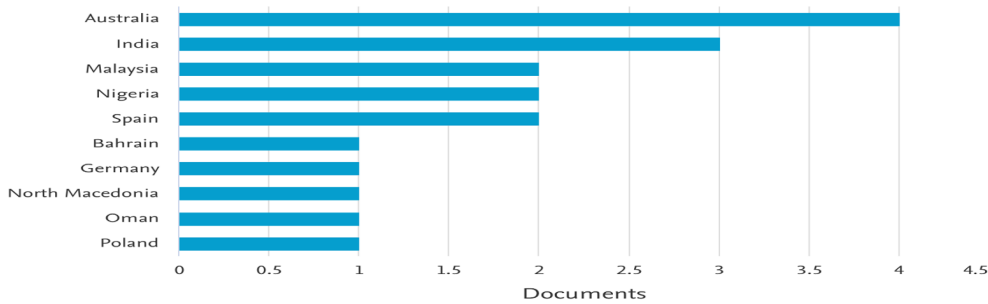


Figure 4. Top 10 active countries in working capital management publications

Figure 4 illustrates the top ten active countries in WCM publications. As revealed in a study on WCM in SMEs, the leading country was Australia, which had four publications (19.05%). This is followed by India with three publications (14.29%); Malaysia, Nigeria, and Spain, each with two publications (9.52%); and Bahrain, Germany, North Macedonia, Oman, and Poland, each with one publication (4.76%).

Table 1

Top 10 cited authors in working capital management publications

Rank	Authors	Titles	Year	No. of citations
1	García-Teruel, P. J., & Martínez-Solano, P.	Effects of working capital management on SME profitability.	2007	439
2	Tran, H., Abbott, M., & Jin Yap, C.	How does working capital management affect the profitability of Vietnamese small- and medium-sized enterprises?	2017	45
3	Rey-Ares, L., Fernández-López, S., & Rodeiro-Pazos, D.	Impact of working capital management on profitability for Spanish fish canning companies.	2021	23
4	Wong, A., Holmes, S., & Schaper, M. T.	How do small business owners actually make their financial decisions? Understanding SME financial behaviour using a case-based approach.	2018	21
5	Afrifa, G. A., & Tingbani, I.	Working capital management, cash flow and SMEs' performance.	2018	16
6	Baker, H. K., Kumar, S., & Singh, H. P.	Working capital management: evidence from Indian SMEs	2019	15
7	Mazzarol, T.	Research review: A review of the latest research in the field of small business and entrepreneurship.	2014	14
8	Gorondutse, A. H., bakar, A. A., Ali, R. A., & Naalah, M. N. I.	The Effect of Working Capital Management on SMEs Profitability in Malaysia.	2017	13

9	Samson, A. A., Mary, J., Yemisi, B.-F., & Erekpitan, I. O.	The Impact of Working Capital Management on the Profitability of Small and Medium Scale Enterprises in Nigeria.	2012	11
10	Sardo, F., & Serrasqueiro, Z.	Determinants of working capital: empirical evidence on manufacturing SMEs.	2021	9

Table 1 summarizes the ten most cited authors in publications on WCM. Note that García-Teruel and Martínez-Solano (2007) have received the highest number of citations at 439, followed by Tran et al. (2017) with 43 citations, and Rey-Ares et al. (2021) with 23 citations. The remaining authors, including Wong et al. (2021), Afrifa and Tingbani (2018), Baker et al. (2019), Mazzarol (2014), Gorondutse et al. (2017), Samson et al. (2012), and Sardo and Serrasqueiro (2021), have received between nine and 21 citations.

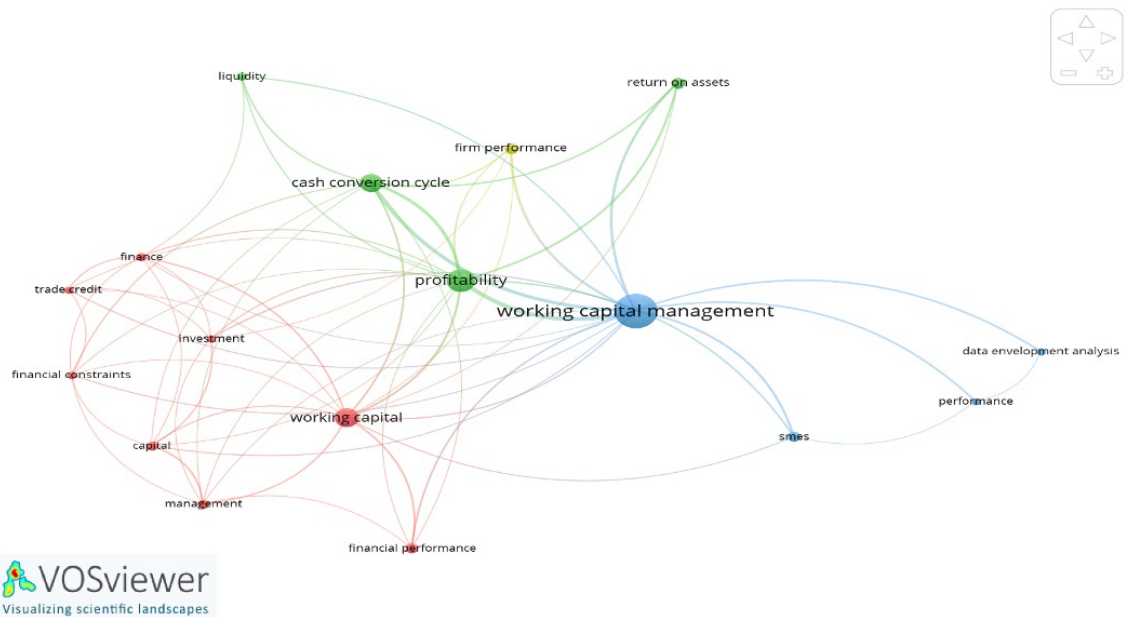


Figure 5. Network of Keywords

Figure 5 presents a network visualization of keywords related to WCM in SMEs. The largest cluster, depicted in red, consists of eight central keywords: capital, finance, financial constraints, financial performance, investment, management, trade credit, and working capital. Meanwhile, the second-largest green cluster comprises four keywords: CCC, liquidity, profitability, and return on asset. Moreover, the third cluster, in blue, includes data development analysis, performance, SMEs, and WCM. Additionally, there is a smaller yellow cluster containing the keyword firm performance. In total, the visualization displays four distinct keyword clusters. Accordingly, the proximity of keywords within each cluster indicates a stronger relationship, while greater distances between clusters represent weaker associations among their respective keywords.

5. Discussion

By analyzing the clusters of WCM in SMEs using VOSviewer software, the results reveal four distinct keyword clusters. Additionally, a review of the Scopus database reveals very few

publications on this topic, highlighting its limited research coverage. The results suggest that it is consonant with Martinho (2021). The study stated that bibliometric analyses help reveal major trends and patterns in WCM practices to ensure that SMEs can understand better practices and advances in the industry. Although thousands of documents from the Scopus database were assessed, only 21 articles were reviewed through bibliometric approaches and subsequently through literature review.

In this framework, the metadata from the databases was benchmarked, gaps in the literature were identified, and trends in publications, authors, affiliated organizations, countries, cited articles, and popular themes or keywords were analyzed. Furthermore, insights into the specific subtopics of "WCM" and "SME" were highlighted. Tangible ways for WCM best practices in SMEs by bibliometric analysis: The two known dimensions and factors that influence WCM in SMEs: Some bibliometric analysis notes the identification of key trends and patterns in WCM practices, thus enabling SMEs to remain knowledgeable about such best practices and development in the industry (Kargin & Alp, 2023).

The results identify the major theme of WCM as 'working capital.' WCM is concerned with optimizing current assets and liabilities to ensure proper liquidity for maintaining day-to-day business operations and fully optimizing operational effectiveness. Moreover, WCM is the most crucial approach to oversee the time value of money within the economic paradigm, particularly in modern times, where the business environment is fast-paced and highly competitive. Correspondingly, good WCM helps ensure that a firm is well-prepared to take advantage of opportunities, minimize the effects of hazards, and increase financial performance and profitability. Hence, WCM has necessarily become the center of study in financial management as it directly changes the ability of the firm to generate revenue and maintain financial stability and profitability. WCM is also essential for all sorts of small or micro businesses and industries and economy segments that need to be adopted through dynamic market conditions and long-term success.

From the bibliometric analysis, a significant association between WCM practices and SME performance was observed, indicating that effective management of components of working capital leads to improved profitability and financial performance of SMEs. In line with this, bibliometric analysis for WCM in SMEs significantly contributes to researchers identifying vital constructs, establishing relationships among constructs, and producing insights that benefit researchers. Additionally, it indicates that the profitability of SMEs and value creation can be improved through informed decision-making and overall financial performance.

6. Conclusion

In conclusion, the results of this study undertaking provide fundamental insights into research on WCM in SMEs. This study involved a thorough review of the literature on SME WCM over a 17-year period (2007 to May 2024), utilizing bibliometric analysis techniques. While numerous qualitative and quantitative studies exist on various aspects of WCM in SMEs, the field still has several opportunities for further exploration, indicating that it has yet to reach a state of comprehensive understanding and maturity. Effectively, this study highlights the contributions of journals, academics, and institutions to advancing the understanding of WCM in education and training. It also offers motivation and opportunities for researchers to explore gaps in information, knowledge, skills, and technology, as well as their implementation.

Clearly, the growth profile of the publications suggests potential changes in different countries in the coming years. The analysis provides a comprehensive overview of research trends and developments in the field of WCM, helping researchers understand the current state of research,

identify research collaborators, and pinpoint the best research topics. In fact, grants and other donations for the government or non-governmental organizations are just limited. Therefore, WCM is more necessary for SMEs and begs more for scientifically published articles. Moreover, it assesses research quality on the body of articles, extracting relevant data therefrom. Nevertheless, this research helps identify the specific articles related to WCM, thus adding to a better understanding of SME enterprise intent, which remains a critical area for future research directions. With the significance of WCM in SMEs, especially with the available merger resources, more high- and quality-scientific research and publication works are called for to generate a better understanding and practice strategies in this area.

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Authors Contributions

All authors contributed to developing ideas.

Conflict of Interest

There is no conflict of interest because of this study.

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