"Trends in scientific and public interest in managerial accounting: Bibliometric analysis"

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# TRENDS IN SCIENTIFIC AND PUBLIC INTEREST IN MANAGERIAL ACCOUNTING: BIBLIOMETRIC ANALYSIS

#### Abstract

In conditions of fierce market competition, changing business environment, digitalization and remote workplaces, managerial accounting plays an increasingly important role in facilitating effective monitoring of a company's activities, making optimal decisions, achieving its goals and development. The paper deals with identifying main trends of scientific and public interest in managerial accounting. Bibliometric analysis is made to determine interconnected clusters of multidisciplinary research in connection with which managerial accounting is considered, and to investigate dynamics in scientific interest on this issue based on tools of Scopus and WoS databases and VosViewer software (the sample of 10,495 articles, including 3,586 in Scopus for 1941-2022 and 6,909 in WoS for 1953–2022). These identified interconnections proved the significance of the managerial accounting component in the system of a company's management, showed dominate place and described its multidimensionality. In particular, six defined clusters reflect key scientific and practical fields, goals, tasks, potential effects, and risks of managerial accounting. Based on analytical analysis using Google Trends (from 2004 to present) and Google Books Ngram Viewer (for 1800-2019), dynamics and trends of public interest on the issue of managerial accounting were also explored and visualized. The highest level of public interest in managerial accounting was indicated in Jordan, Bangladesh, Pakistan, Egypt, Thailand, Korea, the USA, and Canada.

#### Keywords

business, company management, CR, decision making, disclosure, ESG, managerial accounting, performance, reporting

JEL Classification L2

L25, M10, M40

### INTRODUCTION

At the current stage of the development of economic relations, increased competition in domestic and foreign markets, digitalization of business communications, etc., managerial accounting is gaining more and more importance in a company's management. In modern conditions of a changing environment, profitability and effectiveness of business depends primarily on effective, adequate, optimal and timely decisions of a company's management, and managerial accounting aims to facilitate the adoption of such decisions. Internal reporting and its analysis are the basis for identifying internal gaps of a company, organizational transformation, brand strengthening, strategic planning, forecasting, and successful development of the company.

At the same time, the disclosure of individual components of reporting, in particular, regarding sustainable development reporting, environmental, social and governance (ESG) reporting, corporate responsibility (CR) and social responsibility reporting, is welcomed by the leading institutions of the world community and society as a whole (CRRA, 2022). According to the Corporate Register database in 2016, there were 10,563 published reports and 15,538 – in 2020, so the growth is 47.1% (Corporate Register, n.d.b). Moreover, in many countries of the European Union and throughout the world, ESG reporting is becoming mandatory for company management (WEF, 2022). The leading 50 companies in the Rank of ESG Top-Rated Companies – 2023 by Sustainalytics, which covers more than 14,000 companies in 42 industries, include Asian Development Bank, Abertis Infraestructuras SA, Avnet, Inc., Berlin Hyp AG, City Developments Ltd., International Bank for Reconstruction & Development, Universal Display Corp., and others (Sustainalytics, 2023).

The received global recognition and trust based on the publication of reports and thus the presentation of one's business positively contributes to its efficiency in the future. Therefore, value creation is considered as the next step in the evolution of managerial accounting and corporate reporting within a company's management. This statement is actively promoted by the International Integrated Reporting Council (Corporate Register, n.d.a). Totally, the above determines the relevance of the research of managerial accounting as a key component of a company's management.

### **1. LITERATURE REVIEW**

The issue of managerial accounting as a component of a company's management is not new in the social sciences. Kaplan (1984) analyzed the evolution of managerial accounting. Covaleski et al. (1996) considered organizational and sociological approaches to understanding the concept of management accounting. Burns and Scapens (2000) conceptualized the change of managerial accounting within an institutional framework. Bhimani (2009) considered managerial accounting in relation to risk management and corporate governance and argued that management accounting depends on the ability to interpret in technical, analytical, and computational terms. Busco et al. (2007) systematized managerial accounting changes according to key parameters such as agents and changes objects; forms and changes ratio; space and of changes time; and the interaction between change and stability. Sustainable development and changes in a company's environment make a great impact on the company's development (Vasilyeva et al., 2019; Dzwigol & Dzwigol-Barosz, 2020; Dzwigol et al., 2021; Kolosok et al., 2022; Horvathova & Mokrisova, 2023; AL-Hashimi et al., 2023; Lesnikova et al., 2023; Yadav & Yadava, 2023; Dotsenko et al., 2023; Makarenko et al., 2023; Brychko et al., 2023; Hien et al., 2023).

Managerial accounting and reporting disclosures can have a far-reaching impact, from raising financial capital to attracting human and intellectual capital (Hazem & Sharif, 2022; Alharbi & Al-Adeem, 2022; Kaya, 2022; Kuzior et al., 2022; Makarenko & Makarenko, 2023; Dluhopolskyi et al., 2023; Filatova et al., 2023). Contrafatto and Burns (2013) focused on the relationship between organizational change and the involvement of management accounting, social and environmental accounting. Al-Hawatmeh (2020) investigated the impact of managerial accounting on the quality of decision making and the strength of companies' competition. Hadid and Al-Sayed (2021) developed and tested a theoretical model to examine the role of management accountant networking, organizational culture, and information systems quality. Trevisan and Mouritsen (2023) paid attention to decision making and managerial accounting in the context of compromises and compromising. Lyeonov et al. (2023a) described strategic management role, also taking into account aspects of managerial accounting.

Digitalization of management accounting contributes to the formation, accumulation, and use of databases, including economic ones, which promotes openness, transparency, accountability, and trust, increasing the attractiveness of the company for key stakeholders - investors, partners, customers, etc. (Savga, 2018; Verboncu et al., 2018; Seguer & Hasna, 2022; WEF, 2022). Management accounting and the use of information and communication technologies, digital education, also contribute to the search for optimal solutions and increase the effectiveness of organizational development, profitability, risk management within a company's management (Ryabenkov & Vasyliyeva, 2013; Skliar & Samoilikova, 2014; Pakhnenko et al., 2018; Skrynnyk & Vasilyeva, 2020a; Skrynnyk

& Vasilyeva, 2020b; Swiatkiewicz, 2022; Shazly et al., 2022; Skrynnyk & Vasylieva, 2022; Lyeonov et al., 2023b; Skrynnyk, 2023; Mursalov et al., 2023). Dzwigol et al. (2020a) paid attention to the role of managerial accounting in the formation of a company's competitive environment in conditions of Industry 4.0. Blockchain technologies are particularly important in managerial and financial accounting, providing a number of advantages (Kwilinski, 2019; Kwilinski et al., 2022). Dźwigoł and Trzeciak (2023) also focused on the importance of choosing appropriate methods and techniques in management in order to increase the reliability, depth and excellence of the conducted managerial accounting, covering twostage international surveys in managerial activity. Dzwigol et al. (2020b) investigated approaches to modeling competencies and building a model of a strategically oriented approach to the development of a company's managerial competencies using the "fuzzy logic" toolkit for managerial accounting and comprehensive assessment of managers' work.

Chenhall and Langfield-Smith (1998) described benefits of management accounting practices in Australian companies. Abdel-Kader and Luther (2006) studied practices of management accounting in the British food industry. Pavlatos and Kostakis (2015) explored managerial accounting in Greece, especially before and during the economic crisis. Üç and Kasa (2016) identified management accounting techniques used in manufacturing companies in Albania to provide proper ways of understanding the activities of companies, in particular, production activities.

Yoshikawa et al. (1994) reviewed management accounting bibliography and literature in Japanese. Atkinson et al. (1997) described management accounting research and its directions such as the role of managerial accounting in supporting decision making, the link between accounting and organizational structure, and the role of management accounting in organizational change. Scapens (2006) reviewed the changes in managerial accounting research over the past 35 years, emphasizing the interaction of internal and external institutions; the importance of trust in accountants; influence of power chains; and the need to study the role of agency in institutional changes. Hesford et al. (2007) made a bibliographic study devoted to management accounting for the period from 1981 to 2000 based on the data from 10 accounting journals. Harris and Durden (2011) analyzed 116 management accounting articles published between 2008 and 2010 in three leading journals and highlighted key emerging research topics for that period such as trust, leadership, and organizational justice. Lunkes et al. (2013) made literature review of published articles on management accounting based on 421 journal publications in Spain and 321 articles in Brazil. Gatti (2018) studied the impact of management accounting research and identified certain new directions of research for that moment too. Hoffmann (2023) carried out a bibliometric study of management accounting in the interconnection with crisis research.

Even though the scientific results on the issue of managerial accounting, including bibliometric analysis of this issue, are quite significant, over time, the influence of global challenges and achievements, the development of information and communication technologies, this issue needs to be updated and, accordingly, further research developments that are constantly relevant.

Therefore, the purpose of the paper is to identify main trends in scientific and public interest in managerial accounting.

# 2. METHODS

To conduct a bibliometric analysis on the issue of managerial accounting as a key component of a company's management and to show its multidimensionality and dominant trends, the sample of publications was formed of 10,495 articles (3,586 for 1941–2022 from the Scopus database and 6,909 for 1953 to 2022 from the Web of Science database).

Bibliometric analysis was based on the toolkit of Scopus and Web of Science scientometric databases and VosViewer software to determine interconnected clusters of multidisciplinary research in managerial accounting and investigate dynamics in scientific interest involving publishing activity, citation, country, and institution affiliation, etc. Analytical tools were applied to study and visualize the dynamics of public interest in the problem of management accounting from 2004 to the present based on search requests of Internet users, to characterize its peaks and trends, popularity by regions, top queries on this and related topics, etc. using Google Trends and Google Books Ngram Viewer to analyze textual content in a corpus of English-language books for 1800–2019 (time limitations are due to capabilities of the tools).

### 3. RESULTS

Within bibliometric analysis of publications on the issue of managerial accounting as a key component of a company's management, the following stages were identified.

Formation and analysis of the sample of publications indexed in the Scopus database and the Web of Science database according to search request "managerial accounting" in article title, abstract and keywords. For this criterion, 3,586 articles were found in the Scopus database for the period from 1941 to 2022. Publication dynamics on this issue is presented in Figure 1.

The results of dynamic analysis of publications on the issue of managerial accounting indexed in the Scopus database show that the trend is positive in general. Moreover, 30.37% of all publications were indexed for the last 5 years, and 52.40% for the last 10 years from 82 investigated years. This indicates the rapid growth of scientific interest in the issues under study, which has more than doubled over the past 10 years, and justifies its relevance today.

In turn, 6,909 titles were found for the period from 1953 to 2022 in the Web of Science Core Collection according to search topic "managerial accounting". Publication activity is shown in Figure 2.

For this database, the tendency of publication activity is similarly positive. In particular, 39.44% of the sample articles were indexed for the last 5 years, and 65.9% – for the last 10 years out of the 70 years studied. Over the past 10 years, the number of indexed publications in the Web of Science Core Collection has more than doubled, which grounds the significance of this scientific direction.

Comparing the dynamics of publication activity in both researched databases, it is necessary to emphasize the larger volumes of scientific publications and the greater increase in the Web of Science database than in the Scopus database.

Figure 3 also demonstrates a positive tendency in the growth of citations of articles on managerial accounting and indexed in the Scopus database.

For the last 10 years, the number of citations increased more than 45 times (from 120 in 2013 to 5,617 in 2022), which also indicates a significant increase in the interest of scientists in the study of management accounting problems.

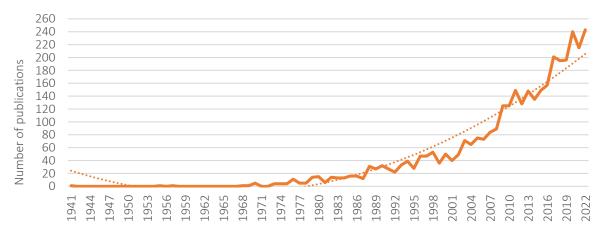


Figure 1. Dynamic analysis of publications on the issue of managerial accounting indexed in the Scopus database for 1941–2022

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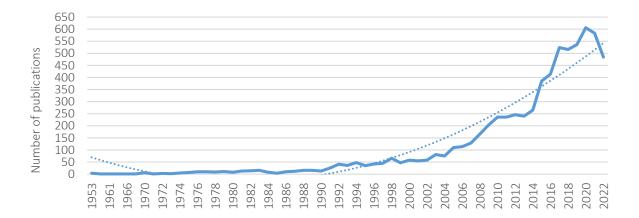


Figure 2. Dynamics of publications on the issue of managerial accounting indexed in the Web of Science database for 1953–2022



Figure 3. Dynamic analysis of citations on the issue of managerial accounting indexed in the Scopus database for 2013–2022

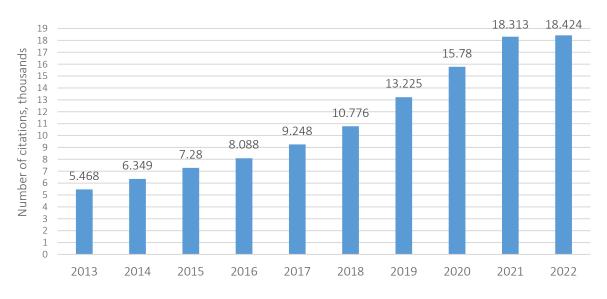


Figure 4. Dynamic analysis of citations on managerial accounting indexed in the Web of Science database for 2013–2022

In the case of the Web of Science database, dynamics of citations on managerial accounting is also positive (Figure 4).

However, over the past 10 years, citations have increased more than 3 times and not as intensively as in the Scopus database. Nevertheless, absolute indicators of citations are higher in Web of Science than in the Scopus database.

Table 1 consists of top 20 journals indexed in the Scopus database with the highest level of publications on the problem under study.

**Table 1.** Top 20 journals by managerialaccounting publications indexed in the Scopusdatabase for 1941–2022

Journal	Number of publications
Journal of Accounting Education	86
Accounting Organizations and Society	75
Contemporary Accounting Research	50
Critical Perspectives on Accounting	36
Management Accounting Research	35
Actual Problems of Economics (indexation was discontinued in 2016)	31
Issues in Accounting Education	31
Journal of Accounting Research	30
Sustainability Switzerland	30
Accounting Auditing and Accountability Journal	29
Journal of Accounting and Economics	28
Accounting And Business Research	26
Accounting Review	26
Management Science	26
Abacus	24
British Accounting Review	24
Decision Sciences	24
European Accounting Review	24
Journal of Cleaner Production	24
International Journal of Production Economics	22

Most of the above journals focus specifically on accounting, management accounting and management, as well as sustainability and business.

According to the Web of Science database, key research areas for the issue of managerial accounting include Business Economics, Engineering, Computer Science, Mathematics, Operation Research Management Science, Environmental Sciences, Ecology, Social Sciences, Psychology, Education, Educational Research, Health Care Sciences Services. They are correlated with modern trends and the directions for future research in managerial accounting, e.g., connected with information and communication technologies, innovation, sustainable development, behavioral aspects in management, health care services, etc.

That is why key directions in relevant research on managerial accounting can be named in the following way: 1) managerial accounting and decision sciences; 2) managerial accounting education; 3) managerial accounting organizations; 4) managerial accounting and sustainability; 5) managerial accounting and auditing; 6) managerial accounting and business; 7) managerial accounting and production economics; 8) managerial accounting and ICT; 9) managerial accounting and innovation; 10) managerial accounting and behavioral aspects; and 11) managerial accounting and health care services.

As for the geographic analysis of scientific interest in managerial accounting, it was noted that out of the 172 countries of the research sample (in Scopus database), 43 were chosen with 15 and more affiliated publications. So, leaders in research on managerial accounting are the United States of America (1,216), the United Kingdom (367), Australia (199), Italy (166), Canada (156), Germany (132), China (129), and others. In turn, according to the results of bibliometric analysis by country based on the sample of the Web of Science database, the dominant leaders are mostly similar as in the Scopus database: the United States of America (1,715), England (606), China (408), Italy (323), Canada (291), Australia (277), and others.

Table 2 describes top 20 universities in the topic under study according to the affiliation of publications in the Scopus database.

According to publication affiliation in the Web of Science database, top universities (or affiliated state bodies) are the following: Ministry of Education and Science of Ukraine (124 publications), University of London (102), University of California System (80), State University System of Florida (79), University of Texas System (77), University System of Georgia (70), University System of Ohio (68), Pennsylvania Commonwealth System of Higher Education (67), California Satet University System (48), and others.

<b>Table 2.</b> Leading universities engaged in research on managerial accounting based on the affiliation
of publications indexed in the Scopus database, 1941–2022

University affiliation	Number of publications 29
The University of Manchester	
University of Illinois Urbana-Champaign	25
University of Pennsylvania	25
New York University	25
Stanford University	21
University of California, Berkeley	21
University of Michigan, Ann Arbor	21
London School of Economics and Political Science	19
Alliance Manchester Business School	19
University of Technology Sydney	18
Michigan State University	18
The Ohio State University	17
The Hong Kong Polytechnic University	17
Georgia State University	17
Wharton School of the University of Pennsylvania	17
Griffith University	17
Nanyang Technological University	16
University of Houston	16
Universidade de São Paulo	16
Copenhagen Business School	16

The results for Scopus and Web of Science scientometric databases significantly differ. Some reasons can be the availability of free access to scientometric databases, the availability of domestic journals that are indexed in one or another database, the difference in the cost of publications depending on the database and quartile, etc.

2. Determination of multidimensional managerial accounting research clusters based on the VOSviewer tool and the Scopus database. Of the 11,292 keywords in 3,586 sample articles for 1941–2022 indexed in the Scopus database, 100 keywords met the threshold of 20 and more occurrences.

The bibliometric map is visualized in Figure 5.

The bibliometric analysis made it possible to define 6 clusters of multidimensional studies on managerial accounting as follows:

 Cluster of managerial accounting within a company's management (yellow) includes research topics such as management, managerial accounting, management accounting, decision-making, management control, performance management, performance measurement, and planning;

- Cluster of corporate governance and corporate responsibility covers the issues of corporate governance, corporate social responsibility, financial reporting, investment, risk management, and risk assessment;
- Cluster of sustainable development and supply chain management relates to sustainability, sustainable development, environmental management, economic and social effects, supply chain management, supply chains, profitability, optimization, manufacture, commerce, and sales;
- Cluster of informational and knowledge management includes research problems on information technology, information systems, information management, intellectual capital, knowledge capital, accounting information, managerial decision, managerial performance, and project management;
- Cluster of efficiency and competition covers performance, efficiency, productivity, industrial management, competition, innovation, investment, and strategic planning;
- 6) Cluster of education and organization relates to education, organization and management, and resource allocation.

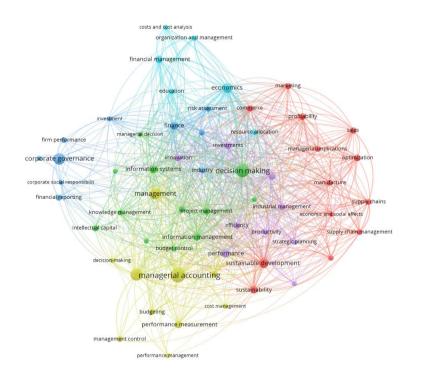


Figure 5. Bibliometric map of multidimensional managerial accounting research based on a sample of the Scopus database

The first cluster included both the areas of managerial accounting and a company's management in general. Other clusters mainly reflect the goals, tasks, potential effects, and risks of managerial management as a key component of a company's management.

The interconnections between managerial accounting and a company's management and other modern areas of research identified above, based on bibliometric analysis, have proven the importance of the managerial accounting component in the system of a company's management, its multidimensionality and determined key cross-disciplinary clusters.

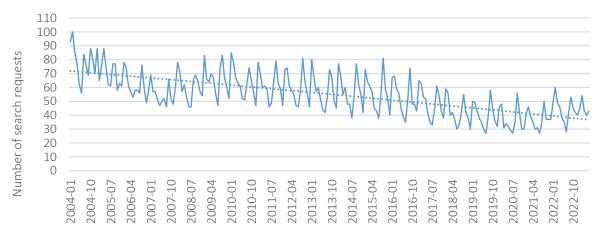
3. Google Trends analytical tools are applied to explore and visualize the dynamics of public interest on the issue of managerial accounting from 2004 to the present based on search requests of Internet users all over the world (Figure 6).

Characteristic year sharp peaks in the change of public interest in management accounting are not observed either during the financial crisis, nor during the COVID-19 pandemic or other global challenges. Generally, this speaks of the mostly resilience and relevance of this direction of research in a changing external environment, and, accordingly, the constant and long-term interest in this issue. However, the built trends show some downward dynamics (in comparison, there is a dynamic growth of scientific interest).

At the same time, Figure 7 demonstrates dynamics of public interest in managerial accounting compared to dynamics of public interest in the issues of management accounting and corporate management.

The obtained results show that from 2007 to 2022, the dynamics of changing public interest in managerial accounting, management accounting and corporate management are mostly similar. Since 2022, dynamics of changing public interest on the issue of corporate (company) management increased in general when dynamics of changing public interest in managerial accounting decreased.

Currently, of the three areas mentioned above, the highest level of interest in managerial is observed in Jordan – 50% (other 50% – management accounting), Bangladesh – 32% (54% –management accounting and 14% – corporate management), Pakistan – 32% (50% – management accounting and 18% – corporate management), Thailand Problems and Perspectives in Management, Volume 21, Issue 4, 2023

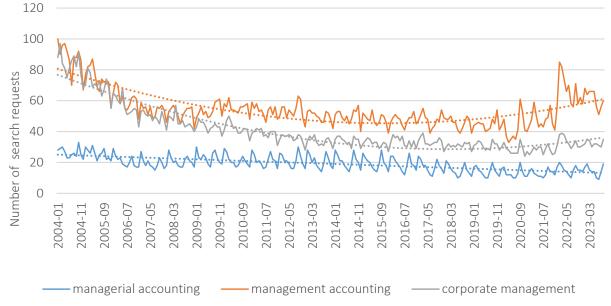


**Figure 6.** Dynamics of public interest in managerial accounting from 2004 to the present based on Google Trends tools

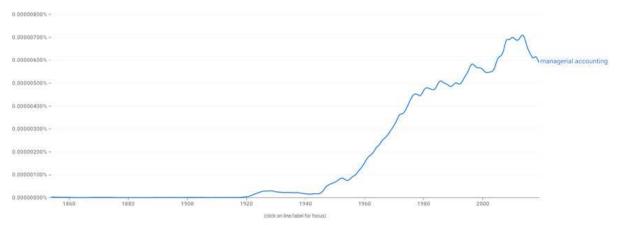
- 32% (38% – management accounting and 30% – corporate management), Egypt – 30% (47% – management accounting and 23% – corporate management), the USA – 29% (33% – management accounting and 38% – corporate management), Korea – 28% (30% – management accounting and 42% – corporate management), Turkey – 26% (34% – management accounting and 40% – corporate management), Canada – 25% (46% – management accounting and 29% – corporate management), and Vietnam – 25% (44% – management).

The most popular queries regarding managerial accounting, in addition to the last one, were managerial and financial accounting, financial managerial accounting, cost accounting, managerial accounting solutions, managerial accounting information, managerial accounting answers, cost accounting with a managerial emphasis, managerial accounting book, difference between financial and managerial accounting, managerial accounting reports, managerial economics, etc.

Another analytical tool, Google Books Ngram Viewer, was applied to analyze textual content in a corpus of English-language books for 1800–2019 using a search request "managerial accounting" (Figure 8).



**Figure 7.** Dynamics of public interest in managerial accounting, management accounting and corporate management from 2004 to the present based on Google Trends tools



**Figure 8.** Analysis of changes in textual content in the corpus of English-language books for 1800–2019 for the search request "managerial accounting" based on Google Books Ngram Viewer

Figure 8 shows how the phrase "managerial accounting" has occurred in a corpus of Englishlanguage books for the period under study, the trend of this unigram (Michel et al., 2010; The Google Books Team, n.d.). In 2019, there is a decrease in using the phrase "managerial accounting" in textual content in a corpus of Englishlanguage books (0.0000058953%) compared to previous years (2015 – 0.0000065370%; 2010 – 0.0000070495%, etc.). In turn, Figure 9 demonstrates the mostly similar dynamics of using phrases "managerial accounting" and "company's management" and their occurrence in a corpus of English-language books for the studied period.

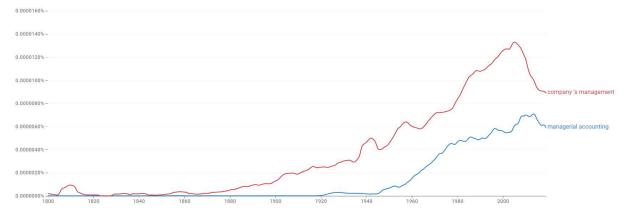
Despite the mostly similar dynamics, which are vividly traced on the unigrams, the occurrence of the phrase "a company's management" decreased from 2005 (0.0000133758%) to 2017 (0.0000090326%) and increased since 2018 (0.0000090921%). If we

consider this time period, then, according to the first request ("managerial accounting"), a drop was observed only in 2019.

Therefore, as a result of investigation, the main trends in managerial accounting were characterized based on bibliometric analysis and analytics and taking into account the multidimensionality of managerial accounting as a key component of a company's management.

#### 4. DISCUSSION

This paper deals with some limitations when forming a sample of scientific publications indexed in the Scopus and Web of Science databases, different combinations of keywords – search queries are possible depending on the synonymous use of certain categories. Therefore, in further studies there is an opportunity to expand the research sample.



**Figure 9.** Analysis of the dynamics of using the phrases "managerial accounting" and "a company's management" and their occurrence in a corpus of English-language books based on Google Books Ngram Viewer

The time limits of the ierвн are conditioned by the availability of indexed articles on the scientific problem under study in one or another scientometric database, and the peculiarity of the functioning of analytical tools. Therefore, this time period may also be extended in the future.

However, this study used a wider sample, period, and therefore other interdisciplinarity patterns than Zyznarska-Dworczak (2018), who made a bibliometric analysis based on scientific articles only in the Web of Science database concerning management accounting research in the countries of Central and Eastern Europe in 1945-2017. The author looked in depth at the role of management accounting in social, ethical, environmental, cultural, and historical contexts. Hoffmann (2023) carried out a bibliometric study of management accounting in the period only from the beginning of the financial crisis in 2007 to 2021 but paying attention to the direction of crisis research. The author also determined standard management accounting topics, such as the development of management accounting systems, the use of management control systems (for strategy and behavior control), changes (process) in management accounting, and the relationship between risk management and management accounting.

The results obtained are based on search requests, including phrases about research issues in titles, abstracts, and keywords, in contrast to the study by Balstad and Berg (2020), who applied bibliometric methods, but taking into account only citation data from management accounting issues in publications indexed in Web of Science and Scopus, covering 506,753 and 1,075,838 cited references for the periods 1945–2018 and 1960–2018, respectively. Besides, this article deals with other methods, instruments, sample, and its time.

Bilan et al. (2022) identified academic trends in organizational management, organizational development and changes, and artificial intelligence. But they presented bibliometric and network analysis only of issues related to the application of artificial intelligence for organizational decisions of company management. Cheng et al. (2023) provided a study on management accounting, but they explored new ideas and new ways of dealing with management accounting issues related only to sustainability based on the documents accepted at the special forum of Journal of Management Accounting Research, devoted to sustainable development issues. Ascani et al. (2021) presented a structured literature review on the role of managerial accountants in sustainability accounting and reporting. In turn, this study covers multidimensionality and trends in managerial accounting as a key component of a company's management based both on complex bibliometric and analytical analysis based on instruments of the Scopus and WoS databases, the Vosviewer software, Google Trends and Google Books Ngram Viewer, covering relevant time and sample of publication. Therefore, the results obtained are justified and relevant.

# CONCLUSION

The purpose of the paper was to identify the main trends in scientific and public interest in managerial accounting. As a result of this study, key trends were determined and analyzed on the basis of bibliometric and analytical analysis.

The tendency of publication activity on managerial accounting was determined as positive. The bibliometric analysis made it possible to define 6 clusters of multidimensional research on managerial accounting: 1) managerial accounting within a company's management; 2) corporate governance and corporate responsibility; 3) sustainable development and supply chain management; 4) informational and knowledge management; 5) efficiency and competition; and 6) education and organization. These clusters mainly reflected the scientifical and practical fields, goals, tasks, potential effects, and risks of managerial accounting as a key component of a company's management.

Public interest in managerial accounting was determined as long-term and mostly constant, however, the constructed trends showed some dynamics of decrease compared to the dynamics of increase in scientific interest. The highest level of interest in managerial accounting was indicated in Jordan, Bangladesh, Pakistan, Thailand, Egypt, USA, Korea, and Canada.

There were some limitations when forming a sample of scientific publications indexed in the Scopus and Web of Science databases, different combinations of keywords – search queries are possible depending on the synonymous use of certain categories. Therefore, future studies can expand the research sample. The timing of the study is determined by the availability of indexed articles on the scientific problem under study in one or another scientometric database, and the peculiarity of the functioning of analytical tools. Therefore, this period may be extended in the future.

# AUTHOR CONTRIBUTIONS

Conceptualization: Sevinj Abbasova. Data curation: Sevinj Abbasova. Formal analysis: Sevinj Abbasova. Funding acquisition: Sevinj Abbasova. Investigation: Sevinj Abbasova. Methodology: Sevinj Abbasova. Project administration: Sevinj Abbasova. Resources: Sevinj Abbasova. Software: Sevinj Abbasova. Supervision: Sevinj Abbasova. Validation: Sevinj Abbasova. Visualization: Sevinj Abbasova. Writing – original draft: Sevinj Abbasova. Writing – review & editing: Sevinj Abbasova.

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