

UNVEILING DYNAMICS AND TRENDS IN LEAN ACCOUNTING THROUGH BIBLIOMETRIC ANALYSIS

Cem Niyazi DURMUŞ*

Visiting Researcher, Kadir Has University

ORCID: 0009-0009-1918-8510 Email: cemniyazi.durmus@khas.edu.tr

ABSTRACT

This study conducts a comprehensive and systematic bibliometric analysis of the academic literature on lean accounting published between 1996 and 2025. In contrast to prior reviews that address lean accounting only tangentially or within the broader lean-management literature, this study focuses exclusively on the lean accounting domain and maps its intellectual, conceptual, and social structure in an integrated manner. To ensure a consistent and reproducible metadata structure, the bibliographic data were retrieved from a single, clearly defined source, the Web of Science Core Collection. The search combined the topic terms “lean” and “accounting”, and the retrieved records were screened against explicit inclusion and exclusion criteria, yielding a final corpus of 53 documents. The analyses were carried out using the Bibliometrix R package via the Biblioshiny interface and VOSviewer. Performance indicators (annual publication and citation dynamics and the most productive authors, sources, institutions, and countries) were combined with science-mapping techniques (co-authorship, co-citation, keyword co-occurrence, and the three-field plot) to characterize the field. The findings indicate a slow but steady growth of scholarly output, a fragmented author-collaboration structure organized around a few small clusters, and a conceptual core dominated by themes such as impact, performance, systems, and implementation, while contemporary themes such as digital transformation, sustainability, and Industry 4.0 remain comparatively under-represented. On this basis, the study offers a structured research agenda that identifies the principal thematic gaps and prospective directions for researchers and practitioners in lean accounting.

Key Words: *Bibliometric Analysis, Lean Accounting, R Studio, VOSviewer.*

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Bu makalede Etik Kurul Onayı gerekmemektedir.

BİBLİYOMETRİK ANALİZ İLE YALIN MUHASEBEDE DİNAMİKLERİ VE EĞİLİMLERİ ORTAYA ÇIKARMAK

ÖZ

Bu çalışma, yalın muhasebe alanında 1996-2025 yılları arasında yayımlanan akademik literatürü kapsamlı ve sistematik bir bibliyometrik analizle incelemektedir. Yalın muhasebeyi yalnızca dolaylı olarak ya da daha geniş yalın yönetim literatürü içinde ele alan önceki incelemelerden farklı olarak bu çalışma, doğrudan yalın muhasebe alanına odaklanmakta ve alanın entelektüel, kavramsal ve sosyal yapısını bütüncül biçimde haritalandırmaktadır. Tutarlı ve yeniden üretilebilir bir üstveri yapısı sağlamak amacıyla bibliyografik veriler tek ve açıkça tanımlanmış bir kaynaktan, Web of Science Core Collection veri tabanından elde edilmiştir. Arama, “lean” ve “accounting” konu terimlerinin birleştirilmesiyle gerçekleştirilmiş ve elde edilen kayıtlar açık dahil etme ve dışlama ölçütlerine göre taranarak 53 belgeden oluşan nihai bir külliyat elde edilmiştir. Analizler, Biblioshiny arayüzü aracılığıyla Bibliometrix R paketi ve VOSviewer yazılımı kullanılarak yürütülmüştür. Alanı betimlemek amacıyla performans göstergeleri (yıllık yayın ve atıf dinamikleri ile en üretken yazarlar, kaynaklar, kurumlar ve ülkeler) bilim haritalama teknikleriyle (ortak yazarlık, ortak atıf, anahtar kelime birlikte oluşumu ve üç alanlı grafik) birlikte kullanılmıştır. Bulgular; bilimsel üretimde yavaş fakat istikrarlı bir büyümeye, birkaç küçük küme etrafında örgütlenen parçalı bir yazar iş birliği yapısına ve etki, performans, sistemler ve uygulama gibi temaların baskın olduğu bir kavramsal çekirdeğe işaret etmekte; buna karşın dijital dönüşüm, sürdürülebilirlik ve Endüstri 4.0 gibi güncel temalar görece sınırlı biçimde temsil edilmektedir. Bu temelde çalışma, yalın muhasebe alanındaki araştırmacı ve uygulayıcılar için başlıca tematik boşlukları ve olası araştırma yönelimlerini tanımlayan yapılandırılmış bir araştırma gündemi sunmaktadır.

Anahtar Kelimeler: *Bibliyometrik Analiz, Yalın Muhasebe, R Studio, VOSviewer.*

INTRODUCTION

As a result of the complexities encountered in the production, procurement, and retail processes and the intensifying local and global competition that places growing pressure on businesses, traditional accounting practices and procedures may be insufficient to provide sufficient flexibility and strong strategic support to companies in different industries in matters such as accounting, auditing, and reporting. In that regard, the lean accounting approach, derived from the lean production philosophy, stands out as an effective tool for achieving goals such as managing costs, increasing efficiency and performance, and reducing waste in applications such as accounting, auditing, and financial reporting. Unlike traditional accounting practices, lean accounting focuses on value-added activities and aims to make business processes, activities, and business models more transparent, flexible, lean, and manageable. This approach significantly increases the competitiveness of enterprises by enabling the restructuring of practices related to accounting, auditing, and reporting across all industries, especially production enterprises and accounting and auditing firms, based on efficiency.

Disruptive technological developments in recent years, rapidly increasing global and local competition, stakeholders' expectations regarding the development of sustainability and green policies that lead to increasing pressure on businesses, the increasing economic crises at the global and local level, and the economic uncertainties and fluctuations they bring with them have led companies to more flexible, strong, resilient and strategic accounting practices and approaches to respond to these developments. The concept of lean accounting has begun to attract the attention of decision-makers in the service and public sectors, as well as in accounting and auditing firms and production companies, and the approach has taken its place among strategic management tools for performance measurement, cost reduction, and a culture of continuous improvement. When the academic literature is examined, interest in lean accounting has begun to attract increasing attention in the research community. In contrast, the theoretical foundations, application methods, and sectoral effects of the lean accounting approach are handled by different disciplines. However, while a significant part of previous studies in the literature on lean accounting has focused on specific applications and conceptual dimensions and frameworks, comprehensive analyses examining the development trends and evolution of the concept in a holistic manner are very rare. Accordingly, examining academic production on lean accounting in a systematic and analytical context is essential to

understanding the evolution of the relevant literature, research gaps, and future trends.

This study conducts a comprehensive bibliometric analysis to reveal critical trends, managerial implications, and valuable insights while reviewing the literature on lean accounting. Drawing on data from the Web of Science Core Collection database, this study examines 53 studies published between 1996 and 2025. It traces the evolution of the literature in the context of lean accounting. This review used VOSviewer and RStudio to clearly show trends in publications, author collaborations, keywords, country-level publication distribution, and the evolution and development of the literature in a conceptual context. The main findings and results show that the concept of lean accounting, as an extension of the lean production philosophy, is attracting increasing attention from the research community. Accordingly, a steady increase is observed in the literature regarding publications on this subject. It proves that there is a growing research interest, albeit slowly.

By using innovative, systematic, and analytical tools and methodological frameworks, this research reveals the implications, importance, and relationships among stakeholders in lean accounting across different industries and accounting, auditing, and financial reporting disciplines. At the same time, it suggests adopting lean accounting practices and increasing stakeholder acceptance. In addition, despite the highly critical findings and inferences obtained in the study, it is necessary to accept the existence of some existing limitations, mainly because it is not yet possible to obtain sufficiently structured data in some databases (TR Index), as well as the fact that the data used are obtained from a single source and cannot be integrated with the data obtained from different sources (Scopus). In future studies, this study can be replicated using data from these databases, and the results can be compared. More comprehensive analyses can be conducted by integrating data from multiple databases.

EMPLOYED METHODOLOGICAL FRAMEWORKS

This investigation categorizes the data sources and implementations into two primary categories, as shown below:

Origin of Data Source and Research Strategy

The bibliographic data used in this study were retrieved on 22 May 2025 from a single, clearly defined source, the Web of Science Core Collection (WoSCC). A single database was deliberately selected in order to preserve

a homogeneous and internally consistent metadata structure, with uniform author, affiliation, keyword, and citation fields, which is a prerequisite for reliable science mapping. Consequently, no cross-database record merging was performed, and the reconciliation of duplicate records across heterogeneous sources was not required; within the WoSCC, records identified as duplicates by the platform were automatically consolidated. The query was executed in the Topic (TS) field, which simultaneously searches the title, abstract, and author keywords by combining the two core terms of the domain with the Boolean AND operator: "lean" (Term 1) AND "accounting" (Term 2). This deliberately conservative query was adopted to prioritize precision and capture studies that explicitly position themselves within the lean accounting domain, rather than the far broader lean manufacturing or general management accounting literatures. The retrieved records were then screened against explicit inclusion and exclusion criteria. Records were included when they were written in English, belonged to the document types article, review, book chapter, or conference proceeding, and were thematically relevant to lean accounting based on a title-and-abstract assessment. Records were excluded when they were not written in English, were editorial notes or corrections without substantive content, or were thematically unrelated to lean accounting despite containing the search terms. After this screening procedure, a final corpus of 53 documents was retained for the bibliometric analysis. It should be acknowledged that restricting the query to the terms "lean" and "accounting" is a conservative choice that may not capture all studies employing related terminology, such as "value stream costing", "value stream accounting", or "lean management accounting". This choice, together with the reliance on a single database, is revisited in the concluding section and proposed as a direction for future work.

The main objective of this review was to conduct a bibliometric analysis to explore the evolving landscape of lean accounting in the accounting and auditing industry, including related developments, trends, and evolution. The conclusions and findings provided an intensive overview of scientific publications in this field, providing information on publication trends, author collaborations, and keyword distributions. In addition, the study aimed to more clearly highlight the effects, advantages, and contributions of lean accounting practices in the industry.

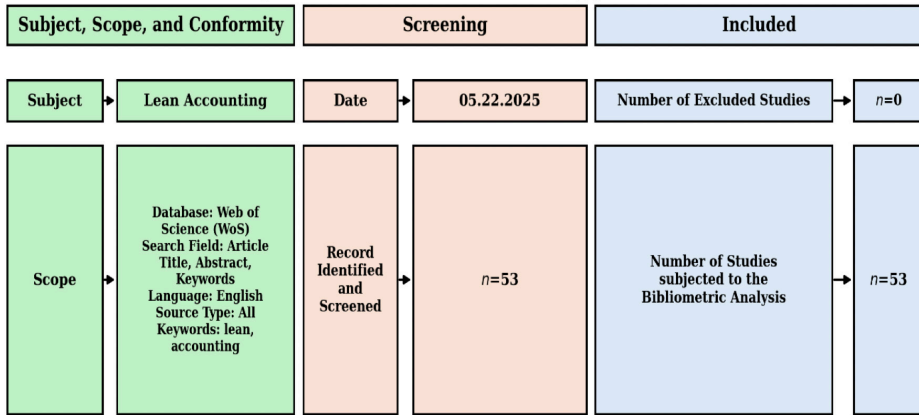
Data Analysis

This study used the Bibliometrix R package program and VOSviewer software to process and analyze the data obtained from WoSCC. Biblioshiny, a web-based tool, was used to visualize the results. The data analysis was conducted using the Bibliometrix database, integrated with R, which provided an effective visual representation of numerical data. The outputs obtained within the scope of the analysis include various bibliometric indicators, such as annual average citation values, most-cited journals, most-productive authors and institutions, publication distributions by country, network structures, resource mapping, word cloud visualizations, and cluster analysis (Eser & Aktan, 2021). The choice of R software strengthened the study's analytical rigor and made an innovative methodological contribution.

In addition, this study employed VOSviewer software, which is widely used across disciplines, to conduct bibliometric analysis (Huang et al., 2022; Shah et al., 2020; Xie et al., 2020). VOSviewer creates network maps by visualizing relationships among bibliometric data, enabling visual analysis of the literature's structural features. The study's main objective is to present a comprehensive bibliometric assessment that will reveal the evolution and status of the discipline under study. Findings obtained: By providing essential data on publication trends, author collaborations, and prominent research themes, it has contributed to a better understanding of the field's overall structure and dynamics.

Procedural Process Map

The research outputs obtained from the WoSCC database are visualized in Figure 1 by the determined methodological approach (Shahidan et al., 2021). In this process, a systematic data-scanning and analysis framework was developed using the PRISMA method, which is widely used in the literature. One of the study's main objectives is to analyze and evaluate the data obtained holistically and present it in a regular and meaningful way. The main findings are presented in Figure 1.

Figure 1. PRISMA flowchart of applications

This investigation used the PRISMA approach to assess the relevant literature for methodological mapping systematically. This approach also facilitates a systematic and analytical literature review, providing researchers and industry practitioners with a practical framework. This methodological framework yields a final corpus of 53 studies on lean accounting, retained after the identification and screening stages described above. This study aims to comprehensively examine, synthesize, and analyze the relevant literature to reveal and illuminate the literature's critical trends, developments, evolution, insights, and findings.

The following research questions are addressed in the study: (RQ1) What are the main findings regarding the general characteristics of lean accounting and auditing studies? (RQ2) What are the top 10 published primary sources in lean accounting? (RQ3) How has the landscape of lean accounting work evolved? (RQ4) What is the distribution of countries, authors, and citation numbers for lean accounting practices? (RQ5) What visual representations of relationships have emerged in studies related to lean accounting? (RQ6) What is the forward-looking outlook for relationships and concepts within lean accounting? (RQ7) What are the global collaborations and partnerships established in the context of lean accounting? (RQ8) What is the trajectory of studies in lean accounting, and what are the field's most relevant and essential concepts?

Objectives and Motivations for This Study

The effects of disruptive technologies emerging in the Industry 4.0 process on the accounting and auditing sector and across all industries are increasing.

At the same time, this situation forces the accounting and auditing industry to develop policies and strategies for digital transformation. Global and local concerns stemming from global warming and climate change compel accounting and auditing firms to develop and pursue sustainability and greener policies. However, the global epidemics encountered in recent years and the serious problems faced by supply chains have led businesses in almost every industry to reconsider and restructure their business models, operations, and activities.

In recent years, the accounting and auditing industry has adopted the concept of lean accounting to rebuild a more sustainable organizational structure, especially through the lean manufacturing approach, a critical and successful philosophy in production processes. The "Lean" approach, first introduced in the literature by Krafcik (1988) through consideration of the Toyota production system, was used by Womack et al. (1990) in the field of accounting and was later referred to as lean accounting. In this context, lean accounting creates an improved, high-quality system that produces accounting, auditing, and reporting services in response to customer demand and reduces the amount of waste as much as possible (Appelbaum et al., 2017). According to the lean accounting approach, accounting and auditing companies should base their strategy on the value provided to the customer by systematically eliminating waste within the organization and throughout the supply chain.

In this context, lean accounting is a fundamental change in how people in the organization think and evaluate. Accordingly, it changes the attitudes and behaviors of the personnel involved in accounting businesses. It has also been defined as providing the highest value to customers by eliminating waste through process design and human factors (Shah & Ward, 2003). The main goal of this approach is to combine less human labor, less inventory, less time to develop quality service, and less space to meet high customer demand, and to produce the highest-quality accounting, auditing, and reporting service as economically and efficiently as possible.

In this context, this review aims to investigate the extent to which the lean accounting approach has been conceptualized and adopted in the literature and related industry, while revealing the latest developments in the literature on this subject.

FINDINGS

The findings and conclusions of this study are based on the well-known international database, the Web of Science Core Collection (WoSCC). Advanced software tools such as R Studio and VOSviewer were used to process and visualize the data.

Descriptive Overview of the Dataset

As a result of comprehensive research and examination, 53 studies were conducted using data from the Web of Science database. Figure 2 shows a summary of the data received.

Figure 2. General information

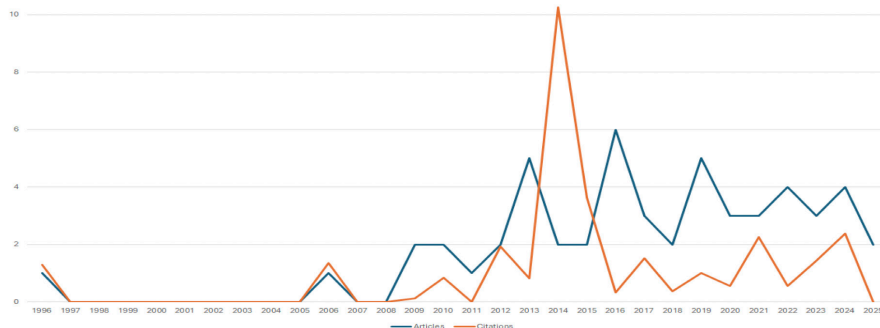


The literature covering publications between 1996 and 2025 included 53 studies across 47 sources; while 149 authors participated in these studies, only 8 were authored by a single author. However, there is a steady improvement in the relevant literature, with an annual increase rate of 2.42%. 18.82% of the studies in the relevant literature were conducted through international cooperation. In addition, there are, on average, 2.96 authors per study. In 53 studies, authors used 202 keywords; the total number of citations used in these studies was 1883, and the average number of citations per publication was 13.55.

Publication Dynamics and the Intellectual Three-Field Structure

The number of studies published on lean accounting from 1996 to 2025 fluctuated, with the highest in 2016. Despite this, the number of published studies increased by an average of 2.42% annually. However, when we look at citations to published studies, the average was 10.2 in 2014. Figure 3 shows the number of studies published each year and the average number of citations.

Figure 3. Number of articles and citations published by years (1996-2025)



These findings show considerable interest among research community members in lean accounting and a steady increase in scientific studies, though this trend fluctuates over time. However, an analysis of citation counts reveals that they do not show a proportional increase with the growing number of publications. Fluctuations in citation counts over the years illustrate the relatively limited scope of research on lean accounting. As a result, the availability of sources for citation in this area is particularly limited in specific periods. There is a disparity between the number of citations and the number of published studies, and an inverse correlation between citations and the number of studies published between 2014 and 2016. This trend, illustrated in Figure 2, underscores the scarcity of academic resources in this field, especially before 2008.

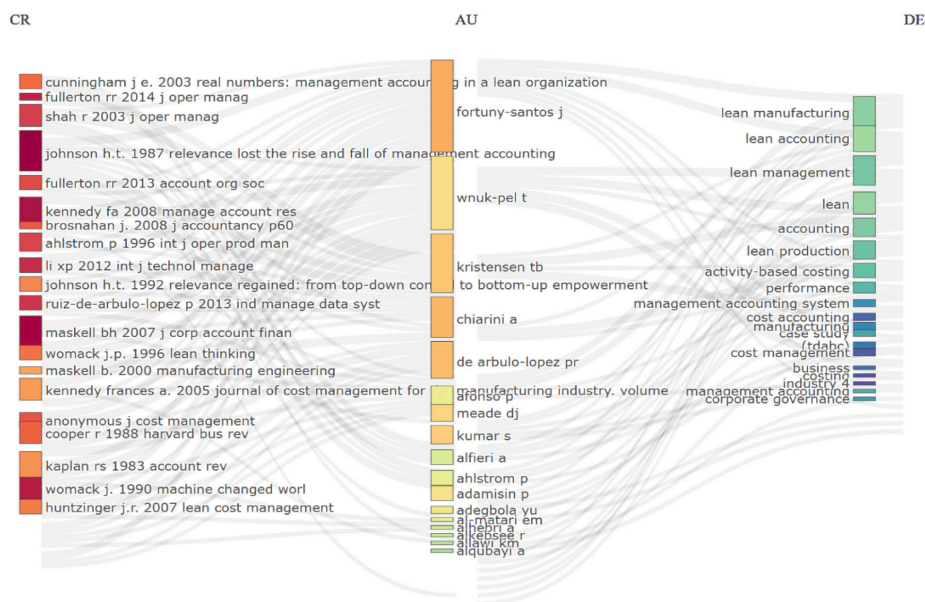
The Three-Field Plot chart presents an intellectual and thematic map of scientific studies in lean accounting. When the cited sources in the left column of the graph are examined, it is evident that the field of lean accounting is primarily grounded in the philosophy of lean production and critical approaches to management accounting. Works such as "Lean Thinking" and "The Machine That Changed the World" by Womack show that the theoretical framework in this field is production-based. However, Johnson's studies questioning the validity of management accounting are also among the essential contributions that form the theoretical basis of lean accounting. This situation reveals that lean accounting studies take a stance against the classical management accounting approach and develop in this context.

The authors in the middle column of the graph show the leading researchers in the field. Names such as Maskell, Kennedy, and Wnuk-Pel stand out with their frequent work in lean accounting. These authors appear to be interested in accounting- and governance-related themes, such as organizational transformation and empowerment (e.g., "bottom-up empowerment"). This shows that lean accounting is not only a technical cost-accounting approach but also a tool for transforming the managerial structure of organizations. Figure 4 exhibits the Three-Field Plot.

The keywords in the right column provide essential clues about the topics and thematic tendencies of the studies. Concepts such as "lean accounting," "lean manufacturing," and "activity-based costing" constitute the basic components of lean accounting. In contrast, concepts such as "management accounting systems," "performance," and "corporate governance" emphasize the managerial and strategic dimensions of this field. In addition, the inclusion of concepts such as "Industry 4.0," "case study," and "feedback" shows that lean accounting is also associated with current technological transformation processes. It reveals that researchers have begun to consider lean accounting in the context of digitalization and data-driven decision-making.

Among the general inferences drawn from the graph, it stands out that lean accounting studies are grounded in deep-rooted theoretical foundations and adopt an interdisciplinary approach. This field, at the intersection of production management, organizational behavior, and financial control systems, offers rich content for academic and applied research. However, the fact that contemporary issues such as digital transformation, sustainability, and ESG (environmental, social, and governance) are not yet adequately covered in the literature indicates a vital research gap that warrants further study in these areas. In addition, the themes that stand out in the studies are primarily drawn from Western sources, so practices in developing countries are insufficiently examined. It could offer a new perspective for future research.

Figure 4. The three-field plot



In conclusion, this Three-Field Plot chart effectively visualizes intellectual resources, leading researchers, and thematic research trends in lean accounting. Careful analysis of the relationships in the graph provides a valuable roadmap for understanding trends in the existing literature and identifying new research areas.

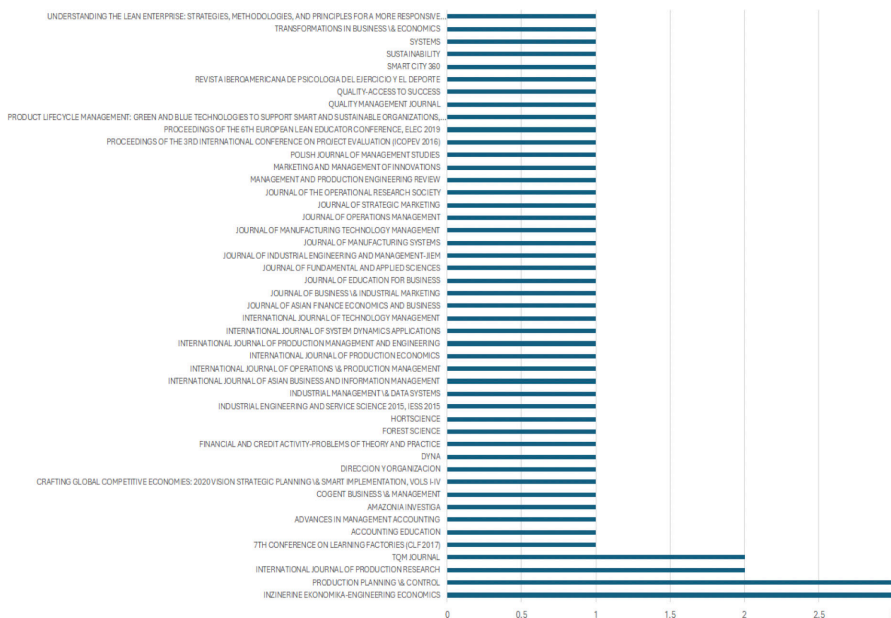
Citation Structure and Interdisciplinary Foundations

This section focuses on the journals that publish the most on and cite most often on lean accounting practices. In this context, Figure 5 illustrates the results for the most-published studies.

The "Most Relevant Sources" data presented in the chart shows the academic sources with the most publications in lean accounting. Among the journals with the most contributions, *Inzinerine Ekonomia–Engineering Economics* and *Production Planning & Control* stand out, each with three publications. This situation reveals that lean accounting is not limited to the accounting discipline but also has strong relationships with areas such as production management and engineering economics. Similarly, journals such as the *International Journal of Production Research* and the *TQM Journal* support the connection between lean accounting and total quality management and production processes.

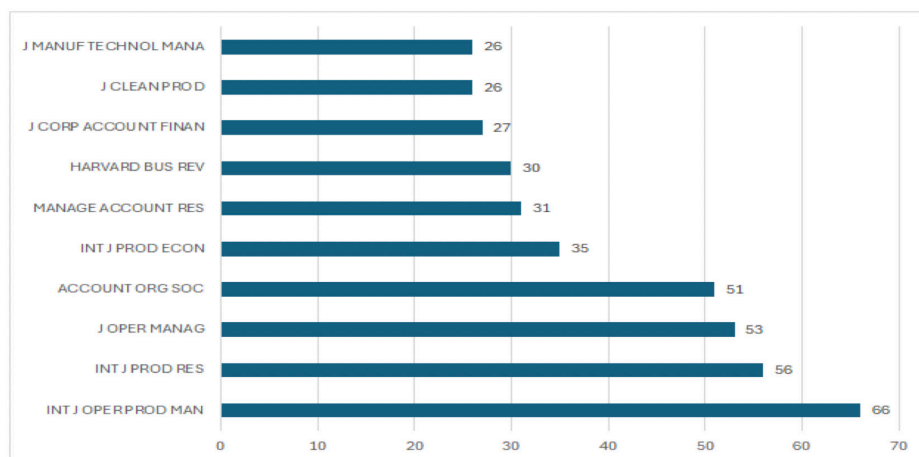
Sources such as Accounting Education, Advances in Management Accounting, and Cogent Business & Management, which are represented as a single publication in the chart, reflect a broader range of literature that addresses different aspects of the field. In particular, the existence of Accounting Education shows that the educational dimension of lean accounting is also being investigated. In addition, conference proceedings, such as those from the 7th Conference on Learning Factories (CLF 2017), indicate that the subject is also associated with industrial practices.

Figure 5. Sources with the most studies on lean accounting



These data show researchers which publications are leading the lean accounting literature and help them identify the sources they should focus on in their literature reviews. On the other hand, the fact that mainstream accounting journals are not included on the list shows that lean accounting remains concentrated in production- and management-oriented disciplines and is not fully integrated with accounting theory. This is an essential insight that the field needs to develop with more theoretical depth and accounting-based approaches. Next, the most cited sources were assessed by the researchers. Figure 6 illustrates the most cited sources.

Figure 6. The most cited sources



The "Most Local Cited Sources" chart shows the most frequently cited sources in the lean accounting literature. Understanding which disciplines the field draws on and its scientific roots, is important. Publications such as the International Journal of Operations & Production Management, the International Journal of Production Research, and the Journal of Operations Management, among the most-cited journals, show that lean accounting studies are grounded in production and operations management. It reveals that lean accounting originates from lean production systems and has a strong applied aspect.

The fact that journals focused on accounting theory, such as Accounting, Organizations and Society, and Management Accounting Research, are also included in the chart indicates that the studies have adopted a more theoretical approach over time. However, the limited number of mainstream accounting journals indicates that the lean accounting literature remains insufficiently integrated into the accounting field. This indicates a need for stronger integration between accounting theory and lean practices.

In addition, the fact that practice-oriented journals such as Harvard Business Review receive many citations indicates that lean accounting is practical for academic and managerial decision-making. However, including environmentally oriented journals, such as the Journal of Cleaner Production, on the list indicates that lean accounting is increasingly associated with the sustainability dimension. This suggests that lean accounting is positioned

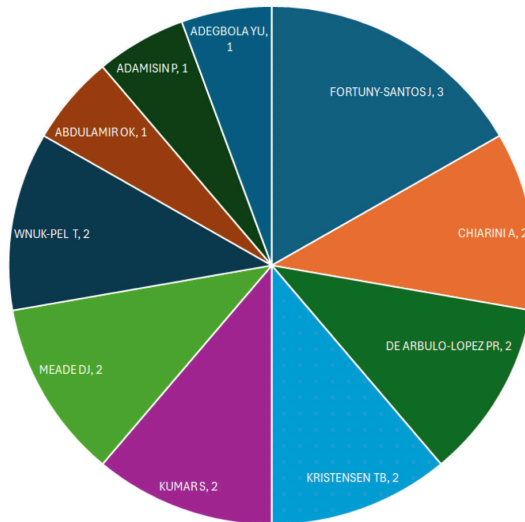
as a tool that can contribute to environmental and social sustainability strategies.

As a result, this graph reveals the interdisciplinary nature of lean accounting, its strong connection with production management, and its aspects that have not yet found a whole place in the accounting literature. Further integration of themes such as sustainability, digitalization, and organizational transformation will make new theoretical and practical contributions to the studies in the field.

The Most Relevant and Cited Authors

This section focuses on the authors who publish the most and are most cited in the field of lean accounting practices. In this context, Figure 7 illustrates the results regarding the most productive authors. Based on the visual data from the "Authors' Production over Time," "Most Local Cited Authors," and "Most Relevant Authors" graphs, several important insights can be drawn regarding the scholarly landscape of lean accounting literature.

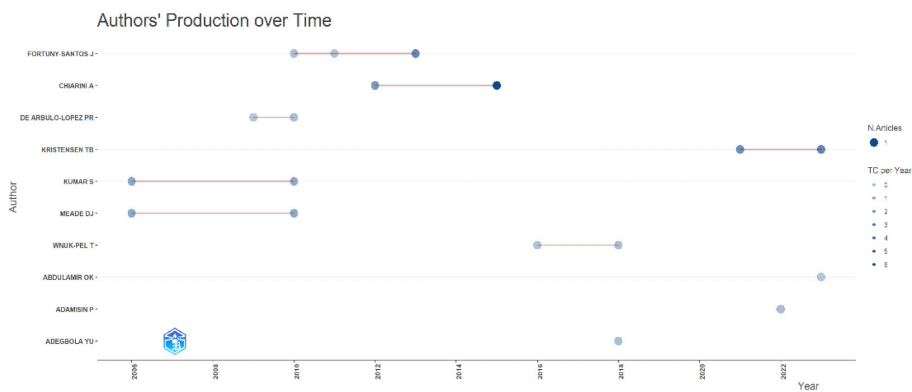
Figure 7. The most published authors



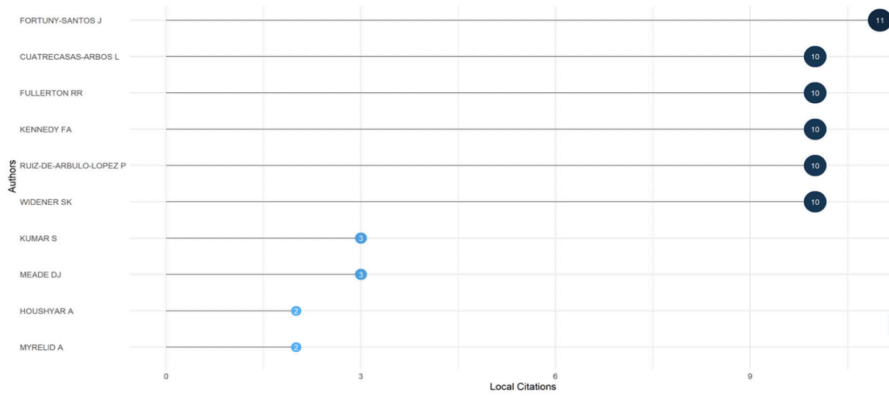
The "Authors' Production over Time" graph illustrates both the temporal distribution of publications by individual authors and their respective annual citation averages. It is evident that initial contributions to the literature began around 2005; however, scholarly output increased noticeably after 2010. Authors such as Fortuny-Santos J demonstrated consistent productivity

during the 2013–2015 period, accompanied by a relatively high average annual citation count, suggesting significant scholarly impact. Early contributors such as Kumar S and Meade DJ were active primarily between 2005 and 2010. Additionally, some authors have published only in a specific year or within a narrow timeframe. High citation averages for authors such as Fortuny-Santos J and Chiarini A indicate strong academic influence, even with moderate publication counts. Figure 8 illustrates the authors' production over time.

Figure 8. Authors' production over time



The “Most Local Cited Authors” graph presents the authors who have received the highest number of local citations, meaning citations from within the dataset of analyzed articles. Fortuny-Santos J ranks first with eleven local citations, underscoring his foundational role within this body of research. Other authors, such as Cuatrecasas-Arbos L, Fullerton RR, and Kennedy FA, also exhibit notable influence within the examined literature set. Despite their productivity, some authors, such as Kumar S and Meade DJ, received fewer local citations, which might suggest that their contributions, while relevant, are not as centrally positioned within this specific scholarly context.

Figure 9. The most cited authors

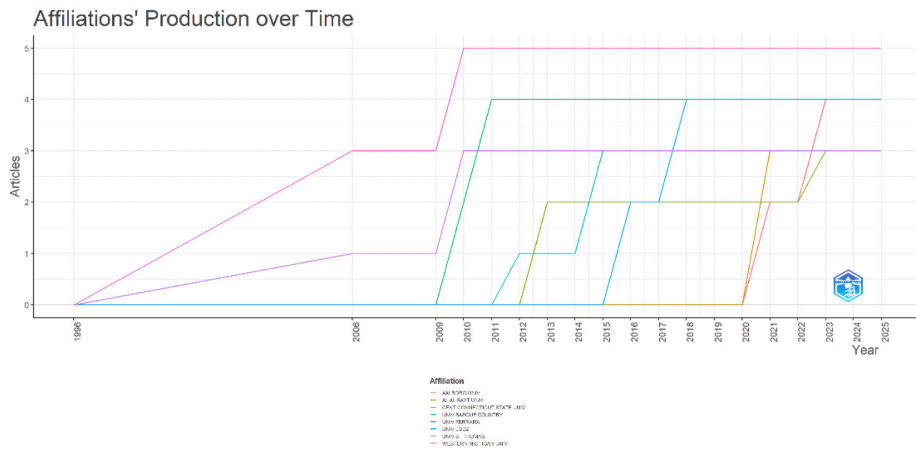
The “Most Relevant Authors” graph identifies the most frequent authors based on the number of documents they appear in. Fortuny-Santos J again emerges as the leading contributor in terms of publication count. He is followed by several authors, including Chiarini A, De Arbulo-Lopez PR, Kristensen TB, Kumar S, and Meade DJ, each with two documents. Although some authors contributed only one publication, their work may still offer valuable insights and make meaningful contributions to the field. The number of documents attributed to an author indicates sustained engagement with the topic and can serve as a heuristic for identifying key voices in the literature.

Taken together, these three visualizations provide a multidimensional view of authorship trends in lean accounting research. Fortuny-Santos J stands out as a central figure in both productivity and impact. The post-2010 increase in publication activity suggests a growing scholarly interest in the topic during the past decade. Authors with high local citation counts may be regarded as providing core theoretical or methodological contributions. In contrast, more recent contributors, even with fewer citations, may represent emerging perspectives or novel research avenues worthy of further exploration.

When the institutions of the authors and the institutions' publication productivity are examined, we face two important implications regarding the affiliations of the authors and the scientific output of these affiliations. The analysis of the two visualizations, “Affiliations' Production over Time” and “Most Relevant Affiliations,” offers significant insights into the evolution of scholarly contributions to the field of lean accounting. These graphs provide a deeper understanding of institutional involvement over time and the

relative importance of different academic affiliations within the field. Figure 10, illustrating affiliations' production over time, highlights the progression of various universities' research on lean accounting.

Figure 10. Affiliations' production over time



Western Michigan University emerges as a pioneer in this domain, contributing consistently since the early 2000s. It reached a peak of five publications by 2011 and has maintained this level, suggesting a sustained commitment to this research area. In contrast, institutions such as the University of Lodz, the University of the Basque Country, and Aalborg University have entered the field more recently, particularly after 2010, showing a rapid rise in scholarly output. These universities each produced four papers, signaling their growing influence on the topic. Other institutions, including Al Al Bayt University, Central Connecticut State University, the University of Ferrara, and the University of St. Thomas, have made moderate contributions with three publications each. Newer contributors, such as Linnaeus University and AGH University of Krakow, have added to the discourse with two publications, reflecting a broader but more recent engagement.

This chronological pattern reveals that scholarly interest in lean accounting increased significantly after 2010, with a noticeable diversification among contributing institutions. Earlier dominance by a few key universities has gradually given way to a more distributed landscape, which may reflect a gradual broadening of the field's institutional and geographic base rather

than full disciplinary maturity. The presence of multiple institutions contributing in the same timeframe suggests a collaborative or converging trend in academic focus, particularly during the post-2010 period.

The second graph, which ranks affiliations by total output, confirms the central role of Western Michigan University, the top contributor with five publications. Universities such as Lodz, the Basque Country, and Aalborg follow closely with four publications each, indicating their emerging leadership roles. Several others, including Al Al Bayt, Central Connecticut State, Ferrara, and St. Thomas, have also made meaningful contributions. The contributions are uneven: only a few institutions have maintained consistent output, while many others contribute sporadically or in smaller volumes.

Overall, the data reflect a field that is still evolving but has entered a stage of broader international academic engagement. The increase in recent contributions by diverse institutions suggests a growing recognition of lean accounting's relevance across different regions and academic systems. This diversity also enhances the potential for interdisciplinary and cross-cultural collaborations, which could enrich the theoretical and practical development of lean accounting.

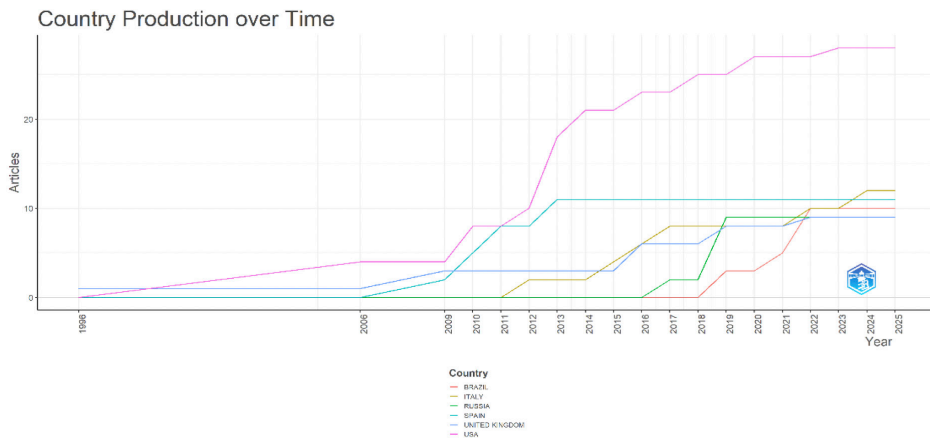
These patterns provide strategic implications for researchers seeking to deepen their involvement in this field. Collaborating with institutions that have demonstrated sustained contributions, such as Western Michigan University, or engaging with emerging players like Aalborg or Lodz, could enhance research impact and visibility. Furthermore, the expansion of the field across various countries presents opportunities to explore region-specific applications and variations of lean accounting practices.

The timeline and contribution patterns suggest that scholarly engagement with lean accounting has broadened over time, although the overall output volume remains modest. While a few North American institutions dominated early work, the recent influx of research from European and Middle Eastern universities indicates a shift toward global discourse. Researchers entering the field today can build upon this foundation by contributing new perspectives, methodologies, and applications, particularly through international collaboration and the exploration of under-researched contexts.

The Most Influential Countries in Lean Accounting

The bibliometric analysis of scientific output on lean accounting reveals significant geographical patterns and temporal trends that offer valuable insights into the evolution and global distribution of research activity in this domain. One of the most noticeable findings concerns the United States, which appears to be the primary contributor to the literature, having consistently produced scholarly work on lean accounting since the mid-1990s. The scientific output from the U.S. shows a steady increase over time, indicating its leadership and sustained interest in the field. In contrast, countries such as the United Kingdom and Spain entered the research landscape somewhat later but have demonstrated increasing engagement since the 2010s. Countries like Brazil, Italy, and Russia have also shown a gradual rise in publication numbers, particularly in the last decade, reflecting growing academic attention in emerging economies. These temporal dynamics are illustrated in Figure 11, which displays the yearly publication trends by country from 1995 to 2025.

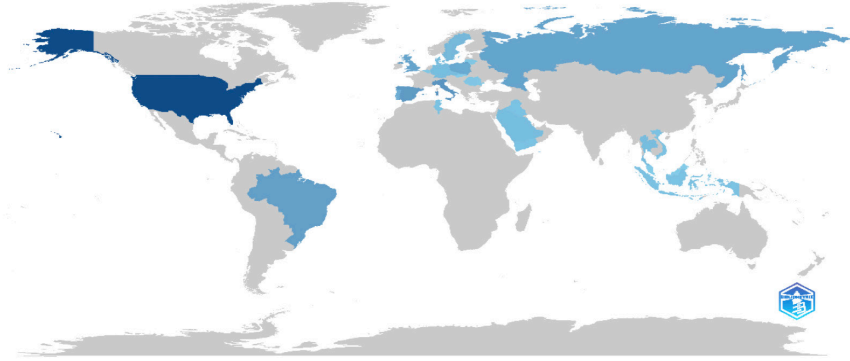
Figure 11. Country production over time



In light of this historical development, a global perspective on the geographic distribution of lean accounting research offers additional insights.

Figure 12. Country scientific production map

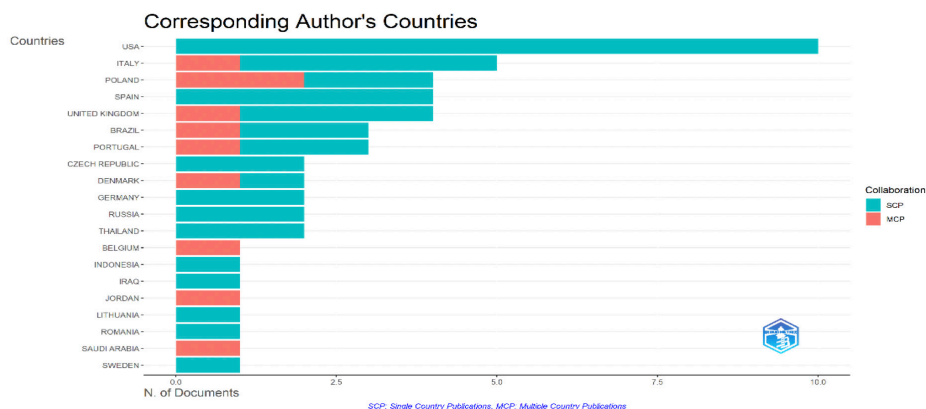
Country Scientific Production



The world map of scientific production highlights that, aside from the dominant output from the United States, European nations such as Italy, Spain, the United Kingdom, Germany, and Poland also demonstrate notable contributions. Meanwhile, countries in Southeast Asia (such as Indonesia, Thailand, and Vietnam) and the Middle East (notably Saudi Arabia and Jordan) are emerging as new centers of academic activity in this area. The varying intensity of contributions, represented through color gradations, helps visualize the global spread and relative output levels across regions. Figure 11 depicts this scientific density across countries, emphasizing both established and emerging research hubs.

The patterns of authorship and international collaboration further enrich the understanding of global research dynamics. An analysis of corresponding authors' countries reveals that the United States, Italy, Poland, Spain, and the United Kingdom have the highest number of corresponding authors, signifying their central role in driving the discourse on lean accounting. Interestingly, the U.S. demonstrates a strong tendency for single-country publications (SCP), underscoring a robust domestic research base. In contrast, European countries such as Italy, the United Kingdom, Portugal, and Denmark exhibit a higher rate of multi-country publications (MCP), indicating a more collaborative and international approach to research. Additionally, the participation of countries such as Thailand, Indonesia, Iraq, and Jordan highlights the growing involvement of previously underrepresented regions. These authorship and collaboration trends are clearly outlined in Figure 13, which categorizes each country's publication types by the corresponding authors' affiliation.

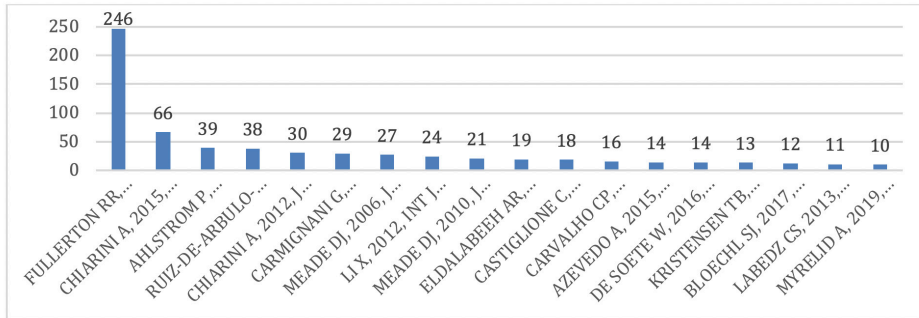
Figure 13. Corresponding author's countries



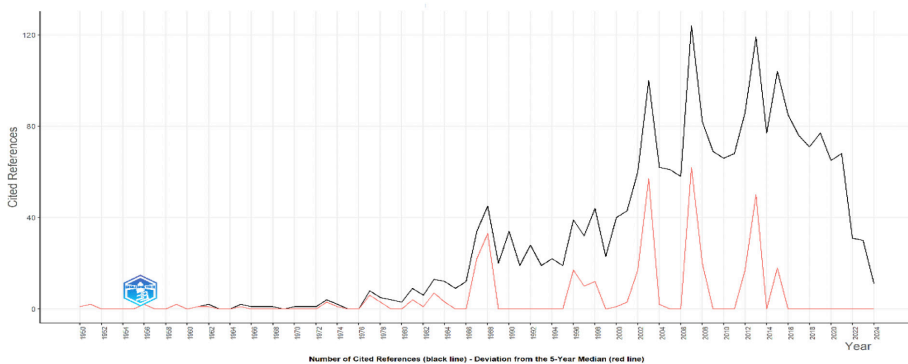
Within the limits of what bibliometric evidence can support, these findings suggest several implications for scholars interested in lean accounting. The United States' leadership underscores the importance of engaging with its academic institutions and outputs. European countries' openness to international collaboration presents an opportunity for joint research initiatives, particularly for emerging researchers. Moreover, the growing involvement of developing countries in lean accounting scholarships suggests a fertile ground for regional research networks and capacity-building efforts. Understanding these dynamics will support more inclusive and globally connected research agendas in the future.

The Most Cited Documents and References

The references cited by these studies, which are the most cited in the field of lean accounting and available in the literature, were also examined. In this context, the study by Fullerton et al. (2014), which examined the effects of lean accounting on businesses adopting a lean production philosophy, received 246 citations. This is followed by a study by Chiarini & Vagnoni (2015), which has 66 citations. These are followed by Åhlström & Karlsson (1996) with 39 citations and Ruiz-De-Arbulo-Lopez et al. (2013) with 38 citations, while Chia (30 citations) ranks below 30.

Figure 14. The most cited documents

The most-cited reference in management-oriented accounting studies was the study of management accounting by Thomas Johnson and Kaplan (1987). This study received 15 citations, followed by Maskell & Kennedy (2007) with 1, and Kennedy & Widener (2008) with 12. Womack et al. (1990) received 11 citations, followed by Fullerton et al. (2014) and Ruiz-De-Arbulo-Lopez et al. (each with 10 citations. Figure 15 shows the distribution of the most cited and least cited studies by year.

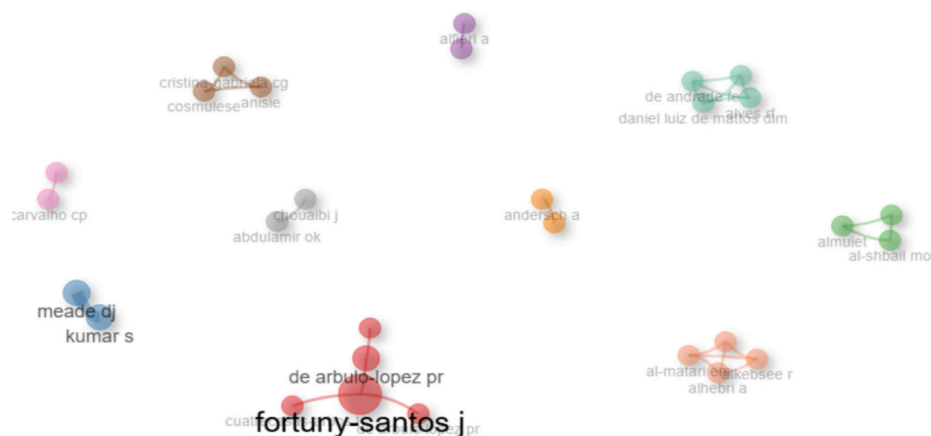
Figure 15. Reference spectroscopy

The General Trends and Networks

This bibliometric study investigates the development and current state of the lean accounting field by analyzing three distinct network visualizations: author collaboration, co-citation patterns, and keyword co-occurrence. These analytical tools collectively provide insight into who collaborates in this research area, which publications form its intellectual foundation, and what core themes and concepts define the field.

The author collaboration network (Figure 16) illustrates the structure of scientific cooperation among researchers in lean accounting. The graph displays multiple small, disconnected clusters rather than a single cohesive research community, indicating that the field remains somewhat fragmented. The most prominent and central figure in this network is Fortuny-Santos J., who collaborates extensively with authors such as De Arbulo-Lopez PR, Cuatrecasas AR, and Lario-Ballesteros M. This central positioning suggests that Fortuny-Santos plays a pivotal role in advancing the field through a productive research group. Meanwhile, other dyadic or triadic collaborations—such as Meade DJ and Kumar S, or Al-Matari M., Elkebsee R., and Alhebri A.—highlight regional research efforts that are significant but less integrated into the broader scholarly conversation. These patterns suggest an opportunity for greater international and interdisciplinary collaboration to enrich the field.

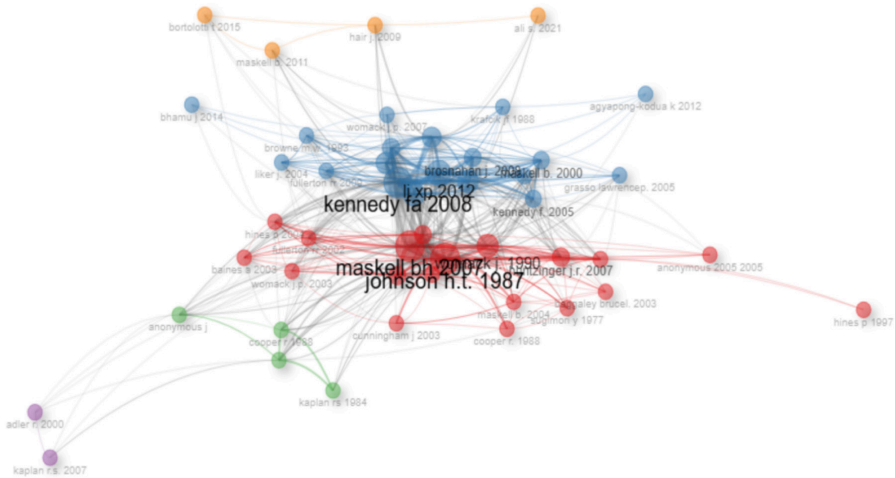
Figure 16. The author collaboration network



The co-citation network (Figure 17) maps the intellectual structure of lean accounting by showing how frequently key authors are cited together in the literature. This network is more densely interconnected than the collaboration network, indicating a strong, shared foundational knowledge base. Central figures such as Johnson H.T. (1987), Maskell B.H. (2000, 2004), Kennedy F.A. (2005, 2008), and Li X.P. (2012) are among the most co-cited authors. Their works serve as cornerstones for later research and are often referenced together, reflecting their shared influence on shaping theoretical and practical approaches to lean accounting. The clustering of these authors suggests thematic subfields within lean accounting, such as

performance measurement, lean implementation frameworks, and strategic cost management. The visual density and interconnectedness suggest that the field rests on a relatively consolidated set of foundational references, even though the overall body of work remains limited in size.

Figure 17. The co-citation network



The keyword co-occurrence network (Figure 18) provides a conceptual overview of the most common topics and thematic concerns in lean accounting research. The term *impact* appears as the largest and most central node, underscoring the field's primary interest in assessing the effects of lean accounting on organizations. Terms such as *performance*, *management*, and *systems* are also prominently featured, highlighting a focus on organizational efficiency, decision-making processes, and overall business performance. In addition, keywords such as *design* and *implementation* suggest that many studies examine how lean accounting systems are structured and applied in practice. The presence of terms such as *fit*, *models*, and *bundles* indicates a concern for theoretical alignment and contextual appropriateness, suggesting ongoing efforts to adapt lean accounting practices to different organizational settings. This thematic mapping reveals that the field is both practically oriented and theoretically grounded, balancing empirical evaluation and conceptual development.

Figure 18. The keyword co-occurrence network



Read together, the three-field plot (Figure 4) and the keyword co-occurrence network (Figure 18) also permit a cautious reading of the field's thematic evolution. The earliest intellectual anchors are rooted in lean production and value-stream costing, from which the discourse has gradually extended to management control and performance measurement concerns, as reflected in the prominence of terms such as performance, management, and systems. More recent but still peripheral nodes, associated with Industry 4.0, digitalization, and sustainability, signal an emerging yet not consolidated thematic frontier. This trajectory suggests that lean accounting is gradually moving from a narrowly cost-oriented conception toward a broader managerial and, increasingly, technological and environmental framing; the latter themes, however, remain thinly represented in the current corpus and therefore constitute the most salient research frontier of the field.

In conclusion, this bibliometric analysis reveals several important characteristics of the lean accounting research landscape. First, while there is a clear presence of influential authors and core theoretical works, collaboration between research groups remains limited, which may constrain the development of a more integrated research community. Second, the field is built on a strong foundation of well-cited literature, indicating theoretical maturity and coherence. Finally, the thematic focus on impact, performance, and implementation suggests that lean accounting continues to evolve in response to both academic inquiry and practical organizational challenges. To further advance the field, future research may benefit from fostering greater international collaboration, exploring emerging topics such as digital transformation in lean systems, and bridging gaps between theory and practice.

FINDINGS AND CONCLUSION

This study offers a comprehensive bibliometric analysis of the lean accounting literature, examining the evolution, scope, and dynamics of scholarly contributions over nearly three decades. The findings shed light on various aspects of the academic landscape, including the most influential authors, institutions, countries, documents, and intellectual structures that define this field. Through visual and quantitative data drawn from co-authorship networks, citation analyses, and keyword co-occurrence maps, a detailed understanding of the lean accounting research domain has been developed.

One of the most prominent insights emerging from this study is the centrality of specific authors, most notably Fortuny-Santos J, whose work stands out for both productivity and scholarly impact. His contributions, particularly between 2013 and 2015, received numerous local citations, indicating their foundational role within the lean accounting corpus. Other notable figures, such as Chiarini A, Cuatrecasas-Arbo L, and Kennedy FA, also play significant roles in shaping the field through impactful publications and consistent scholarly engagement. While early contributors like Kumar S and Meade DJ were active primarily in the formative years of lean accounting literature, their influence appears to have waned in recent years, suggesting a generational shift in scholarly leadership.

Institutionally, Western Michigan University emerged as the most consistent and productive contributor, maintaining its output over an extended period and underscoring its long-standing commitment to the field. In contrast, universities such as the University of Lodz, the University of the Basque Country, and Aalborg University represent newer but rapidly growing centers of academic activity. This shift reflects a broader diversification of institutional involvement post-2010, indicating the field's evolution from a niche area into a more internationally recognized domain of inquiry. These developments suggest a growing recognition of lean accounting's relevance and applicability across various academic and geographic contexts.

Geographically, the United States has played a dominant role in the global lean accounting literature, producing the highest volume of scholarly work and demonstrating sustained interest in the topic since the mid-1990s. However, the past decade has seen growing engagement from European and emerging economies, including Italy, Spain, Brazil, and Poland. Notably, the expansion

into Southeast Asia and the Middle East—represented by countries such as Thailand, Indonesia, Saudi Arabia, and Jordan—signals the globalization of lean accounting research and the broader internationalization of scholarly discourse. These trends are further validated by patterns of authorship and collaboration, with the United States leading in single-country publications, while European nations are more active in international, multi-country research initiatives.

Several highly cited documents anchor the intellectual structure of lean accounting. Seminal works such as Fullerton et al. (2014), Chiarini & Vagnoni (2015), and foundational texts by Johnson & Kaplan (1987) and Maskell & Kennedy (2007) are widely referenced and form the theoretical bedrock of the field. These documents emphasize themes such as the impact of lean practices on organizational performance, the strategic role of management accounting, and the implementation of lean accounting frameworks. Their recurring citation in more recent studies underscores their enduring relevance and influence.

The network analyses further highlight the field's structure and maturity. The co-citation network reveals a dense, interconnected intellectual foundation, suggesting a shared core of theoretical and empirical references. Meanwhile, the author collaboration network is more fragmented, characterized by small, loosely connected clusters rather than an integrated research community. This fragmentation indicates an opportunity for increased collaboration across regions and disciplines. The keyword co-occurrence network shows that the field is conceptually cohesive, with central themes such as impact, performance, systems, implementation, and management forming the core of the discourse. These themes reflect the dual emphasis on empirical evaluation and theoretical development in lean accounting research.

The principal original contribution of this study is to provide a dedicated and integrated bibliometric mapping of the lean accounting domain in isolation, rather than as a sub-theme of the broader lean-manufacturing or management-accounting literatures, covering the full 1996–2025 period and combining performance analysis with science mapping within a single reproducible workflow. Building on this, the study contributes to the academic literature and to practice in several further ways. First, it systematically maps the landscape of lean accounting, offering scholars a clear picture of key contributors, influential institutions, and thematic

directions. For practitioners and policymakers, the findings provide insight into how lean accounting is studied, which methodologies are most referenced, and which geographic and institutional hubs are leading the conversation. This information can guide strategic decisions in academic partnerships, research funding, and curriculum development in accounting and operations management programs.

Despite its comprehensive scope, this study is not without limitations. The analysis is based solely on the Web of Science database, which, while extensive, does not capture all relevant publications, particularly those in regional journals or conference proceedings not indexed in the database. Additionally, citation counts may favor older publications due to their longer exposure time, potentially underrepresenting the influence of more recent but impactful studies. Furthermore, while powerful, bibliometric techniques cannot fully capture qualitative dimensions such as theoretical novelty or practical relevance.

Looking ahead, several promising directions for future research emerge from this study. First, greater emphasis should be placed on international and interdisciplinary collaborations, which could help bridge the fragmented author network and enrich the field with diverse perspectives. Second, emerging themes such as digital transformation, sustainability accounting, and the integration of Industry 4.0 technologies into lean accounting systems represent fertile ground for new inquiry. Third, region-specific studies, especially in underrepresented regions such as Africa, Southeast Asia, and Latin America, could provide valuable insights into the applicability and adaptation of lean accounting principles across diverse institutional and economic environments. Finally, future studies could incorporate mixed-method approaches, combining bibliometric data with qualitative content analysis to provide a more nuanced understanding of the evolving lean accounting discourse.

A Structured Research Agenda for Lean Accounting

To translate the preceding analysis into an actionable agenda, Table 1 consolidates the principal research gaps identified in this review, links each gap to the specific bibliometric evidence that motivates it, and sets out a corresponding direction for future research. The agenda is intended to help researchers and practitioners prioritize themes that are currently underdeveloped in the lean accounting literature.

Table 1. A structured research agenda derived from the bibliometric findings

Research gap	Grounding in the present findings	Proposed future direction
Under-representation of digital transformation and Industry 4.0	Related keywords appear only as small, peripheral nodes in the keyword co-occurrence and three-field maps.	Examine how lean accounting interacts with ERP systems, data analytics, and Industry 4.0 technologies through empirical and case-based designs.
Limited integration of sustainability and ESG concerns	Sustainability-oriented terms and outlets are marginal in the analyzed corpus.	Investigate the coupling of lean accounting with environmental and social performance measurement, as well as green cost management.
Fragmented author collaboration	The co-authorship network is composed of small, loosely connected clusters rather than an integrated community.	Encourage cross-institutional and international research consortia to consolidate the field.
Weak integration with mainstream accounting theory	Mainstream accounting journals are largely absent from the most productive and most cited sources.	Develop theoretically grounded studies that connect lean accounting to established management-control and accounting frameworks.
Geographic concentration in a few Western contexts	The United States and a small set of European countries dominate output.	Conduct context-specific studies in underrepresented regions, including Africa, Southeast Asia, Latin America, and Türkiye.
Predominantly descriptive and single-case evidence-based	The corpus relies heavily on conceptual and single-case contributions.	Adopt mixed-method and larger-sample designs that combine bibliometric evidence with qualitative and quantitative validation.

In conclusion, this bibliometric study indicates that lean accounting has developed into an internationally distributed but still comparatively small and consolidating field of inquiry. A strong foundational literature, emerging international contributors, and a core set of practical and theoretical concerns characterize it. By illuminating the structural, geographic, and thematic contours of this research area, the study not only advances academic understanding but also offers a strategic roadmap for future exploration and collaboration. Through continued scholarly engagement and cross-border partnerships, lean accounting research can further evolve to meet the challenges and opportunities of modern organizational management.

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