


From Divergence to Convergence: Mapping the Hybrid Evolution of Smart, POP, and Dialogic Accounting through Bibliometric and Semantic Lenses

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Abstract

This study examines the academic development and interconnections among Smart Accounting, POP Accounting, and Dialogic Accounting from 2010 to 2025. Despite each paradigm embracing digitization, stakeholder engagement, and sustainability from different perspectives, the literature remains fragmented across separate research streams. The paper argues that a systematic, integrated perspective is required to trace conceptual overlaps and identify research gaps among these emerging approaches. To this end, a bibliometric and semantic analysis was conducted on 222 peer-reviewed articles with the support of Biblioshiny and Leximancer. The articles were selected using a Boolean search strategy targeting digital, participatory, and sustainability-oriented accounting models. The analysis centered on publication trends, co-citation networks, keyword co-occurrence, thematic clusters, and semantic trajectories. The results illuminate a growing, yet theoretically and geographically uneven and fragmented, academic debate.

Smart Accounting is driven by technological disruption, particularly through Artificial Intelligence (AI), blockchain, and cloud computing, which enable real-time automation and transparency. POP Accounting advances inclusive governance by integrating financial and ESG indicators through stakeholder-centric models. Dialogic Accounting emphasizes deliberative engagement but faces challenges in practical implementation. Although there is increasing conceptual overlap, mainly in applications within the public sector, significant gaps in theoretical convergence and geographic coverage persist, especially in emerging economies. Moreover, the decline in citation trends over the period suggests a thematic specialization and decentralization of scholarly attention. Ultimately, the research highlights the potential of hybrid accounting systems that integrate digital technologies, stakeholder engagement, and sustainability to support organizations in addressing the challenges of digital and sustainable transitions.

Keywords: Smart Accounting; POP Accounting; Dialogic Accounting; Digital Transformation in Accounting; Stakeholder Engagement; Bibliometric Analysis.

1. Introduction

In recent years, accounting has progressively moved beyond the confines of purely economic calculations to incorporate technological developments, societal expectations, and ethical considerations (Bellucci et al., 2019; Bessieux-Ollier et al., 2023). This shift is particularly evident in the public sector, which has increasingly adopted reporting frameworks aimed at enhancing transparency and stakeholder engagement (Fusco & Ricci, 2019). Within this context, scholarly research has identified three distinct yet interconnected paradigms: Smart Accounting, POP Accounting, and Dialogic Accounting. Each represents a different degree of openness to digital transformation, stakeholder engagement, and sustainability-oriented reporting practices (Desplebin et al., 2021; Biancone et al., 2024; Bellucci et al., 2019). These paradigms respond to converging challenges, including the automation of information processes driven by Artificial Intelligence (AI), blockchain, and big data, alongside the growing societal demand for transparency, participation, and accountability. Despite growing academic interest, research in this area remains largely compartmentalized. Most studies focus on individual paradigms without exploring their theoretical and applied interconnections (Marrone & Hazelton, 2019; Bessieux-Ollier et al., 2023). This fragmentation is evident in the difficulty of developing accounting tools that support sustainable and circular governance models (Aureli, Foschi & Paletta, 2023), as well as in the limited adoption of authentic dialogic practices across organizational contexts (Fusco & Ricci, 2019). Marrone and Hazelton (2019) argue that research on digital technologies in accounting often overlooks governance and accountability issues, while Fusco and Ricci (2019) highlight the misalignment between participatory goals and the tools used in the public sector. Similarly, Bellucci et al. (2019) and Bessieux-Ollier et al. (2023) emphasize the gap between dialogic intentions and their operational implementation. Alessi et al. (2024) and Abbas and Shahid (2024) further underline the lack of standardization in sustainability disclosure, which undermines the comparability and reliability of published information.

A systemic and integrated approach is therefore required to examine the conceptual and applied convergences and tensions among these paradigms. This study adopts a bibliometric and semantic lens to map their evolution from 2010 to 2025. It addresses the following research questions:

RQ1. What is the evolution of the scholarly debate on Smart Accounting, POP Accounting, and Dialogic Accounting?

RQ2. What relationships emerge among these paradigms in terms of keywords, thematic co-occurrences, and conceptual trajectories?

RQ3. What gaps or underrepresented areas can be identified in the current literature, and how can future research be guided?

The main objective of this research is to capture and visualize conceptual connections among the three paradigms, applying bibliometric (Biblioshiny) and semantic (Leximancer) techniques to a sample of 222 peer-reviewed articles. The study offers a threefold contribution. It provides a critical synthesis of existing research, proposes an integrated theoretical framework, and outlines future research directions that combine technological innovation, participatory engagement, and a focus on sustainability. The structure of the paper is as follows: Section 2 reviews the literature on the three paradigms;

Section 3 details the methodological design; Section 4 presents the findings of the bibliometric and semantic analyses; Section 5 discusses their implications; Section 6 summarizes the contributions; and Section 7 offers reflections and recommendations for future research.

2. Literature Review

In the “New Normal” era, accounting, traditionally seen as a purely analog discipline, is undergoing a profound transformation. The integration of Smart Accounting, POP Accounting, and Dialogic Accounting (Bellucci et al., 2019; Biancone et al., 2024) is redefining the role of financial information in promoting more digital, sustainable, and inclusive disclosure practices. At the core of this shift are three main forces: the incorporation of emerging technologies into audit processes, the rise of hybrid models combining financial and non-financial data, and the development of governance frameworks that promote stakeholder participation (Aureli, Foschi & Paletta, 2023; Biancone et al., 2024). Smart Accounting refers to the deployment of technologies such as artificial intelligence, blockchain, and cloud computing to automate repetitive processes, enhance transparency, and enable real-time auditability and disclosure (Awang et al., 2024; Desplebin et al., 2021). Blockchain facilitates secure and verifiable triple-entry accounting, while Artificial Intelligence (AI) contributes to anomaly detection, predictive analysis, and risk management, particularly when integrated with Robotic Process Automation (RPA) (Al Najjar et al., 2024). Nevertheless, the rapid digitization of the field raises critical ethical and regulatory challenges, including algorithmic opacity, data privacy, and the urgent need to develop digital skills within the profession (Fatzel et al., 2024; Aminu Abdullahi & Abubakar, 2024). Lehner et al. (2022) stress the necessity of embedding inclusive governance principles into the design of AI systems, advocating a shift in focus from technical performance to ethical accountability. This perspective aligns with calls from scholars to revise professional education by integrating AI literacy, data ethics, and cybersecurity into the curriculum (Marrone & Hazelton, 2019).

POP Accounting bridges conventional economic logic with stakeholder-oriented governance, seeking to generate value that transcends shareholder interests (Biancone et al., 2024). Mavlutova et al. (2023) observe that digital innovation within the financial sector advances sustainability, particularly through greater accessibility, efficiency, and informational clarity. Advanced tools such as sentiment analysis enable dynamic assessments of public perception, while the incorporation of ESG indicators and adherence to frameworks like the EU taxonomy reinforce the credibility of environmental and social communication (Biancone et al., 2024). However, in the absence of globally harmonized sustainability standards and in light of persistent concerns about greenwashing, adoption remains uneven, especially across emerging economies with weaker regulatory infrastructures (Alessi et al., 2024; Abbas & Shahid, 2024). Dialogic Accounting advances a participatory vision of governance that fosters active engagement among institutions, enterprises, and civil society (Bessieux-Ollier et al., 2023). It underscores the democratization of financial communication and the integration of human and social capital into organizational decision-making. Yet, structural barriers such as institutional inertia, limited stakeholder literacy, and regulatory shortcomings continue to hinder its widespread uptake (Bellucci et al., 2019; Fusco & Ricci, 2019). Empirical research by Frías-Aceituno et al. (2013) demonstrates that board characteristics, including diversity and engagement, positively influence the dissemination of integrated disclosure practices, reinforcing Dialogic Accounting’s relevance to sustainability objectives. Participatory budgeting tools and

digital platforms have further expanded their applicability in both public and private contexts. Still, traditional accounting systems often fail to accommodate circular business models and long-term ecological goals, as highlighted by Aureli, Foschi and Paletta (2023). Although these paradigms have typically been examined in isolation, recent literature reveals growing conceptual convergence and opportunities for hybridization. Smart Accounting delivers the technological infrastructure necessary for automation and data-driven insight. POP Accounting reframes these outputs within stakeholder value systems, particularly via ESG-oriented interpretations. Dialogic Accounting introduces a deliberative and ethical dimension that supports democratic legitimacy and co-responsibility. Bibliometric studies by Zupic and Čater (2015) show how these paradigms are increasingly intersecting across academic discourse. Vo Van et al. (2024) further document that the adoption of cloud-based accounting systems by SMEs simultaneously enhances operational efficiency and sustainability engagement, illustrating the functional integration of technological and participatory objectives.

3. Methodology

This study constructed its corpus through a comprehensive search of Scopus, a database whose structured indexing ensures that each retrieved record is peer-reviewed and provides the full bibliographic metadata necessary for processing with the Bibliometrix package. The search was restricted to journal articles published in English that address Smart Accounting, POP Accounting, or Dialogic Accounting in relation to digital transformation, sustainability, or stakeholder engagement. Editorials, conference proceedings, and other forms of non-peer-reviewed grey literature were excluded, as they do not meet equivalent standards of editorial rigour. Articles lacking a clear and substantive connection to these paradigms were also removed. To ensure methodological transparency, explicit inclusion and exclusion criteria were defined, and a two-stage screening process was adopted.

In the first stage, publications were retrieved from journals indexed in Scopus. In the second, thematic alignment was evaluated through abstract screening and, where necessary, full-text analysis. The resulting dataset comprises peer-reviewed journal articles published between 2010 and 2025 across the fields of Business, Management and Accounting, Social Sciences, and Economics. Eligibility criteria prioritized both the academic standing of the journal and the thematic relevance of each article to the paradigms under investigation. While peer review provides a foundational level of scholarly credibility, the screening process was further refined through qualitative assessments. These included the journal's standing in established ranking systems, the citation profile of each article, and the degree of thematic coherence between the publication's scope and the study's research objectives. This comprehensive appraisal aimed to ensure that the final corpus represents not only credible but also influential scholarship, while remaining open to recent contributions from emerging outlets where thematic salience was demonstrable. The temporal scope, spanning 2010 to 2025, was chosen to encompass both foundational developments and contemporary advances in the field. The year 2010 marks a pivotal juncture, coinciding with the first recorded cryptocurrency transaction (Arias-Oliva et al., 2019), which laid the groundwork for subsequent innovations in Smart Accounting. Simultaneously, scholarly interest in sustainability, corporate social responsibility, and stakeholder engagement began to inform the evolution of POP and Dialogic Accounting (Bellucci et al., 2019). Abstracts were initially reviewed; full texts were analysed when required, and duplicate entries such as in-press and final versions were consolidated. The identification of relevant literature was guided

by a preliminary review of forty-five seminal sources, which supported the development of a comprehensive keyword set. An iterative refinement process was employed to construct the final search string, integrating synonyms and conceptually adjacent terms to ensure semantic breadth and terminological inclusivity (Bellucci et al., 2019; Bessieux-Ollier et al., 2023). To reduce the risk of excluding pertinent studies due to lexical variability, the Boolean search string was formulated as follows:

("Smart Accounting" OR "Digital Accounting" OR "AI-based Accounting" OR "Blockchain Accounting" OR "Automated Accounting" OR "Cloud Accounting" OR "Big Data in Accounting" OR "Digital Finance") AND ("Pop Accounting" OR "Public Accounting" OR "Sustainability Reporting" OR "Stakeholder Reporting" OR "Social Reporting") AND ("Dialogic Accounting" OR "Corporate Social Responsibility" OR "Participatory Accounting" OR "Social and Environmental Accounting" OR "Collaborative Accounting" OR "Stakeholder-Centric Accounting") AND ("relationship" OR "integration" OR "link" OR "connection" OR "intersection" OR "interaction" OR "overlap" OR "synergy").

A total of 222 articles satisfied these criteria and were exported to the Biblioshiny interface of the Bibliometrix R package for analysis (Aria & Cuccurullo, 2017). This platform enabled a systematic examination of publication dynamics, citation structures, and thematic co-occurrence, allowing the study to map how Smart, POP, and Dialogic Accounting have intersected and, in some cases, diverged within scholarly discourse (Zupic & Čater, 2015). Several limitations must be acknowledged. Dependence on a single database may have led to the omission of relevant studies. The reliance on predefined keywords carries the inherent risk of excluding contributions that employ alternative formulations. Furthermore, the temporal constraint from 2010 to 2025, while methodologically justified, may exclude earlier works that remain theoretically or historically significant (Aureli, Foschi & Paletta, 2023; Alessi et al., 2024).

4. Results of the bibliometric analysis

The following dataset provides information on the correlation between Smart Accounting, POP Accounting, and Dialogic Accounting from 2010-2025. Data collected are mainly from articles written in English in the fields of Social Sciences, Economics, Econometrics, and Finance.

4.1 Descriptive analysis of the literature

Table 1 summarizes the key characteristics of the dataset analyzed. The corpus includes 222 articles published in 122 distinct scientific sources, with a mean article age of 3.46 years. Over the 2010–2025 time frame, the average annual growth rate of publications is 11.33%, indicating the growing academic attention to Smart, POP, and Dialogic Accounting (Zupic & Čater, 2015). Each article received, on average, 27.47 citations, highlighting the significant scholarly impact of the selected works. The dataset also reflects strong engagement with broader academic discourse: a total of 19,764 references were cited across the corpus, and an average of 2,798 keywords were extracted, underlining the thematic diversity and multidisciplinary nature of the field (Vo Van et al., 2024). The collaboration index stands at 3.2, and only 19

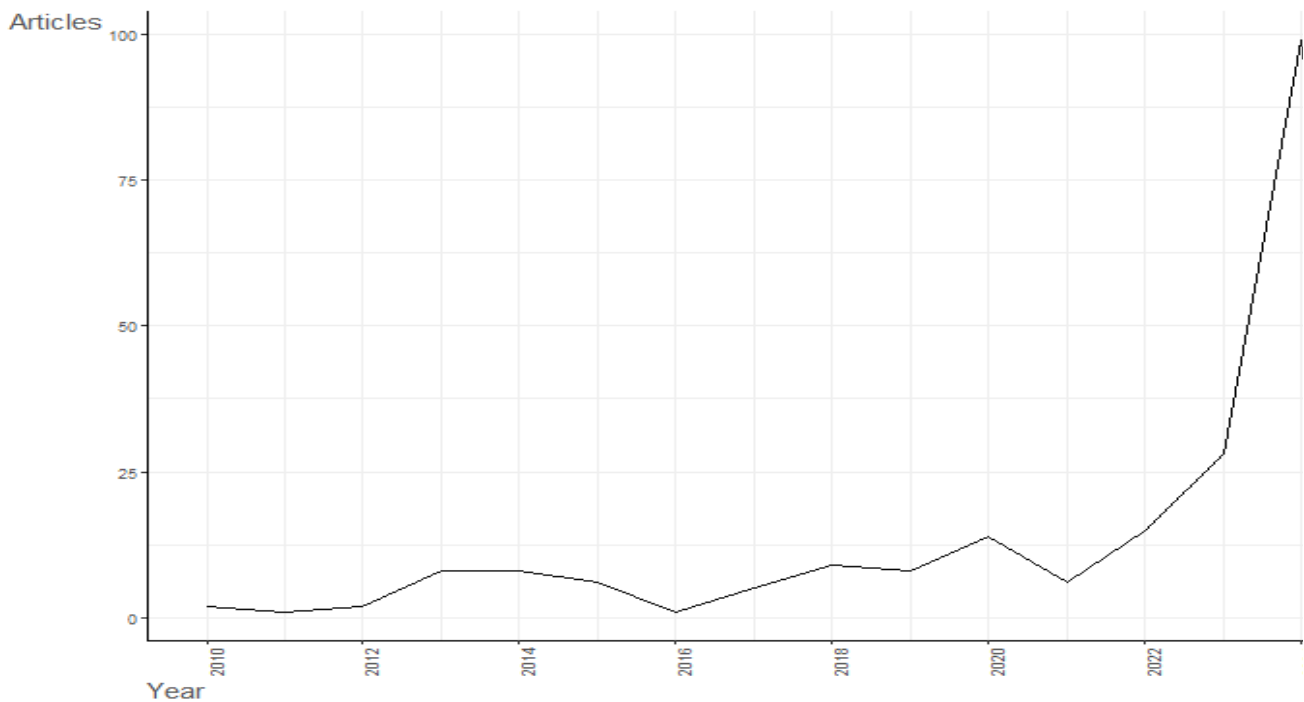
articles were written by a single author, confirming the prevalence of co-authorship and the collaborative orientation of research in this domain (Aureli, Foschi & Paletta, 2023). Moreover, 29.73% of the articles involved international collaboration, reinforcing that this area is gaining traction across national borders (Biancone et al., 2024). As shown in Figure 1, the annual scientific production exhibits a clear upward trajectory, with robust growth in recent years. Between 2013 and 2017, the publication rate remained relatively stable, with only modest fluctuations. However, starting in 2019, a sharp increase occurred, rising from eight publications in that year to ninety-nine in 2024. This acceleration suggests a growing scholarly interest in hybrid and interdisciplinary accounting paradigms, possibly driven by advances in AI, sustainability regulation, and stakeholder-driven governance (Desplebin et al., 2021; Abbas & Shahid, 2024). The quantitative evidence demonstrates the dynamism of this emerging field and its growing integration within the global academic community. The high collaboration index and international co-authorship rates further signal a maturing research landscape increasingly focused on cross-border and cross-disciplinary dialogue.

Table 1. Main Information about data

MAIN INFORMATION ABOUT DATA	
Timespan	2010:2025
Sources (Journals, Books, etc)	122
Documents	222
Annual Growth Rate %	11.33
Document Average Age	3.46
Average citations per doc	27.47
References	19764
DOCUMENT CONTENTS	
Keywords Plus (ID)	394
Author's Keywords (DE)	801
AUTHORS	
Authors	644
Authors of single-authored docs	18
AUTHORS COLLABORATION	
Single-authored docs	19
Co-Authors per Doc	3.2
International co-authorships %	29.73
DOCUMENT TYPES	
article	222

Source: Authors' elaboration using the Bibliometrix R-package. This table summarizes the analyzed dataset, including the number of articles, sources, average citations, keywords used, and collaboration indicators. It highlights the strong international and interdisciplinary nature of the research field.

Figure 1. Annual scientific production

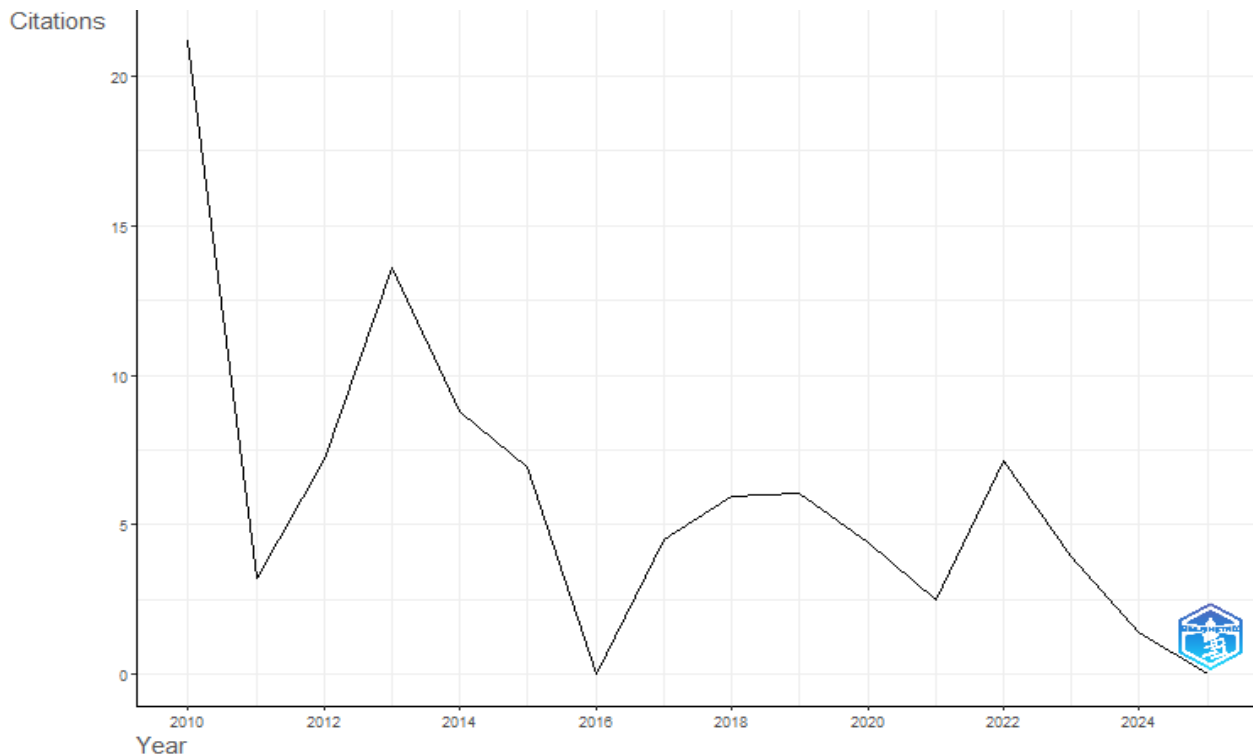


Source: Authors' elaboration using Bibliometrix. This figure shows the annual number of publications on Smart, POP, and Dialogic Accounting from 2010 to 2025. A significant increase in output is observed after 2019, indicating a growing interest in hybrid and sustainability-focused accounting models.

4.2 Authors' citation analysis

The trend in the average number of citations per year for the 222 articles reached its peak in 2010, with an average of 21.16 citations per article. From 2011 onward, a gradual yet steady decline has been observed, despite occasional fluctuations. The most significant drop occurs between 2024 and 2025, when the average fell to 1.41 citations per article. As shown in Figure 2, this pattern suggests an increase in publications over time accompanied by a deceleration in citation accumulation. This trend is indicative of a shift in academic focus toward new theoretical frameworks or a diversification of research themes that contributes to the decentralization of scholarly debate. It is also plausible that the expansion of open-access publishing and the rise of preprint platforms have altered traditional citation patterns. Aminu Abdullahi and Abubakar (2024) argue that while these platforms improve access and dissemination, they may also affect the timing and frequency of citations, especially for more recent publications. In sum, the data point to a research domain that is rapidly expanding but increasingly fragmented, both in terms of theoretical alignment and citation dynamics.

Figure 2. Average citations per Year



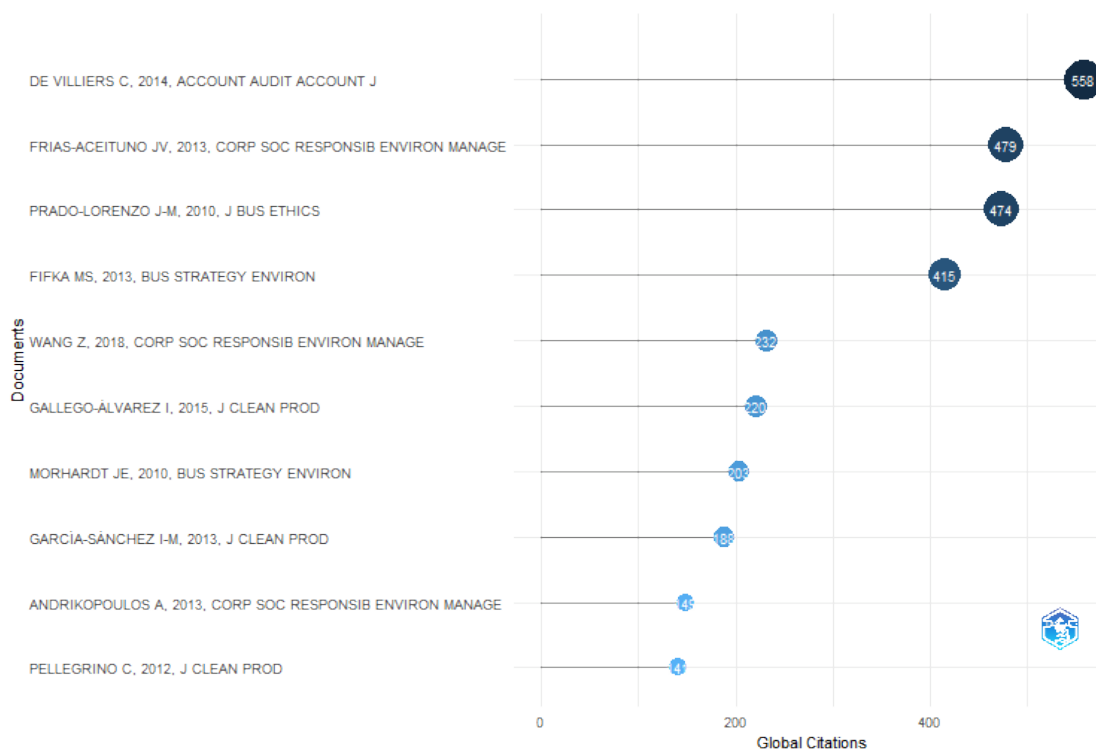
Source: Authors' elaboration using the Bibliometrix R-package. This chart illustrates the average number of citations per article per year. The trend peaks in 2010, then gradually declines, suggesting a fragmentation of scholarly attention and possible shifts in academic focus or citation practices.

Table 2 illustrates that the ten most cited papers were published between 2010 and 2018. The most cited article (390 citations) is by De Villiers (2014) in *Accounting, Auditing & Accountability Journal*. The second most cited work is by Frías-Aceituno et al. (2013) in *Corporate Social Responsibility and Environmental Management*, which addresses corporate social responsibility and environmental management. This is followed by Prado-Lorenzo and García-Sánchez (2010), which discusses the ethical implications of business practices with an emphasis on sustainability. Other contributions include Fifka (2013) in *Business Strategy and the Environment*, which explores business strategies in relation to environmental issues, and Wang et al. (2018) in *Corporate Social Responsibility and Environmental Management*, which examines corporate responsibility in evolving global markets. Gallego-Álvarez et al. (2015), in the *Journal of Cleaner Production*, provide insights into cleaner production practices, while Morhardt (2010), also in *Business Strategy and the Environment*, focuses on sustainable business strategies. In parallel, García-Sánchez et al. (2013) argue in the *Journal of Cleaner Production* for the role of environmental practices in improving corporate sustainability. Andrikopoulos and Krikilani (2013), in *Corporate Social Responsibility and Environmental Management*,

analyze sustainability from a corporate governance perspective, while Pellegrino and Lodhia (2012), in the *Journal of Cleaner Production*, study innovative approaches to environmental management.

The most frequently cited publications are the result of international collaborations. Such collaborations enhance the quality and robustness of research, introduce diverse perspectives, and foster more effective solutions to the challenges of accounting, sustainability, and corporate governance. Moreover, these partnerships increase the likelihood of adopting widely accepted international accounting and sustainability standards.

Table 2. Most globally cited documents



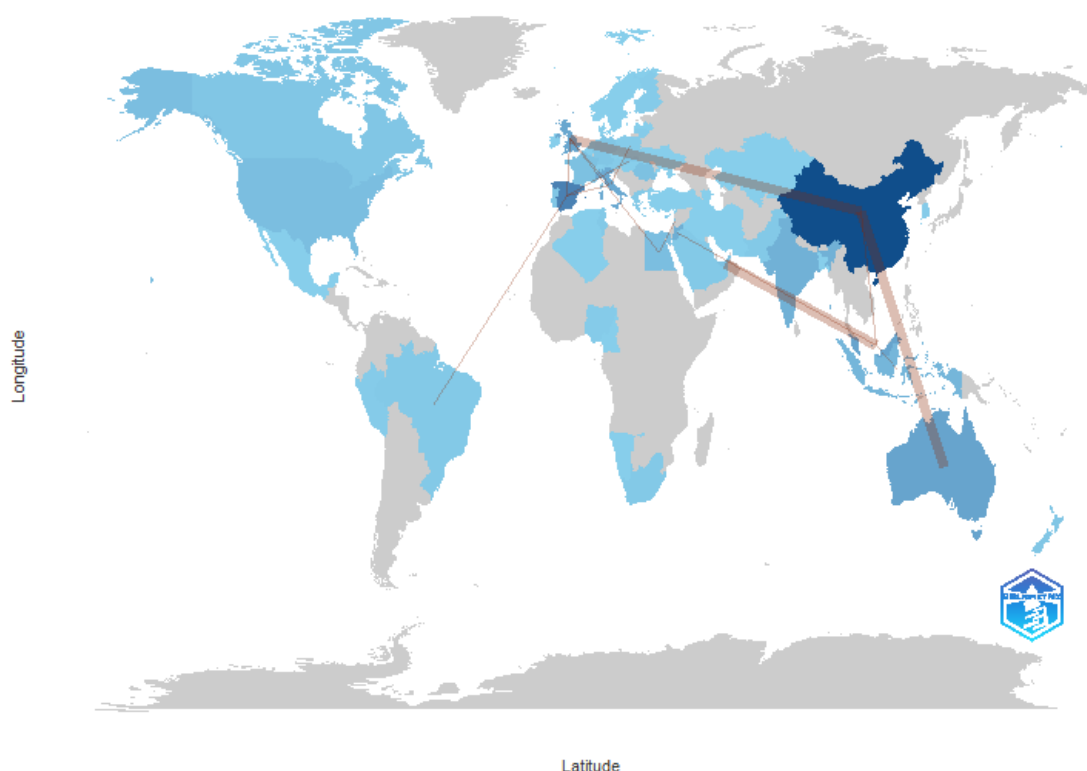
Source: Authors' elaboration using the Bibliometrix R-package. This table lists the ten most cited papers in the dataset, showing citation counts, authors, and journal names. It demonstrates that the most influential contributions were published between 2010 and 2018, mainly through international collaboration.

Figure 3 and Table 3 illustrate the geographical cooperation among the authors of the analyzed papers, highlighting the strongest international links in this field. The most substantial collaboration is between China and Australia, with three joint publications. Other notable partnerships involve China and Malaysia (2), as well as Egypt and Lebanon (2). Additional collaborations include Italy and the United Kingdom, Spain and Brazil, and Italy and Spain, each with two co-authored papers. These joint efforts facilitate the exchange of knowledge to address shared challenges such as sustainability, corporate accountability, and the integration of technology into accounting processes. The collaborations between China, Australia, the UK, and Italy can be attributed to their leading role in deploying advanced technologies to enhance transparency and efficiency in accounting. By contrast, regions such as the Middle East and Latin America are

increasingly experimenting with participatory, public-oriented approaches that align with dialogic accounting, which emphasizes stakeholder engagement and inclusivity in financial reporting (Bellucci et al., 2019).

The exchange of expertise between countries with advanced financial infrastructures and those adopting sustainability reporting models fosters the development of best practices to address contemporary accounting challenges. Moreover, by generating empirical evidence on the applicability of accounting standards across diverse economic contexts, cross-national collaboration supports the policy-making process (Abbas & Shahid, 2024). Finally, international partnerships also play a crucial role in harmonizing ESG reporting standards, thereby promoting greater clarity and transparency in sustainability accounting (Alessi et al., 2024).

Figure 3. Collaboration world map



Source: Authors' elaboration using the Bibliometrix R-package. This world map highlights international research collaborations. Strong connections are visible between countries like China and Australia, the UK and Italy, and Spain and Brazil, underscoring the global scope and cooperative nature of the field.

Table 3. Most important collaborations among international researchers

From	To	Frequency
CHINA	AUSTRALIA	3
CHINA	UNITED KINGDOM	3
	UNITED ARAB	
MALAYSIA	EMIRATES	3
CHINA	MALAYSIA	2
EGYPT	LEBANON	2
ITALY	POLAND	2
ITALY	UNITED KINGDOM	2
JORDAN	MALAYSIA	2
MALAYSIA	INDONESIA	2
SPAIN	BRAZIL	2
SPAIN	ITALY	2
SPAIN	SLOVAKIA	2
SPAIN	UNITED KINGDOM	2
UNITED KINGDOM	EGYPT	2

Source: Authors' elaboration using the Bibliometrix R-package. This table illustrates cross-country research partnerships, identifying the most active collaborations. It emphasizes the global nature of the debate, with notable cooperation between China, Australia, the UK, Italy, and Spain.

4.3 Source Analysis

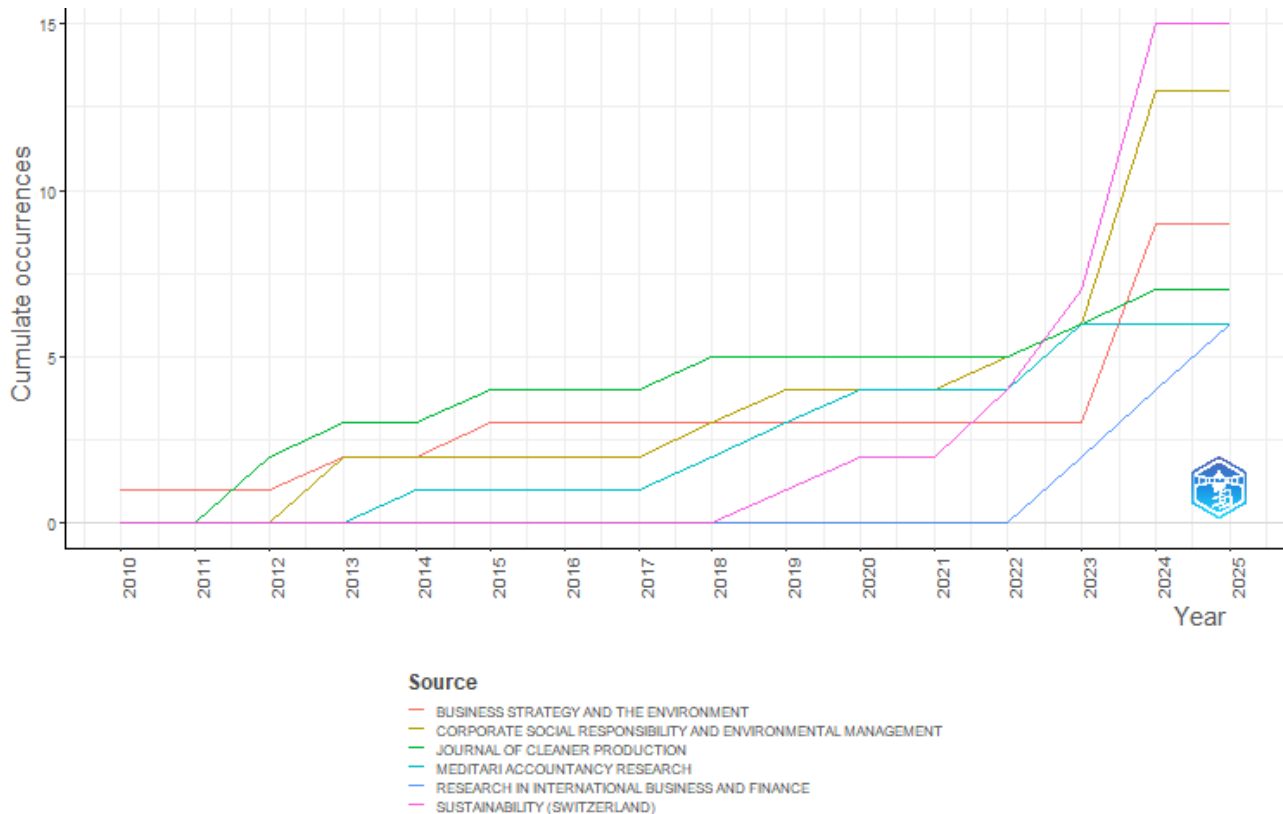
This section provides a summary of the main sources and areas of interest of the international journals contributing to this topic. As shown in Table 4, *Corporate Social Responsibility and Environmental Management* is the leading journal with 13 published articles, demonstrating its central role in the field. *Sustainability* (Switzerland) contains 12 contributions on sustainability, while *Business Strategy and the Environment* contains 9. Further journals of strong interest include the *Journal of Cleaner Production* (7 articles) and *Meditari Accountancy Research* and *Research in International Business and Finance* (6 articles each). Journals such as *Administrative Sciences*, *Australian Accounting Review*, and *Cogent Business and Management* have each published four papers addressing sustainability and corporate governance. This indicates a growing interest in the intersection of business strategy, sustainability, and corporate responsibility. Two main publication trends can be observed in Figure 4. Sustainability, corporate social responsibility, and Environmental management have seen a sharp increase in publications, from no articles in 2010 to 15 in 2024 and 2025. By contrast, journals such as *Business Strategy and the Environment*, *Journal of Cleaner Production*, and *Meditari Accountancy Research* exhibit a slower trajectory, with only modest growth in article numbers over the years. In conclusion, interest in sustainability and corporate responsibility is rising.

Table 4. Most relevant sources



Source: Authors' elaboration using the Bibliometrix R-package. This table shows the academic journals with the highest number of articles on Smart, POP, and Dialogic Accounting. It underlines the leading role of journals focused on sustainability, CSR, and environmental management.

Figure 4. Source dynamics



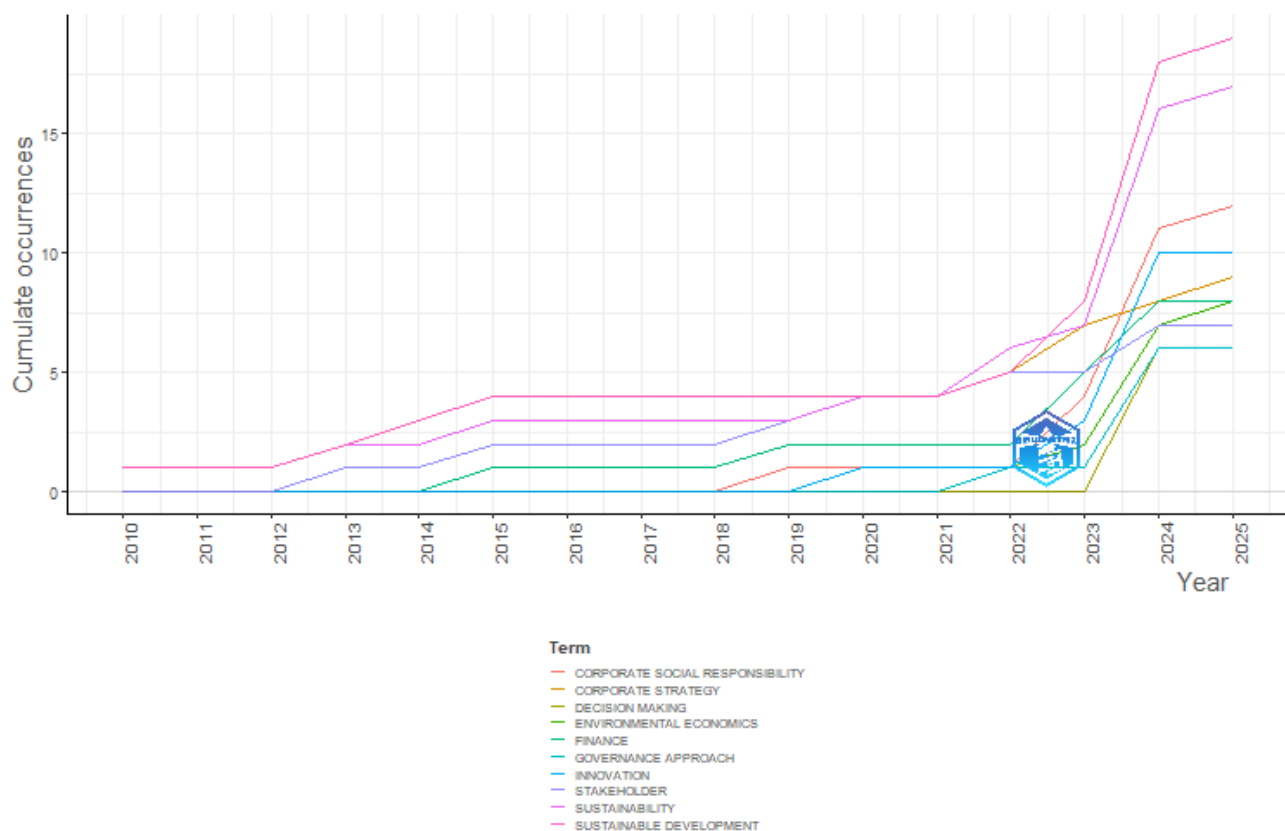
Source: Authors' elaboration using the Bibliometrix R-package. This graph displays the evolution of article frequency by journal over time. Journals such as 'Corporate Social Responsibility and Environmental Management' and 'Sustainability' show strong growth, reflecting increasing attention to sustainability and CSR in accounting.

4.4 Keyword Analysis

In the following section, the study examines the most salient keywords and their co-occurrence across titles, abstracts, and author-provided keywords in the field. Figure 5 shows that the term "sustainability" has experienced the strongest growth. Although other terms were included in the search, this remains one of the most prominent, reflecting its increasing association with "corporate social responsibility," "innovation," and "strategy." In particular, the keyword "sustainable development" has continued to grow steadily, especially since 2017. Keywords such as "stakeholders," "decision making," and "governance approach" have likewise increased in prominence, demonstrating the connections between sustainability and governance, finance, and environmental economics. Figure 6 illustrates the evolution of research topics according to their degree of development (extent of discussion) and centrality (relevance). The thematic map highlights a cluster of motor themes, including "sustainability," "corporate strategy," "industrial performance," and "environmental protection," indicating both maturity and centrality within the field. The "green economy" emerges as a basic theme,

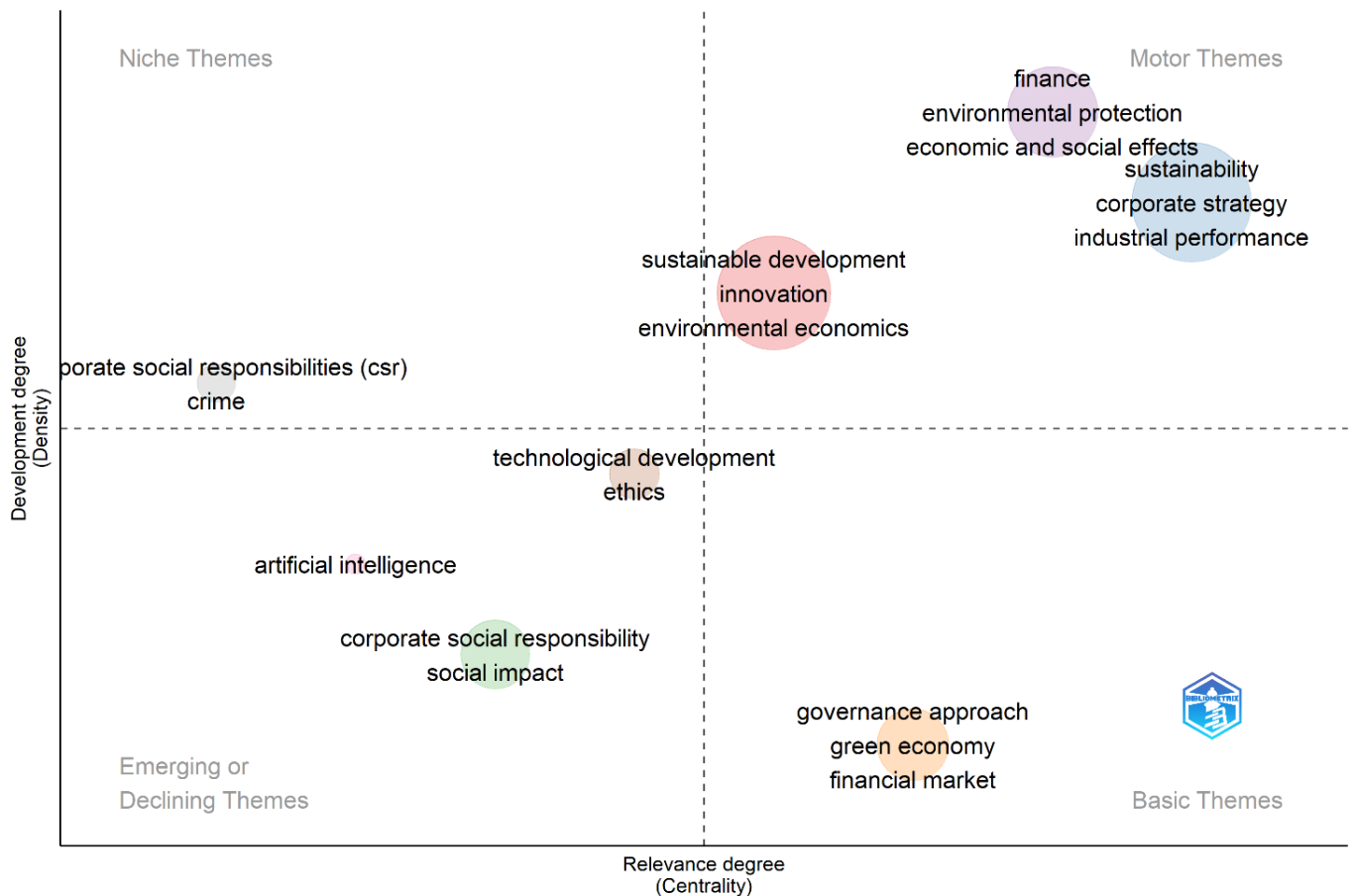
relevant but still undergoing deeper theoretical elaboration. “Corporate social responsibility,” “social impact,” and “artificial intelligence” reflect growing scholarly attention and considerable potential for future advancement. Notably, “sustainable development” and “innovation” occupy a transitional position, underscoring their dynamic and evolving role within the research landscape.

Figure 5. Word Frequency over Time



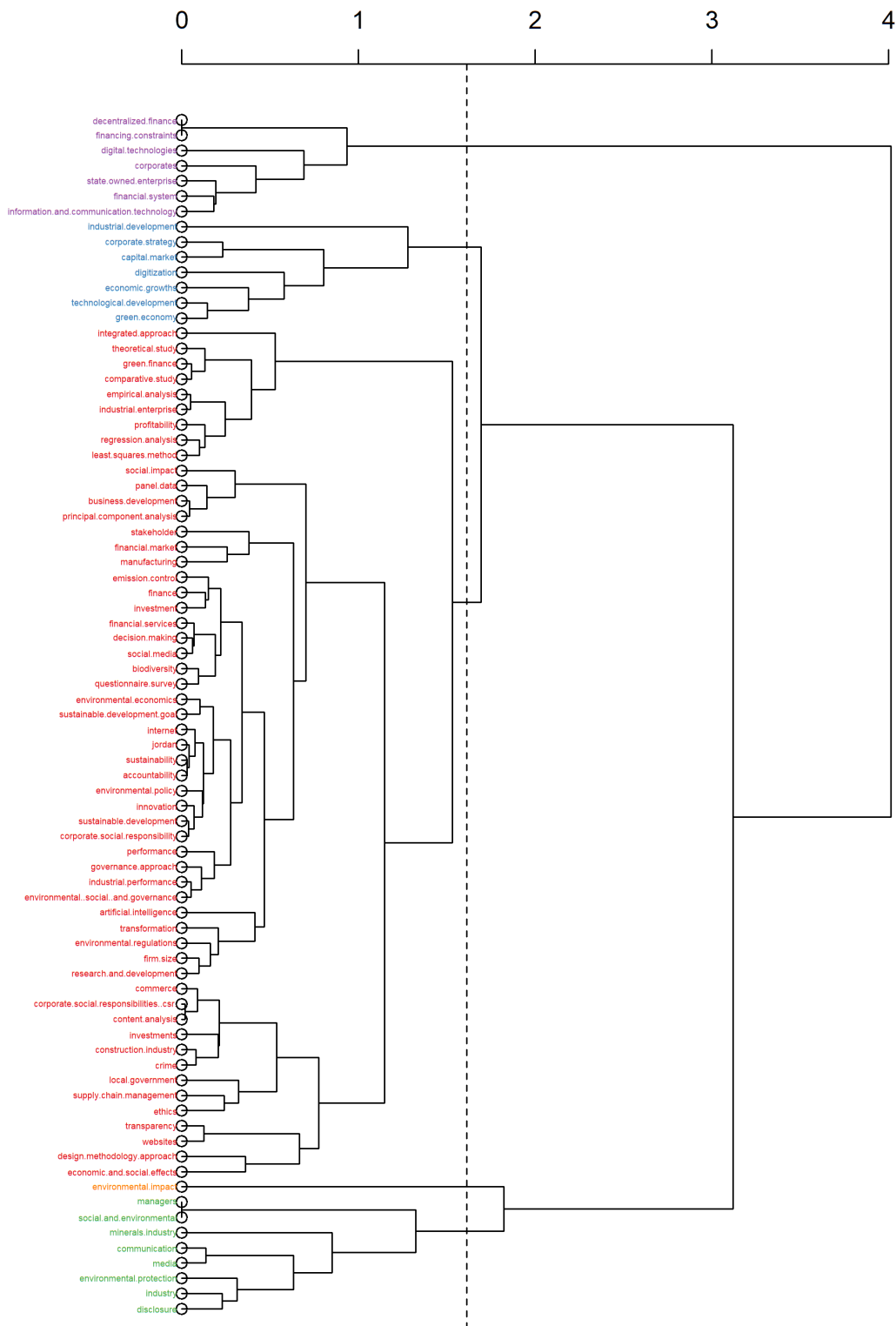
Source: Authors' elaboration using the Bibliometrix R-package. This figure tracks the rising prominence of keywords across the dataset. Terms like “sustainability,” “stakeholders,” and “governance” have shown steady growth, signaling evolving research priorities and interdisciplinary integration.

Figure 6. Thematic map



Source: Authors' elaboration using the Bibliometrix R-package. The thematic map plots clusters of topics based on their development (x-axis) and centrality (y-axis). Areas such as corporate strategy, AI, and sustainable development appear as emerging yet influential themes in accounting research.

Figure 7. Topic dendrogram



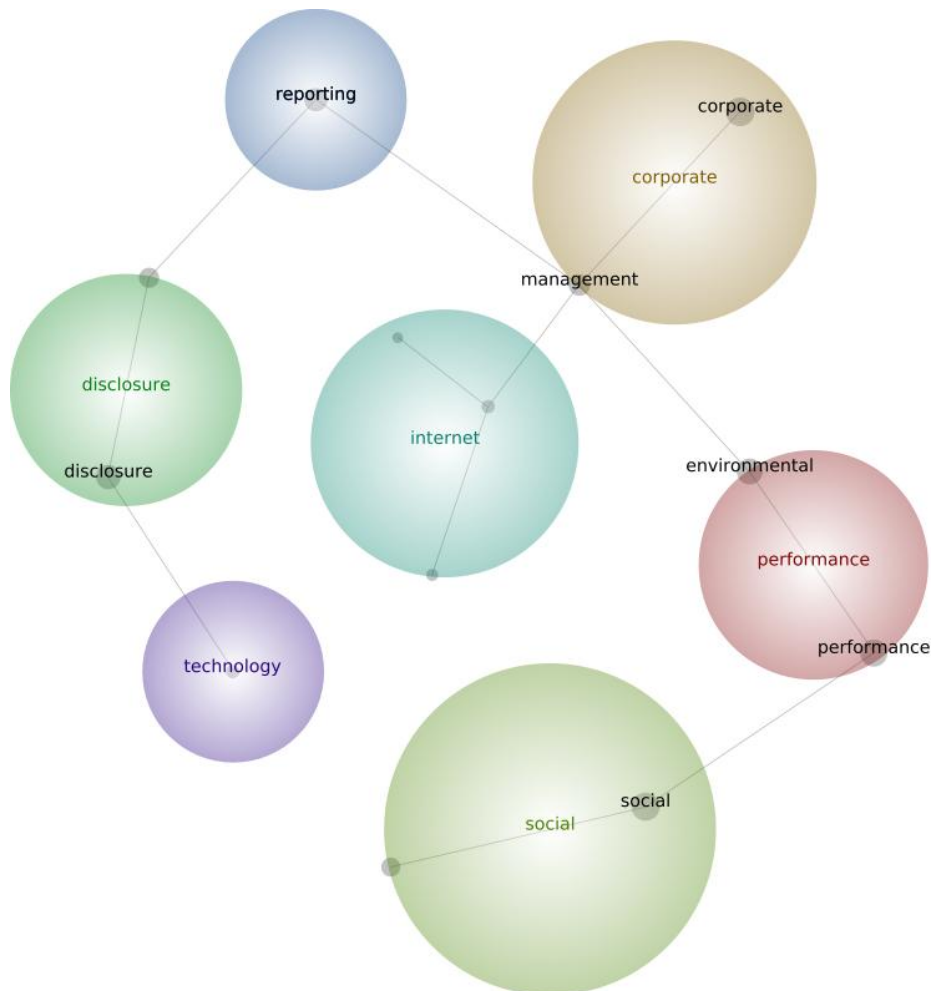
Source: Authors' elaboration using the Bibliometrix R-package. This dendrogram groups research themes into five major clusters. Each cluster reflects a thematic area, ranging from sustainability and corporate governance to environmental impact and digital innovation.

Figure 7 groups keywords related to sustainability and corporate responsibility into five clusters. Cluster 1 concentrates on core sustainability issues, namely corporate social responsibility, corporate finance, and corporate governance. Cluster 2 gathers business-oriented concepts, including corporate strategy, the green economy, and industrial performance. Cluster 3 maps sector-specific themes, for instance, environmental protection and communication. Cluster 4 highlights emerging topics, ranging from decentralized finance to digital technologies. Finally, Cluster 5 concentrates on environmental impact.

4.5 Semantic Results and Thematic Interconnections with Leximancer

The semantic analysis performed with Leximancer yields a map highlighting the three accounting paradigms that underpin the academic debate: Smart Accounting, POP Accounting, and Dialogic Accounting. The concepts of “technology,” “internet,” and “reporting” are strongly associated with Smart Accounting, which recognizes the use of digital tools to streamline transparent, automated, and verifiable real-time reporting and auditing processes (Awang et al., 2024; Desplebin et al., 2021), thereby supporting more robust systems. At the same time, Fatzel et al. (2024) emphasize persistent challenges related to standards, ethics, and gaps in digital competencies. In contrast, “performance,” “corporate,” “environmental,” and “disclosure” are linked to POP Accounting, which seeks to promote comprehensive reporting, measure environmental and social impact, and ensure accessible communication with citizens and stakeholders (Biancone et al., 2024). Here, the notion of performance extends beyond economic efficiency to include social, environmental, and participatory dimensions, consistent with stakeholder capitalism. The integration of digital instruments, such as sentiment analysis, enables participatory financial statements to evolve in more collaborative and interactive ways (Biancone et al., 2024; Abbas & Shahid, 2024). The domain of Dialogic Accounting emerges in the semantic cluster through concepts such as “social,” “management,” and “disclosure,” portraying accounting as a deliberative arena for diverse stakeholders. Bellucci et al. (2019) note that the effectiveness of Dialogic Accounting depends on the intensity and quality of stakeholder engagement, yet empirical findings suggest that such engagement is often declared rather than implemented. Bessieux-Ollier et al. (2023) underscore the shift from “accounting for people” to “accounting with people,” advocating an emancipatory form of accounting grounded in dialogical rather than purely representative logic.

Figure 8. Thematic Clusters of Smart, Pop and Dialogic Accounting: A Conceptual Analysis with Leximancer



Source: Authors' elaboration using Leximancer. This figure visualizes the conceptual structure of the research field using multidimensional scaling (MDS). It highlights thematic groupings based on the co-occurrence of keywords, showing how core concepts like sustainability, stakeholder engagement, and digital technologies are positioned relative to each other in the academic debate.

5. Discussion

The bibliometric analysis of Smart Accounting, POP Accounting, and Dialogic Accounting provides a comprehensive view of the current scholarly landscape and the evolving nature of these interconnected paradigms. The findings reveal a growing interest in these models and a clear semantic and conceptual convergence among them. Keyword clustering shows that terms such as “sustainability,” “stakeholder engagement,” “AI,” and “transparency” frequently co-occur, indicating that once distinct paradigms are increasingly overlapping.

This corroborates Biancone et al. (2024), who emphasize the integration of social, technological, and participatory elements in both theory and practice. Bibliometric evidence reinforces this interpretation, showing that the semantic evolution of key concepts reflects the progressive hybridization of paradigms. For example, terms historically linked to CSR and stakeholder dialogue now appear within clusters focused on AI, blockchain, and automation, suggesting that Smart, POP, and Dialogic Accounting are becoming interwoven. Co-citation analysis supports this trend, with foundational works on sustainability reporting and stakeholder theory cited alongside emerging literature on algorithmic auditing, digital finance, and automated control systems. This interdisciplinary pattern aligns with Bessieux-Ollier et al. (2023), who call for a dialogic, inclusive, and context-sensitive approach to accounting innovation. Nonetheless, several critical issues emerge. The selection of sources, based primarily on Scopus and Google Scholar, while ensuring broad coverage, may exclude significant studies not indexed in these databases. Aureli, Foschi and Paletta (2023) warn of the risks of overlooking niche but theoretically rich contributions, particularly in circular and participatory accounting domains. Another concern relates to the geographical distribution of contributions. Mapping international collaborations shows an intense concentration in high-income countries, particularly China, Australia, Italy, and the UK, while regions such as sub-Saharan Africa and South Asia remain markedly underrepresented. This supports Biancone et al. (2024), who observe that research on participatory accounting in emerging economies is still limited. Greater attention to these regions could foster the emergence of context-sensitive models more attuned to local socio-economic realities. Despite the steady increase in publication volume, the declining average number of citations per article since 2010 suggests fragmentation within the academic discourse. This may reflect the proliferation of open-access and preprint platforms, which reshape citation practices and accelerate the diffusion of highly specialized contributions (Aminu Abdullahi & Abubakar, 2024). While this dynamic indicates growth, it also risks theoretical disconnection and reduced cumulative knowledge. Therefore, although bibliometrics offers robust insights into structural trends, the field would benefit from greater methodological pluralism. As Bessieux-Ollier et al. (2023) argue, integrating interpretive and qualitative methods can capture the nuanced theoretical tensions that purely quantitative approaches may overlook. In particular, incorporating voices from underrepresented contexts would enhance the field's inclusivity, maturity, and practical relevance. Without such integration, there is a tangible risk of overlooking emerging practice-based innovations that are essential for redefining accounting in response to digital transformation, sustainability challenges, and demands for stakeholder participation.

6. Conclusion

This paper presents a bibliometric analysis aimed at tracing the evolution, convergence, and research gaps in the academic debate on Smart Accounting, POP Accounting, and Dialogic Accounting from 2010 to 2025. The study examined the progression of these paradigms, highlighting their conceptual intersections and revealing critical areas that remain underexplored, particularly with respect to normative, ethical, and geographical inclusivity. In response to RQ1, the findings confirm a consistent and significant increase in academic output, especially from 2019 onward, reflecting a broader scholarly orientation toward digital innovation and sustainability.

Smart Accounting has gained momentum through the integration of technologies such as artificial intelligence (AI), blockchain, and automation in financial processes (Desplebin et al., 2021; Awang et al., 2024). POP Accounting has evolved in parallel with stakeholder capitalism, advancing inclusive and accessible reporting mechanisms (Biancone et al., 2024). Dialogic Accounting, grounded in participatory governance, continues to stress the ethical and democratic dimensions of financial communication (Bellucci et al., 2019; Bessieux-Ollier et al., 2023). With regard to RQ2, keyword co-occurrence and thematic clustering demonstrate an increasing conceptual convergence. Smart Accounting prioritizes transparency and operational efficiency; POP Accounting is oriented toward social value and stakeholder responsiveness; Dialogic Accounting introduces a deliberative logic that supports accountability and inclusive engagement. Advanced tools such as sentiment analysis (Biancone et al., 2024) and life cycle assessment (Aureli, Foschi & Paletta, 2023) illustrate how technological and participatory approaches are being jointly applied in public sector financial reporting. In addressing RQ3, the analysis identifies significant gaps in the literature. Although international collaborations are well developed among countries such as China, Australia, Italy, and the United Kingdom, contributions from regions such as sub-Saharan Africa, South Asia, and Latin America remain underrepresented. This geographical imbalance limits the inclusion of culturally embedded and institutionally diverse perspectives on accounting innovation. Research from these regions is closely linked to development objectives, legitimacy, and public accountability. Such contexts have the potential to generate context-sensitive and participatory models (Fusco & Ricci, 2019; Abbas & Shahid, 2024). Moreover, the ethical and regulatory implications of accounting innovation remain insufficiently addressed in the literature, despite their growing importance in digital and sustainability-oriented transformations.

6.1 Theoretical and Practical Contributions

Theoretically, this study supports the emergence of a hybrid paradigm that integrates the core principles of Smart, POP, and Dialogic Accounting. This convergence is not only technical but also ethical and institutional, reflecting a broader transformation of accounting from a neutral reporting instrument into a vehicle for social legitimacy and stakeholder empowerment. By combining automation with participatory logic and sustainability objectives, hybrid models provide a framework for resilient, transparent, and democratically accountable financial practices across both public and private sectors (Vo Van et al., 2024; Biancone et al., 2024).

6.2 Limitations

Despite its contributions, the study presents some methodological limitations. The 2010–2025 period was chosen to capture recent developments, but it may have omitted significant contributions published prior to 2010, particularly in social accounting and participatory reporting. This exclusion may constrain understanding of the historical roots of the phenomenon. For instance, Brown and Jones (2015) demonstrate that the theoretical foundations of dialogic accounting had already been developed in the early 2000s. Another limitation concerns the declining average number of citations per article over time.

This phenomenon may be associated with the fragmentation of academic debate and the expansion of open-access and preprint platforms, which have altered traditional citation dynamics (Aminu Abdullahi & Abubakar, 2024).

7. Future Research Directions

Multiple future research directions emerge from this study. First, scholars should complement bibliometric mapping with qualitative methodologies such as case studies, interviews, and ethnography to gain deeper insight into how Smart, POP, and Dialogic Accounting models are implemented in specific socio-political and organizational contexts (Bessieux-Ollier et al., 2023). Second, greater emphasis should be placed on geographical inclusivity. Research from emerging economies, particularly in sub-Saharan Africa, South Asia, and Latin America, remains underrepresented. Comparative studies across institutional settings could illuminate how diverse cultural, regulatory, and developmental conditions shape the evolution of hybrid accounting models (Alessi et al., 2024; Abbas & Shahid, 2024). Third, future investigations should examine how emerging technologies such as artificial intelligence, blockchain, cloud computing, and machine learning can enhance stakeholder engagement, ESG reporting, and real-time accountability. These technologies create opportunities for designing integrated systems in which automation and participation operate in synergy. However, this integration must be informed by ethical frameworks that address privacy, algorithmic bias, accessibility, and the digital divide. Finally, future research should explicitly engage with the normative dimensions of accounting innovation. As accounting becomes increasingly data-driven and digitally mediated, it is essential to ask who benefits from such systems, whose voices are included, and what values they promote. A truly transformative accounting paradigm must integrate methodological plurality, technological innovation, and ethical reflection within a global and context-sensitive perspective.

References

- Abbas, N., & Shahid, M. S. (2024). Mapping the impact of green finance on corporate sustainability: A bibliometric analysis. *Audit and Accounting Review*, 4(1), 101–130. <https://doi.org/10.32350/aar.41.05>
- Alessi, L., Cojoianu, T., Hoepner, A. G., & Michelon, G. (2024). Accounting for the EU green taxonomy: Exploring its concept, data, and analytics. *Accounting Forum*, 48(3), 365–373. <https://doi.org/10.1080/01559982.2024.2369343>
- Al Najjar, M., Mahboub, R., Nakhal, B., & Gaber Ghanem, M. (2024). Exploring the role of AI in improving VAT reporting quality: Experimental study in emerging markets. *Journal of Risk & Financial Management*, 17(11), Article 477. <https://doi.org/10.3390/jrfm17110477>
- Aminu Abdullahi, A. A., & Abubakar, A. (2024). Bibliometric analysis of accounting literature on artificial intelligence adoption in organizational functions. *FUDMA Journal of Accounting and Finance Research*, 2(3), 153–171. <https://doi.org/10.33003/fujafr-2024.v2i3.126.153-171>
- Andrikopoulos, A., & Kriklandi, N. (2013). Environmental disclosure and financial characteristics of the firm: The case of Denmark. *Corporate Social Responsibility & Environmental Management*, 20(1), 55–64. <https://doi.org/10.1002/csr.1281>
- Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4), 959–975. <https://doi.org/10.1016/j.joi.2017.08.007>
- Arias-Oliva, M., Pelegrín-Borondo, J., & Matías-Clavero, G. (2019). Variables influencing cryptocurrency use: A technology acceptance model in Spain. *Frontiers in Psychology*, 10, Article 475. <https://doi.org/10.3389/fpsyg.2019.00475>
- Aureli, S., Foschi, E., & Paletta, A. (2023). Management accounting for a circular economy: Current limits and avenues for a dialogic approach. *Accounting, Auditing & Accountability Journal*. Advance online publication. <https://doi.org/10.1108/AAAJ-04-2022-5766>
- Awang, Y., Nasir, N. E. M., Taib, A., Shuhidan, S. M., & Ifada, L. M. (2024). Digitalization of the accounting profession: A decade of bibliometric analysis. *Advances in Social Sciences Research Journal*, 11(5), 103–120. <https://doi.org/10.14738/assrj.115.16814>
- Bellucci, M., Simoni, L., Acuti, D., & Manetti, G. (2019). Stakeholder engagement and dialogic accounting: Empirical evidence in sustainability reporting. *Accounting, Auditing & Accountability Journal*, 32(5), 1467–1499. <https://doi.org/10.1108/AAAJ-09-2017-3158>
- Bessieux-Ollier, C., Nègre, E., & Verdier, M.-A. (2023). Moving from accounting for people to accounting with people: A critical analysis of the literature and avenues for research. *European Accounting Review*, 32(5), 1247–1271. <https://doi.org/10.1080/09638180.2022.2052922>
- Biancone, P., Brescia, V., Chmet, F., & Lanzalonga, F. (2024). The evolution of integrated popular financial reporting: Toward a digital-driven collaborative approach using a sentiment-analysis tool. *EuroMed Journal of Business*. Advance online publication. <https://doi.org/10.1108/EMJB-11-2023-0298>

- Biancone, P. P., Secinaro, S., Brescia, V., & Calandra, D. (2024). Which direction for stakeholder capitalism? Approaches and reporting towards POP accounting. *Sustainable Development*, 32(6), 6579–6594. <https://doi.org/10.1002/sd.3052>
- Brown, R., & Jones, M. (2015). Mapping and exploring the topography of contemporary financial accounting research. *The British Accounting Review*, 47(3), 237–261. <https://doi.org/10.1016/j.bar.2014.08.006>
- De Villiers, C., Rinaldi, L., & Unerman, J. (2014). Integrated reporting: Insights, gaps and an agenda for future research. *Accounting, Auditing & Accountability Journal*, 27(7), 1042–1067. <https://doi.org/10.1108/AAAJ-06-2014-1736>
- Desplebin, O., Lux, G., & Petit, N. (2021). To be or not to be: Blockchain and the future of accounting and auditing. *Accounting Perspectives*, 20(4), 743–769. <https://doi.org/10.1111/1911-3838.12265>
- Fatzel, F. H. M., Abdullah, W. R. W., & Zamri, N. (2024). The impact of digital technologies on accounting research: A bibliometric analysis. In *Proceedings of the Conference on Accounting and Business (ICAB 2024)* (p. 459). [Conference paper].
- Fifka, M. S. (2013). Corporate responsibility reporting and its determinants in comparative perspective: A review of the empirical literature and a meta-analysis. *Business Strategy & the Environment*, 22(1), 1–35. <https://doi.org/10.1002/bse.729>
- Frías-Aceituno, J. V., Rodríguez-Ariza, L., & García-Sánchez, I. M. (2013). The role of the board in the dissemination of integrated corporate social reporting. *Corporate Social Responsibility & Environmental Management*, 20(4), 219–233. <https://doi.org/10.1002/csr.1294>
- Fusco, F., & Ricci, P. (2019). What is the stock of the situation? A bibliometric analysis on social and environmental accounting research in the public sector. *International Journal of Public Sector Management*, 32(1), 21–41. <https://doi.org/10.1108/IJPSM-05-2017-0134>
- Gallego-Álvarez, I., Segura, L., & Martínez-Ferrero, J. (2015). Carbon emission reduction: The impact on the financial and operational performance of international companies. *Journal of Cleaner Production*, 103, 149–159. <https://doi.org/10.1016/j.jclepro.2014.08.047>
- García-Sánchez, I.-M., Frías-Aceituno, J.-V., & Rodríguez-Domínguez, L. (2013). Determinants of corporate social disclosure in Spanish local governments. *Journal of Cleaner Production*, 39, 60–72. <https://doi.org/10.1016/j.jclepro.2012.08.037>
- Lehner, O. M., Ittonen, K., Silvola, H., Ström, E., & Wührleitner, A. (2022). Artificial intelligence-based decision-making in accounting and auditing: Ethical challenges and normative thinking. *Accounting, Auditing & Accountability Journal*, 35(9), 109–135. <https://doi.org/10.1108/AAAJ-09-2020-4934>
- Marrone, M., & Hazelton, J. (2019). The disruptive and transformative potential of new technologies for accounting, accountants and accountability: A review of current literature and call for further research. *Meditari Accountancy Research*, 27(5), 677–694. <https://doi.org/10.1108/MEDAR-06-2019-0508>
- Mavlutova, I., Spilbergs, A., Verdenhofs, A., Natrins, A., Arefjevs, I., & Volkova, T. (2023). Digital transformation as a driver of the financial sector's sustainable development: An impact on financial inclusion and operational efficiency. *Sustainability*, 15(1), Article 207. <https://doi.org/10.3390/su15010207>

- Morhardt, J. E. (2010). Corporate social responsibility and sustainability reporting on the Internet. *Business Strategy & the Environment*, 19(7), 436–452. <https://doi.org/10.1002/bse.657>
- Pellegrino, C., & Lodhia, S. (2012). Climate-change accounting and the Australian mining industry: Exploring the links between corporate disclosure and the generation of legitimacy. *Journal of Cleaner Production*, 36, 68–82. <https://doi.org/10.1016/j.jclepro.2012.02.022>
- Prado-Lorenzo, J.-M., & Garcia-Sanchez, I.-M. (2010). The role of the board of directors in disseminating relevant information on greenhouse gases. *Journal of Business Ethics*, 97(3), 391–424. <https://doi.org/10.1007/s10551-010-0515-0>
- Vo Van, H., Abu Afifa, M., & Saleh, I. (2024). Accounting information systems and organizational performance in the cloud-computing era: Evidence from SMEs. *Sustainability Accounting, Management & Policy Journal*. Advance online publication. <https://doi.org/10.1108/SAMPJ-01-2024-0044>
- Wang, Z., Hsieh, T.-S., & Sarkis, J. (2018). CSR performance and the readability of CSR reports: Too good to be true? *Corporate Social Responsibility & Environmental Management*, 25(1), 66–79. <https://doi.org/10.1002/csr.1440>
- Zupic, I., & Čater, T. (2015). Bibliometric methods in management and organization. *Organizational Research Methods*, 18(3), 429–472. <https://doi.org/10.1177/1094428114562629>