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MANAGEMENT CONTROL SYSTEMS IN ESG-BASED GOVERNANCE: MAPPING RESEARCH STREAMS AND FUTURE DIRECTIONS.

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Management Control Systems in ESG-Based Governance: Mapping Research Streams and Future Directions

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Abstract

This study maps existing research streams and future directions on Management Control Systems (MCS) and Environmental, Social, and Governance (ESG). Using a bibliometric approach, 319 Scopus-indexed journal articles were analyzed with VOSviewer. Bibliographic coupling and co-word analysis were employed to examine the knowledge structure, dominant themes, and research gaps within the MCS–ESG literature. The findings show that prior research predominantly emphasizes integrative frameworks and implementation strategies that position MCS as a mechanism for supporting ESG objectives, particularly through performance measurement, strategic decision-making, and accountability systems. Four major research clusters emerge, illustrating the evolving role of MCS in sustainability governance. The analysis also highlights promising avenues for future studies, including digital transformation, sustainability accounting innovation, and the strategic integration of MCS to enhance ESG performance across sectors. This study contributes by explicitly framing MCS as a governance mechanism rather than merely a reporting tool. It provides a conceptual roadmap for scholars and offers practical insights for managers, system designers, and policymakers seeking to align ESG objectives with control systems to advance sustainable development.

INTRODUCTION.

In the past decade, attention to governance practices based on *Environmental, Social, and Governance* (ESG) principles has significantly increased, driven by growing demands for transparency, accountability, and sustainability in the business world (Martínez-Falcó et al., 2025; Rehman et al., 2020). ESG is viewed as a strategic framework that not only influences environmental and social performance but also shapes stakeholder perceptions and the long-term sustainability of organizations (Scarpellini, Marín-Vinuesa, Aranda-Usón, et al., 2020). In line with this, *Management Control Systems* (MCS) play a strategic role in helping organizations balance financial objectives with social and environmental sustainability (Gond et al., 2012; Wijethilake & Lama, 2019b). MCS enables the integration of sustainability strategies into decision-making, performance measurement, and reporting processes, allowing organizations to respond more effectively to market, regulatory, and social pressures (Arjaliès & Mundy, 2013; Gunarathne & Lee, 2021). Despite the rapid growth of literature on MCS and ESG, there remains fragmentation in understanding how these two concepts are globally

integrated (Günther et al., 2016; Schaltegger & Wagner, 2006). Some studies focus on environmental performance measurement, while others emphasize CSR strategies; however, research that comprehensively combines the ESG dimensions within the MCS framework remains limited. Therefore, a systematic approach is needed to map research trends, development directions, and research gaps in this field (Asiaei, Bontis, Barani, et al., 2022; Ferretti et al., 2024).

The urgency of conducting a bibliometric study in the context of the relationship between *Management Control Systems* (MCS) and *Environmental, Social, and Governance* (ESG) stems from the need to synthesize the dispersed body of knowledge across various disciplines (Arjaliès & Mundy, 2013; George et al., 2016) and to identify both theoretical and practical contributions with significant influence (Günther et al., 2016; Schaltegger & Wagner, 2012). A bibliometric approach provides a systematic framework for researchers to (1) map patterns of scientific collaboration among authors, institutions, and countries (Scarpellini, Marín-Vinuesa, Portillo-Tarragona, et al., 2020; Wijethilake & Lama, 2019b), (2) identify major research clusters and sub-themes forming research fronts (Henri & Journeault, 2010), and (3) evaluate conceptual linkages between MCS and ESG within the sustainability governance framework (Ferretti et al., 2024). Through this mapping, the study not only addresses the role of MCS in supporting the achievement of ESG goals (Orlitzky et al., 2003) but also generates an intellectual map that serves as a strategic foundation for developing future research agendas, including the exploration of existing research gaps. Specifically, this study aims to:

1. Investigate the current knowledge structure of MCS and ESG-based governance through *bibliographic coupling analysis*.
2. Predict future research directions on MCS and ESG-based governance through *co-word analysis*.

This paper is structured as follows. The first section presents the background and research urgency. The second section explains the bibliometric methodology employed, including *bibliographic coupling* and *co-word analysis*. The third section presents the main findings, including visualized maps of research clusters, sub-themes, and conceptual interrelationships. The fourth section discusses theoretical, practical, and methodological implications, as well as the identified research gaps. Finally, the fifth section provides conclusions, limitations, and recommendations for future research. Despite the rapid growth of ESG-related bibliometric studies, existing research largely treats ESG as a reporting, disclosure, or performance outcome, while paying limited attention to the internal governance mechanisms that enable ESG integration within organizations. In particular, the strategic and operational roles of Management Control Systems (MCS) in ESG-based governance remain underexplored and insufficiently mapped. Prior bibliometric studies tend to focus on sustainability reporting, CSR disclosure, or ESG performance indicators, without systematically examining how control mechanisms such as budgeting, performance measurement, internal controls, and environmental management accounting support or constrain ESG implementation.

Addressing this gap, this study contributes to the literature by offering one of the first comprehensive bibliometric mappings that explicitly integrates Management Control Systems within the ESG governance framework. By identifying dominant and peripheral research clusters, this study advances theoretical understanding of how MCS mediates tensions between control and flexibility, legitimacy and performance, and accountability and innovation in ESG governance. The findings not only extend prior ESG bibliometric research but also provide a conceptual roadmap for future studies on sustainability-oriented management control systems.

LITERATURE REVIEW

Theoretical Positioning of Management Control Systems in ESG-Based Governance

Management Control Systems (MCS) occupy a central position in corporate governance by translating strategic objectives into operational practices through planning, performance measurement, monitoring, and incentive mechanisms. From a corporate governance perspective, MCS function as internal governance tools that align managerial behavior with organizational objectives, including environmental, social, and governance (ESG) commitments. By embedding ESG targets into budgeting systems, key performance indicators, and evaluation processes, MCS ensure that sustainability objectives are not symbolic but operationally enforced.

From the perspective of legitimacy theory, ESG disclosure alone is insufficient to sustain organizational legitimacy if it is not supported by credible internal control mechanisms. MCS enhance legitimacy by ensuring consistency between disclosed ESG commitments and actual organizational practices, thereby reducing the risk of symbolic adoption or greenwashing. Control mechanisms such as environmental management accounting, sustainability performance measurement, and internal audits strengthen the credibility of ESG initiatives by providing verifiable and comparable data.

Stakeholder theory further emphasizes the role of MCS as a mechanism for balancing competing stakeholder demands. ESG governance requires organizations to reconcile financial performance with environmental protection and social responsibility. MCS facilitate this balancing process by integrating multiple performance dimensions into decision-making and control systems. Rather than constraining managerial discretion, sustainability-oriented MCS can enable strategic flexibility and innovation by guiding resource allocation toward long-term value creation.

In this context, ESG should not be understood merely as an external reporting framework, but as a governance logic that requires internal control infrastructures to be effective. This theoretical positioning provides a foundation for interpreting the bibliometric clusters identified in this study, allowing the clusters to be understood not only as thematic groupings but also as reflections of deeper theoretical tensions and governance roles of MCS in ESG integration.

RESEARCH METHOD

Bibliometric approach

The bibliometric approach was chosen to synthesize fragmented knowledge and identify dominant theories and research trends within MCS and ESG-based governance. Unlike traditional literature reviews, bibliometrics provides objective, data-driven mapping of research patterns, collaboration networks, and conceptual evolution. Using bibliographic coupling and co-word analysis, this study identifies major clusters, emerging themes, and research gaps. VOSviewer serves as the main analytical tool due to its strong visualization capabilities and compatibility with large datasets, ensuring comprehensive and reliable mapping of the field.

1. Bibliographic Coupling

Bibliographic coupling measures how closely related two studies are based on shared references. It helps identify groups of research with similar theoretical foundations even when topics or publication years differ. In this study, it is used to map intellectual connections among publications on MCS and ESG, forming clusters that reveal common conceptual underpinnings across different research streams.

2. Co-word Analysis

Co-word analysis examines the frequency of keyword co-occurrences to uncover conceptual relationships and thematic structures in the field. It identifies dominant research

themes, conceptual linkages, and potential research gaps in MCS–ESG integration. This technique allows for the detection of emerging topics and helps predict future research directions.

Use of VOSviewer

VOSviewer is employed for visualizing bibliometric networks such as bibliographic coupling and co-word analysis. Its efficiency in handling large datasets, user-friendly interface, and strong visualization make it ideal for mapping intellectual and conceptual structures in MCS–ESG research. It ensures the analysis adheres to best practices in bibliometric methodology.

Searching Strategy and Data Collection Procedure

Data collection was conducted in August 2025 using the Scopus database, which contains over 100 million indexed documents across diverse disciplines. To ensure comprehensive coverage, the study used a systematic search strategy involving synonyms, term variations, truncations, and wildcards, focusing on titles, abstracts, and keywords. The main search terms “MCS and ESG” were expanded through related concepts, resulting in a refined dataset used for bibliographic coupling and co-word analyses to identify research patterns and thematic structures.

MCS: ("management control system*" OR "internal control*" OR "performance management system*" OR "management accounting" OR "managerial control*" OR "organizational control*" OR "accounting control*" OR "strategic control*" OR "budget* control*" OR "risk management control*" OR "control practice*" OR "corporate control*") ESG: (ESG OR "environmental social governance" OR sustainab* OR "corporate sustainab*" OR "sustainab* governance" OR "CSR" OR "corporate social responsibility" OR "responsible governance" OR "ethical governance" OR "green governance" OR "triple bottom line" OR "integrated reporting")

To ensure replicability and methodological transparency, this study explicitly documents the database selection, search strings, inclusion and exclusion criteria, and threshold determination procedures. The complete search query was applied to titles, abstracts, and keywords within the Scopus database, and the data screening process followed a systematic and reproducible sequence. While the use of a single database may introduce potential coverage bias, Scopus was selected due to its broad multidisciplinary scope, standardized indexing, and frequent use in high-quality bibliometric studies. Future research may replicate this study using alternative databases or combined datasets to validate and extend the findings.

RESULTS

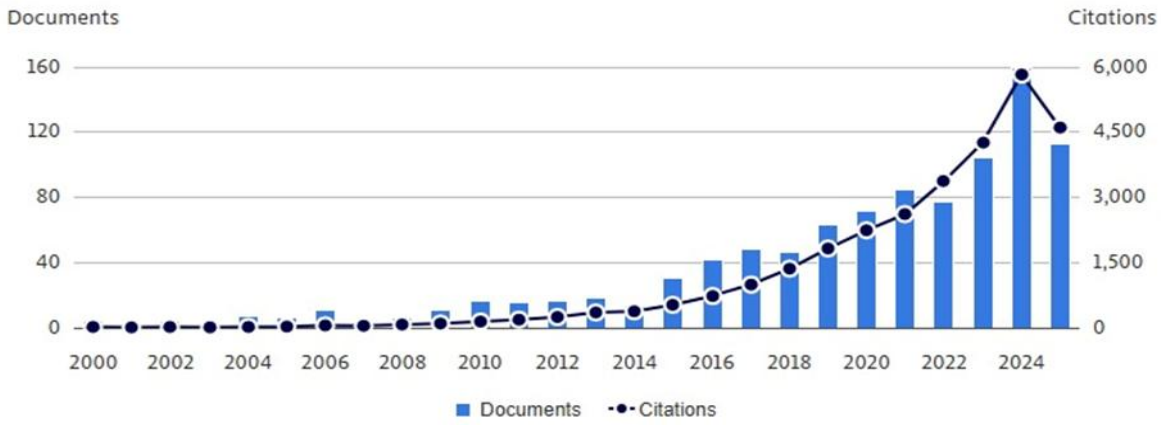
Descriptive Analysis

Based on the Scopus database search results, 983 documents were found related to *Management Control Systems* (MCS) and ESG-based governance, with a total of 30,350 citations. The average number of citations per document was 35.90, and the H-index was recorded at 86.

Figure 1 presents the trend in the number of publications and citations from 2000 to July 31, 2025. The graph reflects a consistent increase in academic interest toward MCS–ESG integration, marked by steady annual growth in both publications and citations, indicating strong potential for future research development.

Similar bibliometric approaches in ESG-related research show parallel trends. For example, Souza et al. (2024) reported a nearly 40% annual growth in ESG publications since 2013, analyzing over 699 articles using bibliometric techniques such as *bibliographic coupling* and *citation analysis*. Meanwhile, Mishra & Pandey (2025) explored the global evolution of ESG research through bibliometrics, analyzing over 14,000 articles from 2015 to March 2025, and found an exponential growth trend in publications, particularly during 2023–2024.

This study did not limit the publication period analyzed, aiming to provide a comprehensive overview of MCS and ESG literature indexed in Scopus. This approach allows



for tracing both the historical development and future trends of the field, particularly in the integration of *decision-support systems* (MCS) toward ESG-based sustainable governance—thereby enriching the depth and academic relevance of this research.

Figure 1.
Number of publications and citations on MCS and ESG in the WoS database accessed on July 31, 2025

Bibliographic Coupling

During the analysis of 368 primary documents using bibliographic coupling, 51 papers were found to have at least 18 citations. Setting an appropriate threshold level is crucial to accurately map the scientific landscape. A threshold that is too high may overlook relevant clusters, whereas one that is too low can result in redundant themes and clusters (Geng et al., 2020).

Since no specific guideline exists in the literature, the threshold was determined through an iterative process, considering various citation levels (15, 16, 17, 18, 19, and 20) to produce coherent document clusters. A citation level of 18 was selected to ensure a sufficient number of documents in each cluster while maintaining strong underlying themes. Moreover, this level allows for clear distinctions among research clusters, contributing to the interpretability and representativeness of the scientific network map.

Bibliographic coupling is a method for analyzing the similarity of references among publications that share citations. The Total Link Strength (TLS) serves as the main focus of the analysis (Zupic & Čater, 2014). TLS is calculated by summing the strength of a document's links with other documents in the dataset, indicating its level of importance within the research network. Based on the results, the top three documents ranked by TLS are Günther et al. (2016) with 250 TLS, Lueg & Radlach (2016) with 220 TLS, and Gond et al. (2012) with 202 TLS. Table 1 presents the top ten documents from the bibliometric analysis, ranked according to their TLS values.

The visualization of the bibliographic coupling network using VOSviewer is shown in Figure 2, displaying four distinct clusters that operate independently of one another, represented in red, green, blue, and yellow. The following discussion elaborates on recent trends in research related to Management Control Systems (MCS) and Environmental, Social, and Governance (ESG)-based governance, with cluster labeling based on inductive interpretation. This interpretation was carried out by reviewing representative articles within each cluster and synthesizing them according to common themes and identified research streams. Table 2

summarizes the results of the bibliographic coupling analysis, including the cluster number and color, label, number of publications, and representative studies.

Tabel 1.
Top 10 Documents in Bibliographic Coupling Analysis

Ranking	Publication	No. of Citation	Total link strength
1	Günther et al., (2016). Environmental management control systems: a conceptualization and a review of the empirical evidence.	152	250
2	Lueg & Radlach, (2016). Managing sustainable development with management control systems: A literature review.	171	220
3	Gond et al., (2012). Configuring management control systems: Theorizing the integration of strategy and sustainability	418	202
4	Maas et al., (2016). Integrating corporate sustainability assessment, management accounting, control, and reporting	268	191
5	George et al., (2016). Barriers to and enablers of sustainability integration in the performance management systems of an oil and gas company.	122	153
6	Henri & Journeault, (2010). Eco-control: The influence of management control systems on environmental and economic performance.	422	108
7	Berry et al., (2009). Emerging themes in management control: A review of recent literature.	298	90
8	Durden, (2008). Towards a socially responsible management control system	148	90
9	Gunarathne et al., (2016). Fostering social sustainability management through safety controls and accounting:	145	85
10	Asiaei, Bontis, Alizadeh, et al., (2022). Green intellectual capital and environmental management accounting: Natural resource orchestration in favor of environmental performance.	175	77

Note: Sorted based on TLS

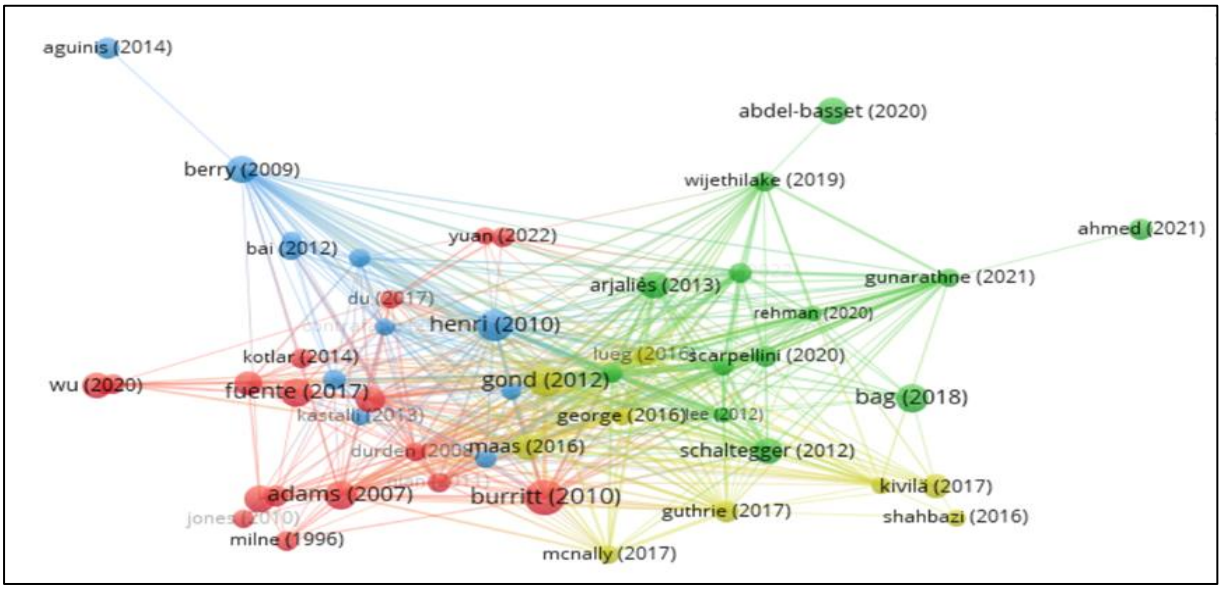


Figure 2.

Bibliographic coupling of MCS and ESG

Table 2.
Bibliographic Coupling Analysis on MCS And ESG

Cluster No. and Color	Cluster Label	Number of Publications	Representative Publications
1 (Red)	*"Integration of Management Control Systems and Sustainability Reporting: Navigating ESG, Legitimacy, and Accountability in Organizational Strategy"*	18	Adams (2007), Durden (2008), Burritt & Schaltegger (2010), Schaltegger (2018), Pizzetti (2021), Adams (2007).
2 (Green)	*"Transformation of Management Control Systems through ESG and Sustainability Innovation: The Role of Digitalization, Environmental Accounting, and Performance Measurement Mechanisms"*	13	Arjaliès & Mundy (2013), Schaltegger & Csutora (2012a), Günther et al. (2016), Wijethilake & Lama (2019b), Abdel-Basset & Mohamed (2020).
3 (Blue)	*"The Role of Environmental Management Accounting and Management Control Systems in Driving Innovation, Accountability, and Sustainability Performance"*	11	Bartolomeo et al. (2000), Burritt & Saka (2006), Henri & Journeault (2010), Contrafatto & Burns (2013), Burritt et al. (2019).
4 (Yellow)	*"Integration of Management Control Systems and Sustainability Reporting: From Performance Measurement to Strategic Accountability"*	9	Gond et al. (2012), Lueg & Radlach (2016), Maas et al. (2016b), Kivilä et al. (2017).

Cluster 1 (Red): Integrating MCS and Sustainability Reporting

This cluster explores how Management Control Systems (MCS) integrate with sustainability reporting to manage ESG dimensions, enhance legitimacy, and strengthen accountability. Studies emphasize MCS as not only control tools but also strategic mechanisms embedding sustainability into decisions and culture. The cluster highlights the importance of transparency, stakeholder trust, and avoiding greenwashing, positioning MCS as a bridge between business strategy and sustainability.

Cluster 2 (Green): ESG, Digitalization, and MCS Transformation

Cluster 2 focuses on the transformation of MCS driven by ESG requirements, sustainability innovation, and digitalization. Research shows that integrating ESG into MCS requires balancing control and flexibility, supported by environmental accounting and digital tools for real-time performance tracking. This integration enhances data-driven decision-making, accountability, and sustainable competitiveness, making MCS more adaptive and innovation-oriented.

Cluster 3 (Blue): Environmental Management Accounting and Sustainability Performance

This cluster highlights the role of Environmental Management Accounting (EMA) and MCS as catalysts for innovation, accountability, and improved sustainability performance. EMA provides environmental data for decision-making, while its integration with MCS strengthens transparency and target achievement. Together, EMA and MCS foster organizational transformation toward innovative, responsible, and sustainable business practices.

Cluster 4 (Yellow): MCS, Sustainability Reporting, and Strategic Accountability

Cluster 4 examines how MCS link sustainability reporting with strategic performance measurement and accountability. Studies underline that sustainability reports serve not only as communication tools but also as internal control instruments. The cluster emphasizes that data quality, indicator relevance, and strategic alignment determine the effectiveness of MCS in achieving ESG and long-term sustainability objectives.

Co-Word Analysis

The co-word analysis was conducted using the same database to identify the most frequently used keywords in the literature. Similar to bibliographic coupling, Geng et al. (2020) suggest that selecting an appropriate threshold is essential to avoid forming too many irrelevant clusters, which can obscure the analysis, or too few clusters, which may overlook emerging themes.

This analysis tested several threshold values ranging from 6 to 12 keyword occurrences to produce the most coherent thematic network. Of the 2,052 keywords identified, 58 met the threshold of eight occurrences and were grouped into four clusters. The selection of this threshold was based on multiple trials to optimize cluster clarity and significance.

A threshold of eight occurrences was chosen because it produced the most substantial clusters, highlighting the main research areas while maintaining the clarity of the network map. Moreover, this threshold captured the most relevant and impactful keywords without overemphasizing less significant terms.

The fifteen most frequently used keywords are listed in Table 3, including *"sustainable development"* (218 occurrences), *"budget control"* (217 occurrences), *"sustainability"* (135 occurrences), and *"CSR"* (85 occurrences).

Figure 3 presents the network structure resulting from the co-word analysis, showing four distinct clusters representing diverse themes. Each cluster was labeled inductively based on interpretative analysis of its dominant keywords.

Table 3.
Top 15 Keywords in The Co-Occurrence of Keywords Analysis.

Rank	Keyword	Occurrences	Total link strength
1	sustainable development	218	701
2	budget control	217	676
3	sustainability	135	305
4	corporate social responsibility	85	119
5	decision making	69	249
6	management accounting	66	90
7	environmental management accounting	59	112
8	management control systems	58	85
9	environmental management	52	194
10	internal control	51	69
11	economic and social effects	36	170
12	environmental impact	34	162
13	corporate governance	33	43
14	investments	33	129
15	climate change	32	113

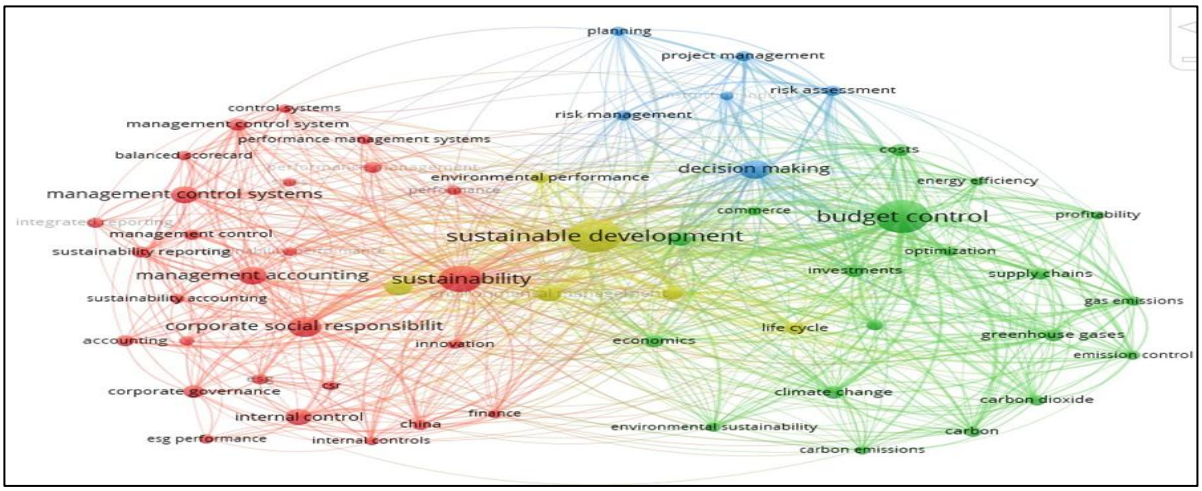


Figure 3.
Co-word analysis on MCS and ESG

The summary of the co-word analysis is presented in Table 4, which includes the number and color of clusters, cluster labels, the number of keywords, and representative keywords.

Table 4.
Summary of co-word analysis on MCS and ESG

Cluster No and color	Cluster label	No. of keyword	Representative Keywords
1 (red)	"Integrasi Sistem Pengendalian Manajemen, Tata Kelola Perusahaan, dan ESG untuk Meningkatkan Kinerja dan Akuntabilitas Keberlanjutan"	27	management control systems, performance management, internal controls, management accounting, balanced scorecard, corporate governance, ESG, ESG performance, corporate social responsibility, corporate sustainability, integrated reporting, sustainability reporting, sustainability accounting, sustainability performance, innovation.
2 (green)	"Management Control and Optimization for Carbon Reduction and Sustainable Supply Chains"	19	carbon emissions, greenhouse gases, climate change, emission control, energy efficiency, environmental sustainability, optimization, supply chains, costs, profitability, investments, developing countries.
3 (blue)	"Risk Management and Strategic Decision-Making in Construction Project Planning"	6	Construction industry, Project management, Planning, Decision making, Risk assessment, Risk management.
4 (Yellow)	"Environmental Management Accounting and Performance for Sustainable Development"	6	Environmental management, Environmental management accounting, Environmental performance, Environmental impact, Life cycle assessment

Cluster 1 (Red): Management Control Systems as the Foundation of ESG-Based Corporate Governance

Cluster 1 focuses on how Management Control Systems (MCS) function as the foundation for implementing ESG-based corporate governance. Core themes include *internal control*, *corporate governance*, and *ESG performance*, emphasizing MCS as a mechanism for ensuring compliance, transparency, and accountability in sustainability strategy. This cluster highlights that MCS is evolving beyond financial monitoring toward enabling integrated reporting, sustainability alignment, and stakeholder legitimacy. It demonstrates that strong control systems can embed ESG principles into daily operations and decision-making, enhancing both organizational performance and public trust.

Conclusion: Cluster 1 reflects the shift from traditional control toward holistic governance systems that combine financial and ESG dimensions to drive long-term value creation.

Cluster 2 (Green): Management Control and Optimization for Carbon Reduction and Sustainable Supply Chains

Cluster 2 explores how MCS and optimization techniques are used to reduce carbon emissions and support sustainable supply chain management. The main themes—such as *carbon emissions*, *energy efficiency*, and *climate change*—illustrate how MCS aligns operational efficiency with environmental responsibility.

The literature emphasizes balancing environmental goals, cost control, and profitability, particularly in developing countries, where resource constraints demand innovative sustainability solutions.

Conclusion: Cluster 2 positions MCS as a strategic enabler of low-carbon operations and sustainable value chains, integrating financial efficiency with environmental stewardship.

Cluster 3 (Blue): Risk Management and Strategic Decision-Making in Construction Project Planning

Cluster 3 centers on the intersection of risk management, strategic decision-making, and project planning within the construction sector. Research underscores how early-stage risk identification, assessment, and mitigation contribute to project success in cost, time, and quality dimensions.

A proactive and quantitative approach to risk management enhances planning reliability and stakeholder confidence, positioning it as both a control mechanism and a strategic capability.

Conclusion: Cluster 3 demonstrates that integrating **risk management into strategic planning** strengthens project sustainability and organizational resilience.

Cluster 4 (Yellow): Environmental Management Accounting and Performance for Sustainable Development

Cluster 4 examines the link between Environmental Management Accounting (EMA) and environmental performance as drivers of sustainable development. EMA serves as a decision-support tool for tracking environmental impacts and optimizing resource allocation. By integrating life cycle assessment and environmental performance indicators, organizations improve transparency, regulatory compliance, and sustainability reputation. Conclusion: Cluster 4 confirms EMA's role as a strategic accounting framework that connects environmental performance measurement with sustainable development objectives.

The findings demonstrate that Management Control Systems (MCS) have evolved beyond their traditional role as internal control mechanisms to become strategic tools that integrate Environmental, Social, and Governance (ESG) principles, corporate governance, and sustainability accounting. Cluster analysis shows distinct theoretical contributions: Cluster 1

links MCS with legitimacy, accountability, and integrated reporting; Cluster 2 connects MCS transformation with digitalization, ESG performance measurement, and supply chain optimization; Cluster 3 highlights the role of Environmental Management Accounting (EMA) and risk management in fostering innovation and strategic decision-making; while Cluster 4 focuses on environmental performance measurement and life cycle assessment as integral elements of sustainability strategy. Collectively, these findings enrich the theoretical foundation of MCS by framing it as a cross-disciplinary mechanism that drives innovation, strengthens organizational legitimacy, and enhances long-term sustainability performance.

From a practical perspective, this study provides valuable insights for managers, regulators, and stakeholders on how to optimize the role of MCS as a strategic instrument for integrating ESG principles within sustainable governance frameworks. The findings suggest that organizations can use MCS to improve the quality of sustainability reporting, strengthen accountability, manage risks, and enhance environmental performance through the application of Environmental Management Accounting. Furthermore, integrating MCS with ESG enables firms to align business strategies with increasingly stringent market and regulatory expectations while fostering innovation, operational efficiency, and competitive advantage in the sustainability era.

Despite its contributions, this study has several limitations. First, the bibliometric analysis relies on selected databases, which may exclude relevant but unindexed publications. Second, the interpretation of clusters derived from bibliographic coupling and co-word analysis may involve a degree of researcher subjectivity. Third, the focus on MCS, ESG, and sustainable governance does not empirically explore causal relationships within organizational performance contexts. To address these limitations, future research should expand database coverage, include grey literature, and employ mixed-method approaches to empirically examine the role of MCS in ESG integration. Moreover, cross-industry and cross-country analyses are recommended to provide deeper insights into variations in implementation and their impacts on accountability, innovation, and sustainability performance.

CONCLUSION

This study maps the scientific landscape of *Management Control Systems (MCS)*, ESG-based governance, and sustainability performance through bibliometric analysis using bibliographic coupling and co-word analysis. The findings reveal four main clusters, reflecting strategic themes ranging from MCS integration with sustainability reporting, transformation through digitalization and innovation, to risk management, environmental accounting, and sustainability performance management. These findings underscore the central role of MCS in promoting accountability, legitimacy, and ESG goal achievement, while highlighting the need for cross-disciplinary and cross-industry approaches to optimize its strategic impact on organizational sustainability.

From a managerial and regulatory perspective, the findings suggest that Management Control Systems can be leveraged to operationalize ESG governance through concrete mechanisms. Managers may design ESG-based key performance indicators (KPIs) within MCS to monitor environmental efficiency, social impact, and governance quality. Furthermore, MCS can serve as an internal safeguard against greenwashing by linking ESG disclosures to verifiable performance data and internal audits. ESG objectives can also be embedded into budgeting and performance evaluation processes, ensuring that sustainability considerations influence strategic decision-making rather than remaining symbolic commitments. For regulators and policymakers, the results highlight the importance of encouraging firms to develop sustainability-oriented control systems as part of ESG governance frameworks.

Overall, this study contributes to the sustainability governance literature by repositioning Management Control Systems as a core enabling mechanism for ESG integration,

rather than a passive reporting infrastructure.

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