

## Unveiling the Landscape of Sustainability and Earnings Management: A Bibliometric Analysis of Scholarly Research

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**Abstract:** Sustainability practices and reporting provide the necessary information regarding firms' initiatives to balance their ethical and moral behavior in conducting business to align with stakeholders' requirements, and the existence of earnings management could threaten the objectives. These two intertwined concepts need to be understood thoroughly. Notwithstanding the plethora of studies examining the intersection of sustainability and EM, a notable gap exists in exploring research frontiers and the resourcefulness derived from past publications in this domain. Thus, the study aims to perform a bibliometric analysis of documents within this domain and fill the gap that specifically reflects in exploring the research frontiers and resourcefulness from past studies of sustainability and EM. The study conducted a bibliometric analysis of the 282 documents on the Scopus database for the period of 2005 to 2022 for sustainability and EM topics. Advanced tools such as Microsoft Excel to analyze the data, VosViewer, Wordshift, Harzing Publish and Perish for visualization and metric analysis have been used. The results reveal an increasing trend in scholarly interest in this topic. It also elucidates the evolution of language, influential authors, institutions, countries (with the top 3 countries being South Korea, China, and Indonesia), and keyword clusters. The analysis conveys insightful information for future researchers exploring the dynamic landscape of this topic. In conclusion, the study of sustainability and EM is experiencing a growing trajectory from researchers. It is recommended that future studies consider other keywords and use another database.

**Keywords:** *Bibliometric analysis, sustainability, CSR, ESG, earnings management*

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### 1. Introduction

Sustainability practices encompass the deliberate disclosure undertaken by organizations, wherein they publicly communicate their performance in environmental, social, and governance (ESG) domains, corporate social responsibility (CSR), or any conscientious and socially responsible initiatives integrated into their business operations. Sustainability practices reflect the firm's initiative to ethically and morally conduct the business while taking care of the various stakeholders' considerations. Implementing sustainability practices entails strategic endeavors to mitigate environmental impact, foster stakeholder relationships, and refine corporate governance methodologies. The overarching goal of sustainability practices is to provide transparency and accountability in organizations' actions, enabling investors, customers, and other stakeholders to make well-informed decisions regarding their support and engagement in business endeavors. The ascendancy of sustainability is not a recent occurrence in the fields of research, academia, and business. Sustainability is delineated as a type of development that involves meeting the immediate needs of the current generation while protecting future generations' needs (1987) has emerged as a pivotal global priority.

Concurrently, many studies have been performed on sustainability to elucidate an in-depth understanding of sustainability practices. Some investigations delve into the relationship between sustainability and firm performance (Bofinger et al., 2022; Gregory, 2022; Wong et al., 2021), while others inquire into the inherent competitive advantages of sustainability (Mohammad & Wasiuzzaman, 2021), with certain research concentrating on identifying the factors that influence sustainability practices (Hasan et al., 2022; Kuzey & Uyar, 2017). It is undeniable that adopting sustainability practices yields manifold benefits to firms, as demonstrated by previous scholarly investigations. Nevertheless, implementing sustainability, coupled with significant costs, has sparked concerns regarding the potential entanglement with EM practices within sustainable firms. Scholars posit that certain firms engaging in sustainability practices may manipulate their earnings to offset the substantial costs associated with sustainability. This deliberate adjustment of earnings is

seen as a means for these firms to secure their self-interest and provide a veneer for potentially opportunistic behavior (Ehsan et al., 2020; Nguyen, 2022).

Notwithstanding the plethora of studies examining the intersection of sustainability and EM, a notable gap exists in exploring research frontiers and the resourcefulness derived from past publications in this domain. Consequently, this study is driven by the motivation to undertake a bibliometric analysis of documents that specifically address the dimensions of sustainability and EM, framing its investigation through the lens of seven distinct research questions as follows:

RQ1: What is the current landscape of publications concerning sustainability and EM?

RQ2: Which languages are prominently used, and what are the prevalent categories of subjects in studies about sustainability and EM?

RQ3: What is the most active source title contributing to the sustainability and EM field?

RQ4: What are the frequently used keywords and their evolution and clustering themes in sustainability and EM research?

RQ5: Which countries and institutions published the highest level of publication output in sustainability and EM?

RQ6: Who are the prolific authors and what is the impact on the research domain?

To adequately answer the research questions, the study employed analysis within the Scopus database to delineate the comprehensive wealth of scholarly information, except for data for 2023.

Upon completion of the study, three significant contributions to the body of knowledge are expected to be conveyed. Primarily, bibliometric analysis helps researchers identify the future directions of sustainability and EM and the research gaps that researchers can later exploit. Future scholars may regard this study as a foundation for expanding their comprehension and awareness of the development and manifestation of sustainability and EM. Next, VOSviewer provides text mining capabilities that are useful in creating and presenting co-occurrence networks comprising crucial terminologies extracted from a collection of scholarly works, thus enabling assistance for future research in looking at the keywords being used. It will be of great relevance to researchers to enlighten them and uncover more issues regarding the study of sustainability and EM that is still underutilized. Finally, the use of Harzing Publish or Perish software facilitates the evaluation of the impact of research on sustainability, and EM could impart noteworthy information for future research. Hence, synthesizing the evolution of sustainability-EM research with the key authors, co-occurrence, and even the results of the most productive countries can contribute to assisting future scholars with a comprehensive roadmap for future empirical studies.

The remainder of the paper is structured as follows. The following section discusses relevant previous studies related to sustainability and earnings management (EM). Next, an explanation of the bibliometric analysis methodology follows. Then, later sections will present and discuss the results from the analysis and discussion, followed by the study's conclusion and limitations.

## 2. Literature Review

The significance of sustainability has escalated, as it serves as a pivotal factor in striking a balance between the progress of advancing nations and safeguarding the interests of diverse stakeholders, thereby establishing a middle ground. It encompasses a comprehensive outlook regarding the harmonization of diverse stakeholders' respective needs and wants, grounded in the interconnectivity of people, plants, and profit (Adams & Abhayawansa, 2022). The introduction of sustainability in the Brundtland Report has led to the birth of broad definitions of sustainability, such as CSR, ESG, corporate sustainability, sustainability practices, and sustainability development (Brundtland, 1987). As suggested by Martínez-Ferrero et al. (2016) Sustainability involves businesses engaging in transactions while considering environmental, social, and economic factors, with the primary goal being to protect a company's assets and the interests of society. Accordingly, Imoniana et al. (2018) Define sustainability as the practice of appropriately handling business transactions with due diligence to economic, environmental, and social aspects to meet the objective of safeguarding assets and promoting the interests of society as a whole.

According to Bae et al. (2020) Management must invest in sustainability to maintain a good corporate image. Nevertheless, at the same time, management is prone to pursue its self-interest. A company's sustainability plays a crucial role in gaining support from stakeholders, while adopting EM can harm a company's long-term sustainability as it focuses on short-term tactics (Ehsan et al., 2021). Extensive academic research indicates that EM negatively impacts shareholders and has serious consequences for other stakeholders, as demonstrated by the Enron, WorldCom and Lehman Brothers scandals. This unethical behavior led to significant losses, including employee terminations, losses in employee pension funds, and reduced tax revenue (Hickman et al., 2021; Muliati et al., 2021). Sustainability practice that focuses on delivering value to a wide range of stakeholders has been applauded for its above-average benefit. It delivers both financial and non-financial data that are valuable to the stakeholders.

On the contrary, EM practices that deliberately disseminate inaccurate information about a company's economic performance to users of financial reports have hampered the goal of the sustainability principle. These opposing viewpoints have resulted in investigations of whether ethical companies engage in EM. Supporters of socially responsible firms argue that companies that value financial transparency and reliability will refrain from altering their accounting figures (Ehsan et al., 2021). In contrast, the opposing perspective suggests that companies prioritizing sustainability are more likely to manipulate their income to gain a competitive advantage with external investors and stakeholders (Dimitropoulos, 2020).

While there has been extensive research on sustainability and EM separately, the relationship between these two areas has been largely overlooked, leaving the notion that sustainability and EM are interconnected, as both are included in the stakeholder communication strategy (Kumar et al., 2023).

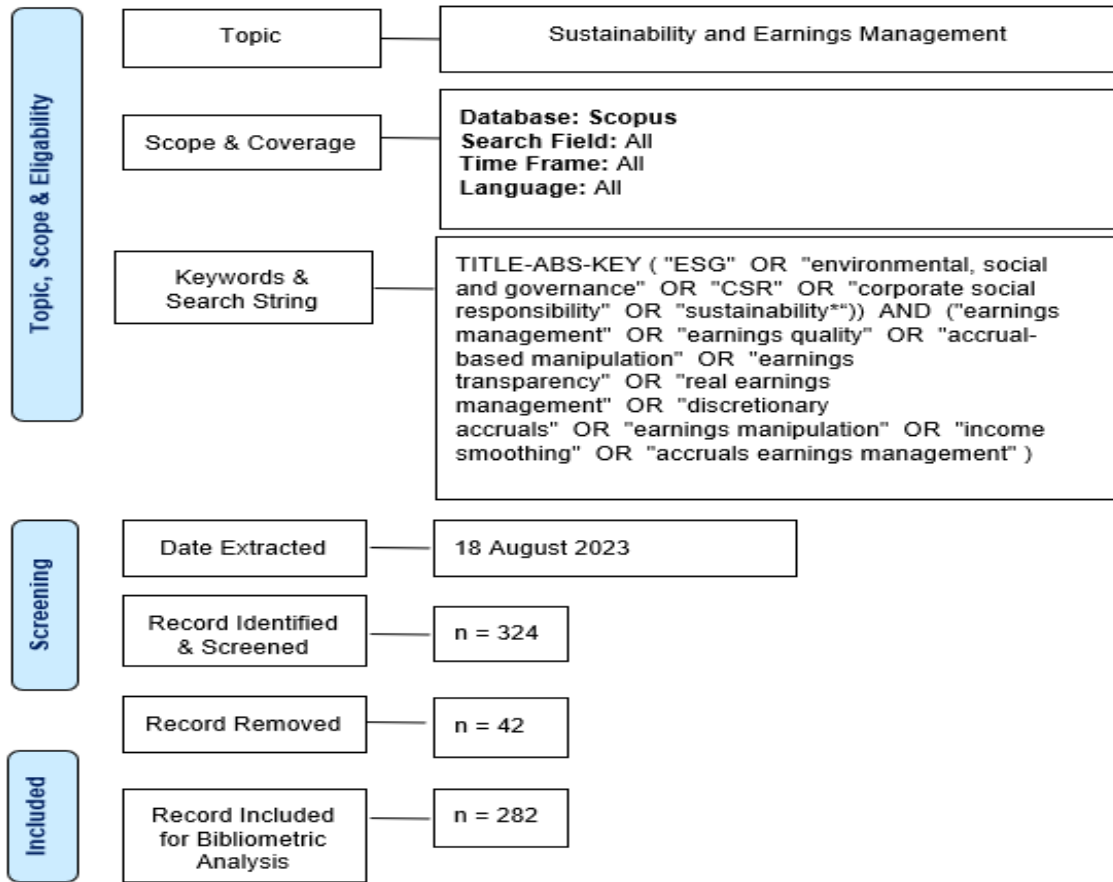
### 3. Method, Data and Analysis

Bibliometric analysis is a statistical examination of written publications, including books, articles, conference proceedings, and book reviews. This method employs computer-assisted techniques involving quantitative methods to analyze patterns of publication, citation, and usage. (Donthu et al., 2021; Lim & Kumar, 2023). Its purpose is to identify key research contributions and authors, trends, and analysis, as well as their interconnections, and provide valuable insights into the field of study. The bibliometric analysis has been getting attention recently due to its ability to uncover research trends in particular areas of interest and reveal detailed information (Ahmi & Mohd Nasir, 2019).

Accordingly, the present study employed bibliometric analysis using VOSViewer (vosviewer.com), Wordsift, and Harzing's Publish or Perish to answer the research questions. VOSViewer is a freely available software that can construct and visualize the relationship networks for the given search consisting of two standardized weights: the size and total strength of the links (Anuar et al., 2022). The links' significance and strength are determined by the nodes' size and the thickness of the lines intertwined between these two aspects (Donthu et al., 2021). The outcome from the analysis in VOSViewer presents interesting and meaningful information, for example, regarding the theme, the connectivity between institutions, authors, countries, and the evolution in the research field examined. Meanwhile, Harzing Publish or Perish software is a program that can analyze academic citations and assist in imparting useful information regarding research impact by a particular research field.

This study imports the necessary data from the Scopus database for bibliometric analysis. The Scopus database has been chosen for this study because of its extensive academic collections, with approximately 1,714 titles nowadays. (Anuar et al., 2022). A series of keywords for searching the relevant documents in conducting this bibliometric analysis was identified using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) as adopted from (2009) With the keyword search string (TITLE-ABS-KEY ("ESG" OR "environmental, social and governance" OR "CSR" OR "corporate social responsibility" OR "sustainability\*" AND "earnings management" OR "earnings quality" OR "accrual-based manipulation" OR "earnings transparency" OR "real earnings management" OR "discretionary accruals" OR "earnings manipulation" OR "income smoothing" OR "accruals earnings management" ) after extant literature reviews has been conducted as per depicted in Figure 1.

Figure 1: PRISMA flow diagram for the search strategy



Source: Moher et al. (2009)

The data extracted from the Scopus database gathered 324 documents from the August 18, 2023, search. The filtration process consists of exclusion made to 2023, as 2023 has not yet ended during the analysis, and the study did not fulfill the concept of sustainability and EM. Finally, 282 documents were generated after removing 42 unrelated documents. Tools such as Microsoft Excel, Harzing Publish and Perish, and VOSViewer were employed to analyze the data extracted further.

#### 4. Results and Discussion

The current landscape of publications

To answer the first research question one (RQ1: What is the current landscape of publications concerning sustainability and EM?), the study analyzed the evolution of published studies according to the year that represents the trends in sustainability and EM studies.

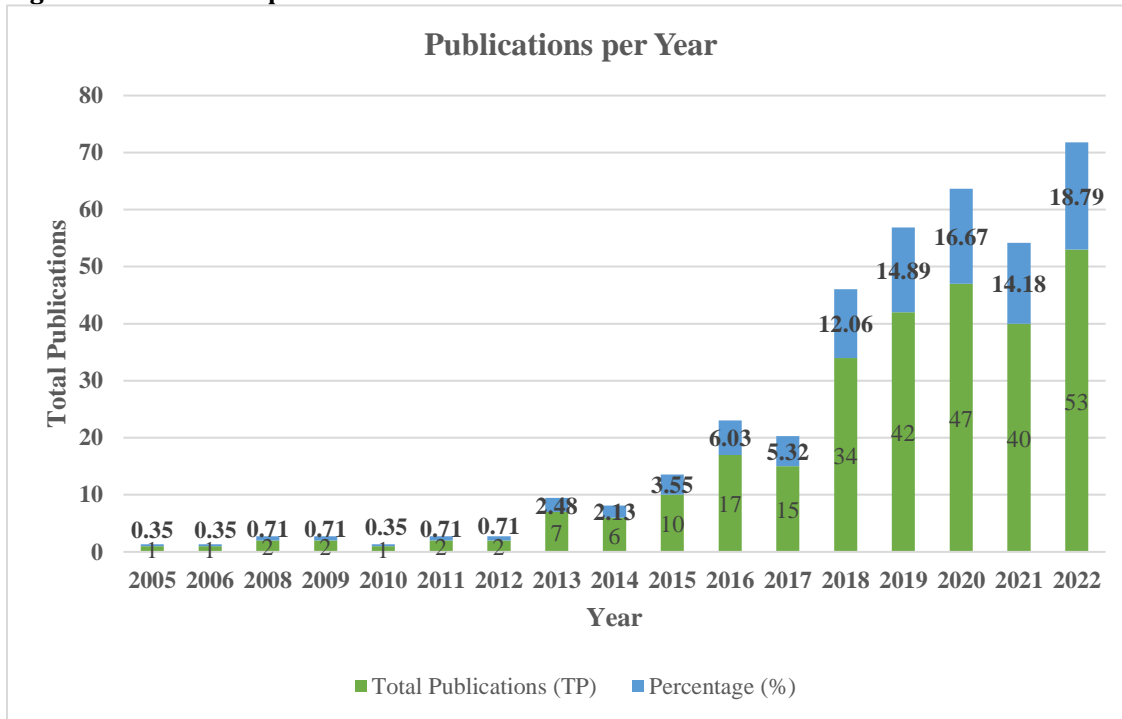
##### *Publication per year*

Figure 2 shows the total number of publications of 282 documents throughout the past two decades. Accordingly, during the initial years of observation from 2005 to 2010, there was a small relative number of publications, with one or two publications per year. A possible reason could be the infancy of research in this field, with limited resources available and less attention given by researchers. Nevertheless, there was a noteworthy increment in publications from 2011 to 2016, with a noteworthy increase in 2017 (7 publications) and 2016 (17 publications). However, the small number of publications has considerably increased over the past ten decades (2013-2022). Between 2017 and 2022, constant growth has been evident, categorized by a

remarkable upsurge in 2020 (47 publications) and 2022 (53 publications), representing 16.67% and 18.79% of total publications, respectively. The upward trends may explain growing concerns from researchers on this topic, supported by the availability of funding due to the increased attention given.

Besides that, there have also been large corporate scandals involving the engagement of fraud and earnings management that have shocked global businesses. Many initiatives have been adopted by (inter)national regulatory bodies to mitigate the adverse impact of EM, which has sparked concerns in the academic field. Moreover, the introduction of Sustainable Development Goals by the United Nations (2015) Has stamped a significant additional landscape to the research field in sustainability and EM at large. Thus, it has contributed to the significant momentum gained in this field of study, in which the emergence of new research groups and collaboration has contributed to the steady increase in publications.

**Figure 2: Publication per Year**



*Document types and source types*

This study later observed the document types by distinguishing the published research into its publication category encompassing articles, book chapters, reviews, conference papers, conference reviews, books, and other related documents. This study identified nine document types related to sustainability and EM, as summarized in Table 1. The total publications show that most research is published as articles, accounting for 88.3% of the total, with a total publication of 249 out of 282 documents. The document types are followed by single-digit percent published as book chapters of 4.26%, review and conference papers of 2.84% individually, and the remaining document types account for less than 3% of total publications.

Additionally, Table 2 illustrates that these documents are disseminated to four distinct source types: journal, book series, conference proceeding, and book. The study found that most documents published in journals comprised 91.84% of total publications, with the other three source types, namely, book series, conference proceedings, and book sharing, remaining at 8.16%. The results suggest that researchers mostly preferred journals because they serve as a platform for researchers to reach and share their findings with a wider audience, thus rendering the availability of an increase in impact factor for such research and authors due to an increase in citations. In addition, given the fact that publication in journals often involves critical peer review from experts in the fields, it helps to maintain the quality of the publication. Publications in high-impact factor journals render the quality of the research conducted and increase the recognition from the audience.

**Table 1: Document Type**

Document Type	Frequency	% (N=282)
Article	249	88.30
Book Chapters	12	4.26
Reviews	8	2.84
Conference Paper	7	2.48
Conference Review	2	0.71
Book	1	0.35
Data Paper	1	0.35
Editorial	1	0.35
Erratum	1	0.35
<b>Total</b>	<b>282</b>	<b>100.00</b>

**Table 2: Source type**

Source Type	Frequency	% (N=282)
Journal	259	91.84
Book Series	8	2.84
Conference Proceeding	8	2.84
Book	7	2.48
<b>Total</b>	<b>282</b>	<b>100.00</b>

Prominent languages of publications and prevalent subject area

The study further analyzes the language used by researchers in their research publication to answer part of research question two (RQ2: What are the languages mostly used and the prevalent categories of subjects in studies of sustainability and EM?).

*Prominent languages of publications*

Data in Table 3 shows that English dominates most languages used for publications relating to research in sustainability and EM at 98.23% of total languages used compared to other languages such as Korean, 1.06%, Arabic, and Spanish, each with 0.35%. The preliminary explanation could be that English serves as the universal language for academic communication on a global scale, thus making it easy to understand and disseminate within the field.

**Table 3: Language of documents**

Language	Frequency	% (N=282)
English	277	98.23
Korean	3	1.06
Arabic	1	0.35
Spanish	1	0.35
<b>Total</b>	<b>282</b>	<b>100.00</b>

*Prevalent subject area*

Moreover, to address RQ2, the subject area involved in sustainability and EM has been observed. Table 4 supports that the subject area of business, management, and accounting, with 190 publications (67.38%), has dominated the publications, followed by economics, econometrics, and finance, with 128 (45.39) publications. Besides that, other notable subject areas contributing to sustainability and EM research included social sciences (32.62%), environmental science (22.34%), and energy (16.67%) and computer science (7.09%); arts and humanities (4.96%); engineering (4.61%); decision science (3.90%) and earth and planetary sciences (1.06%).

A plausible reason for the stated result could be that sustainability is a worldwide focus in which most businesses move towards the agenda that involves accounting and business management, and association with EM can be seen as hampering the business and management's future sustainability (Kim et al., 2019). Therefore, sustainability and EM studies regularly involve business, management, and accounting.

**Table 4: Prevalent subject area**

Subject Area	Total Publication	% (N=282)
Business, Management and Accounting	190	67.38
Economics, Econometrics and Finance	128	45.39
Social Sciences	92	32.62
Environmental Science	63	22.34
Energy	47	16.67
Computer Science	20	7.09
Arts and Humanities	14	4.96
Engineering	13	4.61
Decision Sciences	11	3.90
Earth and Planetary Sciences	3	1.06
Medicine	3	1.06
Multidisciplinary	2	0.71
Psychology	2	0.71
Chemical Engineering	1	0.35
Mathematics	1	0.35
<b>Total</b>	<b>282</b>	<b>100.00</b>

**Most active source title**

This study is expected to identify the most active source title contributing to sustainability and EM studies to answer RQ3. According to the analysis result in Table 5, the most active source title, most of the published research within the sustainability and EM theme has been published under Sustainability, with 12.77% of total publications. However, it is remarkable that the second top journal, Corporate Social Responsibility and Environmental Management, is far behind at only 3.9%. The possible reason for this outcome could be attributed to the fact that Sustainability is an open-access journal with no subscription needed for users to access it, which renders easy accessibility to a wider audience, hence increasing its potential for citation. Other contributing source titles include Business Strategy and the Environment (2.13%), Journal of Business Ethics (2.13%), and Journal of Financial Reporting and Accounting (1.77%).

**Table 5: Most active source title**

Source Title	Publisher	TP	(%)
Sustainability	Multidisciplinary Digital Publishing Institute (MDPI)	36	12.77
Corporate Social Responsibility and Environmental Management	Wiley-Blackwell	11	3.90
Business Strategy and the Environment	Wiley-Blackwell	6	2.13
Journal of Business Ethics	Springer Nature	6	2.13
Journal of Financial Reporting and Accounting	Emerald	5	1.77
Finance Research Letters	Elsevier	4	1.42
Managerial Auditing Journal	Emerald	4	1.42

Accounting Forum	Elsevier	3	1.06
Cogent Business and Management	Taylor & Francis	3	1.06
Corporate Governance: An International Review	Wiley-Blackwell	3	1.06

Notes: TP=total number of productions; %=percentage from total number of productions of 282.

Frequently used keywords and the clustering theme

This study also sought to answer RQ4: What are the frequently used keywords and their evolution and clustering theme in sustainability and EM research? Thus, the study evaluates the frequently used keywords and clusters the keywords with the aid of Wordsift and VosViewer software.

*Frequently used keywords*

Table 6 details the frequently used keywords used by researchers in conducting the study on this topic. The result illustrates that the top ten keywords, such as CSR, earnings management, earnings quality, accruals earnings management, corporate governance, real earnings management, sustainability, CSR disclosure, financial performance, and stakeholder theory, are some of the dominant keywords used in the publications. For example, the CSR keyword has occurred 146 times from the keywords used by authors.

Besides that, the result from the analysis using Wordsift identified that the evolution of keywords has been documented for the past two separate periods, as per Figure 3. During the early years, not many keywords were used compared to the recent years. Figure 3 shows that over the past ten years, the evolution in keywords used in this topic signifies that the research has been widely spread by incorporating other fields, such as ESG, carbon and transparency. However, it is noticeable that keywords like CSR and earnings management are still largely used in this research. The limited number of keywords used in the early years of research on this topic is probably because this topic is still in its infancy, and most scholars are concentrating on examining the very base and foundation of sustainability and EM topics. However, as years went by with more issues revolving around businesses, the evolution of this research topic simultaneously led to the birth of vast research themes that translated to several keywords being used.

**Table 6: Top 10 keywords**

<b>Rank</b>	<b>Keywords</b>	<b>Occurrence</b>
1	CSR	146
2	Earnings Management	122
3	Earnings Quality	42
4	Accruals Earnings Management	41
5	Corporate Governance	39
6	Real Earnings Management	34
7	Sustainability	13
8	CSR Disclosure	13
9	Financial Performance	7
10	Stakeholder Theory	7



Figure 3: Evolution of Frequently Used Keywords from Year 2005 to 2022



*Clustering theme*

Further, looking at the network visualization map of co-occurrence authors' keywords, the clustering theme of research in sustainability and EM have been grouped into six different clusters, as indicated in Figure 4. The map portrays the theme of research that has been conducted from the publications, which is represented by the size of the nodes and colors. Meanwhile, the thickness of the lines signifies the strength of the relationship. The clusters derived from the network occurrence show that this field of study has yielded six research themes.

**Green Cluster**

The green cluster is dominated by keywords such as earnings management with other co-keywords such as financial sustainability, CSR disclosure, and tax avoidance. Understanding EM is always related to financial sustainability. Firms might opt for earnings management to mask and create false hope for the stakeholders of their true financial health and stability. Thus, the keywords are always interconnected with each other. The inclusion of CSR disclosure in sustainability and EM indicates that some studies on CSR disclosure focus on the relatedness of these keywords to other keywords within the cluster, such as tax avoidance. The strategy in EM could minimize the firm's tax liability and affect its sustainability in the long term. The study of EM as a strategy for tax avoidance is especially critical to identify the effects of such practice on the firm's sustainability. The studies with these keywords are multifaceted, with the interplay among the keywords either complementing or exposing contradicting effects to firms.

**Purple Cluster**

Keywords such as CSR, financial performance, information asymmetry, and voluntary disclosure are grouped in the purple cluster. This group research addresses the issue within the information asymmetry that could be mitigated by including CSR as voluntary disclosure. CSR, as one of the definitions of sustainability, promotes ethical and responsible business activities and operations often tainted by the information asymmetry inherent in EM. Therefore, the information asymmetry between managers and stakeholders could be learned through the lens of voluntary disclosure of sustainability in some countries. The navigation between these keywords and earnings management underscores the critical elements of disclosing more than legally required (voluntary disclosure and CSR), which relates to financial performance and the information possessed by management that could give rise to a one-sided advantage.

**Red Cluster**

The red cluster identified earnings quality as the central point with other keywords, for example, ESG, IFRS, and earnings persistence, reflecting that this cluster's research theme revolves around the financial reporting standards and non-financial reporting standards, with some focus given to Korean Chaebol firms. Earnings

quality is often related to earnings informativeness through the adherence to International Reporting Standards (IFS). Thus, the quality and persistence of earnings could also relate to the ESG initiatives of firms that arguably impart a positive impact. Thus, this cluster connects the dots of the theme from the accuracy, transparency, and informativeness of financial and non-financial reports.

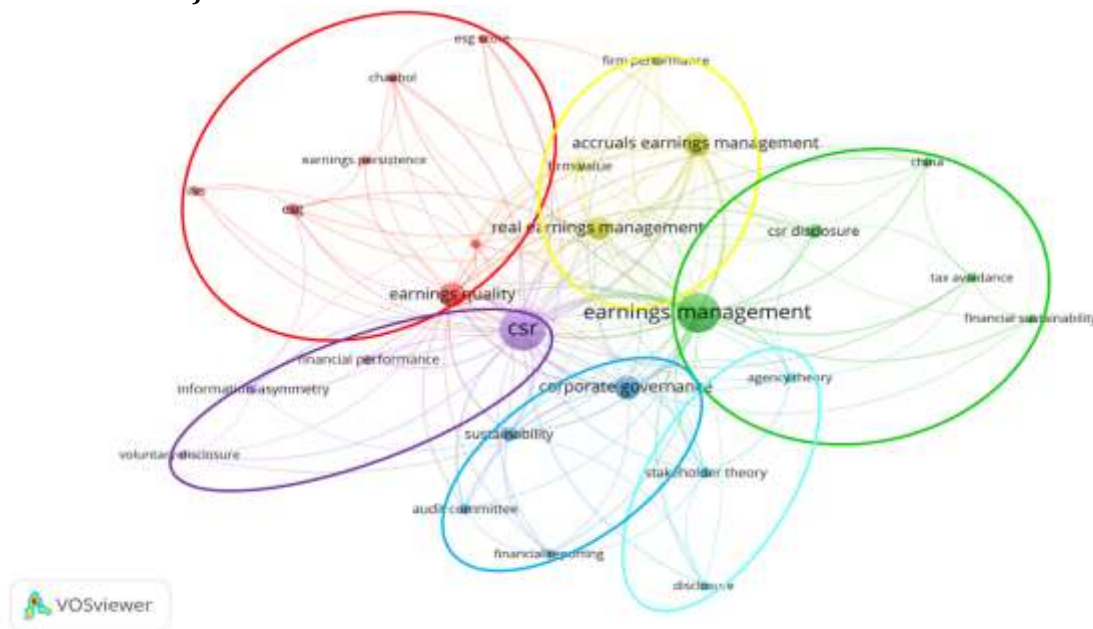
#### Yellow Cluster

The yellow cluster consists of accruals earnings management, real earnings management, and firm value and performance keywords, translating the research highlights in the different practices of EM and performance within sustainability and EM research. The cluster focuses on the different measurements employed by firms when exercising EM in their business practice. Different methods of EM result in different outcomes that serve the purpose of the management interest. While some firms exercise accrual earnings management, others may prefer real earnings management because auditors and regulators hardly detect this type of EM, owing to its nature of practice within the normal course of business operation. Thus, EM, in essence, will affect the firm's value and performance, whether on the positive or negative side.

#### Dark Blue and Turquoise Cluster

Dark blue and turquoise clusters focused on corporate governance, sustainability, audit committee, agency theory, and stakeholders' theory highlight the issue in governance and the social aspect of sustainability. Audit committees, as part and parcel of corporate governance, serve as a means of promoting sustainability by overseeing the management and governance of business activities and acting as the first responders to any EM practices. The stakeholders' theory mainly opposes the practice of EM with implicit agency cost since this theory upholds the principle of serving the broader interest of stakeholders. This cluster exhibits that studies in sustainability and EM usually involve agency and stakeholder theories because these theories have been widely used to explain the evolution and occurrence of sustainability and EM.

**Figure 4: Network visualization map of co-occurrence authors keyword (Minimum Number of Occurrences = 5)**



#### Countries and institutions with highest publication

To answer research question five, this study identified the most active countries in producing research in sustainability and EM, as well as the respective institutions that actively publish research on this topic.

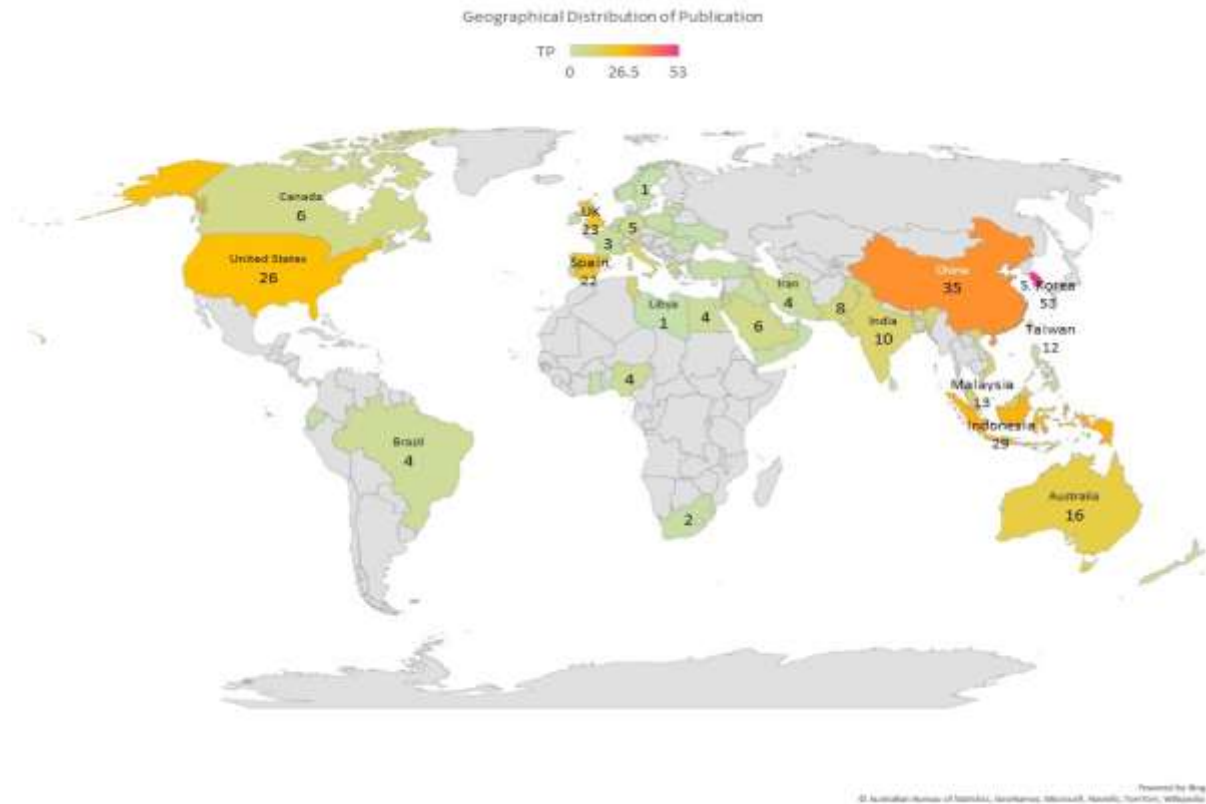
*Most active countries with highest publication*

As depicted in Table 7, it is identified that South Korea published 53 sustainability and EM research publications, followed by China with 35 documents. Among other top countries contributing to publication in this research topic are Indonesia (29), the United States (26), and the United Kingdom (23). It is supplemented with the world map to exhibit the total publications according to countries, as per Fig. 5. The pink color on the map represents the country with the most publications, such as South Korea. As the map shifts from a darker pink color to a lighter green, the number of publications in that country gets smaller compared to the more intense map color.

**Table 7: Most active countries in publications**

Country	Total Productions	Percentage (%)
South Korea	53	18.79%
China	35	12.41%
Indonesia	29	10.28%
United States	26	9.22%
United Kingdom	23	8.16%
Spain	22	7.80%
Australia	16	5.67%
Malaysia	13	4.61%
Taiwan	12	4.26%
India	10	3.55%

**Figure 5: Most active publications by country**



*Institution with highest publication*

Additionally, Table 8 shows that Chung-Ang University in South Korea leads research in sustainability and EM with 16 documents, followed by the University of Sfax, Tunisia, with 14 documents and 12 publications from Yonsei University in South Korea.

**Table 8: Institution with the highest publication**

Institution	Total Publication	Percentage (%)
Chung-Ang University	16	5.67%
University of Sfax	14	4.96%
Yonsei University	12	4.26%
Universidad de Salamanca	11	3.90%
Hanyang University	6	3.55%
Kangwon National University	4	1.42%
University of Memphis	4	1.42%
Universidad de Murcia	3	1.06%
Sungkyul Christian University	3	1.06%
Emory University	3	1.06%

*Prolific authors and publications impact*

From the author's profile perspective, this study examined the prolific authors according to papers published within the array of most cited papers, cites per year, citations per author for the publication and total publication per author to answer RQ6. It also analyzes the total impact of research published in sustainability and earnings management using Harzing Publish or Perish software to identify the citation metrics for the 282 documents extracted from the Scopus database as of August 18, 2023.

*Prolific authors*

Table 9 presents that the research publication by Kim et al. (2012) Entitled: "Is earnings quality associated with corporate social responsibility?" collectively garnered 962 total citations, with a citation per year of 87.45 citations and citations per author of 321. Next, Prior et al. (2008) Wrote an article titled "Are socially responsible managers ethical? Exploring the relationship between earnings management and corporate social responsibility," which has been referenced 489 times. This analysis provides an understanding of the influential publications on this topic. Besides, according to the data provided in Table 10, the most productive author is Martínez-Ferrero, J., who has produced eight publications in sustainability and EM research. García-Sánchez, I.M. also authored seven documents, followed by Chung, C.Y. for five publications based on the analysis.

**Table 9: Most Influential Authors with Total Citations**

Authors	Title of publication	Journal	Cites	Cites Per Year	Cites Per Author
Kim et al. (2012)	Is earnings quality associated with corporate social responsibility?	Accounting Review	962	87.45	321
Prior et al. (2008)	Are socially responsible managers ethical? Exploring the relationship between earnings management and corporate social responsibility	Corporate Governance: An International Review	498	33.2	166
Chih et al. (2008)	Corporate social responsibility, investor protection, and earnings management: Some international evidence	Journal of Business Ethics	325	21.67	108
Hong and Andersen (2011)	The Relationship Between Corporate Social Responsibility and Earnings Management: An Exploratory Study	Journal of Business Ethics	185	15.42	93

Choi et al. (2013)	Corporate social responsibility, corporate governance, and earnings quality: Evidence from Korea	Corporate Governance: An International Review	170	17	57
Scholten and Kang (2013)	Corporate Social Responsibility and Earnings Management: Evidence from Asian Economies	Corporate Social Responsibility and Earnings Management	155	15.5	78
Martínez-Ferrero et al. (2016)	Corporate Social Responsibility as a Strategic Shield Against Costs of Earnings Management Practices	Journal of Business Ethics	128	18.29	43
Martinez-Ferrero et al. (2015)	Effect of financial reporting quality on sustainability information disclosure	International Journal of Accounting	126	15.75	42
Wang et al. (2018)	Mandatory Corporate Social Responsibility (CSR) Reporting and Financial Reporting Quality: Evidence from a Quasi-Natural Experiment	BRQ Business Research Quarterly	107	21.4	36
Bozzolan et al. (2015)	Corporate Social Responsibility and Earnings Quality: International Evidence	The International Journal of Accounting	104	13	26

**Table 10: Most Active Authors**

<b>Author</b>	<b>Total Publications</b>	<b>Percentage (%)</b>
Martínez-Ferrero, J.	8	2.84%
García-Sánchez, I.M.	7	2.48%
Chung, C.Y.	5	1.77%
Choi, D.	3	1.06%
Choi, H.	3	1.06%
Hwang, J.	3	1.06%
Oh, H.M.	3	1.06%
Rezaee, Z.	3	1.06%
Sial, M.S.	3	1.06%
Siregar, S.V.	3	1.06%
Velte, P.	3	1.06%
Abdullah, D.F.	2	0.71%
Al-Hawary, S.I.S.	2	0.71%
Arfiansyah, Z.	2	0.71%
Aryan, L.A.	2	0.71%

*Publications impact*

Next, regarding the total impact of r as per Table 10. The analysis described that in total, the documents had been cited 6586 times with a citation per year of 365.89, average citations per paper of 23.35, citation per author at 122.59, and h-index and g-index of 36 and 74, respectively, for all the publications.

**Table 11: Impact of publications in sustainability and EM**

Publication Years	2005-2022
Citations	6586
Papers	282
Citations/ year	365.89
Citations/ paper	23.35
Citations/ author	122.59
Papers/ author	122.59
h-index	36
g-index	74

## 5. Conclusion and Suggestions

The current study leveraged bibliometric analysis to unveil the resourcefulness of the evolutions, current states and trends as well as the future trajectory of research in sustainability and EM. Extracted from the Scopus database, the current study has drawn 282 documents to chart the key themes and keywords, eminent scholars, institutions, and countries about this field of study. The result in the earlier section illuminates that the increasing concerns in sustainability and EM have sparked constant study by scholars.

In addition, the analysis also prepares the user with useful information on the subject areas involved, the most active country in the publication being South Korea, with journal publication having become the venue for researcher to publish their study. It also reveals the most influential authors and the impact of the publications on sustainability and the EM field. In addition, the analysis also underlined the clustering of themes for the study involving sustainability and EM. In essence, the outcome indicates that the research on this topic has been expanded to include other interesting themes to portray the publication's objectives better.

The evolution of sustainability was initially driven by the awareness of socially responsible practices that have been translated into firm practices. Contemporary business has manifested that the idea of sustainability permeates around the business circle, ranging from shareholders to investors, consumers, or the community, holistically serves as a guide in ensuring the going concern of business is aligned with the environmental, social, and governance that uphold ethical principles. Gradually, firms are susceptible to adopting sustainable practices in their business operations to remain relevant and outperform their peers in this era, whereby brand reputation and image are important. Having a good sustainability practice has been proven by past scholars to engender several advantages flowing into firms.

Sustainability and EM, both of which fall within the purview of business management, present a prominent interplay to a business's future success and long-term financial health. Sustainability practices are inherently related to high implementation costs, but over time, they give rise to positive outcomes in firms' financial performance. However, with the increasing attention given to sustainability, firms can consistently portray their ethical practices while bearing the cost of sustainability implementation, which sometimes could be enormous. This situation has raised the issue of EM intertwined with firms' sustainability practices. Nevertheless, when firms with sustainability are wrongfully involved in EM, the potential risk of entanglement between these two contradictory practices is alarming. Even though some short-termism managers argue that the practice of EM is to balance off the sustainability cost, it is especially harmful to business since it defeats the purpose of sustainability practice to meet the financial obligations while simultaneously considering environmental impact, social welfare, and upholding good governance.

Moreover, the involvement of firms in EM at the expense of shareholders gives rise to ethical concerns and firms' viability. The practice of EM of window dressing the financial earnings undermines the transparency and accuracy of the financial earnings presented and prompts the issue of a breach of shareholders' trust that leads to legal issues. When the transparency and accuracy of the financial statement are tainted, it may mislead the user of the financial statement into believing that the firm is doing well, but the firm may be facing crucial financial problems. Thus, any decision made by referring to the misleading financial statement could jeopardize

the stakeholders. EM, even though sometimes started on a small scale, if not prevented, will cause adverse effects to the extent that it can cause the collapse of a firm.

The findings of this study have several policy implications for regulators and policymakers. Firstly, the understanding of the EM can assist the regulator and policymakers in assessing whether the existing governance in place is effective and efficient in mitigating the pervasive issue of EM or whether the practice of sustainability has been used as a disguise for unethical EM practices. Next, insight into this topic can help regulators determine and design suitable governance mechanisms that are tailored to the specific issue of sustainability and EM.

Subsequently, the current study proposes several avenues that future researchers can explore. Future research could complement the findings from this study by providing a more in-depth analysis, for example, the content or meta-analysis of this topic, and by incorporating the systematic literature review in the study. In addition, integrating integrated reporting with sustainability and earnings management could provide a more nuanced understanding of this field. Integrated reporting enhances the decision-making process for investors and firms as a whole, thus elevating the information usefulness to be more inclusive of a more holistic approach by combining financial and non-financial information.

Moreover, future research also suggested studying the integration of a more inclusive definition of sustainability with EM interaction that covers a larger geographical scope, such as advanced and emerging economies. A comparison study between these two largely different economies improves the identification of the cause and effect as well as the understanding of the diverse characteristics that shape the sustainability and EM practices in these economies. Besides that, given the role of small and medium enterprises (SMEs) in economic growth, the current study proposed examining the nexus of sustainability and EM in this niche context. The expected outcome could be used as preliminary work in constructing an index or measurement that is tailored to the requirements and needs of SMEs. Further, the study of sustainability and EM in financial institutions is

However, without overdoing it, this study is not free from limitations. Firstly, the study limits the utilisation of specific queries/ keywords that perhaps do not 100 per cent possess the ability to capture all pertinent documents. Thus, it is recommended that future research take into consideration other possible keywords that can better capture the data from the database. Moreover, the data gathered from the Scopus database could be expanded to other databases, thus advancing a more profound and comprehensive outcome. Finally, given that the data was extracted in 2023, not all the documents in the Scopus database have been analyzed until recently.

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