INNOVATION AND SUSTAINABILITY ACCOUNTING: A BIBLIOMETRIC ANALYSIS

1 INTRODUCTION

The concept of Sustainability has gained increasing traction over time. The 1972 United Nations (UN) Conference on the Human Environment was the first major conference to address environmental issues. In the following years, the concept of Sustainable Development evolved. Through the Brundtland Report in 1987 and the 1992 UN Conference in Rio de Janeiro, the concept of the triple bottom line was established. It represents an ethical concept that concerns fighting poverty while protecting the environment on a macro level (Robèrt et al., 2002).

Sustainable development, when incorporated by an organization, is referred to as corporate sustainability, encompassing all three pillars: economic, environmental, and social. These three dimensions interact, and companies are encouraged to conduct their activities in alignment with people, profit, and planet (Ebner & Baumgartner, 2010).

Sustainability Reports are developed and published by various entities in both the public and private sectors. Therefore, growing the relationship between companies, their stakeholders, and the community. Additionally, there are numerous different standards for Sustainability reporting (Alvares & Cintra, 2015).

Amongst the many different reporting standards, the Global Reporting Initiative (GRI) is one of the most acclaimed sustainability reporting standard-setting bodies (Villiers, La Torre & Molinari,2022), which has developed stakeholder-oriented reporting standards aimed at ensuring the disclosure of information that facilitates an understanding of how reporting organizations influence social and environmental matters (Villiers et al., 2022).

Additionally, the Trustees of the International Financial Reporting Standards (IFRS) Foundation announced the formation of the International Sustainability Standards Board (ISSB) during the COP26 conference, held in Glasgow. Due to the “growing calls for the urgent need for further consistency in reporting and comparable information”, the IFRS Foundation explains that the best option would be to create a new Sustainability Standards Board. This option would better contribute to “reducing complexity and achieving comparability in sustainability reporting” (IFRS Foundation, 2020).

In addition to standard-setting bodies, other metrics, such as the Sustainable Development Goals (SDGs) and the Environmental, Social, and Governance (ESG) framework, are highly relevant to Sustainability Reporting. The SDGs were set by the United Nations (UN) for the period between 2015 and 2030. Therefore, the countries that adhered to the goals committed to mobilizing efforts to eradicate all forms of poverty, fight inequalities, and face climate change in the next fifteen years.

From a pragmatic perspective, examining how innovations in accounting practices and approaches can support companies' use of organizational resources to contribute to sustainable development (Schaltegger et al., 2017) is a direct link to sustainability reporting research. Sustainable development, as an evolutionary process of improvement, is rooted in real-life problems that involve practitioners and academics alike in a transdisciplinary collaborative search for new ways to combat problems of unsustainability and achieve more sustainable results (Lang et al., 2012; Scholz, 2011).

In this context, this study proposes to examine the intersections between sustainability and innovation in accounting through a bibliometric analysis of the literature, exploring the concept of sustainable development. The study analyzes existing literature to contribute to the development of research that helps achieve the SDGs through innovation in sustainable accounting.

This article contributes to understanding the evolution and future direction of publications in Innovation and Sustainability related to accounting, which can guide future

research that integrates sustainability into accounting and governance, leading to relevant and innovative research.

1.1 RESEARCH QUESTION AND OBJECTIVE

In this context, the problem addressed in this article is related to understanding and mapping innovation and sustainability in accounting, with the aim of analyzing academic productions to support the development of relevant research that contributes to achieving the Sustainable Development Goals (SDGs). This study proposes to examine the intersections between sustainability and innovation in accounting through a bibliometric analysis of the literature, exploring the concept of sustainable development.

2 THEORETICAL FRAMEWORK

The discussion about accounting and management in the pursuit of sustainability was established in 1992. Through the Business Council for Sustainable Development (BCSD), founded by a Swiss businessman during the 1992 Earth Summit in Rio de Janeiro, and subsequently by ECO-92, the 1992 UN Conference on Environment and Development was also held in Rio de Janeiro. During the Conference, a document called The Earth Charter was created. It is an international declaration of fundamental values and principles aimed at fostering a just, sustainable, and peaceful global society. This document was considered relevant in Accounting Research, and after 1992, articles regarding accounting and sustainability began to be published.

Until the early 1990s, accounting had largely overlooked a broad range of activities associated with environmental impact, particularly those developed by the private sector (Milne, 1996). During this decade, more in-depth studies on the relationship between accounting and sustainability began to emerge, aiming to develop these themes in tandem. For instance, I developed an interdisciplinary course that included lectures and cases for senior students specializing in business or natural sciences (Loucks, 1997).

Different approaches to integrating accounting and sustainability have been developed, such as the analysis of footprints and sustainable national income (Gerlagh et al., 2002). Otherwise, points out that strong sustainability is difficult, mainly because there is no reduction in material throughput; thus, the belief in attaining sustainability is based on the integration of policies supported by the shares and stakeholders of sustainable development (Bartelmus, 1999).

On the same path of prioritizing the shares and stakeholders of sustainable development, it states that to achieve economic sustainability and maintain social well-being, investments in various types of assets should be made. According to the author, “under certain conditions, consumption can be sustained by depleting resources, or various kinds of natural capital, while building up other kinds of capital”, but choices should be made based on the use of a set accounting of prices (Cairns, 2006).

Researchers have explored the relationship between innovation and accounting since at least 1971 (Cominskey & Groves, 1971). Around that time, accounting innovation was showing signs of development that would be used for the next seventy years. For instance, Edwards (1985) refers to accounting innovation as the concept of having a double-entry accounting system, which involves dividing accounts into two categories: the conventional balance sheet and a revenue account. Proposes an approach to teaching accounting information systems as an innovative course, focusing on computerized information systems that accountants can use for both planning and control decisions (Shaoul, 1990).

Abernethy and Bouwens (2005) show the determinants of accounting innovation implementation. According to the authors, “one of the major impediments to the successful

implementation of accounting innovation is that management accounting systems are generally used to serve the decision control needs of top management", but the authors argue that, at the same time, to support decision management, the lower-level managers should be involved.

On the other hand, Pacharn & Zhang (2006) defend the idea that innovation accounting occurs due to incentives, providing two examples: the first related to organizational innovation and the second to technological innovation. In both scenarios, authors corroborate with Abernethy & Bouwens (2005), emphasizing the role of accounting information in stewardship.

Guenther (2013) suggests that accounting can serve as a tool for social innovation because, in general, the value created by firms and recorded in accounts should be allocated to both society and private individuals. According to the authors, the mix of organizations, technical and organizational solutions (such as machines, buildings, or processes), human beings as part of a social system in terms of internal (such as workforce) or external stakeholders (such as customers) of the organization can build an innovation as a social innovation is defined as "a novel solution to a social problem that is more effective, efficient, sustainable, or just than present solutions and for which the value created accrues primarily to society as a whole rather than private individuals" (Social Innovation, 2009, apud Guenther & Guenther, 2013).

Chiwamit, Modell, and Yang (2014) also highlight the relevance of management accounting innovations for society. For instance, at that time, authors argued for the importance of Economic Value Added (EVA) as a governance mechanism to produce an analysis that encompasses a broader range of societal interests.

Finally, Schaltegger, Etxeberria, and Ortas (2017) indicate that environmental and social impacts of companies' activities are a concern, but also that such impacts can provide opportunities for firms to be more in touch with sustainability. Authors discuss what innovation in accounting for sustainability may encompass and affirm that more research is needed to develop corporate accounting approaches to address environmental and social challenges more effectively.

3 METHODOLOGY

In this study, a quantitative methodology based on the BiblioShiny tool for BiblioMetrix in the R software was employed through a bibliometric analysis. This tool was designed by Aria and Cuccurullo (2017) to map science comprehensively. The primary information from the sample was analyzed, including the number of documents, journals, and citations over the entire period, as well as keywords and co-authorship information. Based on the findings, it is possible to analyze the annual scientific production, the most relevant journals, the journal's impact regarding the number of publications and citations, the most cited words throughout the period and in recent years, and the co-authorships between Brazilians and foreigners who have published on the topic of Sustainability Reporting.

Documents were collected from Scopus to proceed with the bibliometric analysis using the Bibliometrix tool. Scopus is an extensive, multidisciplinary abstract and citation database designed for academic and professional research, and it is one of the most globally recognized academic databases, having been on the market for 20 years. To find articles related to the main topic, a search was conducted using the keywords: 'Sustainability' and 'Innovation'. The search results were limited, and only articles in the categories of 'Business, Management and Accounting' and 'Economics, Econometrics and Finance' were kept and exported into the tool. No geographical limitations were imposed; however, only documents written in English, Portuguese, and Spanish were selected.

The selection resulted in 2,808 documents being exported to the platform, spanning the time period from 1994 to 2024. The annual scientific production was relevant after 2010, with 32 articles containing the keywords.

Table 1 – Annual Scientific Production from 1994 to 2024

Year	Number of Publications	Year	Number of Publications
1994	1	2010	32
1995	0	2011	38
1996	0	2012	55
1997	1	2013	91
1998	2	2014	68
1999	0	2015	95
2000	3	2016	89
2001	3	2017	124
2002	5	2018	166
2003	3	2019	189
2004	6	2020	204
2005	7	2021	225
2006	22	2022	315
2007	12	2023	419
2008	27	2024	590
2009	16		

Source: research data (2024)

4 RESULTS AND DISCUSSION

This section presents the results of the bibliometric analysis. Six analyses were conducted. the results of the first analysis, highlighting the ten most relevant journals according to the number of publications related to Sustainability and Innovation. It is observed that the most relevant journals according to the number of publications are, respectively: Journal of Cleaner Production (309 publications), Business Strategy and the Environment (205 publications), Technological Forecasting and Social Change (180 publications), Resources Policy (109 publications), Environment, Development and Sustainability (57 publications), Technology in Society (56 publications), Technology Analysis and Strategic Management (45 publications), Economic Research-Ekonomska Istraživanja (42 publications), Ecological Economics (40 publications), and Research Policy (39 publications).

Examining the results, it is evident that all ten most relevant journals according to the number of publications are international, with a strong emphasis on environmental and sustainability themes. Among these, the Journal of Cleaner Production stands out as one of the most influential, consistently publishing research on sustainability practices and environmental management. Similarly, Research Policy is highly regarded for its in-depth studies on innovation and the societal impacts of technological advancements, offering a broad perspective on how these elements connect to sustainable development.

The second analysis, which showcases the evolution of academic production in the journals over the years, focuses on five journals that are the most relevant, according to the number of publications from the previous analysis. It can be verified that, although Technological Forecasting and Social Change was the pioneering journal in scientific academic production on the topic of Sustainability and Innovation, starting in 2013, the Journal of Cleaner

Production surpassed it in the number of publications. The other journals showed consistent growth in the number of publications over the years.

The third analysis highlights the countries with the highest academic production on the topic of Sustainability Reporting and the evolution of academic production on the topic in the selected countries. it can be observed that, until 2023, the United States led in academic production on the topic of Sustainability and Innovation. Currently, China leads in academic production on the topic, followed by the United Kingdom, the United States, Italy, and Germany, respectively.

The fourth analysis indicates the global academic production on the topic of Sustainability Reporting. Darker shades of blue represent higher scientific production, indicating a greater number of articles published by authors from that country. The countries that publish the most on the topic are China, the United Kingdom, the United States, followed by Italy, Germany, the Netherlands, and then Spain, Brazil, and India.

presents the fifth analysis, highlighting the documents on Sustainability and Innovation that are most frequently cited in other articles globally. The most globally cited documents by other authors showcase renowned specialists in their knowledge fields, such as Jochen Markard, a senior researcher at ETH Zurich, Switzerland, and affiliated with the Zurich University of Applied Sciences (ZHAW). His research integrates concepts from innovation studies, political science, and management, exploring topics such as net-zero transitions, decarbonization, and policy dynamics.

The last analysis is based on the word cloud. The cloud presents the most cited words in the analyzed documents. The most cited words appear in the middle of the cloud, in a bigger font, whilst the least cited words appear in the borders in a smaller font. The most globally cited words in documents on the topic of Sustainability and Innovation are, in order from the most cited to the least cited: Innovation, with 1223 citations, representing 17% of total citations; Sustainability and Sustainable Development, with 1054 and 1061 citations respectively, representing 14% of total citations; Environmental Economics, with 227 citations; China, with 222 citations. Other cited words include Technological Development, Environmental Sustainability, Technological Innovation, Environmental Management, and Climate Change.

5 CONCLUSIONS

The research showed that studies involving Sustainability and Innovation evolved gradually over time, achieving consistency in the 2000s, with significant growth beginning in 2009. The United States led this research topic for years; however, around 2020, the United Kingdom took the lead in publications, and since 2023, China has taken the lead. These changes demonstrate global interest in the topic. The research also indicated that the leading academic journals focusing on this type of research are the Journal of Cleaner Production, Business Strategy and the Environment, and Technological Forecasting and Social Change. The authors who contribute most to this area of interest are international; however, Brazilian researcher Dr. Simone Sehnem stands out nationally for her scientific contributions. The study had limitations related to the database, linguistic restrictions, and study area filters. Nevertheless, the results offer relevant insights into publication trends and highly relevant contributions, contributing to future studies on Sustainability and Innovation in accounting research.

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