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Corporate Sustainability Reporting Directive (CSRD) Following its First Application: A Bibliometric Analysis

Lorenzo Coronella

Department of Management and Law

University of Rome "Tor Vergata"

Email: lorenzo.coronella@uniroma2.it

Abstract

The transition from the Non-Financial Reporting Directive (NFRD) to the Corporate Sustainability Reporting Directive (CSRD) stimulated research on the implications of this sustainability reform. The discussion began far before the first application of the directive and spanned transversal sectors (e.g., management, accounting, economics, and finance). Studies on this topic aimed to explore both the requirements and the implications of the CSRD. Given this picture, the aim of this paper is to analyze the scientific production on the CSRD relying on a bibliometric analysis of the literature from the first paper published on this topic to date. To do so, I employed a bibliometric analysis on a sample of 117 papers addressing the CSRD, analysing them through co-citation analysis, bibliographic coupling, and keyword analysis. The cluster analysis of the keywords revealed a great attention to severe themes (i.e., sustainability, stakeholders, climate change, regulation, management perspectives, sustainable development, corporate sustainability, sustainability reporting, biodiversity, indicators, and performance). Following the analysis and discussion, this paper highlights the key features of studies on CSRD and provides insights and implications for both scholars and companies. To the best of my knowledge, this is the first comprehensive work on a systematic analysis of the literature on the CSRD.

Keywords – Bibliometric Analysis; Corporate Sustainability Reporting Directive; CSRD; Sustainability.

Paper type – Literature Review

Sommario

La Direttiva sulla Rendicontazione di Sostenibilità Aziendale (CSRD) dopo la sua prima applicazione: un'analisi bibliometrica. – La transizione dalla Direttiva sulla Rendicontazione Non Finanziaria (NFRD) alla Direttiva sulla Rendicontazione di Sostenibilità Aziendale (CSRD) ha stimolato la ricerca sulle implicazioni di questa riforma della sostenibilità. La discussione è iniziata ben prima della prima applicazione della direttiva e ha attraversato settori trasversali (ad esempio, management, contabilità, economia e finanza). Gli studi su questo argomento hanno mirato a esplorare sia i requisiti sia le implicazioni della CSRD. In questo contesto, l'obiettivo del lavoro è analizzare la produzione scientifica relativa alla CSRD, facendo affidamento su un'analisi bibliometrica della letteratura dal

primo articolo pubblicato su questo tema fino ad oggi. A tal fine, è stata impiegata un'analisi bibliometrica su un campione di 117 articoli che affrontano la CSRD, analizzandoli attraverso l'analisi di co-citazione, il *bibliographic coupling* e l'analisi delle parole chiave. L'analisi a cluster delle parole chiave ha rivelato una forte attenzione a temi cruciali (ovvero sostenibilità, stakeholder, cambiamento climatico, regolamentazione, prospettive di management, sviluppo sostenibile, sostenibilità aziendale, rendicontazione di sostenibilità, biodiversità, indicatori e performance). A seguito dell'analisi e della discussione, il lavoro evidenzia le caratteristiche chiave degli studi sulla CSRD e fornisce spunti e implicazioni sia per gli studiosi sia per le aziende. Per quanto a conoscenza dell'autore, questo è il primo lavoro completo su un'analisi sistematica della letteratura sulla CSRD.

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1 Introduction

The European Union's Corporate Sustainability Reporting Directive (CSRD) (Directive 2022/2464/EU) represents the most comprehensive reform to corporate disclosure in the Union since the introduction of the Non-Financial Reporting Directive (NFRD) a decade earlier (Venturelli, Caputo, Leopizzi & Pizzi, 2019). The NFRD (Directive 2014/95/EU) aimed to enhance transparency by mandating that certain large public interest entities disclose information on environmental, social, and employee matters, respect for human rights, and anti-corruption measures. While it marked an important first step, its limited scope (entities with more than 500 employees), reliance on high-level, non-binding guidance, and heterogeneous national transpositions produced data that were often incomplete, incomparable, and of uneven quality. These shortcomings set the stage for a substantive legislative change with the adoption of the CSRD in December 2022. The CSRD reconfigures the architecture of sustainability reporting around scope expansion, standardization, assurance, and digitization (Martinčević, Primorac & Dorić, 2024). First, the directive expands the population of reporting entities beyond the NFRD to include all large EU entities and listed SMEs. Second, it replaces the NFRD's principle-based approach with mandatory European Sustainability Reporting Standards (ESRS), developed through a formalized process with the European Financial Reporting Advisory Group (EFRAG) and adopted by the Commission as delegated acts. Third, it requires publication within the management report in a machine-readable, digitally tagged format, introducing limited assurance and thereby elevating sustainability information to a status closer to financial reporting. Crucially, the CSRD codifies the "double materiality" perspective, obliging undertakings to report on both how sustainability matters affect the firm and the firm's impacts on people and the environment (Dyczkowska & Szalacha, 2025).

To operationalize this shift, the Commission adopted a set of cross-cutting and topical ESRS. These standards address disclosure on strategy, governance, impacts, risks, and opportunities across environmental (including climate), social, and governance themes (Leal Filho et al., 2025). The ESRS are intended to both improve the consistency and comparability of data and enable the digital tagging required by the CSRD.

In the original schedule, undertakings previously subject to the NFRD began applying CSRD for financial years starting in 2024 (reporting in 2025), followed by other large entities (financial year 2025; reporting in 2026), and listed SMEs (financial year 2026; reporting in 2027).

After that, in February 2025, the Commission tabled an "Omnibus" simplification package aimed at reducing administrative burdens and right-sizing the scope and sequencing of sustainability obligations (Nicolo, Zampone, Sannino, & Polcini, 2025). The package included a "stop-the-clock" measure to

postpone the application dates for certain CSRD cohorts, as well as a set of targeted measures. In April 2025, the Parliament and Council adopted the “stop-the-clock” directive, which deferred the application of the CSRD for other large entities to 2028 and for listed SMEs to 2029. The Commission also signalled a strategic intention to reduce ESRS datapoints and clarify requirements, thereby cutting recurring costs while preserving decision-useful information for investors and stakeholders.

In this context, management and accounting research explored the CSRD both before and after the first implementation. The aim of this paper is, therefore, to map these studies through a bibliometric analysis (Donthu, Kumar, Mukherjee, Pandey, & Lim, 2021), evidencing the main features of the research and their relevant findings. The remainder of the paper is structured as follows: Section 2, Methodology; Section 3, Findings; Section 4, Keywords analysis; Section 5, Discussion and concluding remarks.

2 Methodology

I performed a bibliometric analysis in this paper (Das, Di Virgilio & Puccio, 2024; Zilia, Zanderighi & Orsi, 2024; Secinaro, Dal Mas, Brescia, & Calandra, 2022), as it aligns with the research aim. Indeed, bibliometric analysis helps answer the research questions, as it represents a rigorous method for exploring large volumes of data (Donthu, Kumar, Mukherjee, Pandey, & Lim, 2021). The subsequent sections present the sample selection process and the sample analysis process.

2.1 Sample selection

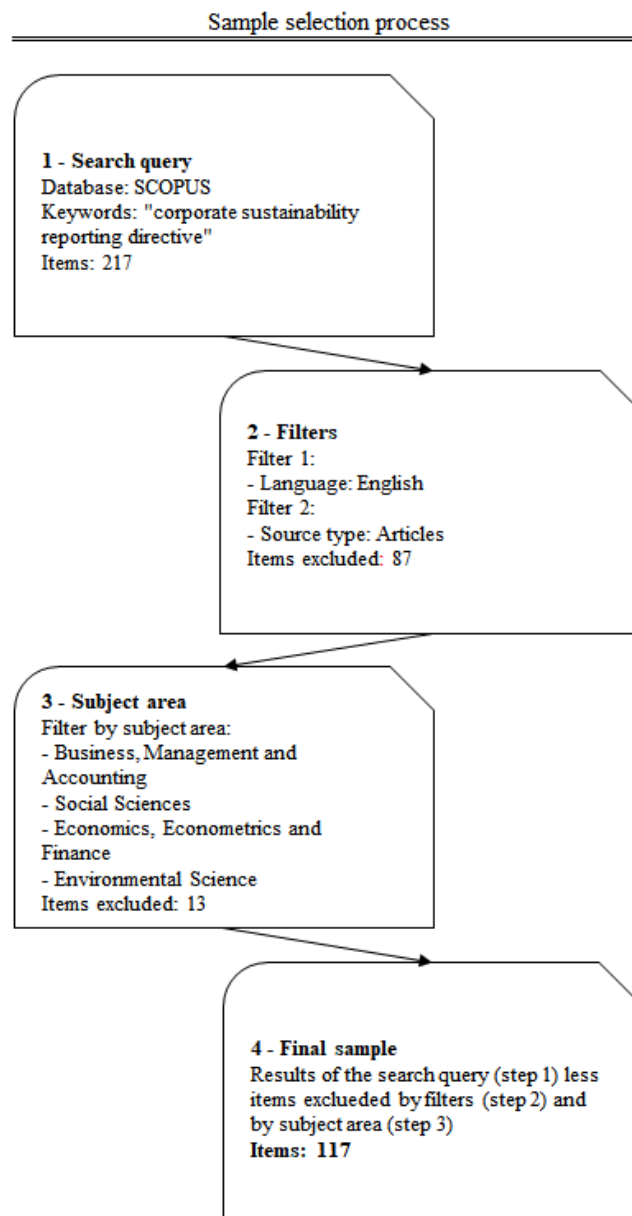
To select the sample for the analysis, I relied on the Scopus database, widely used by authoritative literature to conduct bibliometric analysis in the management and accounting field (Camilli, Mechelli, & Coronella, 2024; Pizzi, Caputo, Corvino & Venturelli, 2020). The sample selection was conducted in September 2025. To define the most suitable sample for the research (Linnenluecke, Marrone & Singh, 2020), I followed the logical steps presented below.

The search query consisted of “corporate sustainability reporting directive” and was searched within the article title, abstract, and keywords on the Scopus database. This search query led to an initial result of 217 documents. Then, I applied the filters to the sample, i.e., document type and language (only articles written in English were selected). After these filters, 130 documents were found.

Finally, I applied the last filter by subject area, selecting only “business, management, and accounting” and areas somehow related to this, i.e., “social sciences”, “economics, econometrics and

finance”, and “environmental science”. The decision to limit the subject area to better address the research question is a technique used in bibliometric analyses (Rosato, Caputo, Valente & Pizzi, 2021). Following this final filter, 117 documents were selected, representing the final sample. Figure 1 presents the logical steps followed to define the sample.

Figure 1 – Logical steps of the sample selection process



Source: Author's elaboration

2.2 Sample analysis

The sample is explored through bibliometric analysis, which consists of a performance analysis (publication-related metrics, citation-and-publication-related metrics), science mapping (citation analysis, co-citation analysis, bibliographic coupling), and a network analysis (keywords analysis, clustering) (Donthu, Kumar, Mukherjee, Pandey, & Lim, 2021). Specifically, the main analyses are co-citation analysis, bibliographic coupling, and keywords co-occurrence analysis.

Co-citation analysis is a bibliometric method that examines how frequently two documents are cited together by subsequent publications. The underlying assumption is that if two works are repeatedly co-cited, they are likely to share a conceptual or thematic connection, even if they do not cite each other directly. This analysis helps map the intellectual structure of a research field, identifying seminal works and tracing the development of scientific paradigms over time.

Bibliographic coupling is a bibliometric analysis that assesses the similarity between two documents based on the extent to which they share common references. Two publications are considered bibliographically coupled when they cite one or more of the same sources. Finally, keyword co-occurrence analysis investigates the frequency with which specific keywords appear together in the same documents. By analyzing these co-occurrence patterns, it is possible to identify central themes, conceptual linkages, and interdisciplinary connections within a research topic. I used this approach to identify the thematic clusters discussed in the cluster analysis.

The visualization of the results is provided through Bibliometrix (Aria & Cuccurullo, 2017) and VOSviewer (Van Eck & Waltman, 2010) tools.

3 Findings

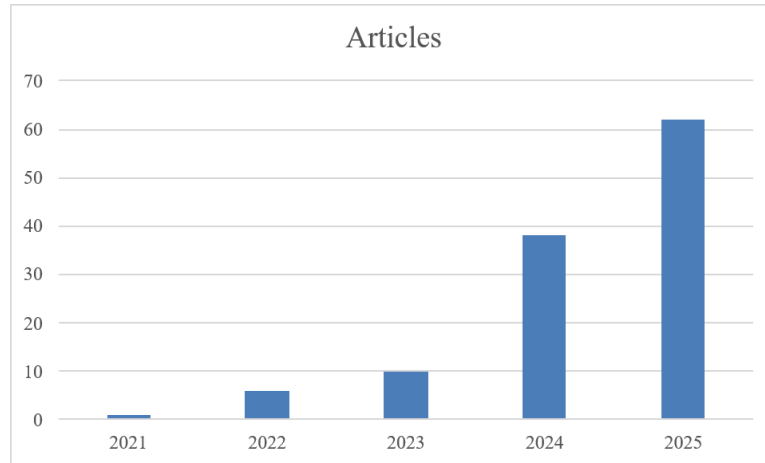
3.1 Overview

The sample spans from 2021 to 2025 and consists of 117 papers. Figure 2 presents the annual production.

As can be seen, production began in 2021, the year the European Commission presented the draft of the CSRD to replace the NFRD. At that time, only 1 paper was published about CSRD, as there was still no evidence to be observed. This is also true for the subsequent years from 2022 to 2023, but the increasing interest in the topic led to an increase in the annual production (6 papers in 2022 and 10 papers in 2023), especially following the approval of the directive in 2022. 2024 marked the first year of

the application and was characterized by the production of 38 papers. Finally, 2025 is not only the year of the first reports but also the year of the adoption of the Omnibus package, further stimulating research on the topic, with scientific production reaching 62 papers as of September 2025.

Figure 2 – Annual scientific production



Source: Author's elaboration

Table 1 – Most prolific authors

Authors	Frequency
Krasodomska, J.	3
Zarzycka, E.	3
Zieniuk, P.	3
Aboud, A.	2
Eliwa, Y.	2
Greiling, D.	2
Macuda, M.	2
Mezzanotte, F. E.	2
Novicka, J.	2
Pizzi, S.	2
Păunescu, M.	2
Saleh, A.	2
Traxler, A. A.	2
Velte, P.	2
Zülch, H.	2

Source: Author's elaboration

Table 1 shows the most relevant authors (as per paper published), who are Krasodomska, Zarzycka, Zieniuk, Aboud, Eliwa, Greiling, Macuda, Mezzanotte, Novicka, Pizzi, Păunescu, Saleh, Traxler, Velte, Zülch.

Regarding sources, the most relevant are *Sustainability (Switzerland)*; *Management Decision*; *Sustainability Accounting, Management and Policy Journal*; *Business Strategy and the Environment*; *European Business Law Review*; *Accounting in Europe*; *Corporate Social Responsibility and Environmental Management*; *European Company and Financial Law Review*; *Business Ethics and Leadership*; *Euromed Journal of Business*; *International Journal of Law and Management*; *Journal of Applied Accounting Research*; *Journal of Risk Finance*; *Meditari Accountancy Research*; *Sustainable Development*. Table 2 presents the most relevant sources, along with the total number of papers published.

Table 2 – Most relevant sources

Sources	Frequency
<i>Sustainability (Switzerland)</i>	15
<i>Management Decision</i>	10
<i>Sustainability Accounting, Management and Policy Journal</i>	5
<i>Business Strategy and the Environment</i>	4
<i>European Business Law Review</i>	4
<i>Accounting in Europe</i>	3
<i>Corporate Social Responsibility and Environmental Management</i>	3
<i>European Company and Financial Law Review</i>	3
<i>Business Ethics and Leadership</i>	2
<i>Euromed Journal of Business</i>	2
<i>International Journal of Law and Management</i>	2
<i>Journal of Applied Accounting Research</i>	2
<i>Journal of Risk Finance</i>	2
<i>Meditari Accountancy Research</i>	2
<i>Sustainable Development</i>	2

Source: Author's elaboration

These sources highlight a wide interest in the topic, which is transversal, as the most relevant sources are from different sectors, i.e., management, accounting, ethics, finance, and economics. The sample is also composed of high-rated journals (3 ABS) (CABS, 2024), *Accounting, Auditing and*

Accountability Journal; Business Strategy and the Environment; Ecological Economics; Foundations and Trends in Accounting; International Journal of Accounting.

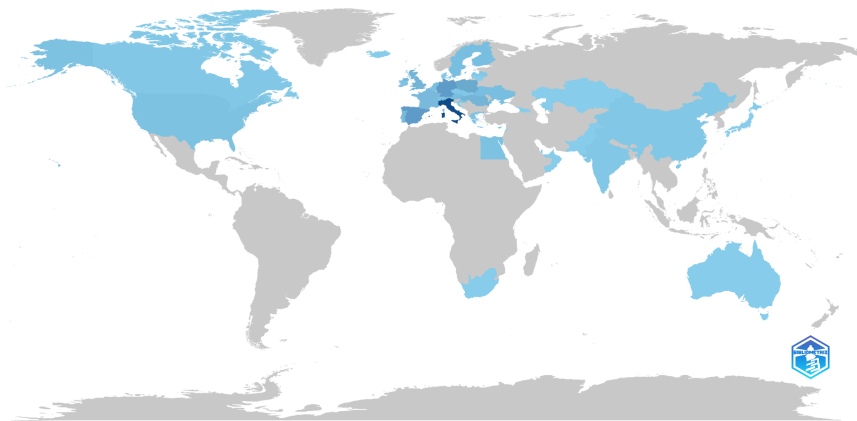
The most cited articles of the sample are presented in Table 3.

Table 3 – Most cited articles

Articles	Total citations
Hummel & Jobst (2024)	79
Ottenstein, Erben, Jost, Weuster & Zülch (2022)	69
Fiandrino, Gromis di Trana, Tonelli & Lucchese (2022)	48
Posadas, Ruiz-Blanco, Fernandez-Feijoo & Tarquinio (2023)	41
Balogh, Srivastava & Tyll (2022)	40
Velte (2023)	39
Aboud, Saleh & Eliwa (2024)	34
Oliver Yébenes (2024)	31
Hristov & Searcy (2025)	29
Songini, Pistoni, Comerio & Tettamanzi (2023)	28

Source: Author's elaboration

Figure 3 – Country scientific production



Source: Author's elaboration

The five most cited articles are: Hummel and Jobst (2024), who studied sustainability disclosure legislation and major standard-setting initiatives; Ottenstein, Erben, Jost, Weuster, and Zülch (2022) and Posadas, Ruiz-Blanco, Fernandez-Feijoo, and Tarquinio (2023), who both studied the effects of the

NFRD on firms' sustainability reporting practices; Fiandrino, Gromis di Trana, Tonelli, and Lucchese (2022), who explored the disclosure quality of non-financial information; and Balogh, Srivastava, and Tyll (2022), who investigated the relevance of ESG disclosure factors.

Finally, Figure 3 highlights the country's scientific production, where Italy is leading with 50 papers, followed by Germany (18), Spain (18), Poland (14), United Kingdom (10), Hungary (9), Romania (9), France (7), Portugal (7), Austria (6), Finland (6), Netherlands (6), Sweden (6), and Ukraine (6).

3.2 Co-citation analysis

3.2.1 Articles

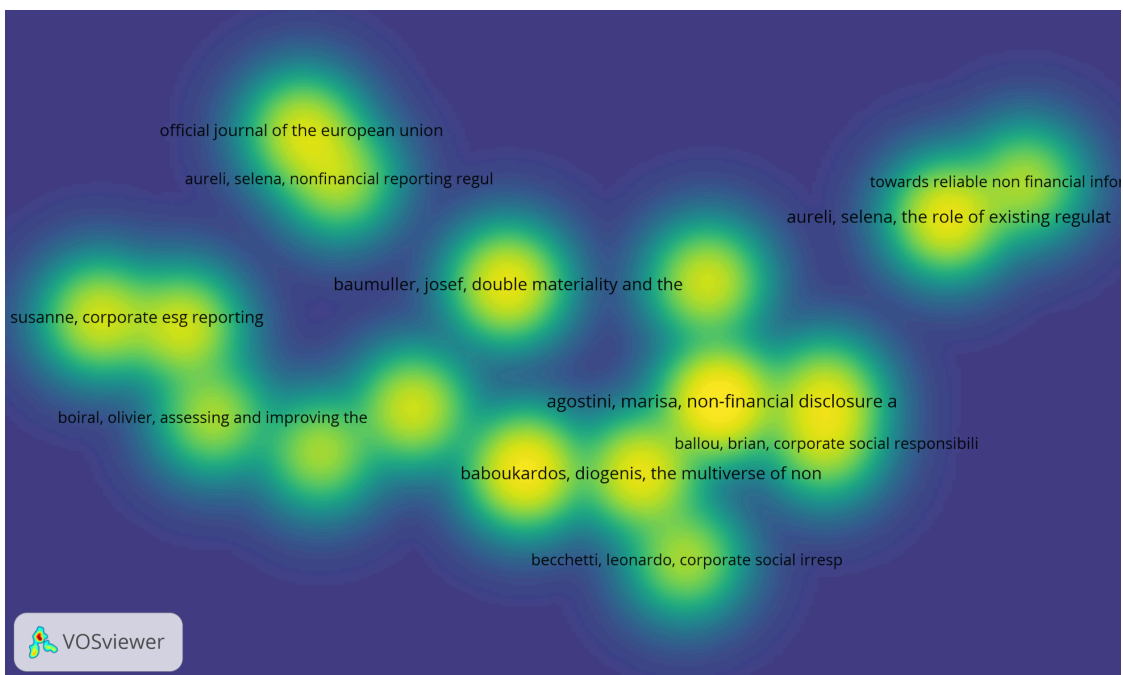
The sample of 117 papers cited 940 references. 20 references had at least 3 citations. The most cited papers are:

- Agostini, Costa, and Korca (2022). Non-financial disclosure and corporate financial performance under directive 2014/95/EU: Evidence from Italian listed companies. *Accounting in Europe*, 19(1), 78-109.
- Albu, Albu, Apostol, and Cho, (2021). The past is never dead: the role of imprints in shaping social and environmental reporting in a post-communist context. *Accounting, Auditing & Accountability Journal*, 34(5), 1109-1136.
- Albu, Albu, Cho, and Pesci (2023). Not on the ruins, but with the ruins of the past - Inertia and change in the financial reporting field in a transitioning country. *Critical Perspectives on Accounting*, 96. <https://doi.org/10.1016/j.cpa.2022.102535>
- Atif, Hossain, Alam, and Goergen (2021). Does board gender diversity affect renewable energy consumption? *Journal of Corporate Finance*, 66. <https://doi.org/10.1016/j.jcorpfin.2020.101665>
- Atkins and Maroun (2018). Integrated extinction accounting and accountability: building an ark. *Accounting, Auditing & Accountability Journal*, 31(3), 750-786.
- Aureli, Magnaghi, and Salvatori (2019). The role of existing regulation and discretion in harmonising non-financial disclosure. *Accounting in Europe*, 16(3), 290-312.
- Aureli, Salvatori, and Magnaghi (2020). A country-comparative analysis of the transposition of the EU non-financial directive: An institutional approach. *Accounting, Economics, and Law: A. Convivium*, 10(2), 1-30.

- Baboukardos, Gaia, Lassou, and Soobaroyen (2023). The multiverse of non-financial reporting regulation. *Accounting Forum*, 47(2), 147-165.
- Baumüller and Sopp (2022). Double materiality and the shift from non-financial to European sustainability reporting: review, outlook and implications. *Journal of Applied Accounting Research*, 23(1), 8-28.
- Beske, Haustein, and Lorson (2020). Materiality analysis in sustainability and integrated reports. *Sustainability Accounting, Management and Policy Journal*, 11(1), 162-186.

The density analysis presented in Figure 4 shows that, apart from papers, institutional references (such as the official journal of the European Union) and factsheets (i.e., *Towards Reliable Non-Financial Information Across Europe* by Accountancy Europe, 2020) are also included. Co-citation is weighted by the number of citations in the graphical presentation.

Figure 4 – Density analysis of the co-citation of the articles



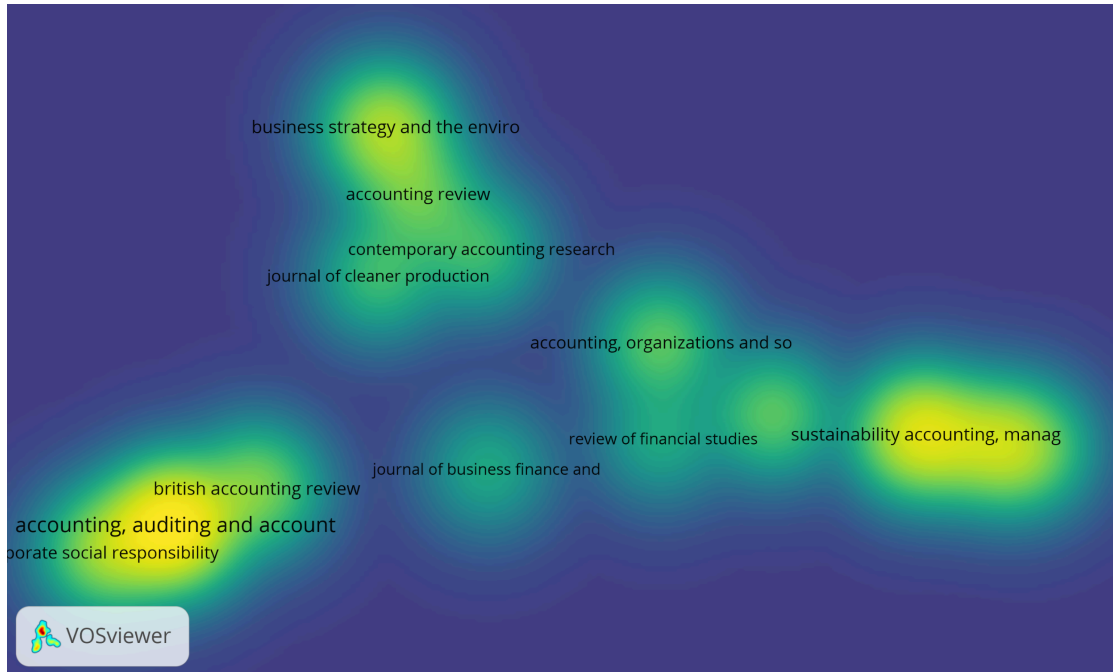
Source: Author's elaboration

3.2.2 Journals

Following the co-citation analysis for the journals, 15 sources are cited at least 3 times. The density diagram (Figure 5) shows that the central journals in the debate are *Accounting*, *Auditing and*

Accountability Journal; Business Strategy and the Environment; Accounting, Organizations and Society; Sustainability, Accounting, Management and Policy Journal. Co-citation is weighted by the number of citations in the graphical presentation.

Figure 5 – Density analysis of the co-citation of the journals



Source: Author's elaboration

The other journals that emerged from the co-citation analysis are *Corporate Social Responsibility and Environmental Management; British Accounting Review; Journal of Business Finance & Accounting; Accounting Review; Contemporary Accounting Research; Journal of Cleaner Production; Review of Financial Studies; Accounting in Europe; Business and Society*.

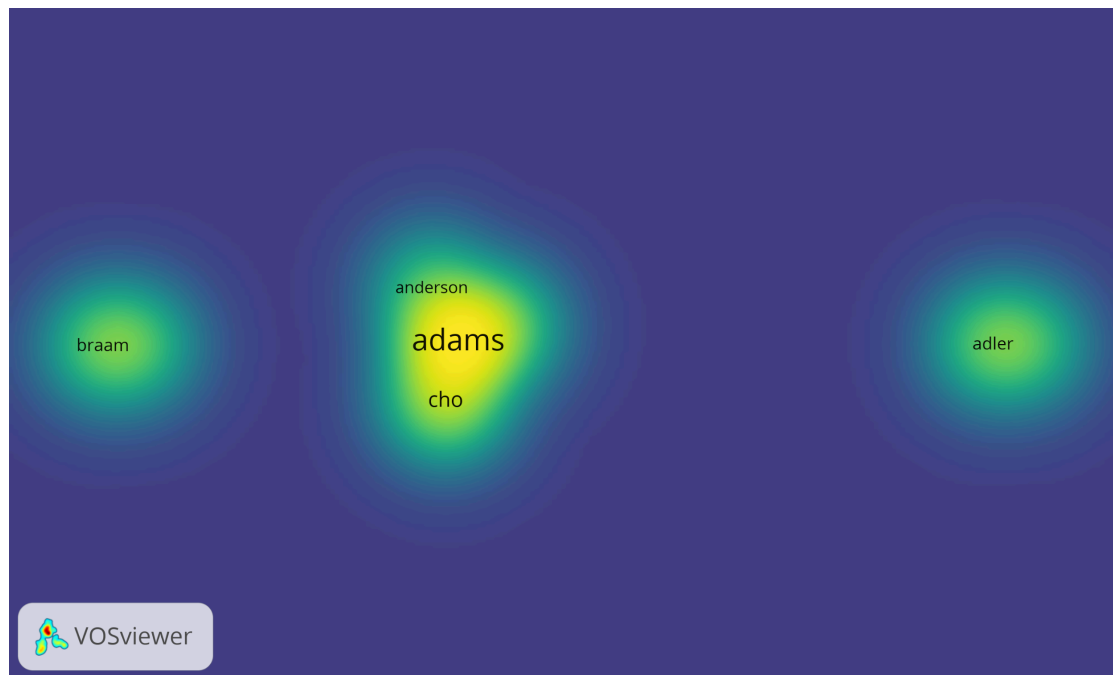
3.2.3 Authors

The co-citation analysis for the authors highlights that 10 authors are cited more than three times. The most cited authors are Carol Adams, Ralph W. Adler, Geert Braam, and Charles Cho. These are some of the most important and influential scholars in the field of sustainability and environmental reporting, with highly relevant studies (Adams, 2002; Braam, de Weerd, Hauck & Huijbregts, 2016;

Cho & Patten, 2007; Milne & Adler, 1999) that continue to represent the theoretical foundation for research in the field.

Figure 6 shows the co-citation density diagram for the authors. Co-citation is weighted by the number of citations in the graphical presentation.

Figure 6 – Density analysis of the co-citation of the authors



Source: Author's elaboration

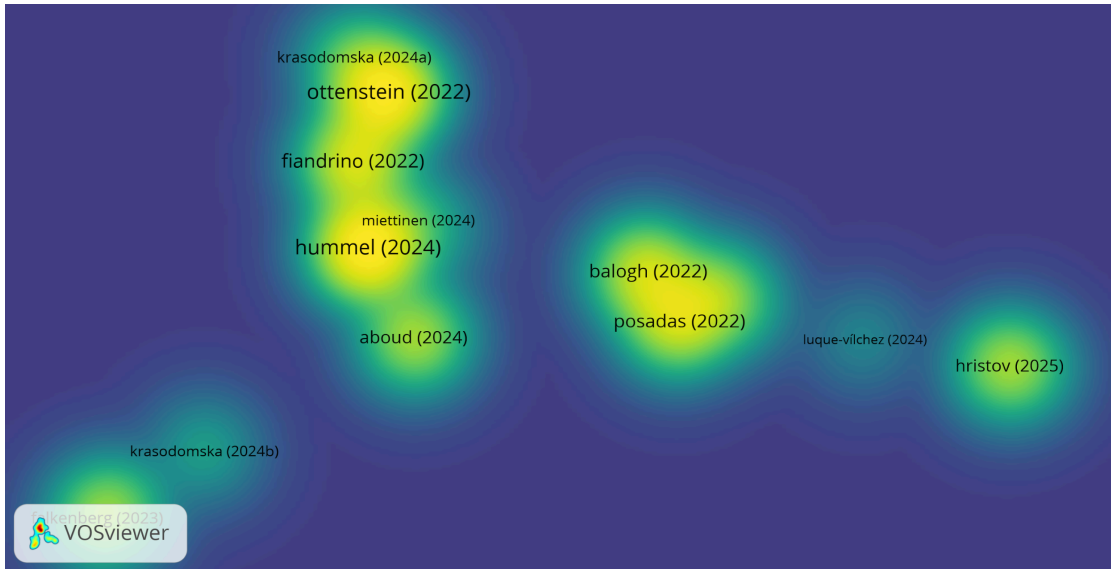
3.3 Bibliographic coupling

3.3.1 Articles and journals

The analysis conducted through the bibliographic coupling highlights that at least 2 citations are shared by 41 articles, which represent 35% of the sample, highlighting a strong interconnection between the studies and a solid foundation of the topic in the literature. These results are even more significant if we consider that the topic has been studied only in recent years (mainly 2024 and 2025), showing that a strong theoretical basis is being built around CSRD in the literature. The most relevant papers in this sense are from the first years of the sample, i.e., Balogh, Srivastava and Tyll (2022), Posadas, Ruiz-Blanco, Fernandez-Feijoo, and Tarquinio (2023), Ottenstein, Erben, Jost, Weuster, and Zülch (2022), Fiandrino, Gromis di Trana, Tonelli, and Lucchese (2022), and Songini, Pistoni, Comerio, and

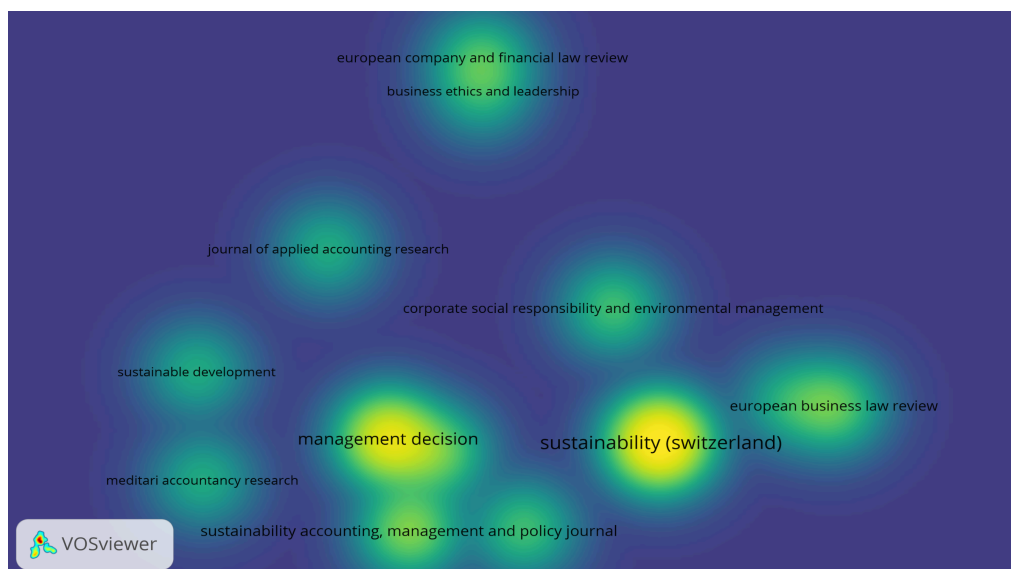
Tettamanzi (2023); but there are also some exceptions, i.e., Hummel and Jobst (2024) and Hristov and Searcy (2025), which means that that studies evolve rapidly and take into account also the latest evidence. Figure 7 shows the density diagram of the bibliographic coupling of the articles.

Figure 7 – Density diagram of the bibliographic coupling of the articles



Source: Author's elaboration

Figure 8 – Density diagram of the bibliographic coupling of the journals



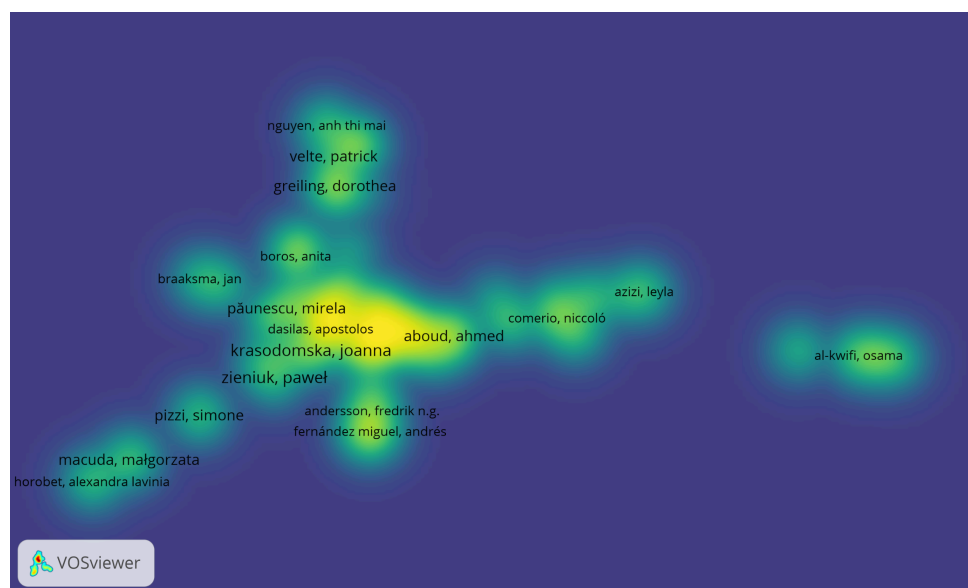
Source: Author's elaboration

Finally, the density diagram of the bibliographic coupling of the journals (Figure 8) shows that the topic is explored transversally, as sources from different sectors refer to each other. The total number of journals that share at least 2 citations is 16 (which corresponds to 23% of the sample). *Management Decision*, *Sustainability (Switzerland)*, and *Sustainability Accounting, Management and Policy Journal* show the highest index of bibliographic coupling (5 citations).

3.3.2 Authors

The bibliographic coupling analysis of the authors reveals that there are still no scholars who represent a definitive point of reference among others on the topic; this is likely due to the novelty of the topic, which still lacks the necessary maturity. Indeed, the authors with at least one publication and a minimum number of citations equal to 2 are 114; however, if we consider authors with at least two publications and a minimum number of citations equal to 2, only 11 authors meet the thresholds. Finally, only three authors published at least three papers with a minimum number of citations equal to two in the sample. Figure 9 shows the density diagram of the bibliographic coupling of the authors.

Figure 9 – Density diagram of the bibliographic coupling of the authors



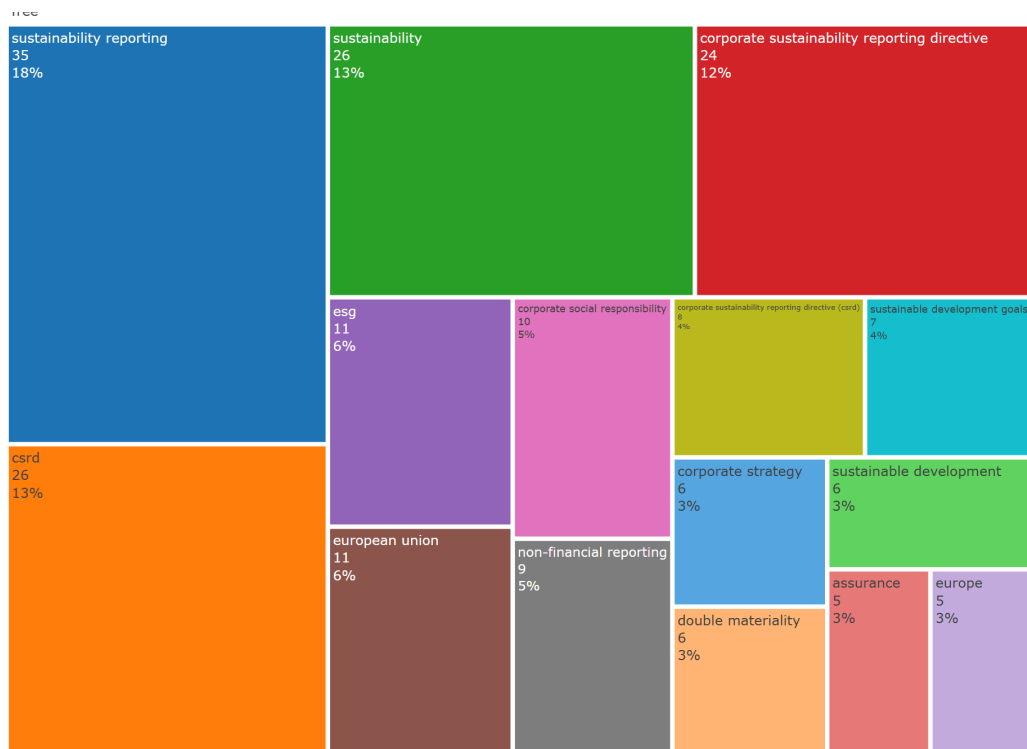
Source: Author's elaboration

4 Keywords analysis

The keyword analysis is conducted using both Bibliometrix and VOSviewer tools. More precisely, Bibliometrix is used to observe the word cloud, the tree map and the thematic map, which give an overview of the keywords of the sample. Then, VOSviewer is used to identify the clusters related to the keywords and analyze them.

Figure 10 presents the word cloud, which displays the most representative keywords in the sample. The most important terms are “CSRD” (16% of the sample, represented by either the terms “CSRD” and “Corporate Sustainability Reporting Directive”, for a total count of 50) and “sustainability reporting” (11% of the sample, for a total count of 35). Other representative keywords include “sustainability” (8%), “ESG” (4%), “European Union” (4%), “corporate social responsibility” (3%), and “non-financial reporting” (3%).

Figure 10 – Keywords tree map



Source: Author's elaboration

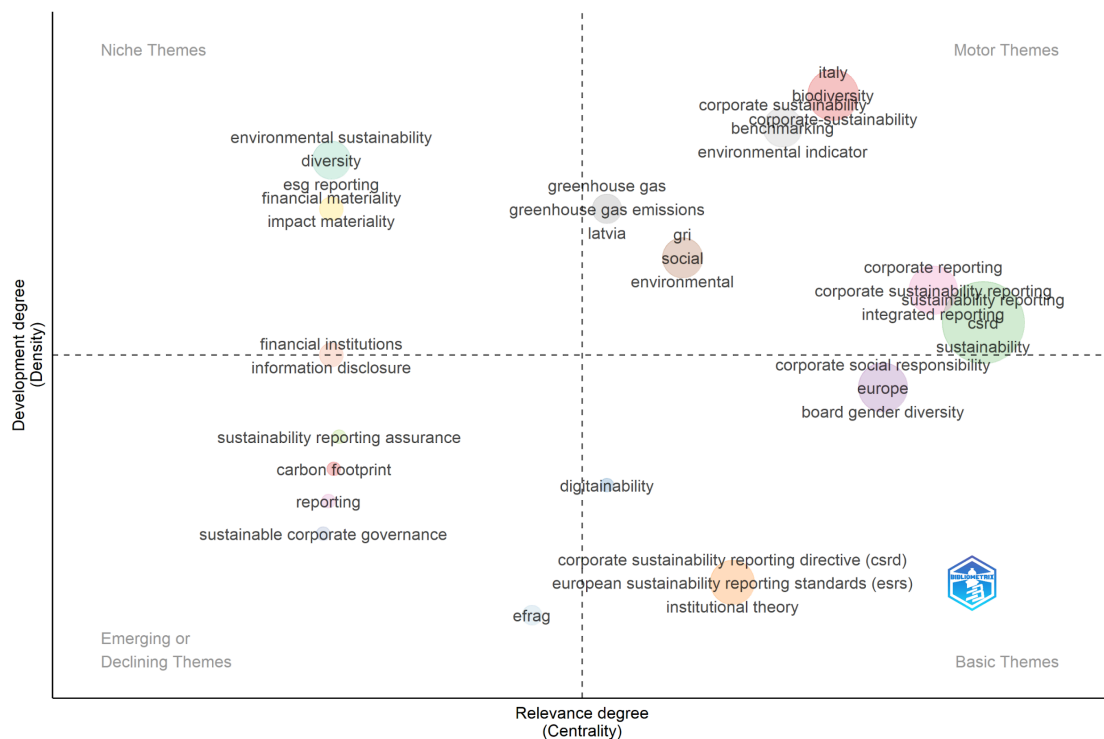
Figure 11 presents the word cloud of the keywords.

Figure 11 – Keywords word cloud



Source: Author's elaboration

Figure 12 – Keywords thematic map



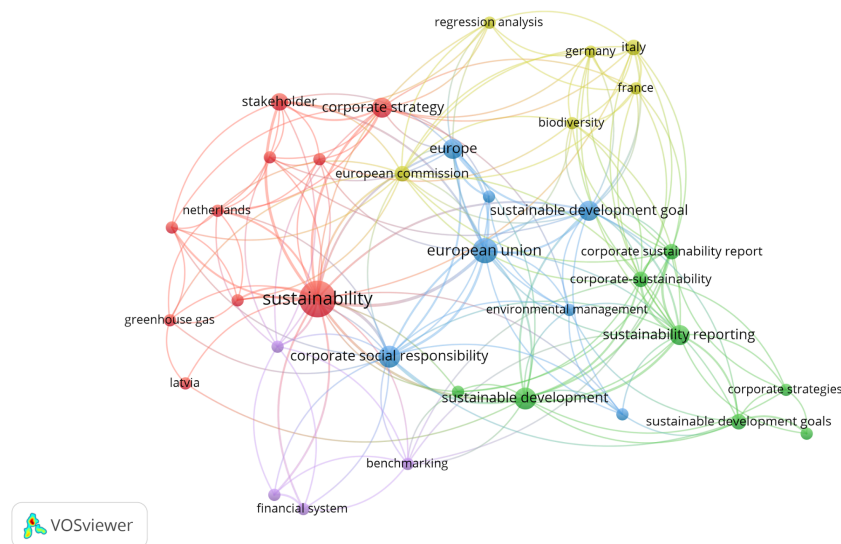
Source: Author's elaboration

The thematic map (Figure 12) classifies keywords based on the degree of topic development (density) and the degree of topic relevance (centrality). This allows us to identify the motor themes (highly developed and central), of which the more relevant are “corporate reporting”, “corporate sustainability reporting”, and “sustainability reporting” linked to CSRD. The niche themes (highly developed but not central) are mainly “environmental sustainability”, “diversity”, “financial materiality”, and “impact materiality”. “Board gender diversity”, “corporate social responsibility”, and “European sustainability reporting standards” represent the basic themes (high relevance but still underdeveloped), which are fundamental themes that could be further explored. Finally, the underdeveloped and less central themes are “carbon footprint”, “sustainability reporting assurance”, and “sustainable corporate governance”.

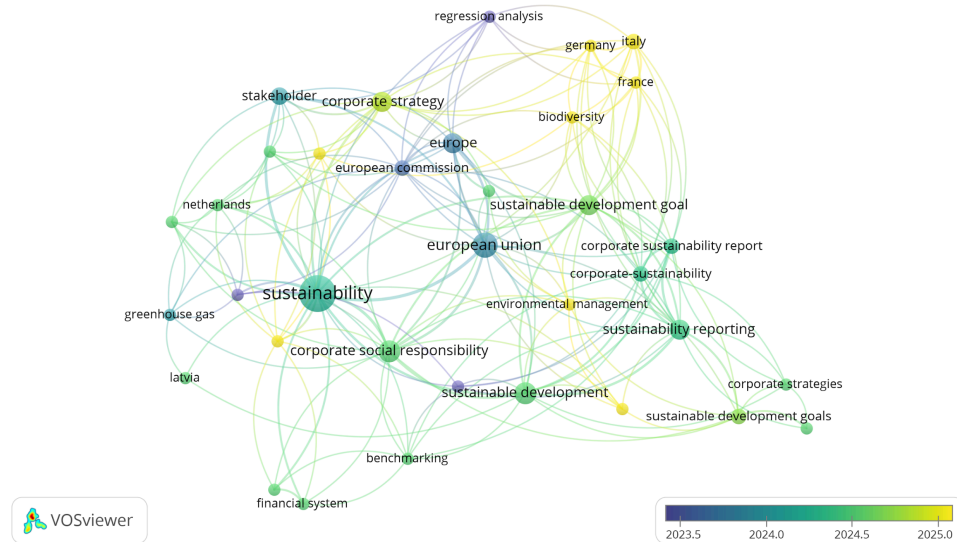
4.1 Cluster analysis

To conduct the cluster analysis, this paper relies on the co-occurrence network diagram (created using VOSviewer), which is displayed in Figure 13. To build the diagram, I selected only the keywords that occurred at least twice to highlight the most frequently discussed themes.

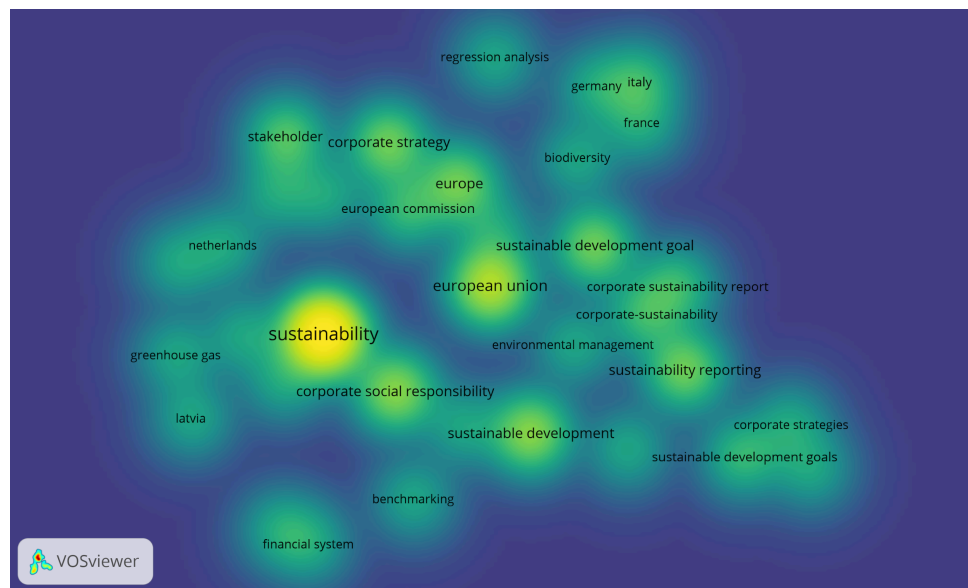
Figure 13 – Keywords co-occurrence network diagram



Source: Author's elaboration

Figure 14 – Keywords co-occurrence overlay diagram

Source: Author's elaboration

Figure 15 – Keywords co-occurrence density diagram

Source: Author's elaboration

The diagram identifies five clusters: the red cluster (sustainability, CSR, stakeholder, climate change), the blue cluster (Europe, EU, governance, regulation), the green cluster (sustainable

development, corporate sustainability, reporting), the yellow cluster (biodiversity, countries), and the purple cluster (indicators, benchmarking, performance). These clusters will be analyzed in the subsequent sections.

Figure 14 shows the overlay of the clusters based on average citation (showing the most relevant keywords), while Figure 15 highlights the density of the keywords.

4.1.1 Red cluster

The red cluster refers to sustainability, stakeholders, and climate change. The main keywords are “sustainability”, “stakeholder”, “climate change”, “corporate strategy”, and “greenhouse gas”.

Using 2017–2022 data and a 2SLS/Heckman design, Schneider, Kayser, Retsch, Thun, and Zülch (2025) highlight that an “integrative understanding of sustainability” (i.e., embedding it in strategy, the business model, and the top management team) improves bottom-line metrics (e.g., ROA) but not necessarily top-line growth. The strongest effects occur when all three anchors are present. The study aligns with CSRD emphases and adds causal rigor to the nexus between sustainability and performance.

Analyzing European Commission consultation data through Innovation Resistance Theory and the normativity lens, Damiano and Valenza (2025) find both psychological and functional barriers depress acceptance of the transition from NFRD to CSRD. Conducting a content analysis of 17 Euronext Growth Milan SMEs, Paoloni, Modaffari, and Piedepalumbo (2025) show that few disclosures are ESRS-aligned; climate coverage is often “substantive” descriptively but omits financial impact assessments, i.e., the double-materiality financial side is largely absent.

A comparison across seven standards (namely, European Sustainability Reporting Standards, UNI 11919, Global Reporting Initiative, Sustainable Development Goals Disclosure Recommendations, International Integrated Reporting Council Framework, Sustainability Accounting Standards Board Standards, Task Force on Climate-related Financial Disclosures standards) conducted by Bux et al. (2025) finds that EFRAG, UNI, and GRI are the most complete and least discretionary. Following this, the authors propose common steps to improve comparability, which are stakeholder mapping, topic and risk identification, thresholds, matrix, disclosure, monitoring, and engagement. A lexicon study conducted by Oliveros Fontaine, del Campo, and Urquía-Grande (2024) from 2014 to 2022 reveals that the increasing separate use of investor is not statistically associated with a richer sustainability vocabulary, suggesting that, prior to the CSRD, investor discourse did not systematically deepen in sustainability. This could represent a basis for future studies following CSRD application. Sharma (2025) conducted interviews with 20 experts and portrayed CSRD as both a catalyst and a compliance challenge. Indeed, listed firms adapt faster, and non-listed firms and SMEs struggle with resources and

complexity. Moreover, the mandatory assurance is framed as a strategic investment and standardization is expected to enhance comparability and stakeholder trust.

Bartolacci, Del Gobbo, and Soverchia (2025) observed that two large Italian family businesses emphasize financial materiality over impact materiality. The authors argue that stewardship-oriented stakeholder relationships can expand awareness and balance both sides of double materiality over time.

Finally, surveying 75 large organizations preparing for their first CSRD reports, Novicka (2025) shows that digital sustainability reporting mediates the relationship between sustainability and business performance, and big-data analytics capability is a key enabler.

4.1.2 Blue cluster

The blue cluster refers to regulation and management perspectives. The main keywords are “European Union”, “corporate social responsibility”, “sustainable development goal”, “management practice”, and “environmental management”.

Aboud, Saleh, and Eliwa (2024) used a propensity score matched difference-in-differences (EU and US) targeting the NFRD implementation and found that mandating disclosure mitigates ESG decoupling. Effects are weaker when ESG information is independently audited, stronger in non-controversial industries, and not moderated by national enforcement strength, suggesting regulation itself constrains disclosure performance gaps. These findings are also important for CSRD, which replaced NFRD.

Pisano, Lepore, Nastari, and Al-Gamrh (2025) analyzed 728 European firms (2017-2023) and documented systematic under-reporting of environmental actions but a decline in decoupling by 2023. Board independence, gender diversity, and the presence of a CSR committee are associated with reduced environmental decoupling. Moreover, CSR committees have the most significant impact on increasing disclosure. The temporal pattern is consistent with tightening requirements under the CSRD, improving alignment.

Tsalidis (2024) introduced an Occupational Health and Safety Potential (OHSP) midpoint indicator for social life cycle assessment, enabling product-level quantification using hours (preferred) or monetary proxies. The approach is framed as responsive to CSRD data needs, helping firms disclose OSH across their supply chains with clearer attribution of life-cycle hotspots. Novicka and Volkova (2025) conceptualized digital sustainability reporting, arguing that ESRS and value-chain disclosures mandated by CSRD push firms toward integrated digital systems; they offer managerial guidance for building capabilities that satisfy double materiality and structured tagging at scale. Tănase et al. (2025) presented a managerial model that links the usage of accounting information systems to the

quantification of CSR indicators and a composite CSR index, suggesting that accounting information systems can bridge the implementation gap between regulatory intent and decision-useful, auditable metrics.

Becchetti, Mancini, and Solferino (2024) exploited Italy's size threshold with a regression-discontinuity design and found that mandatory non-financial reporting increases waste management, the use of recycled inputs, pollution control, and emission reduction, providing evidence of an environmental response to disclosure mandates.

Finally, Lin (2022) contrasted the EU's CSRD path with the UK's post-Brexit framework, highlighting the UK's reliance on NFRD-style regimes and proposing an industry-based, risk-responsive approach tailored to the UK's institutional specifics, signalling emerging regulatory fragmentation across Europe.

4.1.3 Green cluster

The green cluster refers to sustainable development, corporate sustainability, and reporting. The primary keywords are "sustainable development", "corporate sustainability", "sustainability reporting", and "corporate sustainability report". This is the most populated cluster of the sample.

Studies on pre-application of the CSRD focused on different themes. Pizzi and Caputo (2025) studied how non-EU firms (specifically US corporations) reacted ex-ante to the EU CSRD in their statutory filings, finding that only a minority of US firms (which tend to have more sophisticated governance systems) disclose forward-looking CSRD-related information. Raimo, L'Abate, Sica, and Vitolla (2025) studied the extent to which pre-CSRD integrated reports complied with ESRS disclosure requirements and what drives compliance. The authors found that ESRS compliance was low, and that larger firms and environmentally sensitive industries exhibited higher alignment.

Regarding firm values, Huang, Mirza, Umar, and Horobet (2025) observed that disclosing environmental factors is consistently and positively associated with firm value, suggesting markets price transparency around environmentally material practices; results are robust across valuation approaches. Mahmood, Mehmood, Terzani, De Luca, and Djajadikerta (2025) studied whether the ESG disclosure contributes to firm value in the transition from NFRD to CSRD, and found that the post-CSRD-issuance period shows lower average ESG scores and lower average firm value in univariate comparisons, and that there is a positive association between ESG disclosure and firm value overall.

Severe studies addressed the materiality issue. Morganho, Milánes-Montero, and Pérez-Calderón (2025) conducted a content analysis of 45 Portuguese and Spanish firms (from 2018 to 2022) to build a composite materiality-assessment disclosure index. The authors found that governance and sectoral

effects are determinant, as industry and board size significantly predict disclosure depth. Mezzanotte (2024) argued that the impact materiality was adopted by the EU following alignment with EU Green Deal and GRI-style sustainable development framing, strengthening accountability via due diligence and impact management, and supporting sustainable-investment markets.

Regarding performance, Li, Zhao, and Taghizadeh-Hesary (2025) found that CSRD significantly improves the financial performance of enterprises in the EU, with stronger effects in firms with older boards, smaller size, and higher female representation.

There are also practical contributions, like Operato, Gallo, Marino, and Mattioli (2025), who proposed a framework to derive science-based, ESRS datapoint-level metrics that are auditable first under limited, and assurance; and Farkas and Matolay (2024) argue for embedding CSRD within existing management system logics (planning, control, continuous improvement) and building Decision Support Systems that operationalize materiality, target-setting, and performance integration. Hristov and Searcy (2025) proposed a Sustainability Balanced Scorecard framework with four stages (i.e., material theme identification, initial assessment, strategy and actions, and reporting) explicitly tying ESRS requirements to governance processes and indicators. Fragidis and Papafloratos (2025) proposed a structured information architecture that treats ESRS datapoints as atomic units.

4.1.4 Yellow cluster

The yellow cluster refers to biodiversity and countries. The main keywords are “biodiversity”, “regression analysis”, “Germany”, “France”, and “Italy”.

Research on biodiversity, sustainability reporting, and nonfinancial disclosure provides complementary insights into how policy, culture, finance, and corporate practices intersect. Erhart, Menyhért, Erhart, and Hagyo (2025) develop a novel methodology that links industrial pollutant data from the European Pollutant Release and Transfer Register with the geographic locations of Natura 2000 protected areas. The authors demonstrate that numerous sites are vulnerable to significant risks of eutrophication and ecotoxicity, particularly in highly industrialized regions such as the Benelux countries, southern Germany, northern Italy, and southwestern France. With hundreds of industrial facilities located within 500 meters of sensitive areas, the study underscores the urgent need for improved monitoring and coordinated international action to protect biodiversity.

Turning from ecological risks to financial practices, Azizi, Scope, Ladusch and Sassen (2025) investigate how major European financial institutions disclose biodiversity-related risks and impacts. Using institutional theory and content analysis of non-financial reports, the study finds that disclosure remains low and inconsistent across institutions, although regulatory frameworks such as the EU

Taxonomy, the Sustainable Finance Disclosure Regulation, and the CSRD are encouraging improvements. The authors emphasize that financial institutions, given their capital allocation role, are crucial mediators for biodiversity protection but currently fall short of transparent and comprehensive reporting.

Casciello, Maffei, and Zampella (2025) examine the cultural context of sustainability reporting in Germany, Spain, France, and Italy between 2018 and 2023. Using Hofstede's cultural dimensions and regression models, the authors show that in cultures with higher power distance, individualism, masculinity, and indulgence, nonfinancial disclosure tends to be less relevant to investors. By contrast, in countries with stronger uncertainty avoidance and long-term orientation, sustainability information is more valued in capital markets. These findings underscore the importance of regulators and companies considering cultural traits when designing and evaluating disclosure policies.

Öhlinger and Lehner (2025) critique the alignment between European biodiversity policy and scientific evidence. Using a teleological approach to interpret the European Green Deal's legal framework, the authors show that EU biodiversity policy places too much emphasis on pollution control, while underrepresenting other major drivers of biodiversity loss, particularly land-use change. They argue for stronger land-use policies, improved enforcement mechanisms, and better integration of biodiversity considerations into agriculture and sectoral policies.

Focusing on assurance practices, Vander Bauwhede and Van Cauwenberge (2022) studied over 1,800 firm-year observations from European listed companies after the Non-Financial Reporting Directive. The results indicate that larger firms, those with stronger ESG performance, and firms in certain industries are more likely to adopt assurance of their sustainability reports. Crucially, assurance is positively associated with stock market value, suggesting that investors reward verified information. This supports the European Commission's move toward mandatory assurance under the upcoming Corporate Sustainability Reporting Directive.

Posadas, Ruiz-Blanco, Fernandez-Feijoo, and Tarquinio (2023) investigate how institutional pressures influenced sustainability reporting before and after the implementation of Directive 2014/95/EU. The study shows that normative (professional and societal expectations) and mimetic (imitation of peers) mechanisms improved the quality of reports, whereas coercive pressure from the regulation itself had a minimal effect. The findings suggest that cultural and professional norms, as well as competitive dynamics, may be more effective drivers of reporting quality than regulation alone. Institutional pressures are also investigated by Pizzi and Coronella (2024), who investigate whether listed SMEs are prepared for the CSRD. The authors apply institutional theory to examine the isomorphic pressures that drive SMEs' disclosure practices. Using a dataset of 174 Italian listed SMEs between 2017 and 2021, and employing panel logistic regression, they assess whether sectoral and

geographical dynamics influence the voluntary adoption of sustainability reports. The findings reveal a strong presence of mimetic isomorphism, where SMEs tend to imitate the sustainability reporting practices of larger, listed firms and competitors within the same industry. However, geographical proximity does not appear to influence disclosure behaviour, suggesting that listed SMEs are more oriented toward national and international competitive pressures than local dynamics.

4.1.5 Purple cluster

The purple cluster refers to indicators, benchmarking, and performance. The primary keywords are “environmental indicator”, “benchmarking”, “financial system”, and “industrial performance”.

Monteiro, Roque, and Faria (2024) investigate large Portuguese companies and the extent to which the publication of sustainability reports influences financial performance. Using both univariate and multivariate analyses, the authors demonstrate that there is no statistically significant difference between firms that disclose sustainability information and those that do not. This finding challenges the often-assumed immediate financial benefits of reporting and instead suggests that the value of sustainability disclosure may lie in long-term legitimacy and compliance with international frameworks such as the NFRD and the CSRD.

Morosan-Danila, Grigoras-Ichim, Jeflea, Filipeanu, and Tugui (2025) developed an econometric model tailored to the construction sector in Romania. By integrating financial, social, and environmental indicators into a composite sustainability score, the study reveals that financial resilience (particularly variables such as return on assets, debt ratio, and equity structure) strongly influences both financial and environmental performance. In contrast, the social dimension remains less clearly explained by financial indicators, underscoring the difficulty of operationalizing social sustainability within quantitative models. Importantly, the model aligns with the CSRD and ESRS requirements, offering a replicable framework for sector-specific sustainability evaluation.

Niemann, Morssinkhof, van der Linden, and de Vries (2025) focused on SMEs in the Netherlands, analyzing the indirect effects of the CSRD through value-chain data requests. Based on a representative survey and qualitative interviews, the findings reveal that while a majority of SMEs have not yet been approached for sustainability data, those integrated into international supply chains already face significant reporting pressures. These demands, particularly related to environmental metrics such as carbon emissions, often exceed the resources and digital capacities of SMEs. The study, therefore, highlights a tension: while sustainability data requests can promote competitiveness and innovation, they also risk imposing disproportionate burdens on smaller firms unless adequate support mechanisms are introduced.

Finally, Schneider, Woerle, Kagermeier, Zaeh, and Reinhart (2024) introduce a methodological innovation in the field of manufacturing risk assessment by combining Life Cycle Assessment with Failure Mode and Effects Analysis. This hybrid framework enables a bottom-up identification of transitory sustainability risks (emerging from regulatory change and shifting market expectations). The case study application demonstrates that this approach provides manufacturers with robust, quantitative insights, allowing them to benchmark sustainability performance, enhance resilience, and ensure alignment with evolving European standards.

5 Concluding remarks

CSRD serves as a central driver in the EU's reshaping of reporting practices, governance, and strategy. In this study, I conducted a bibliometric analysis of the literature on CSRD to identify the main trends in the research field and the practical implications of the directive.

Evidence points to measurable bottom-line benefits when sustainability is truly integrated into strategy, the business model, and top management; persistent execution gaps (especially around double materiality and climate-related financial effects) among SMEs and even early adopters; heterogeneous stakeholder resistance rooted in both psychological and functional barriers; and promising implementation levers (data capability, digital reporting readiness, and operational design propositions) that translate policy into performance.

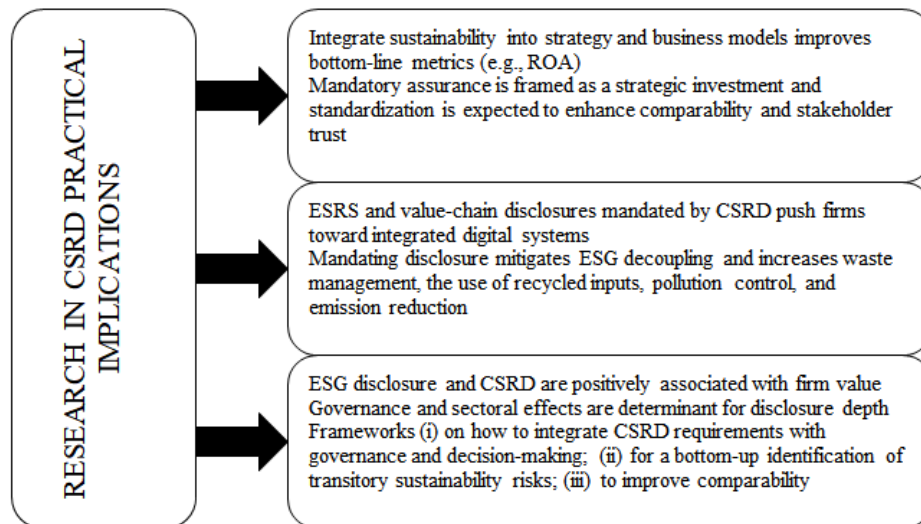
Biodiversity risks remain high and insufficiently addressed by both policy and financial institutions. Cultural contexts, institutional pressures, and assurance mechanisms significantly shape how nonfinancial information is disclosed, perceived, and valued. The studies underscore the need for integrated approaches that combine strong regulation, cultural awareness, financial accountability, and scientific evidence in order to effectively advance biodiversity protection and sustainability reporting in Europe.

The financial benefits of sustainability reporting are not immediate and depend heavily on contextual, sectoral, and temporal factors. Robust assessment frameworks must integrate financial, social, and environmental indicators, while also acknowledging the relative difficulty of measuring social sustainability. Moreover, SMEs, though not always directly regulated, are increasingly embedded in reporting ecosystems through their participation in value chains. Methodological innovations, such as the integration of Life Cycle Assessment and Failure Mode and Effects Analysis, offer practical tools for managing sustainability risks in a dynamic regulatory environment.

Materiality assessment is seen as the primary driver of reporting content and quality. Impact materiality is normatively justified but operationally demanding, given the risks of discretion and data quality. Board size and industry context shape the depth of materiality disclosures, indicating an interplay between governance capacity and sector salience. Moreover, it has been observed that reduced disclosure–performance gaps occur after the implementation of mandatory disclosure rules, suggesting that disclosure rules can catalyze not only transparency but also behavioral change. Finally, disclosures are framed not only as compliance duties but also as levers for strategic advantage.

To outline the practical implications of CSRD, I present in Figure 16 an interpretive framework that captures the contributions to practice emerging from the literature.

Figure 16 – Interpretative framework for practical implications of CSRD research



Source: Author's elaboration

This paper has both theoretical and practical implications as it is the first to systematically analyze the literature on a novel sustainability regulation (i.e., CSRD) that will affect EU member states, evidencing the areas of study, the topic of interest, and the major findings, including practical insights for firms. Moreover, future research could delve further into understudied topics, as evidenced by the analysis, e.g., board composition.

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