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Auditing the Sustainability Reports – Challenges and Perspectives

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Abstract

This paper analyzes the most recent sustainability reports of Romania's largest companies listed on the Bucharest Stock Exchange (BVB), using NVivo to examine ESG-related keywords across sectors. The results highlight strong emphasis on governance and environmental themes, especially within the banking, technology, energy, and materials industries. In contrast, the healthcare and food & beverage sectors show comparatively lower sustainability engagement. While most companies demonstrate alignment with established frameworks, the depth and structure of disclosures vary. Despite the growing importance of audit and assurance under the CSRD, explicit references to these elements remain limited. This study offers a current snapshot of sustainability reporting practices in Romania, providing a reference point for comparative analysis with forthcoming disclosures.

Key words: *sustainability reporting; Romania; BSE; NVivo; CSRD; EU Taxonomy; content analysis;*

JEL Classification: *M14, Q56, M41, G38*

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1. Introduction

Sustainability reporting has become a key area of interest for companies and stakeholders within the business environment. In this context, it is essential to clearly define the applicable regulations and to identify the relevant standards, implementation rules, involved parties, as well as the processes of verification and certification of sustainability reports prepared by companies. As currently defined, sustainability reports primarily include information about the company, its operating environment, social activities, and aspects of corporate governance—thus falling under the umbrella of ESG, which stands for Environmental, Social, and Governance. This framework reflects the three key dimensions used to evaluate a company's broader impact: environmental, social and governance.

As this article examines auditing of sustainability reports on the Bucharest Stock Exchange, it sees growing interest in publishing such reports in Romania. The rise of sustainability reporting in Romania can be attributed to recognition of excellence through awards, as well as increasing stakeholder demand for transparent and direct disclosures, as seen in existing literature and the progression of ESG practices in Eastern Europe.

Romania is also following the global trend in the evolution of sustainability reporting, a trend that is gaining momentum worldwide. At the same time, although this growth has led to the emergence of numerous regulations, there are ongoing controversies regarding the implementation of these frameworks and, subsequently, the usefulness and transparency of the reports—especially considering the level of know-how being developed. Some critics argue that many reports fail to address the key points of interest for market participants.

To overcome this deficiency, independent assurance conducted by professional auditors is increasingly regarded as essential. Audited sustainability reports diminish information asymmetry and render ESG disclosures more credible. As emphasized by Auliani, Pramesti, & Yunita (2023), external audits conducted by government agencies, non-governmental agencies, or professional firms enhance public trust and ensure companies' adherence to sustainability.

The auditing of these kinds of reports guarantees the validity of financial and non-financial information since auditors use strict verification techniques. Their function is changing, going beyond classical financial control to encompass examination of environmental and social data. The paper discusses how auditors make it possible to advance the quality and integrity of sustainability reports, providing an overview of current practice and directions for further research and activities for corporate accountability.

2. Literature Review

2.1. Sustainability reporting – purpose and benefits

Corporate reporting was mentioned as early as 1997 by John Elkington, who introduced the concept of the Triple Bottom Line (TBL). This concept refers to the idea that a company's or organization's performance should go beyond financial results and also present, alongside performance criteria, details regarding its social and environmental impact.

In the following years, the global frameworks recognized a considerable development, on the basis established by the Triple Bottom Line (TBL). Those most know reporting frameworks today are the Global Reporting Initiative (GRI) and the Corporate Sustainability Reporting Directive (CSRD). The GRI framework offers one of the most widely adopted structures for sustainability reporting, helping organizations disclose their ESG impacts clearly and comparably. Key standards include GRI 302 (Energy), GRI 305 (Emissions), GRI 403 (Occupational Health and Safety), GRI 404 (Training and Education), and GRI 205 (Anti-corruption). These guidelines support transparency on issues such as climate impact, labor practices, and governance, aligning corporate reporting with stakeholder expectations and global norms.

The Corporate Sustainability Reporting Directive (CSRD) was adopted by the European Union in 2022 as a major update to the Non-Financial Reporting Directive (NFRD). It came into force on January 5, 2023, and reporting obligations begin gradually starting with the 2024 financial year. The CSRD broadly enlarges the universe of sustainability reporting by requiring more companies—large non-listed and some SMEs—to report ESG information in a standardized, audited, and readily accessible electronic format. It integrates sustainability into business strategy and corporate governance in an effort to improve the quality, consistency, and credibility of non-financial information for stakeholders and investors.

There is no need to emphasize the general benefits of sustainability reporting—especially in the current business context, where a company's actions are closely scrutinized and increasingly correlated with both financial outcomes and the broader impact of specific environmental, social, or governance (ESG) events. ESG analysis, which stands for Environmental, Social, and Governance assessment, plays a vital role in offering a multidimensional view of organizational performance beyond traditional financial metrics.

Such analysis contributes to enhanced transparency, helps identify potential risks at an early stage, supports alignment with legal and regulatory frameworks, strengthens corporate reputation, attracts long-term oriented and sustainability-focused investors, and improves strategic and operational coherence.

In this sense, researchers Raimo et al. (2025), using manual content analysis, evaluated 166 EU companies' integrated reports from 2023, systematically coding the presence or absence of required disclosures. A linear regression model was applied to assess the influence of firm size and environmental sensitivity.

Findings indicate a relatively low average compliance with ESRS but show that larger firms and those in environmentally sensitive industries are more likely to align with ESRS requirements. This study contributes empirical evidence on compliance gaps between the existing framework and the newly introduced ESRS, framing compliance as a strategic response to evolving regulations.

In this evolving business environment, where financial reporting alone is no longer sufficient, sustainability reporting emerges as a critical tool for ensuring corporate relevance and competitiveness. Stakeholder expectations have grown more complex, demanding integrated insights that reflect not only profitability but also ethical responsibility and environmental impact.

2.2. Implementation of sustainability reporting in Romania

In line with global developments, Romania has progressively aligned its corporate sustainability reporting practices with international and European frameworks.

At the European level, Romania has been subject to the Non-Financial Reporting Directive (NFRD) and, more recently, the Corporate Sustainability Reporting Directive (CSRD). These directives aim to harmonize ESG disclosures across EU member states and ensure consistent quality and comparability of sustainability data.

The national transposition of these standards has been formalized through the Ordinance of the minister of finance (OMF) no. 85/2024, which represents a milestone in Romania's sustainability regulatory landscape. This ordinance lays out detailed obligations for ESG reporting applicable to large companies—including those listed on the Bucharest Stock Exchange, financial institutions, and other entities of public interest. It mandates transparent disclosure of both positive and negative sustainability impacts and requires ESG factors to be integrated into business strategy.

The ordinance mentioned introduces a phased implementation, starting with financial year 2024 for large entities with over 500 employees, and gradually extending through 2028 to smaller entities and subsidiaries of foreign companies. A particularly important clarification came in late 2024, when the Romanian Ministry of Finance confirmed that Wave 2 companies—initially thought to be required to report under NFRD standards—will only begin reporting obligations aligned with CSRD from 2025 onward.

According the Ordinance of the minister of finance no. 85, companies that meet the reporting criteria have two options: they can either prepare a local sustainability report or be included in their parent company's group-level sustainability report. However, if the second option is chosen, the report must clearly and separately present concise ESG-related information specific to the Romanian subsidiary. This ensures transparency and relevance for local stakeholders, even within a consolidated reporting structure.

Overall, the implementation of this legal framework significantly enhances Romania's sustainability reporting infrastructure, aligning it with EU ambitions while reinforcing corporate transparency over reporting, accountability of issued reports and stakeholder engagement.

Using sustainability reports from 668 Romanian companies during the period 2019-2021, the study examines the relationship between environmental performance, a non-financial metric, and financial performance. It applies two analytical methods: the grid method to assess environmental performance and a linear regression model to test its correlation with financial performance. Statistical techniques like tolerance analysis and the Durbin-Watson test help refine the findings. Results reveal a positive correlation - companies with high turnover and longer operational histories tend to have stronger environmental performance. This underscores the connection between sustainability efforts and financial success (Dobre et al., 2025).

2.3. Contextual familiarization and regulatory alignment

Table no. 1 indicates a clear direction of the regulations for sustainability reporting and assurance in the European Union, while also referencing the local implementation measures adopted in Romania.

Table no. 1. Applicable frameworks for sustainability reporting

Framework	Type	Purpose
CSRD (Corporate Sustainability Reporting Directive)	Legal directive (EU)	Mandates sustainability reporting for large and listed companies in the EU.
ESRS (European Sustainability Reporting Standards)	Reporting standards	Defines content, structure, and indicators for sustainability reports under CSRD.
ISAE 3000 (Revised)	Assurance standard	Outlines assurance procedures for non-financial information, including sustainability data.
OMF no. 85/2024 (Romania)	National legislation	Implements CSRD in Romania, establishing the national requirement for sustainability report assurance.

Source: authors' projection

Regulatory Foundation – CSRD (Corporate Sustainability Reporting Directive). The CSRD serves as the overarching legal framework that mandates sustainability reporting for large and listed companies across the EU. It significantly expands the scope and detail of prior requirements (formerly under NFRD), aiming to improve transparency and comparability of sustainability disclosures.

Reporting Framework – ESRS (European Sustainability Reporting Standards). To operationalize the CSRD, the ESRS provides the standardized content and structure for what companies must report. These standards define the specific environmental, social, and governance (ESG) metrics, ensuring consistency in sustainability disclosures across sectors and geographies.

Assurance Framework – ISAE 3000 (Revised). For verifying the reported non-financial information, ISAE 3000 (Revised) is the international standard used by auditors. It supports both limited and reasonable assurance engagements and outlines procedures for gathering and evaluating evidence on sustainability disclosures.

National Implementation – OMF no. 85/2024 (Romania). Romania has transposed the CSRD into national law through OMF no. 85/2024. This ordinance mandates the application of ESRS standards and formalizes the requirement for limited assurance on sustainability reports by independent auditors, beginning with the 2024 financial year.

The EU's first Omnibus package, released on February 26, 2025, proposes changes to several sustainability regulations, including the Corporate Sustainability Reporting Directive (CSRD) and the Corporate Sustainability Due Diligence Directive (CSDDD). The "stop-the-clock" directive, a key part of the package, was adopted by the European Parliament on April 3, 2025, and by the Council of the EU on April 14, 2025. This directive postpones the application of certain CSRD and CSDDD requirements. Additionally, the Omnibus package includes proposals to simplify the EU Taxonomy and the Carbon Border Adjustment Mechanism (CBAM).

2.4. Assessment of the double materiality determination process

Following the initial phase of contextual familiarization and alignment with regulatory frameworks, the next critical step in the assurance process focuses on evaluating how the reporting entity determines its material sustainability topics. This begins with an in-depth assessment of the double materiality determination process (DMA). The auditor examines the methodologies used to assess actual and potential impacts across the value chain, as well as how financial risks are judged over short-, medium-, and long-term horizons. Special attention is given to the stakeholder engagement processes, which are key to grounding materiality decisions in external expectations.

2.4.1. Substantiation of disclosures with verifiable evidence

The assurance process continues with the verification of whether all material sustainability matters identified through the DMA are appropriately disclosed in the report. Auditors examine the traceability and reliability of data, and whether:

- quantitative and qualitative disclosures are supported by primary documentation;
- the scope, boundaries, and assumptions underpinning the disclosures are clearly articulated and consistent with the assessment framework.

2.4.2. Types of the Assurance Opinion

Table no. 2 outlines the two recognized types of assurance engagements applicable to sustainability reporting under the CSRD and ISAE 3000 frameworks: limited assurance and reasonable assurance.

Table no. 2. Types of assurance

Type of Assurance	Procedures performed	Opinion Formulation	Example Expression
Limited Assurance	Auditor performs limited procedures to identify material misstatements.	**Negative assurance**	"Nothing has come to our attention that... is misstated."
Reasonable Assurance	Auditor performs extensive testing, similar to financial audit standards.	**Positive assurance**	"In our opinion, the information presents fairly…"

Source: authors' projection

Limited assurance is the current requirement under CSRD and involves less extensive procedures—mainly inquiries and analytical reviews. The auditor's conclusion is expressed as a negative assurance, indicating that nothing has come to their attention to suggest material misstatements. This approach is more cost-effective and suited for the early stages of sustainability assurance implementation.

In contrast, reasonable assurance resembles a traditional financial audit in its depth and rigor. It provides a higher level of confidence and is expressed as a positive opinion, asserting that the sustainability disclosures are, in the auditor's opinion, free from material misstatement. While not yet mandatory, the shift toward reasonable assurance is expected in the coming years as assurance practices mature.

3. Materials and methods

The objective of this research was to assess the extent to which major Romanian companies listed on the Bucharest Stock Exchange (BVB) disclose non-financial information related to sustainability in their most recent publicly available reports, for the companies analyzed (**Appendix 1**). The sample selection followed a three-step procedure. First, we identified the key economic sectors relevant both to the Romanian economy and to sustainability reporting, grouping them into six categories: Energy and Utilities, Materials Industry, Financial Services, Pharmaceutical and Healthcare Industry, Technology & IT, and Food & Beverage Industry. In the second step, we selected representative companies within each sector that are listed on the BVB, based on their financial size, market visibility, and sectoral relevance. In the final step, we included only those entities that had published a recent sustainability report (NFRD/CSRD/GRI, integrated report, or stand-alone ESG report), available for download either on the BVB platform or on their corporate websites. The resulting sample consists of 35 companies, regarded as ones the largest traded firms from Romania due to their compliance with all three criteria: sectoral importance, stock market listing, and transparency in ESG reporting (Table no. 3). Based on these reports (available in Romanian), obtained from the official BVB database and company websites, we conducted a qualitative content analysis to evaluate the level of sustainability disclosure.

Table no. 3. Analyzed companies	
Sector	**Companies**
Energy and Utilities	Electrica S.A., Romgaz S.A., OMV Petrom S.A., Hidroelectrica S.A., Nuclearelectrica S.A., Transelectrica S.A., ENGIE România S.A., E.ON Energie România S.A., GreenGroup
Materials Industry	Alro S.A., Chimcomplex S.A., Romcarbon S.A., Holcim România S.A., ROCA Industry, TeraPlast S.A.
Financial Services	Banca Transilvania S.A., BRD - Groupe Société Générale, UniCredit Bank S.A.
Pharmaceutical and Healthcare Industry	Antibiotice S.A., Biofarm S.A., MedLife S.A., Farmaceutica REMEDIA S.A., Zentiva S.A., Rețeaua de Sănătate, Ropharma
Technology & IT	UiPath, AROBS Transilvania Software S.A., Digi Communications N.V., Autonom Services
Food & Beverage Industry	Coca-Cola HBC România, Ursus Breweries, Heineken România, Danone România, Aquila Part Prod Com S.A., Purcari Wineries Public Company Limited

Source: authors' projection

In addition, the aim of this research is to determine the key subjects addressed in the sustainability reports through a qualitative study facilitated by NVivo software. NVivo is a widely used tool in social science and policy research that supports systematic coding, querying, and visualization of textual data. According to Bazeley and Jackson (2013), NVivo enables researchers "to work more efficiently; to manage, shape and make sense of unstructured information" and facilitates deeper insights through thematic exploration and frequency analysis. The whole report database was uploaded to the software and the word frequency analysis tool utilized to extract and plot the most used words. This enables us to identify the most prominent themes highlighted by the reporting agencies.

Furthermore, we did a comparison of which reports contain the highest amounts of these essential words to try and determine if there are general patterns within industries or companies, or if different organizations write about similar topics differently, even with the presence of globally accepted sustainability reporting standards. Beside this, we have also analyzed the distribution of companies across various industries and whether their sustainability reports were subject to an assurance engagement.

Stemming from this conceptualization, the present study is informed by the following research questions:

Q1: What types of non-financial information are most frequently highlighted in the sustainability reports of the selected Romanian companies?

Q2: Can we identify patterns, gaps, or inconsistencies in how companies apply current sustainability reporting standards in practice?

4. Results

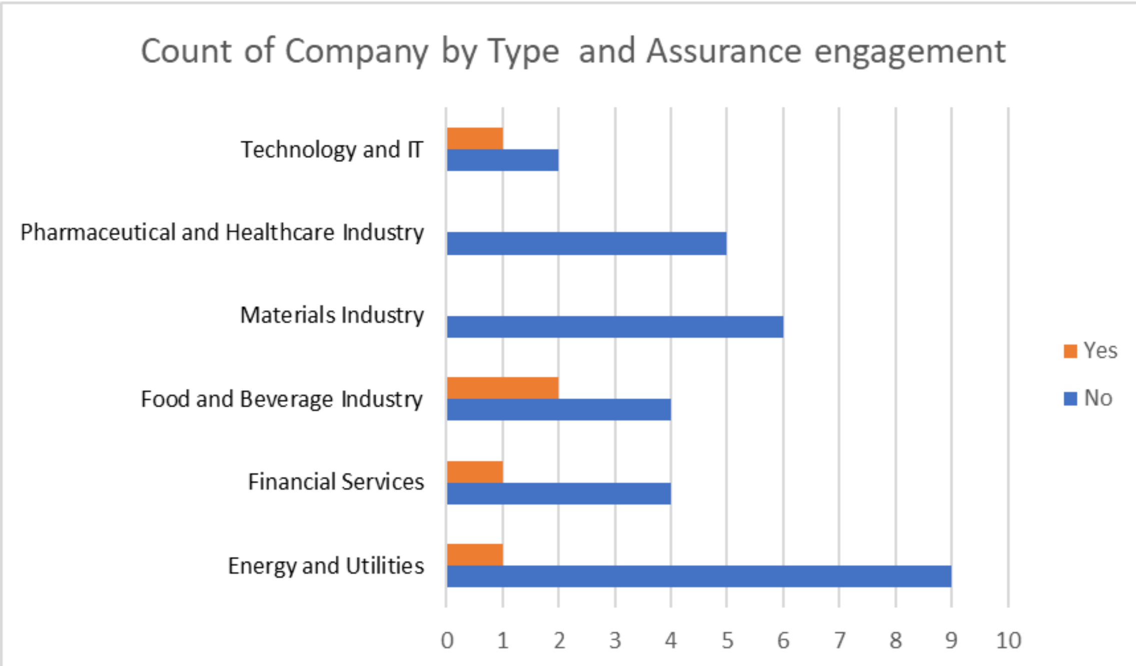
As part of this research, each sustainability report was individually reviewed to identify references to external assurance or audit procedures. The analysis involved a targeted search for key terms such as audit, assurance, and reporting ("audit", "asigurare", "raportare" *in Romanian*). This allowed for a systematic assessment of whether the disclosures were subject to any form of external verification or limited assurance engagement.

The chart in **Figure no. 1** illustrates the distribution of assurance engagements across various company types listed on the Bucharest Stock Exchange (BVB), based on an in-depth review of sustainability reports. According to the data, only a limited number of companies—most notably from the Food and Beverage, Financial Services, and Energy and Utilities sectors—explicitly reported having undergone third-party limited assurance.

Companies such as OMV Petrom, Banca Transilvania, Coca-Cola HBC România, and Heineken România disclosed having implemented assurance engagements in line with ISAE 3000 (Revised), typically covering selected performance indicators. These cases contrast with the broader trend observed in Pharmaceuticals, Healthcare, and parts of the Materials Industry, where reports either mention only internal checks, board approvals, or no assurance at all.

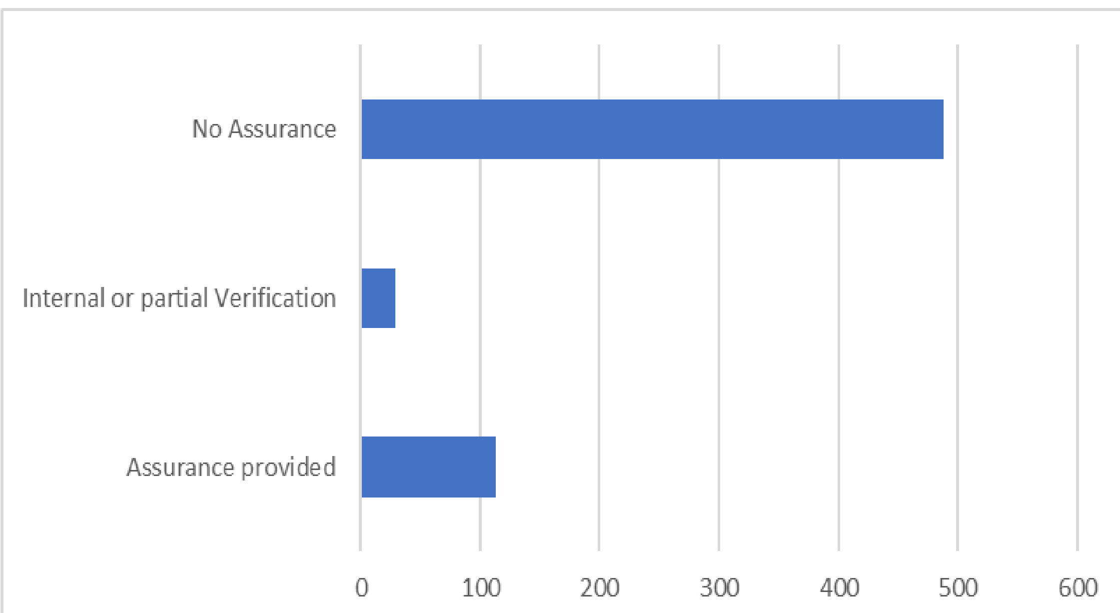
Out of the 35 sustainability reports analyzed, 34 were prepared and published at the local (Romanian) level. Only one report - Danone România - was included as part of a broader group-level report. However, in this case, the Romanian entity is referenced only briefly, with minimal information provided, highlighting a lack of visibility for country-specific performance within group disclosures.

Figure no. 1. Assurance engagements by company type



Source: authors' projection

Figure no. 2. Distribution of assurance in sustainability reports

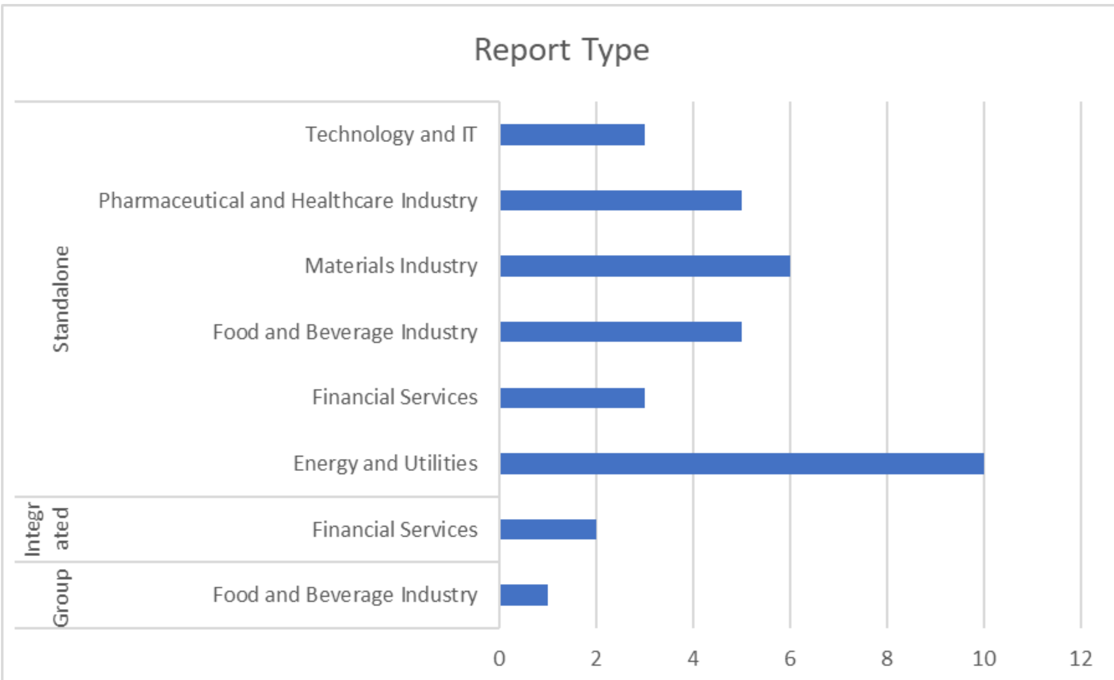


Source: authors' projection

The findings reveal a fragmented assurance landscape, with third-party verification still uncommon. While some sectors are beginning to align with CSRD expectations, most reports analyzed are from 2023 - before assurance became mandatory. Since 2024 reports were not yet available at the time of review, the low uptake reflects the absence of a legal requirement. As CSRD enforcement progresses, clearer guidance and stronger oversight may be needed to ensure consistency and credibility.

Figure no. 2 shows a clear imbalance in how companies approach assurance of their sustainability reports. Out of the total analyzed, a significant majority - 28 companies - did not benefit from any third-party assurance, indicating that their disclosures were not independently verified. Only 5 companies reported having formal assurance engagements, typically involving limited assurance based on the ISAE 3000 standard. Additionally, just 2 companies referred to internal or partial forms of verification, such as internal audits or board-level reviews. These findings suggest that external assurance remains the exception rather than the norm in current sustainability reporting practices.

Figure no. 3. Report types per industry



Source: authors' projection

Figure no. 3 illustrates the distribution of sustainability report types across industries. The *Energy and Utilities* sector leads with the highest number of standalone reports, indicating a strong preference for separate ESG disclosures. Other sectors like *Materials*, *Healthcare*, and *Food and Beverage* also show a similar tendency. Integrated reports are less common and appear only in *Financial Services*, while group-level reports are rarely used, found mostly in *Food and Beverage*.

Table no. 4 shows that the average length of sustainability reports varies slightly across sectors. Technology and IT reports are the most extensive, with an average of 71 pages, followed closely by Food and Beverage and Financial Services. In contrast, reports in the Pharmaceutical and Healthcare sector tend to be shorter, averaging 56 pages.

Further on, by applying the Word Frequency Query feature in NVivo, we extracted the most frequently used words from the entire dataset. The word cloud support is a visual representation of the results with each font size indicating the relative frequency of each word. We used the criteria: "within minimum length 9", "Display words:

100" and "include stemmed words". As predicted, the most dominant word is „sustenabilitate" (sustainability) standing for the key theme present among the documents under analysis. Other frequent words include „activități" (activities), „resurselor" (resources), „siguranță" (safety), „reducerea" (reduction), „raportare" (reporting), and „performanță" (performance).

Table no. 4. Average number of pages per report/ industry	
Industry	**Average number of pages per report**
Energy and Utilities	67
Financial Services	69
Food and Beverage Industry	70
Materials Industry	59
Pharmaceutical and Healthcare Industry	56
Technology and IT	71
Overall average	**65**

Source: authors' projection

Figure no. 4. Sustainability reports

Source: authors' projection

The findings highlight the principal concern areas that Romanian companies feature in their sustainability reports. The saliency of terms associated with resource utilization, occupational safety, risk management, and regulatory compliance („conformitate") indicates strong adherence to the dominant ESG (Environmental, Social, and Governance) principles. Furthermore, the recurring mention of terms such as "taxonomie," "implementarea," and "standardele" indicates growing acknowledgment and familiarization with official reporting standards, which could encompass the EU Taxonomy Regulation and GRI Standards.

The application of this lexicographic charting (**Figure no. 4**) facilitates the identification of both the shared characteristics among firms and the potential deficits in disclosure of certain dimensions of sustainability. In the sections that follow, we will examine the various priorities for these issues by industry and assess the standardization of terminology as well as the scope of disclosure in the framework of existing sustainability standards.

According to **Table no. 5**, the two most common terms - "financiare" (financial) and "sustenabilitate" (sustainability) - represent a discourse where sustainability is regularly depicted in relation to financial performance and adherence to regulations.

Repeated terms, e.g., "management," "employees," "risks," and "compliance," demonstrate emphasis on internal control, compliance with regulations, and social responsibility. The occurrence of environmentally related words—e.g., "climatic," "materials," and "taxonomy" - demonstrates growing integration of European Union regulatory jargon and environmental risk-related issues within corporate communication. Typically, the iterative mention of the term "decembrie" (December) implies a patterned trend in reporting practice, namely that a significant number of organizations schedule their sustainability reports towards the close of the financial year. The observation emphasizes the strong link between the timing of non-financial and financial reporting and identifies the central role of December as a time marker in corporate sustainability discourse.

Table no. 5. Top used words and frequency			
Top 10 words used in Sustainability reports from BVB			
Words	**Lenght**	**Count**	**Weighted Percentage**
financiare	10	4.105	0,25%
sustenabilitate	15	3.998	0,24%
management	10	2.133	0,13%
companiei	9	1.999	0,12%
angajaților	11	1.990	0,12%
riscurilor	10	1.951	0,12%
conformitate	12	1.895	0,12%
climatice	9	1.750	0,11%
materiale	9	1.680	0,10%
decembrie	9	1.640	0,10%
TOTAL	104	23.141	1,39%

Source: authors' projection

Table no. 6. Top keywords by ESG dimension identified in 2023 sustainability reports of BSE-listed companies		
Environmental**(E)**	Social**(S)**	Governance**(G)**
climatic	employees	management
materials	health	compliance
emissions	communities	board
taxonomy	safety	reporting
resources	responsible	governance
climatic	employees	management

Source: authors' projection

Table no. 5 presents the most common terms used in Bucharest Stock Exchange-listed companies' sustainability reports, framed within the ESG (Environmental, Social, Governance) framework. The framing brings to the fore the thematic priorities of the reports under analysis and offers insight into the priorities and disclosure practices of Romanian businesses.

Table no. 6 illustrates the top recurring keywords by ESG dimension identified in the 2023 sustainability reports of BVB-listed companies. Within the Environmental (E) category, terms such as "climatic," "materials," "emissions," "resources," and "taxonomy" signal an increased concern with environmental impact and alignment with EU priorities like the Green Deal and Taxonomy Regulation (European Commission, 2020; Täger, 2021). The Social (S) dimension is represented by words such as "employees," "health," "communities," and "safety," reflecting companies' focus on internal stakeholders and social responsibility, especially relevant in emerging market contexts (Hąbek & Wolniak, 2016; KPMG, 2020). For Governance (G), frequent terms like "management," "compliance," "reporting," and "board" emphasize the influence of regulatory structures and increasing adherence to frameworks such as the CSRD (Eccles et al., 2012).

Based on the dataset analyzed, the sustainability reports reviewed span across six major sectors in the Romanian economy: ***Energy and Utilities, Materials Industry, Financial Services, Pharmaceutical and Healthcare, Technology and IT, and the Food and Beverage Industry***. These sectors were selected due to their economic significance and the presence of companies with established reporting practices.

Among the most prominent and long-standing reporters are **OMV Petrom, Electrica**, and **Romgaz** in the **Energy sector**, all of which have been consistently publishing non-financial or sustainability reports in line with EU guidelines. In the **Financial Services sector,** institutions such as **Banca Transilvania, BRD - Groupe Société Générale, UniCredit Bank,** and **BCR** are known for transparent ESG communication and are frequently cited in Romanian CSR media for their reporting maturity.

In the **Pharmaceutical and Healthcare industry**, companies like **Antibiotice S.A.**, **Biofarm**, and **MedLife** have increasingly adopted ESG disclosures, particularly regarding social responsibility and governance. The **Technology sector** includes emerging yet active reporters such as **Bittnet Systems, AROBS**, and **Digi Communications,** while **Autonom Services** stands out as a local pioneer in integrated reporting and circular economy topics.

The **Food and Beverage industry** is represented by global actors with local subsidiaries, such as **Coca-Cola HBC România** and **Heineken România,** which typically follow high reporting standards dictated at group level.

Further on, we searched for the implication of external financial auditor into the sustainability reports (**Tables no. 7 and 8**).

Table no. 7. Sustainability reports including external assurance or audit references

Name of company	Number of references	Coverage
DIGI COMMUNICATIONS	4	0.01%
ANTIBIOTICE	2	0.01%
BRD	1	0.01%

Source: authors' projection

Table no. 8. Sustainability reports containing general references to audit or auditor terms

Name of company	Number of references	Coverage
DIGI COMMUNICATIONS	266	0,06
UNICREDIT	72	0,03
BRD	70	0,03
ALRO GROUP	69	0,03
MEDLIFE	37	0,02

Source: authors' projection

The presence of audit-related terminology ("raport de audit", "raportul de audit", "raport audit") was detected in a limited number of sustainability reports. The results show that only three companies - DIGI Communications, Antibiotice, and BRD - explicitly referenced audit or external assurance in their sustainability disclosures. The number of references remains extremely low (maximum 4 mentions, coverage 0.01%) and suggests that external assurance is still not a common to be integrated sustainability reports among BVB-listed companies analyzed.

To further investigate the presence of assurance-related content, we refined the text search in NVivo by using broader criteria: "audit" OR "auditor". This allowed us to capture general references to the audit process, beyond the strict phrasing of "audit report". The results revealed that mentions of these terms remain limited across sustainability reports; however, several reports demonstrated a more consistent use of audit-related language. Specifically, reports from DIGI Communications, UNICREDIT Bank, Antibiotice S.A., ALRO Group, and MedLife recorded the highest number of occurrences. These results suggest that, while the formal inclusion of an audit report within sustainability disclosures is rare, some companies are increasingly integrating or referencing audit procedures in their ESG narratives. This may reflect a transition phase, as firms begin to align with the assurance obligations imposed by regulations

Table no. 9. Top keywords by ESG dimension identified in selected sustainability reports of BSE-listed companies		
Name of company	**References**	**Coverage**
UNICREDIT	2.792	1.92%
DIGI COMMUNICATIONS	2.692	1.20%
ROMPETROL	1.691	0.91%
ROMCARBON	839	1.17%
ROCAINDUSTRY HOLDINGS	397	1.28%
TERAPLAST	370	1.11%
TOTAL	**8.781**	**7.59%**

Source: authors' projection

In **Table no. 9**, we used the *Text Search Criteria* function in NVivo, applying the AND operator to identify the co-occurrence of the top ten most frequent keywords within selected sustainability reports. The keywords included: "financiare" (financial), "sustenabilitate" (sustainability), "management", "companiei" (company), "angajaților" (employees), "riscurilor" (risks), "conformitate" (compliance), "climatice" (climatic), "materiale" (materials), and "decembrie" (December).

The results show varying degrees of ESG keyword coverage across reports. UNICREDIT leads with 1.92%, followed by Roca Industry (1.28%) and DIGI (1.20%). While Romania has several strong market players, no single sector dominates ESG reporting. High coverage appears across diverse industries such as banking, technology, materials, and energy, indicating a dispersed engagement with sustainability topics. In contrast, healthcare and food & beverage companies show lower ESG keyword presence, suggesting either a different reporting focus or less alignment with standard ESG frameworks.

Conclusions

The analysis of sustainability reports from major Romanian companies listed on the Bucharest Stock Exchange (BVB) reveals a clear orientation toward topics such as "sustenabilitate" (sustainability), "financiare" (financial), "management", and "riscurilor" (risks). These terms reflect a growing organizational focus on governance, regulatory compliance, and the integration of sustainability into risk and strategic management. The frequent presence of "climatice" (climatic), "emisiilor" (emissions), and "materiale" (materials) further indicates increasing attention to environmental impact and alignment with EU initiatives such as the Green Deal and the Taxonomy Regulation.

In terms of governance, the repeated use of terms "conformitate" (compliance) and "raportare" (reporting) highlights a shift toward more formal, regulation-driven disclosures. This trend is most evident in sectors such as banking, technology, energy, and materials, where companies like UNICREDIT, DIGI, and Roca Industry demonstrate a higher density of ESG-related language. In contrast, healthcare and food & beverage sectors show lower engagement with ESG terminology, suggesting either a different strategic focus or a lag in applying comprehensive reporting standards.

Throughout the analysis, several inconsistencies were observed in the way companies apply sustainability reporting frameworks. Although many reports reference alignment with GRI or CSRD principles, the depth, terminology, and structure of disclosures vary considerably—even among companies within the same sector. Some reports present detailed, indicator-driven narratives, while others remain general and descriptive, lacking clear metrics or structured ESG categorization. These disparities point to an uneven level of maturity and raise concerns about the comparability and reliability of disclosed information, despite formal adherence to recognized standards.

This study also addresses a notable gap in the literature, as most academic research focuses on large multinational corporations or Western European markets. Romania, as an emerging EU member state, remains underrepresented in empirical studies on sustainability disclosure. By conducting a systematic keyword-based analysis using NVivo's Text Search Criteria (with "AND" operator), this research provides new insight into how ESG principles are reflected in practice across various industries at the national level.

Although current findings show limited inclusion of audit-related content in ESG disclosures, broader keyword analysis indicates that some companies are beginning to reference audit processes more frequently – this is mostly generated by the fact that in 2024 (with reporting of 2023) the implication was limited, as there was no regulatory pressure in the market. At the same time, the identification of words such as "audit" or "auditor" suggests a growing awareness of the need for credible, externally validated reporting, considering CSRD requirements. As regulatory expectations evolve, the auditor's involvement will be essential—not only for formal assurance but also for enhancing the transparency, comparability, and stakeholder trust in sustainability information.

This paper reveals that while a few companies have begun to adopt limited assurance practices aligned with international standards like ISAE 3000, the majority either lack third-party verification or provide insufficient disclosure on assurance. This uneven landscape underlines the importance of future enforcement and harmonization once CSRD becomes fully applicable.

Nevertheless, several limitations should be acknowledged. All reports analyzed were written in Romanian, which may limit comparability with other studies conducted on English-language disclosures. Additionally, the study reflects primarily the reporting activity for the 2023 financial year, as the official deadline for 2024 reports had not yet passed at the time of writing. Therefore, the findings represent a preliminary snapshot rather than a complete view of post-CSRD implementation.

A follow-up study, once all 2024 reports are available, will be essential for capturing the full extent of regulatory impact and for evaluating the consistency of ESG integration in a more standardized disclosure landscape.

Appendix 1 – Referenced companies and sustainability report sources

1. Electrica S.A. - Societatea Energetica Electrica SA, https://www.electrica.ro/wp-content/uploads/2024/06/ELSA_RO_Raport_de_Sustenabilitate_Electrica_2023.pdf
2. S.N.G.N. Romgaz S.A., https://www.romgaz.ro/sites/default/files/2024-06/Raport%20sustenabilitate%20Romgaz%202023.pdf
3. OMV Petrom S.A., https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522253251887/raport-de-sustenabilitate-omv-petrom-2023.pdf
4. Hidroelectrica S.A., https://cdn.hidroelectrica.ro/cdn/raport_sustenabilitate/Raport_de_sustenabilitate_2023.pdf
5. Rompetrol Rafinare S.A., https://rompetrol-rafinare.kmginternational.com/upload/files/2024-09-19-kmgi-sr-2023-ro-spread-14mb-3602.pdf
6. ENGIE Romania S.A., https://www.engie.ro/doc/engie-raport-sustenabilitate-2023.pdf
7. E.ON Energie România S.A., https://www.eon-romania.ro/content/dam/eon/eon-romania-ro/documents/Raport-Sustenabilitate-EON-Romania-2023-RO.pdf
8. Transelectrica S.A., https://www.transelectrica.ro/documents/10179/16919692/01_Raport+sustenabilitate+al+Transelectrica+2023+final.pdf/f4696cbe-8396-4da6-bcaf-dd86837ee3a8
9. Nuclearelectrica S.A., https://nuclearelectrica.ro/ir/wp-content/uploads/sites/9/2024/04/SNN-Raport-sustenabilitate_RO_150mic_20240426-1.pdf
10. GreenGroup (GREEN TECH INTERNATIONAL S.A.), https://www.green-group-europe.com/storage/files/docs/Green%20Group%20Raport%20sustenabilitate%202023%20digital%20RO-1.pdf
11. Alro S.A., https://www.alro.ro/sustenabilitate/rapoarte-sustenabilitate
12. Chimcomplex S.A., https://chimcomplex.com/wp-content/uploads/Chimcomplex-SA-Raport-de-Sustenabilitate-2023-RO.pdf
13. Romcarbon S.A., https://www.romcarbon.com/wp-content/uploads/2024/06/ROCE-Raport-de-sustenabilitate-2023-RO.pdf
14. Banca Transilvania S.A., https://www.bancatransilvania.ro/files/app/media/relatii-investitori/prezentari-roadshows-

ri/Prezentari%20generale/Raport-Sustenabilitate-2023.pdf

15. BRD - Groupe Société Générale, https://www.brd.ro/sites/default/files/2024-12/Raport_Sustenabilitate_%20BRD_2023_RO.pdf
16. Antibiotice S.A., https://www.antibiotice.ro/wp-content/uploads/2024/06/RAI2023_Antibiotice.pdf
17. Biofarm S.A., https://www.biofarm.ro/assets/pdf/2022_ESG_Report_final.pdf?r=604
18. MedLife S.A., https://www.medlife.ro/sites/default/files/2024-08/MEDLIFE_RAPORT%20DE%20SUSTENABILITATE_ROMANA_FINAL.pdf
19. AROBS Transilvania Software S.A., https://arobs.com/wp-content/uploads/2024/06/AROBS-ESG-report-2023-Final.pdf
20. Purcari Wineries Public Company Limited, https://purcariwineries.com/wp-content/uploads/2024/06/Purcari-Wineries_Raport-Sustenabilitate-2023.pdf
21. Aquila Part Prod Com S.A, https://static1.squarespace.com/static/5f9280e565985529d8bbf8a5/t/66cc5b0c3d670b2996eccf57/1724668693345/Raport+de+Sustenabilitate_Aquila_2023.pdf
22. Holcim România S.A., https://www.holcim.ro/sites/romania/files/2024-04/raport-anual-de-mediu-2023-holcim-romania-sa-ciment-alesd.pdf
23. ROCA Industry, https://rocaindustry.ro/wp-content/uploads/2025/04/HCMaqCYq06GWMOlgchabYAWq4jRnYHgjEzS2Somg.pdf
24. TeraPlast S.A., https://investors.teraplast.ro/wp-content/uploads/2024/06/RO_Raport-de-sustenabilitate-2023.pdf
25. UniCredit Bank S.A., https://www.unicredit.ro/content/dam/cee2020-pws-ro/DocumentePDF/Institutional-Rezultate-financiare/RAPORT-ANUAL-31-12-2023-IN-CONFORMITATE-CU-REGULAMENTUL-5-2018.pdf
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27. Zentiva S.A., https://www.zentiva.ro/-/media/files/zentivacom/sustainability/2024/2024-sustainability-report.pdf?la=ro-ro&hash=5D7C9D1C073C2DCDE06A9546A5E14A636CFE90D7
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29. Digi Communications N.V., https://www.digi-communications.ro/ro/see-file/DIGI_20240507083713_Raport-Anual-2023.pdf
30. UiPath, https://uipathfoundation.com/wp-content/uploads/2025/05/Annual-Report-2023.pdf
31. Coca-Cola HBC România, https://ro.coca-colahellenic.com/content/dam/cch/ro/documents/raport-2023-Coca-Cola-RO.pdf.downloadasset.pdf
32. Ursus Breweries, https://ursus-breweries.ro/dezvoltare-durabila/#rapoartele-de-dezvoltare-durabila-pdf
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34. Danone România, https://danone.ro/rapoarte-anuale/
35. ROPHARMA SA, https://ropharma.ro/pdf/rapoarte/rapoarte_anuale/CGC_RA2024.pdf

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Evolution of Sustainability Reporting Frameworks

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Abstract

This research paper offers an extensive overview of the evolution of sustainability reporting practices, from the use of several frameworks by companies across the European Union, to the transition to a single regulation: the European Sustainability Reporting Standards. The article aims to expand the research conducted in sustainability reporting by narrowing and focusing only on a five-year time period.

The analysis encompasses a bibliometric examination of a sample of more than 1,000 articles from Web of Science over a time-horizon of five years using VOSviewer software. The keywords selected as relevant for this research included phrases such as "sustainability reporting", "ESG reporting", "Corporate Social Responsibility Reporting" and "European Sustainability Reporting Standards".

The results of this research show a clear interest for sustainability information on all three components, E, S and G, but an insufficient number of articles on the transition to ESRS, its requirements and assurance practices regarding the accuracy and completeness of these reports.

Possible limitations of this research may include the exclusion of other academic writing beyond the established time-horizon and utilization of only articles from only one database, Web of Science.

Despite the abundance of research in the sustainability domain, this paper contributes to a clearer understanding of ESRS data-points and topics to be addressed by the companies that fall under the umbrella of the CSRD requirements.

Key words: *reporting; sustainability; ESG; Corporate Social Responsibility Reporting; European Sustainability Reporting Standards;*

JEL Classification: *M14, Q01, Q56*

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Introduction

In the context of an emerging economy, every company seeks to remain competitive by delivering quality products and services, as well as adapting to the new trends in sustainable processes. Through sustainability reporting, undertakings can demonstrate that they are environmentally and socially responsible and they can also improve communication with various stakeholders (Manes-Rossi et al., 2018). Some of the key features that any sustainability statement must take into consideration are transparency, value creation, performance improvement, reputation, accountability and stakeholder engagement. A broader image of impacts, risks and opportunities that companies are facing can be disclosed through three main components: environment, social and governance (ESG). The environmental part relates to the utilization of energy, greenhouse gas emissions (GHG), waste management, biodiversity, water consumption and pollution. Social components encompassed in ESG reporting may refer to the relationship between the company and its own workforce, the society around the business, health and safety policies, diversity and inclusion issues. The governance elements include organizational practices, ethical policies, risk management and so on (Filho et al., 2025).

During the last decades, several reporting frameworks were established in an effort to support companies in their journey of transition to sustainability practices. Such examples of standards include the Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB), the Taskforce on climate-related Financial Disclosure (TCFD), the International Integrated Reporting Council (IIRC) and the Sustainable Development Goal Disclosure Recommendations (SDGD).

However, in order to ensure comparable and more reliable information, a transition to a unified reporting framework has been long awaited. Thus, the European Commission laid the foundation for a new set of regulations in 2023, the European Sustainability Standards (ESRS) which are effective as of 1 January 2024. The first set of sustainability statements are published in 2025 for the financial year 2024, as part of the management report. As Parrondo (2024) states, the ESRS regulations align with the United Nations' SDGs and are also applicable across all environmental, social and governance sectors. Throughout this approach, the ESRS require a full-spectrum disclosure on impacts, risks and opportunities, also creating long-term value for companies. The impact of this transition is also reflected in the EU stock market, with a reported 25% increase in the share of total prices made up of non-fundamental components. Investors' focus is slowly shifting towards sustainable objectives that can be measured by ESG scores (Alessi et al., 2022).

This research aims to examine the stages of the sustainability reporting over the past five year, with focus on the ESRS regulations. A detailed description on the topics is provided in the literature review chapter, in order to emphasize the rigorousity of the standard on every ESG matter. Moreover, the paper presents the development and evolution of non-financial reporting, up until the establishment of the Corporate Sustainability Reporting Directive (CSRD). A more in-depth research is performed with the help of a bibliometric analysis on keywords occurrence, co-authorship by country and bibliographic coupling of articles. The research conducted aims to highlight a gap in literature regarding the transition to ESRS, but an increased interest for sustainability reporting per general.

The results of this research paper may be valuable for any user that wants to understand how sustainability reporting has evolved during the past five years and what are the new uncertainties that companies are facing nowadays. Furthermore, the study contributes to academic research in the sustainability field, offering a clearer point of view over the topics and requirements addressed by the ESRS.

The paper is split in four sections: 1 - Introduction, 2 - Literature Review, where the evolution of the sustainability reporting is described in a step-by-step manner and the transition to ESRS is highlighted, 3 - Research Methodology section which presents the refining approach chosen for the bibliometric analysis, 4 - Results and Discussions chapter which supports through several maps the literature review and finally, 5 - Conclusions based on the whole research.

1. Literature Review

1.1 Developments and evolution in sustainability reporting

For the last few years, sustainability reporting has been playing a major role in influencing how companies communicate with stakeholders and how they operate across the industries. This current trend is more significant in Europe, as the European firms started to report sustainability information annually. From less than 10% of companies in 2006, an impressive increase took place in Europe, to more than 80%. The percentage growth was due to the publication of the Global Reporting Initiative (GRI) guidelines in 2007 (Stolowy & Paugam, 2018). Tsang et al. (2023) state that the companies' main goals are to maximize the shareholders' wealth and to provide benefits to society. Several benefits of sustainability reporting identified by the same author as mentioned prior, are lower cost of capital, increased satisfaction among customers and employees, access to better finance and a better brand image.

However, there are still many overlapping definitions related to sustainability. The majority of them contain notions about corporate social responsibility, integrated reporting, non-financial reporting and, of course, environmental, social and governance issues (Stolowy & Paugam, 2023). To illustrate the existing diversity in definitions, Durand et al. (2022) analyzed a sample of 5,411 corporate reports that were referring to sustainability topics. The findings of the research showed that the sustainability reporting topics have different names, but contain similar information. The list consists of several titles, such as: annual review, global responsibility report, environmental report, non-financial statement, sustainability report and so on.

Furthermore, the diversity of wording when it comes to sustainability is also demonstrated by Fometescu and Hategan (2023), who have conducted a bibliometric analysis over non-financial information reports covering the period 2002 - 2022. The findings show a strong relationship between sustainability-related keywords, categorized in four clusters. Among the most relevant ones, we can identify: "CSR", "non-financial information", "non-financial performance", "sustainability reporting", "cost", "performance", "indicators", "environmental disclosures" and so on.

Sustainability and non-financial reporting have been in the spotlight for several organizations that have proposed frameworks or standards in order to facilitate the presentation of environmental, social and governance topics. Before the European Sustainability Reporting Standards (ESRS), the most relevant frameworks applied by the companies across the world were: the Global Reporting Initiative (GRI), the Task Force on Climate-related Financial Disclosure (TCFD), the International Integrated Reporting Council (IIRC), the Sustainability Accounting Standards Board (SASB) and the Sustainable Development Goal Disclosure Recommendations (SDGD).

The GRI was the first standard at global level that provided guidelines for sustainability reporting, with a percentage of 96% of the world's largest companies to apply it. The Standards contain three categories: Universal Standards, which set the general principles, Sector Standards, which include industry-specific requirements and Topic Standards, which focus on GHG emissions or energy issues. The TCFD's goal is to emphasize the ability of different investors to understand the business and to highlight the climate related risks and opportunities. It is structured on four key disclosures: governance, strategy, risk management and metrics and targets. The IIRC established the concept of integrated reporting, meaning that a document must contain both financial and sustainability information. The framework was based on the six capitals model, presented in a holistic manner: natural, financial, manufacturing, intellectual, human and social. SASB was a framework that provided industry-specific standards that were mainly focused on the financial impact that sustainability issues could have on the business. Currently, IIRC and SASB have been consolidated under the International Financial Reporting Standards Foundation (IFRS). Last but not least, the SDGD are based on three fundamental concepts: "Long term value creation for the organisation and society", "Sustainable development context and relevance" and "Materiality". These create the foundation of the framework's 17 Goals, the Sustainable Development Goals which address issues related to environment, social and governance (Cooper & Michelon, 2022).

In the context of unclear and non-comparable sustainability reporting standards, The European Union released the Corporate Sustainability Reporting Directive (CSRD). It was adopted on 14th of December 2022 and entered into force on 5th of January 2023, replacing the Non-Financial Reporting Directive (NFRD). Stolowy & Paugam (2018) summarized the key aspects that the new Directive highlights:

- sustainability reporting is extended to large companies and companies listed on regulated markets;
- reports will require external limited assurance;
- preparing the information in a digital format for better comparability and transparency;

- prepare the sustainability statement in accordance with the requirements of the European Sustainability Reporting Standards (ESRS).

As indicated in CSRD, Article 5, point 2 (a)-(c), the timeline for implementation is the following:

– In 2024 (for FY 2023): large companies that have already been subject to NFRD;

– In 2025 (for FY 2024): large companies which meet two out of three criteria (50mil. EUR turnover, 25mil. EUR assets, 250+ employees)

– In 2026 (for FY 2025): small and medium-sized companies (SMEs) which are listed on public-interest and some financial entities;

– In 2028 (for FY 2027): also including non-EU companies with 150mil. EUR turnover in EU countries.

Alongside CSRD, there are also new regulations on ESG topics that require companies to disclose significant sustainability information: Regulation (EU) 2020/852 of the European Parliament and of the Council (EU Taxonomy), Corporate Sustainability Due Diligence Directive (CSDDD), Sustainable Finance Disclosure Regulation (SFDR), EU Regulation on Deforestation-Free Products (PwC, 2021). Moreover, there are both internal and external benefits that the CSRD brings to the companies and their stakeholders (**Table no. 1**).

Table no. 1. Benefits

Internal benefits	External benefits
Better overview of sustainability-related impacts, risks and opportunities	Help the external users to understand the business's true value
Positive impact on management strategy and policy	ESG factors incorporated in external ratings
Correlation between financial performance and sustainability-related actions	Sustainability indicators offer the stakeholders a more robust image of the company's future performance
Monitorization of the company's development compared to peer competitors	Demonstrate how sustainability practices of a company can impact the environment
Avoid ESG conflicts that might damage the company's reputation	Improve the company's reputation, brand power and increase the stakeholders' trust

Source: https://www.pwc.com/sk/en/environmental-social-and-corporate-governance-esg/esg-reporting.html, 2021

Table no. 2. KPMG survey of sustainability reporting

Key findings	World's largest 250 companies	All 5,800 companies in the survey
Report on sustainability	96%	79%
Publish a carbon target	95%	80%
Have a sustainability leader	56%	46%
Consider sustainability in leadership pay	41%	30%

Source: https://kpmg.com/dk/en/home/insights/2024/11/survey-of-sustainability-reporting-2024.html, 2024

According to KPMG survey (2024), sustainability reporting is being integrated as part of the businesses' usual practices. The research included 5,800 companies, out of which 250 are the world's largest ones. The key findings of the survey are presented in **Table no. 2**.

However, the four most powerful economies in Europe – Germany, France, Italy and Spain – are divided over the implementation of the CSRD. Germany and France called for a two-year delay in CSRD implementation which could affect more than 13,000 companies, and France insisted on delaying indefinitely the due diligence rules. Meanwhile, Italy requested the EU not to delay the CSRD implementation, as there are thousands of Italian companies which will report under the legislation. Also, Spain demands that the CSRD should be detailed only when addressing smaller companies, but after that, it should be mandatory, adding pressure on Brussels not to comply with the requests of Germany or France (Abnett, 2025).

1.2 An overview of the European sustainability reporting standards

The Corporate Sustainability Reporting Directive (CSRD) was created by the European Union, replacing the Non-Financial Reporting Directive (NFRD). The scope of the new directive is to expand and strengthen the requirements regarding sustainability reporting, also improving some key characteristics of any reporting documents: transparency, comparability, consistency and accountability. Moreover, CSRD is applicable to a larger range of companies, including listed small and medium-sized companies (SMEs) and non-EU companies that have significant EU operations. The concept of double materiality is another key aspect of the CSRD that requires companies to evaluate their impact from two points of view: financial materiality and impact materiality. Last but not least, when reporting on non-financial matters, companies must apply the European Sustainability Reporting Standards - ESRS (Faqih & Kramer, 2024).

Starting on 1 January 2023, the sustainability reporting has been elevated to the same level of scrutiny as the financial reporting due to the establishment of the Corporate Sustainability Reporting Directive (CSRD). The number of companies impacted from various industries across the European Union is over 42,500 firms. Member States from Europe had to transpose the Directive into their national law by 6th of July 2024. However, several countries failed to comply with the deadlines imposed by the European Union, but managed to transpose the CSRD regulations by the end of 2024. As of 28 January 2025, 6 Member States had introduced a draft proposal, 3 Member States have consultations in progress and 20 Member States fully transposed the regulations (Accountancy Europe, 2025). **Table no. 3** presents the countries which have adopted the CSRD and the number of companies impacted by this legislation in financial year 2024 and 2025.

Table no. 3. List of CSRD transposition by countries and number of affected companies

Belgium	4,880
Bulgaria	800
Croatia	520
Czech Republic	2,000
Denmark	2,472
Finland	1,270
France	4,600
Hungary	429
Ireland	1,500
Italy	4,000
Lithuania	300
Norway	1,250
Romania	not specified
Slovakia	not specified
Slovenia	170
Sweden	2,240

Source: Accountancy Europe, https://accountancyeurope.eu/publications/csrd-transposition-tracker/, 2025

As per European Union (2022, article 19a, pts. 1-2), the sustainability statement should be included in a dedicated section of the management report, making it clearly identifiable for any type of stakeholder. The information reported should include the following aspects, in short:

- A description of the business model, including its resilience in relation to impacts, risks and opportunities, plan and financial investments to limit the global warming to 1,5 Celsius degrees as per Paris Agreement;
- Time-bound targets related to sustainability goals, including the reduction of greenhouse gas emissions by 2030 and by 2050;
- An explanation of the roles that administrative, management and supervisory bodies have regarding sustainability matters;
- Policies adopted by the company regarding sustainability;
- Details about the incentive scheme linked to sustainability that addresses the administrative, management and supervisory bodies;

– Key points of due diligence processes implemented that are related to the undertakings' own operations, upstream or downstream value chains;
– A summary of the principal sustainability risks a company is exposed to and how it manages these risks.

As the CSRD mandates a more detailed reporting regarding sustainability issues, the European Sustainability Reporting Standards (ESRS) provide the framework for the companies on which topics and sub-topics should be included depending on the materiality assessment. The ESRS were developed by the European Financial Reporting Advisory Group (EFRAG) in 2022, and adopted on the 31st of July 2023 by the European Commission through a Delegated Act. Under the ESRS, sustainability reports should include the following information, which closely aligns with the requirements set by EU Directive 2022/2464:

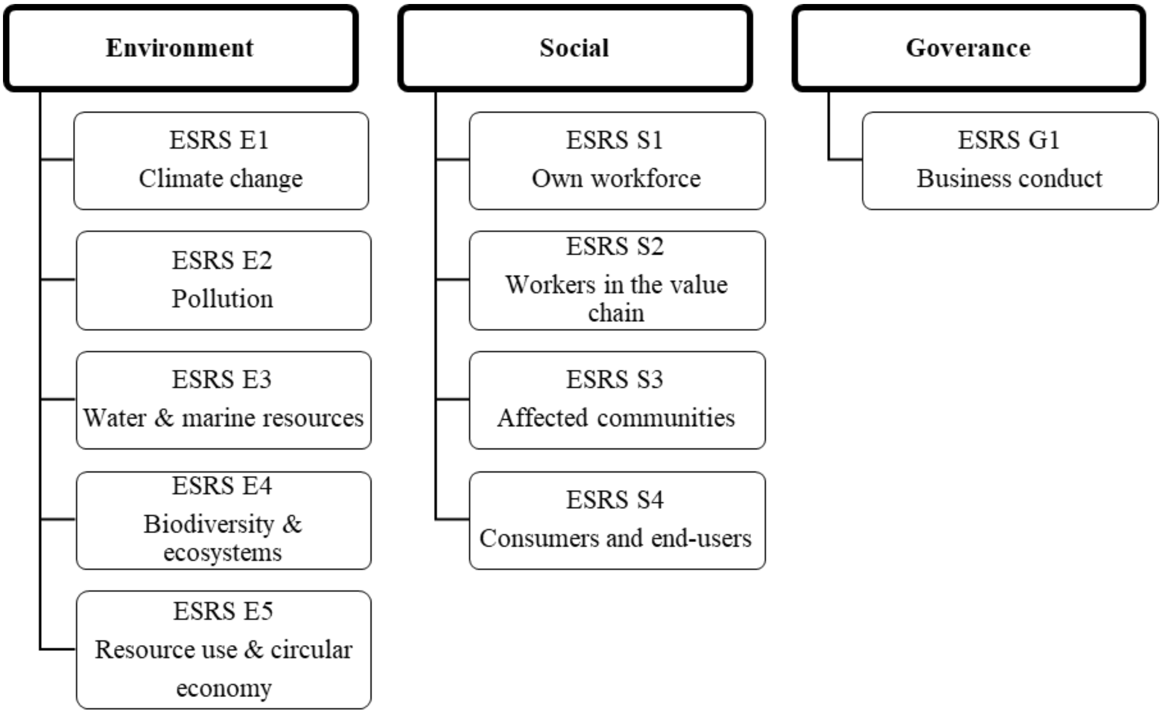
a) a summary of the strategy and business model adopted by the company;
b) company's targets within its time frames;
c) the roles of administrative, management and supervisory bodies alongside their expertise, skills and capabilities;
d) indicate if there are incentive programs connected to sustainability topics;
e) a description of the company's policies regarding environmental, social and governance matters;
f) risks linked to company's own operations or its value chain and other sustainability-related risks;
g) relevant metrics for the data-points that are mandatory to be presented. (Bataleblu et al., 2024)

As demonstrated in **Table no. 3**, Romania is among the countries that have transposed Directive 2013/34/EU (CSRD) through OMFP no. 85/2024. The new Order became applicable in the beginning of year 2025, for the financial year of 2024. Also, along the implementation of the new regulations, OMFP no. 1802/2014 and OMFP no. 2844/2016 are updated with the statements from Article 1 of the CSRD Directive (CECCAR Business Magazine, 2024). OMFP No. 85/2024 mentions that there are three types of sustainability reporting: individual, consolidated or related to third party countries. Individual sustainability reporting is related to medium-sized and large entities that, at the balance sheet date, exceed at least two of the three stipulated criteria: total assets – 25.000.000 RON, net turnover - 50.000.000 RON or average number of employees during the financial year - 50. On the other hand, in the case of a group consisting of a parent company and subsidiaries, two of the three criteria need to be met for reporting: total assets – 125.000.000 RON, net turnover – 250.000.000 RON or average number of employees during the year - 250. Finally, third party countries prepare and publish sustainability statements through the medium or large-sized subsidiary based in Romania, or through a branch in Romania. In both cases, the entity must have generated a net turnover of more than 150 million EUR on the territory of the European Union for the last two consecutive financial years. The sustainability statement must be included in the management report, providing relevant information for a better understanding of how sustainability practices impact the companies' performance, development, operation or financial position.

The structure of the ESRS consists of three important categories: cross-cutting standards, topical standards and sector-specific standards. The cross-cutting standards contain general reporting requirements explained in section ESRS 1 and general disclosures presented in ESRS 2. On the one hand, in ESRS, valuable information is presented in order to facilitate the reporting process: qualitative characteristics, double materiality, due diligence, value chain, time horizons, the structure of the statement, basis for preparation, references to other parts of the reporting package, transitional provisions and several appendices. On the other hand, ESRS 2 disclosures are structured as follows for both topical and sector-specific standards: governance (GOV), strategy (SBM), impact, risk and opportunities (IRO), and, metrics and targets (MT). ESRS 2 also includes Minimum Disclosure Requirements regarding policies (MDR-P), actions (MDR-A), metrics (MDR-M) and targets (MDR-T) (European Commission, 2023).

As Hummel and Jobst (2024) explain, the topical standards are divided into three main topics: environmental (E1 to E5), social (S1 to S4) and governance (G1), which can be divided into sub-topics and even sub-sub-topics. Sector-specific standards are applied by companies that have identified material impact, risks and opportunities which are material for them, but are not covered by the topical standards (**Figure no. 1**).

Figure no. 1. ESRS Topics



Source: PwC, ESG in reporting and assurance, building trust and protecting reputation through responsible, transparent reporting, https://www.pwc.be/en/challenges/esg/rep-assurance.html, 2023

1.3 Key principles of ESRS topics and sub-topics

As the United States withdrew from the Paris Agreement in January 2025, the European Commission announced that it plans to ease the rules regarding the sustainability reporting that affect thousands of companies to make European industries more competitive against the United States and China. As of February 2025, the proposal is still in draft form, but it is designed to target only the companies with more than 1,000 employees and a net turnover which exceeds 50mil. EUR (Abnett, Furness, 2025).

Nevertheless, the European Commission presented on the 26th of February 2025 an Omnibus Package on sustainability matters: "Sustainability Reporting Simplification Proposal" and "Stop-the-clock Proposal". Some of the key simplification aspects of the proposal are presented in **Table no. 4**.

Creating a link between financial and non-financial reporting, the sustainability statement is integrated in the consolidated annual reporting package of companies. The disclosure of the sustainability statement must be reported under the European Sustainability Reporting Standards (ESRS) starting on the 1st of January 2024. The ESRS are split in three main categories: cross-cutting standards (ESRS 1 and ESRS 2), topical standards (environmental, social and governance) and sector-specific standards. In some cases, certain aspects related to a company may not be sufficiently detailed in the standard, thus the additional information should be reported under the entity-specific information disclosures. The sector-specific standards are designed to provide a more comprehensive analysis, minimizing gaps that could potentially appear. However, it is extremely important that sustainability statements remain comparable across companies that operate in the same industry. A balance between specific details and consistency with the general requirements is required, as it ensures that the information is both comparable and relevant (Martinez-Torres, 2024).

According to the European Commission (2023, ESRS 1, Section 6.4, para. 77), the sustainability matters should be included in a dedicated section of the management report. The information in the statement could be sectioned in three-time horizons. The first one is the short-term, limited at reporting period in financial statements. The second one is medium-term which begins from the end of the short-term period, up to five years. The last one is the long-term horizon, which is more than five years long.

Table no. 4. Omnibus proposal for simplification of the CSRD	
CSRD	***Proposed changes***
Reduction of scope	
Wave 1: listed, +500 employees and either +50mil. EUR net turnover or +25mil. EUR assets Wave 2: +250 employees and either +50mil. EUR net turnover or +25mil. EUR assets Wave 3: Listed small and medium-sized companies Wave 4: Non-EU Groups	Threshold only applies to companies with +1,000 employees and either +50mil. EUR net turnover or +25mil. EUR assets.
Review of the ESRS	
Set of ESRS required after the Double Materiality Assessment	-Removal of 25% of data points -Prioritize quantitative data points over narrative fields -More clarity around nature of data points
The value-chain	
The maximum information that companies could collect from SMEs in their value chain	New information cap determined by a new set of voluntary standards for undertakings not subject to reporting
Assurance	
Limited assurance becomes reasonable assurance by 2028	Limited assurance remains, reasonable assurance removed
Listed small and medium-sized companies (LSME)	
CSRD and ESRS required for LSME	Removed
Sector-specific standards	
Required as of July 2026	Removed

Source: Greenomy, Navigating the New Omnibus Proposal: Key Updates & Implications, https://app.livestorm.co/greenomy/navigating-the-new-omnibus-regulation-key-updates-and-implications/live?s=49fb5313-1e04-4390-956d-5a8313a77139#/, 2025

Alongside the targets disclosed, all the information that is presented in the sustainability statement must meet five qualitative characteristics, just as financial statements do. Firstly, the information should be relevant in order to impact the stakeholders' decisions and predictions. Secondly, the statement must faithfully represent all the impacts, risks and opportunities that a company is exposed to and also how it adapts the strategy to achieve its targets. Comparability is the third characteristic, meaning that the sustainability statement can be compared with the undertaking's prior period statements or with other undertakings from the same or similar industries. The fourth one is verifiability, which gives users confidence that the information is neutral, complete are accurate. Also, several observers could reach to a consensus on faithful representation of topics. Last but not least, sustainability statements must be understandable, meaning that all the data presented shall be clear and concise (European Commission, 2023, ESRS 1, Appendix B).

Another important matter related to time horizons stated in the ESRS is the fact that companies should set short-term, medium-term and long-term targets, as well as disclose the actual progress made towards meeting them. Moreover, to ease the process of reporting sustainability information, the legislation accommodated transitional provisions for several matters:

- Transitional provisions related to entity-specific disclosures: transition phase is three years;
- Transitional provisions related to the value chain chapter: transition phase is three years;
- Transitional provisions related to presentation of comparative information: transition phase is one year;

– Transitional provisions related to Disclosure Requirements that are phased-in: transition phase is one or three years, depending on the Disclosure Requirement. (Bataleblu et al., 2024)

As stated by the European Commission (2023, ESRS 1, Section 1, para. 8), topical ESRS are structured in topics and sub-topics, but where necessary companies can also add sub-sub-topics. **Table no. 5** provides a table of all the sustainability matters covered by the topical ESRS.

Table no. 5. Topics and sub-topics

Topical ESRS	Topic	Sub-topic
ESRS E1	Climate change	Climate change adaptation Climate change mitigation Energy
ESRS E2	Pollution	Pollution of air Pollution of water Pollution of soil Pollution of living organisms and food resources Substances of concern Substances of very high concern microplastics
ESRS E3	Water and marine resources	Water Marine resources
ESRS E4	Biodiversity and ecosystems	Direct impact drivers of biodiversity loss Impacts on the state of species Impacts on the extent and condition of ecosystems Impacts and dependencies on ecosystem services
ESRS E5	Circular economy	Resources inflows, including resource use resource outflows related to products and services Waste
ESRS S1	Own workforce	Working conditions Equal treatment and opportunities for all Other work-related rights
ESRS S2	Workers in the value chain	Working conditions Equal treatment and opportunities for all Other work-related rights
ESRS S3	Affected communities	Communities' economic, social and cultural rights Communities' civil and political rights Rights of indigenous peoples
ESRS S4	Consumers and end-users	Information-related impacts for consumers and/or end-users Personal safety of consumers and/or end-users Social inclusion of consumers and/or end-users
ESRS G1	Business conduct	Corporate culture Protection of whistle-blowers Animal welfare Political engagement and lobbying activities Management of relationships with suppliers including payment practices Corruption and bribery

Source: European Commission, European sustainability reporting standards, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022L2464#art_1, 2023

The nine disclosure requirements under ESRS E1 – Climate change (E1-1, E1-2, E1-3, E1-4, E1-5, E1-6, E1-7, E1-8, E1-9), should include several details that are related to the undertaking's efforts to align with the Paris Agreement, namely to contribute to the goal of limiting the increase in average temperature to 1.5°C above the pre-industrial level. The main Greenhouse gases addressed in this section are CO_2 – carbon dioxide, CH_4 – methane, N_2O – nitrous oxide, which are usually the ones that companies report on. The information required by these disclosure requirements is related to GHG emission targets, climate change mitigation actions through decarbonization levers, implementation of the company's transition plan and if the case, aligning economic activities (revenue, CapEx, OpEx) that are subject to Taxonomy Regulations (European Commission, 2023, ESRS E1).

In terms of pollution, there are six disclosure requirements that ESRS address: E2-1, E2-2, E2-3, E2-4, E2-5, E2-6. The sustainability matters that fall under ESRS E2 relate to pollution of air, soil, water and substances of concern. Usually, companies must display how pollution impacts them, what actions are being taken to prevent or mitigate negative impacts, how risks and opportunities are addressed and what are companies' plans to adapt their strategy and business model to pollution (European Commission, 2023, ESRS E2).

Water and marine resources are covered in five disclosure requirements, E3-1, E3-2, E3-3, E3-4 and E3-5 that address several matters, such as surface water and groundwater, entities' water consumption, water withdrawals or discharges. If this topic is material for a company, it should include in its sustainability statement information regarding positive and negative impacts on marine resources, plans for reducing water consumption, protection of aquatic ecosystems or restoration of freshwater and marine habitats (European Commission, 2023, ESRS E3).

ESRS E4 encompasses the biodiversity and ecosystem matters through six disclosure requirements that are related to the undertaking's relationship with freshwater, marine or terrestrial habitats and fauna or flora species (E4-1, E4-2, E4-3, E4-4, E4-5, E4-6). Moreover, the company must disclose how its business positively or negatively affects biodiversity and ecosystems, as well as plans and actions in order to prevent, mitigate and conserve them (European Commission, 2023, ESRS E4).

The last environmental disclosures focus on resource use and circular economy (E5-1, E5-2, E5-3, E5-4, E5-5, E5-6). The standard includes requirements for companies to disclose details about their resource inflows, outflows and waste, throughout the entire business process. Minimizing waste, releases of hazardous substances, refurbishment, recycling processes and other matters are also significant parts of this topic (European Commission, 2023, ESRS E5).

As for the social part of the sustainability statement, companies must report on the impacts, risks and opportunities related to their own workforce, as stated in ESRS S1 (S1-1 to S1-17). A very wide variety of information is required with respect to own workforce, such as details about working conditions (working time, adequate wages, social dialogue, work-life balance), equal treatment and opportunities (gender pay-gap, hours of training, inclusion of persons with disabilities, cultural diversity, discrimination) or work-related rights (child labor, forced labor, privacy) (European Commission, 2023, ESRS S1).

Additionally to its own employees, a company could also include, if material, information about workers in the value chain. As stated in ESRS S2 (S2-1, S2-2, S2-3, S2-4 and S2-5), the objective of these disclosure requirements is to present material impacts, risks and opportunities related to value chain workers, such as how the undertaking affects them, the workers' conditions, if they benefit from equal treatment and so on. The value chain of a company is divided into two parts: upstream - suppliers of materials for manufacturing and downstream – customers and other third parties that get the products or services to the end consumer. Information about value chain workers is important because the undertaking should partner with responsible suppliers and customers in order to achieve its sustainability targets (European Commission, 2023, ESRS S2).

Another significant topic is presented in ESRS S3, through five disclosure requirement categories: S3-1, S3-2, S3-3, S3-4 and S3-5. Affected communities are tightly connected to the undertaking's own operations and value chain in both positive and negative aspects. Actual or potential impacts on affected communities can be communities' economic, social and cultural rights, civil and political rights, and the distinctive rights of indigenous people (European Commission, 2023, ESRS S3).

Consumers and end-users are a key component of the value chain for any business. Usually, undertakings with higher environmental risks should also report the actions taken to prevent, mitigate or remediate potential negative impacts caused by their consumers and end-users. ESRS S4 comprises information about customers' or end-users' safety, inclusion, privacy, freedom of expression and so on through disclosure requirements S4-1, S4-2, S4-3, S4-4 and S4-5. It is important to highlight that these requirements are applicable to both the undertaking's own operations and its value chain practices (European Commission, 2023, ESRS S4).

Last but not least, governance is the main pillar for any successful business. Through six disclosure requirements G1-1, G1-2, G1-3, G1-4, G1-5 and G1-6, ESRS G1 addresses the undertaking's strategy and approach with respect to business conduct. The most relevant subject matters that need to be disclosed are related to corporate culture, anti-bribery and anti-corruption policies, management of relationships with suppliers, lobbying activities, payment practices and so on (European Commission, 2023, ESRS G1).

All these topical disclosure requirements interact with one another and also with ESRS 2, General Disclosures. The ESRS 2 comprises four major categories which indicate the objectives of the Standard. Furthermore, in order to address specific subject matters for several types of industries, the four categories are split into more detailed disclosure requirements, as indicated in **Table no. 6**.

Table no. 6. ESRS 2, general disclosures

Basic for preparation	BP-1 – General basis for preparation of sustainability statements
	BP-2 – Disclosures in relation to specific circumstances
Governance	GOV-1 – The role of the administrative, management and supervisory bodies
	GOV-2 – Information provided to and sustainability matters addressed by the undertaking's administrative, management and supervisory bodies
	GOV-3 - Integration of sustainability-related performance in incentive schemes
	GOV-4 - Statement on due diligence
	GOV-5 - Risk management and internal controls over sustainability reporting
Strategy	SBM-1 – Strategy, business model and value chain
	SBM-2 – Interests and views of stakeholders
	SBM-3 - Material impacts, risks and opportunities and their interaction with strategy and business model
Impact, risk and opportunity management	• Disclosures on the materiality assessment process
	IRO-1 - Description of the processes to identify and assess material impacts, risks and opportunities
	IRO-2 – Disclosure requirements in ESRS covered by the undertaking's sustainability statement
	• Minimum disclosure requirement on policies and actions
	MDR-P – Policies adopted to manage material sustainability matters
	MDR-A – Actions and resources in relation to material sustainability matters
	• Metrics and targets
	MDR-M – Metrics in relation to material sustainability matters
	MDR-T – Tracking effectiveness of policies and actions through targets

Source: European Commission, European sustainability reporting standards, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022L2464#art_1, 2023

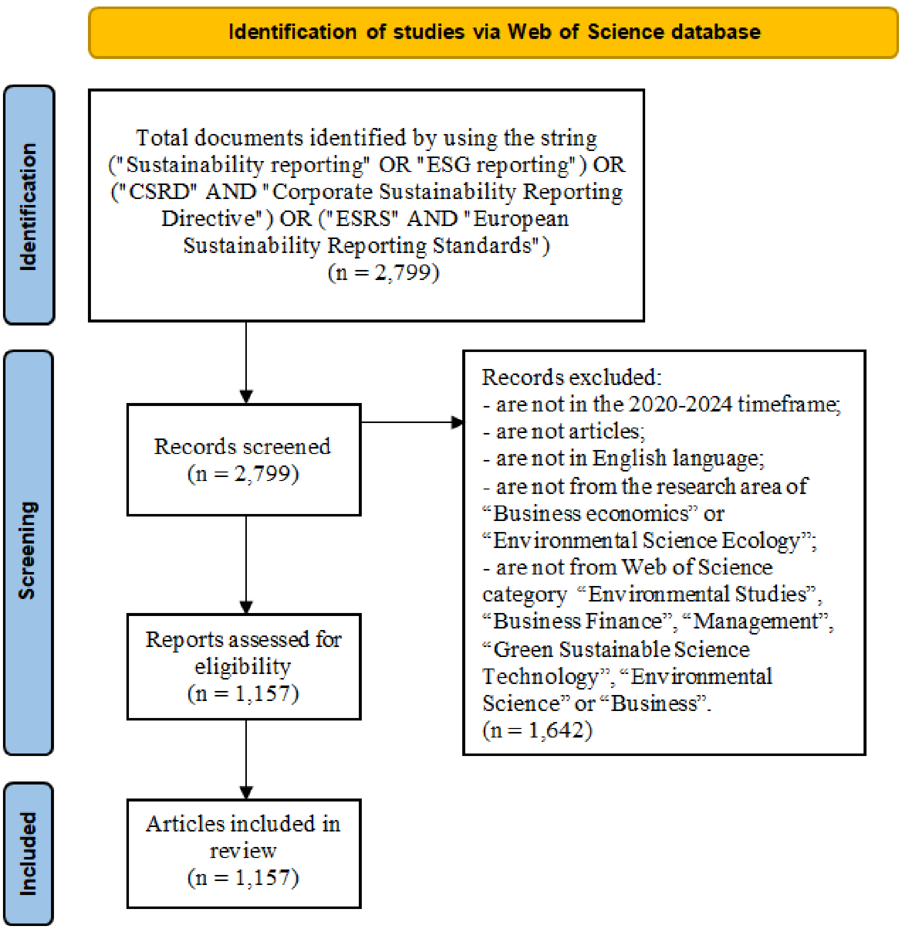
2. Research Methodology

The process of preparing a bibliometric analysis consists of obtaining several scientific outputs resulting from various publications in specific fields, academic journals or databases with the help of statistics and numerical analysis. This review method adopts a macro-level approach, also revealing the dynamics of the selected research fields which consist of hundreds or even thousands of academic papers. Moreover, bibliometric analysis provides objectivity within the examined sample of academic papers (Ozturk et al., 2024).

In order to identify pertinent literature on ESG reporting and the implementation of CSRD and ESRS in current reporting trends, the authors developed a research strategy based on bibliometric analysis using version 1.6.20 of the VOSviewer software. As Van Eck and Waltman (2010) state, VOSviewer can be used to construct maps of keywords, authors, co-citations and so on, allowing the researchers to examine the data in full detail. Additionally, it is particularly effective when the sample size exceeds 100 items.

The database used in this research was Web of Science (WoS) – Clarivate, because it is a platform that provides access to high-quality academic papers, ensuring credibility across a wide range of fields of study. Web of Science also allows different download formats which could be useful depending on the chosen software. For the purposes of this research, the "Tab delimited file" format was selected, saving the data as .txt files. The data were extracted from WoS on 24 March 2025.

Figure no. 2. Sampling process



Source: own data processed, 2025

To ensure a high-quality search in the sustainability reporting practices, using the CSRD and ESRS frameworks, a tailored Boolean string was established with the help of appropriate operators: ("Sustainability reporting" OR "ESG reporting") OR ("CSRD" AND "Corporate Sustainability Reporting Directive") OR ("ESRS" AND "European Sustainability Reporting Standards"). This string was used within the "topic" section of WoS search engine, which includes the title, abstract, keywords, and author keywords. Initially, we identified a number of 2,799 research papers (Figure no. 2). The timeframe was selected from 2020 to 2024 to reflect a period of significant developments, changes and adaptations in the sustainability frameworks. The five-year time horizon was chosen to allow analysis of a complete and relevant period. Our database includes only articles as they are the most relevant category of academic writings that can also be helpful and understandable for users of the sustainability statements. To ensure consistency, English was the only language selected, to cover a broader range of articles. The results indicated a database of 1,421 articles.

Additionally, to further refine our research, we also selected the areas "Business Economics" and "Environmental Science Ecology". To finalize the refining process, we limited the articles to the following WoS Categories: "Environmental Studies", "Business Finance", "Management", "Green Sustainable Science and Technology", "Environmental Science", and "Business".

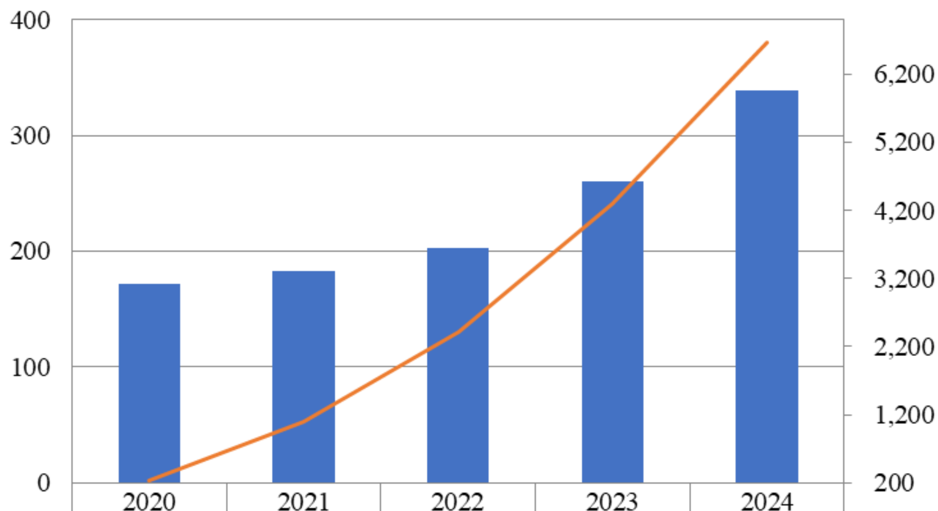
The final database comprises a number of 1,157 articles which were included in our analysis.

The final database was imported into VOSviewer software, using a thesaurus file to replace abbreviations with full phrases, convert plural words into their singular forms, and combine similar expressions into a single idiom.

3. Results and Discussions

The first step of the research conducted is a performance analysis emphasized in **Figure no. 3**. As shown in this graphic, the publications on ESG reporting and CSRD framework, have increased since 2020, from 172 to 339 publications. Moreover, the citations have grown exponentially from 255 in 2020 up to 6,642 in 2024.

Figure no. 3. Evolution of publications and citations by year



	2020	2021	2022	2023	2024
Publications	172	183	203	260	339
Citations	225	1,097	2,421	4,301	6,669

Source: own data processed, 2025

The increase in researchers' interest is due to the fact that in 2023, the new CSRD framework came into force, alongside the ESRS which is applicable from 1 January 2024. However, there had been several research papers conducted in the last five years which indicated an intense concern about sustainability and ESG reporting. As it is already known, financial information is no longer enough to satisfy the needs of stakeholders, so sustainability statements have become essential in most reporting packages of undertakings. Of course, the peak of publications and citations occurred in 2024, as several entities became subject to reporting under the ESRS requirements. The phenomenon of adapting to sustainability practices and reporting is intensively studied in the academic sphere.

In terms of publication sources, Figure no. 4 indicates top ten most relevant journals where researchers publish articles about sustainability reporting, CSRD and ESRS legislation. The horizontal axis shows the number of articles found in each of the most relevant journals. As it can be observed, the "Sustainability" Journal includes the most articles, as it covers a broader area regarding sustainability: corporate sustainability reporting, sustainability science, reporting frameworks, sustainability in the supply chain and across several industries. In addition, the sustainability statement is a topic that can also be found in accounting and business journals, as it has gradually become an important section in the reporting packages over recent years. Therefore, the ESG topic is a subject of wide interest and can be found in multiple journals in the Web of Science database.

Figure no. 4. Top 10 most relevant journals in sustainability reporting research

Source: own data processed, 2025

Table no. 7. Top 10 most cited articles

Title	Author(s)	Year	Citations	Journal	IF
New challenges for corporate sustainability reporting: United Nations' 2030 Agenda for sustainable development and the sustainable development goals	Tsalis, Thomas A.; Malamateniou, Kyveli E.; Koulouriotis, Dimitrios; Nikolaou, Ioannis E.	2020	315	Corporate Social Responsibility and Environmental Management	8.3
The impact of board composition on the level of ESG disclosures in GCC countries	Arayssi, Mahmoud; Jizi, Mohammad; Tabaja, Hala Hussein	2020	218	Sustainability Accounting Management and Policy Journal	5.2
Corporate ESG reporting quantity, quality and performance: Where to now for environmental policy and practice?	Arvidsson, Susanne; Dumay, John	2022	216	Business Strategy and the Environment	12.5
Corporate involvement in Sustainable Development Goals: Exploring the territory	van der Waal, Johannes W. H.; Thijssens, Thomas	2020	208	Journal of Cleaner Production	9.8
Organizations' engagement with sustainable development goals: From cherry-picking to SDG-washing?	Heras-Saizarbitoria, Inaki; Urbieta, Laida; Boiral, Olivier	2022	176	Corporate Social Responsibility and Environmental Management	8.3

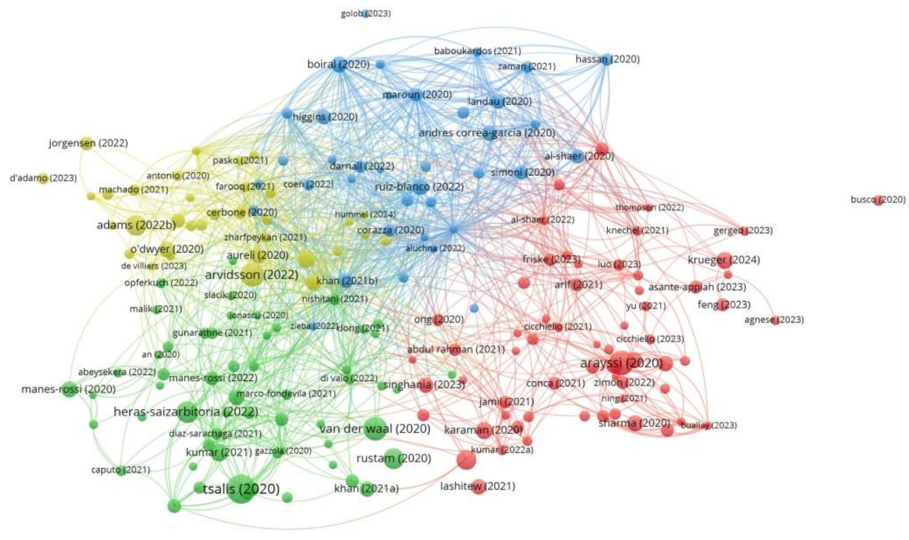
Title	Author(s)	Year	Citations	Journal	IF
Environmental awareness, firm sustainability exposure and green consumption behaviors	Rustam, Adeela; Wang, Ying; Zameer, Hashim	2020	161	Journal of Cleaner Production	9.8
Connecting the COVID-19 pandemic, environmental, social and governance (ESG) investing and calls for 'harmonisation' of sustainability reporting	Adams, Carol A. A.; Abhayawansa, Subhash	2022	155	Critical Perspectives on Accounting	8.3
Do institutional investors drive corporate transparency regarding business contribution to the sustainable development goals?	Garcia-Sanchez, Isabel-Maria; Rodriguez-Ariza, Lazaro; Aibar-Guzman, Beatriz; Aibar-Guzman, Cristina	2020	154	Business Strategy and the Environment	12.5
What do we know about business strategy and environmental research? Insights from *Business Strategy and the Environment*	Kumar, Satish; Sureka, Riya; Lim, Weng Marc; Kumar Mangla, Sachin; Goyal, Nisha	2021	117	Business Strategy and the Environment	12.5
Green logistics performance and sustainability reporting practices of the logistics sector: The moderating effect of corporate governance	Karaman, Abdullah S.; Kilic, Merve; Uyar, Ali	2020	109	Journal of Cleaner Production	9.8

Source: own data processed, 2025

Another analysis conducted over the sample of academic papers from Web of Science highlights the top ten most cited articles between 2020 and 2024. As demonstrated in **Figure no. 4**, there are certain journals that are more relevant in the sustainability subject. In **Table no. 7** we can identify four out of five journals that are also in top ten most significant journals in ESG research: “Business Strategy and the Environment”, “Corporate Social Responsibility and Environmental Management”, “Journal of Cleaner Production” and “Sustainability Accounting Management and Policy Journal”. Also, a wide concern for sustainable development goals and sustainable practices can be observed in each of the articles’ titles. These articles were published in between 2020 and 2022, but they do not mention the CSRD or ESRS frameworks. The lack of sufficient research in the new European reporting requirements is also indicated by the low citations of the existing papers and the relatively small number of articles in comparison to GRI or SDGD frameworks. Furthermore, **Figure no. 5** presents the interconnections between the articles. The most emphasized paper in this map is by the author Tsalis, Thomas A., also demonstrated in **Table no. 7** as the article with the most citations. Tsalis et al. (2020) conducted an empirical analysis on a sample of 48 sustainability reports from 20 Greek companies to highlight the strategies that each undertaking from different industries tries to adapt to the United Nations' 2030 Agenda by applying the requirements of the Sustainable Development Goals (SDGs). Even if the article recalls practices in accordance with the Global Reporting Initiative (GRI), a framework that has been replaced by the ESRS nowadays, it still remains a highly relevant piece of research for understanding the evolution of sustainability reporting over the last decade. Other relevant linkages from different clusters could also be found in **Table no. 7**, such as Arayssi, Mahmoud (2020), Arvidsson, Susanne (2022), each with over 200 citations per article.

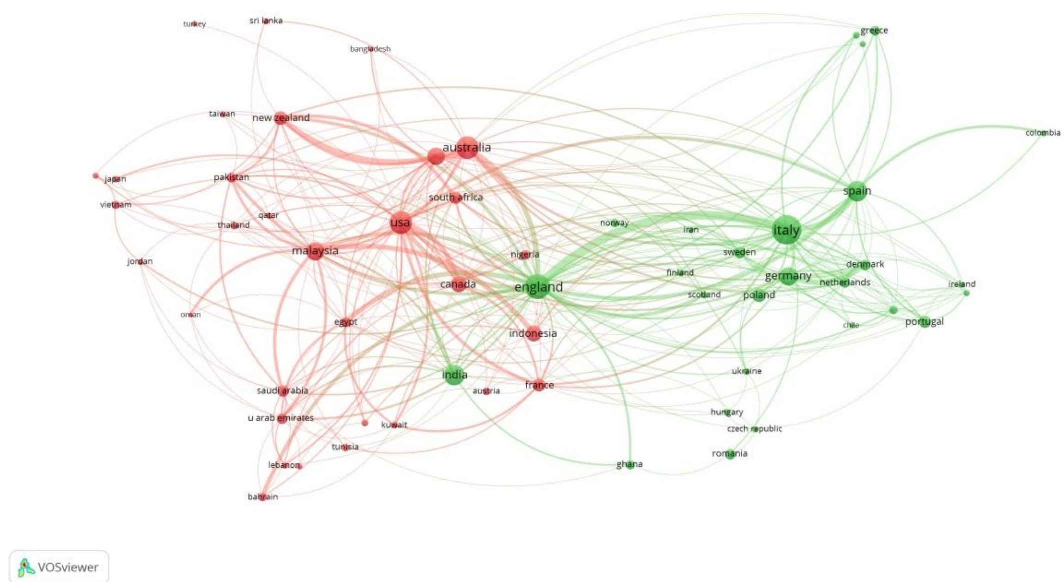
With regard to the countries that are concerned with sustainability reporting, we demonstrated in **Figure no. 6** that a wide variety of nations are conducting research on the latest ESG trends. In the first cluster, non-European countries with strong economies can be identified: The United States of America, Australia, New Zealand, Saudi Arabia, Canada and Malaysia. The second cluster is formed mainly by European countries which have more developed economies and powerful companies in industries such as energy, manufacturing, oil and gas: England, Italy, Germany, Spain, and Poland. Strong relationships between certain countries can be seen through the thicker lines connecting the dots. For example, researchers from England collaborate with academics from Australia, Italy, the USA and even India or Pakistan. Another example is Italian and Malaysian or South African researchers who cooperate in their sustainability studies. Thus, sustainability is a worldwide concern that is rapidly increasing as all industries are switching their practices to more environmentally friendly solutions in order to preserve natural resources. In **Figure no. 6** we can see that countries with strong economies are investing in more research on the ESG topic, forming relationships between each other without any nationalities or language barriers.

Figure no. 5. Bibliographic coupling of articles



Source: own data processed, 2025

Figure no. 6. Co-authorship by county

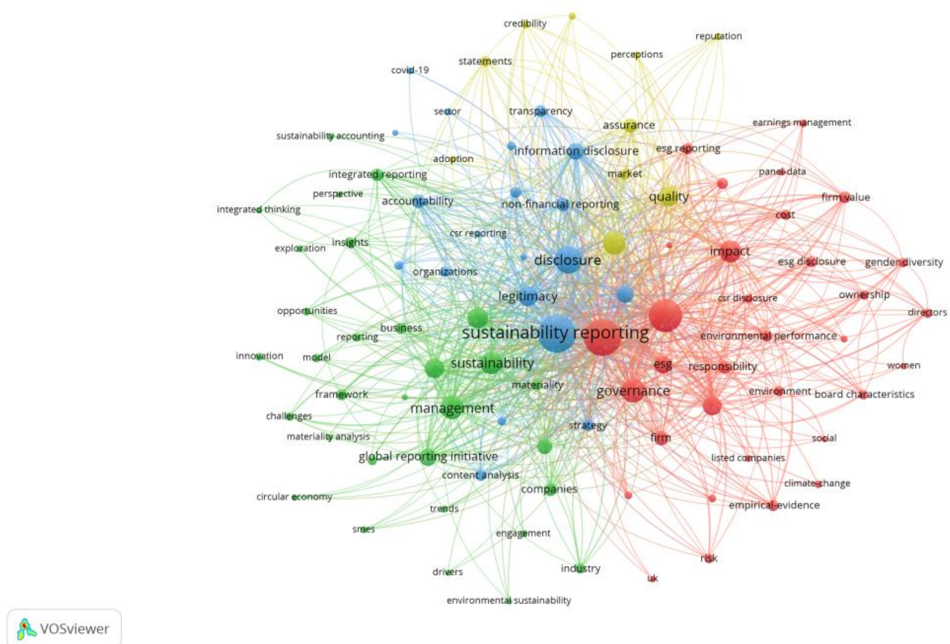


Source: own data processed, 2025

Another important part of the analysis consists of the map of the keywords that were found using the Boolean string ("Sustainability reporting" OR "ESG reporting") OR ("CSRD" AND "Corporate Sustainability Reporting Directive") OR ("ESRS" AND "European Sustainability Reporting Standards") and the thesaurus file, as mentioned in the "Research Methodology" chapter. The minimum number of occurrences of a keyword set was at 15 times. Out of 3,585 words, a number of 94 met the criteria. The threshold was set at a lower number as the sustainability topic encompasses an extensive number of words related to various domains. For a more accurate research, the focus has been kept on the practices adopted by companies from different industries. As a result, the following words occupy the top positions: "corporate social responsibility", "management", "sustainability reporting", and "determinants" (**Figure no. 7**).

Table no. 8 shows the keywords grouped in four clusters. Each cluster highlights a different point of view regarding sustainability reporting.

Figure no. 7. Keywords clusters related to sustainability, CSRD and ESRS



Source: own data processed, 2025

Table no. 8. Clusters of top five keywords

Cluster 1 - RED	Cluster 2 - GREEN	Cluster 3 - BLUE	Cluster 4 - YELLOW
Corporate social responsibility	Management	Sustainability reporting	Determinants
Performance	Sustainability	Disclosure	Quality
Governance	Stakeholder	Legitimacy	Assurance
Impact	Sustainable development goals	Environmental disclosure	Market
ESG	Global reporting initiative	Information disclosure	Statements

Source: own data processed, 2025

Cluster 1 (red)'s most relevant word is "corporate social responsibility" with 544 occurrences, 93 links and total link strength of 3,375. Also, cluster 1 shows how corporate governance, CSR and ESG factors blend together in order to help a company develop responsible practices that lead to financial success. Cluster 2 (green) is related to the role of the management in coordinating responsible and sustainable practices, with 195 occurrences, 91 links and total link strength of 1,203. Moreover, as continuous practices of economic prosperity, the undertakings have integrated in their actions the sustainable development goals and consultations with their key stakeholders in order to identify the best sustainable practices. The third cluster (blue) focuses on some key characteristics of an ESG statement: "legitimacy", "accountability", "transparency", having as the strongest point "sustainability reporting" with 566 occurrences, 93 links and total linkage strength 2,964. The last cluster (yellow) pinpoints the idea of assurance over the sustainability statements, "quality", "assurance", "sustainability assurance", and "credibility". However, the word "determinants" has the most occurrences (92). It has 2,876 links and a total link strength of 1,496 and refers to different factors that could impact the reporting process, thus modifying the assurance opinion.

Previous research papers that include bibliometric analysis suggest as well, that there is a gap in the literature regarding reporting on environmental, social and governance aspects (Ellili, 2024). The same study mentioned earlier argues the importance of adapting to changes in reporting requirements, sustainability practices and economic growth. At the same time, Osobajo et al. (2022) state the importance of maintaining adequate relationships with companies' stakeholders in order to achieve a balance between economic prosperity, efficient environmental practices and social equity. The most relevant countries when it comes to sustainability research are represented by the Anglo-American and European areas (Teh, 2024), as it was also demonstrated in **Figure no. 6** from this paper.

Conclusions

The literature review and the bibliometric analysis conducted in this research paper highlight the importance and imperative need for sustainability reporting for every major company. As undertakings are part of a circular economy, they all interact with one another, placing environmental, social and governance topics at the center of attention for both own activities and stakeholders' decisions. The aim of this article is to emphasize the necessity of sustainability reporting as part of the management report and to also provide a clear view of the evolution of frameworks. Moreover, the focus is directed towards the implementation of ESRS through CSRD too.

Each of the three components of the acronym "ESG" plays a significant role for each undertaking, ensuring a smooth running of the business. The environmental aspect is arguably the most critical, as it relates to the potential for severe harm to natural resources. These marine, soil and air resources should always be preserved in order to benefit from them for an undefined period of time. The social aspect is related to both own employees and affected communities, which play crucial roles for companies. The more valued an employee feels, the more they benefit the firm by prosperous activities. Also, to show that safety and health of communities that are impacted by companies' activities, several policies have been implemented to preserve the nature and welfare. Nonetheless, all the policies and strategies could not be adopted and respected without efficient governance. Strong business conduct is embedded in every corporate culture and it is also spread among key stakeholders, such as suppliers or customers.

The first conclusion that can be drawn from this article is that the European Sustainability Reporting Standards are in a continuous change, hampering their users. For this reason, this year has brought up the idea of an updated set of regulations that can facilitate a smoother transition to CSRD requirements and adaptation to report on relevant ESG topics. As the current ESRS data-points are strict and at times ambiguous, the European Commission proposed an Omnibus alternative to simplify the requirements. Currently, the document is only at the proposal stage, creating even more uncertainty for companies which have already embarked in the sustainability reporting journey. Even if it was created to reduce requirements and the number of companies that fall under the CSRD reporting umbrella, the new simplification proposal has to pass several approvals from European Parliament and Council.

The second conclusion is supported by the bibliometric analysis conducted on 1,157 articles from Web of Science. The scientific maps showed an increased number of papers on sustainability reporting and ESG subject matters, but a lower interest granted for the new regulations, CSRD or ESRS. This leads to a gap in the literature, which is also transposed in uncertainties in practice. Given the accelerated rhythm of the reporting requirements and the stakeholders' constant need of complete and transparent information, academic literature should adapt and offer more guidance for its users. Additionally, even if the collaborations between authors are strong, the number of countries in which sustainability is a crucial topic is reduced. Gradually, territories with lower economies should integrate in their practices the sustainability concept. This process is also outlined in the Sustainable Development Goals: SDG 10 - Reduced Inequalities and SDG 17 - Partnerships for the Goals.

The limitations of this study are considered to be the refining methods used and the utilization of only one database source, Web of Science. Even if the WoS is the most complex and utilized database among the researchers, it may not comprise all articles written on the selected topic. Besides this, the filters applied narrowed down even more the analysis, especially the timeframe chosen or the document type. The selected period might miss the latest research findings on ESRS requirements or other relevant opinions from stakeholders about the sustainability statement's content.

Future possible research directions for this study consist of extending the analysis on another database, such as Scopus, and combining the results. This method could ensure a more accurate conclusion over the reporting practices and overview of the companies. Moreover, the Boolean string can be improved by adding keywords related to assurance, which starting from this year, is a mandatory service for several undertakings. Relevant words include phrases such as "sustainability assurance", "sustainability audit", "limited assurance" or "ISAE 3000".

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Considerations Regarding Environmental Reporting Regulations

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Abstract

This study investigates the regulations that have been taken into account regarding the discipline of environmental reporting. Thus, the present paper aims to analyze and discuss the main regulations that have existed for environmental reporting, those that are currently in force and how these regulations will evolve in the future. To this end, the opinions of some researchers highlighted for the specialized literature were highlighted together with the author's own analyses in the field. In particular, the regulations in the field of environmental reporting are analyzed internationally and nationally on financial accounting and reporting, as well as financial audit activities. The paper formulates assessments regarding the preparation of auditors to provide assurance services in the case of environmental and sustainability reporting, in close connection with the actions and activities that should be undertaken for the further improvement and deepening of the regulations in the field.

Key words: *environmental reporting; CSRD; GRI; NFRD; regulations;*

JEL Classification: *M41, Q56*

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1. Introduction

Sustainable development is a goal in the development and standardization of non-financial reporting and for the management of companies.

A growing number of companies consider it relevant to disclose social and environmental activities by adopting non-financial reporting practices (de Villiers and Alexander, 2014). This trend has been influenced by the emergence of legislative obligations to disclose non-financial information (Michelon, Pilonato and Ricceri, 2015).

Environmental reporting has become an important concept in the way companies communicate with stakeholders over the years. In combination with other non-financial reporting concepts (e.g. social, governance) it has established a particular trend in Europe, where companies frequently report non-financial information (Stolowy and Paugam, 2018).

There are diverse opinions in the literature regarding the key players in sustainability accounting; however, there are also concerns regarding the regulation that should be established as a guide in the development of sustainability reports or environmental reports (Cho et al., 2015; Stolowy and Paugam, 2023). The main concerns raised are related to companies mentioning one or more regulatory standards at the time of reporting and the continuous change of regulations in the field.

The environmental reporting process began in 2021 to undergo a process of innovation in terms of standards. Some organizations considered merging to develop convergent standards. Certain regulations existed previously and formed the basis of voluntary and mandatory reporting. The specialized literature offered different opinions on past, present and future regulations (Ienciu, 2009; Laine, Tregidga and Unerman, 2021; Tregidga and Laine, 2021; Rimmel, 2021a; Rimmel et al., 2021; Giner and Luque-Vilchez, 2022; Stolowy, and Paugam, 2023). Based on the specialized literature, we identified various regulations that were the subject of the analysis; there were also other regulations that we did not consider because no studies could be identified to complement the information found.

Thus, taking into account the abundance of regulations in the field and the challenges that environmental reporting currently faces, our research aims at two important objectives:

OB1: Evaluation of the main regulations and directives that formed the basis of environmental reporting

OB2: Involvement of auditors within these regulations that involved environmental reporting

The proposed study is structured in five sections. In the first section, the present one, preliminary aspects for the scientific approach undertaken were highlighted. The second section analyzes the main regulations and directives in the field, respectively the involvement of auditors. The last two sections include discussions and conclusions of the research undertaken.

2. Analysis of the main regulations in the field, with references from the specialized literature

For the analysis undertaken, we consider relevant for the analysis the GRI standards (multi-stakeholder strategy for sustainability reporting), Triple Bottom Line Reporting, Environmental Accounting Externalities, Value Reporting Foundation (VRF), IFRS regulation on environmental accounting (financial accounting perspective on environmental accounting and specific environmental certifications (e.g. ISO and EMAS – the most recognized in this field). Finally, we will turn our attention to EU Directive 95/2014 (the first convergent standard for non-financial reporting) and CSRD (2021) (EU Directive 2464/2022) (standard that refers more to sustainability reporting). Last but not least, we will also discuss the involvement of auditors in ensuring the audit within these reports, especially within the framework of the two directives.

2.1. GRI standards

There is a mandatory feature for annual reports to disclose voluntary information on social and environmental aspects through narrative sections. The most representative initiative is the Global Reporting Initiative (GRI), considered the main benchmark for preparing sustainability reports (Moneva, Archel and Correa, 2006). Even though other initiatives refer to standards such as Accountability 1000 and Social Accountability 8000, GRI is considered to have the most structured and detailed guidelines for companies to prepare environmental reporting (Tregidga and Laine, 2021), as they have disclosure guidelines for each environmental topic (e.g. climate, water, energy, material use, on which companies should report.

The development of the GRI Guidelines began in the 1990s as a need for accountability and improved environmental performance among American companies (Rimmel, 2021b). This request was made by a non-profit organization CERES (Coalition for Environmentally Responsible Economies), which is composed of investors, foundations, NGOs, public pension managers, organizations and unions.

Regarding the development of new sector standards, the GSSB approved in 2019 the "GRI Sector Program" for 40 high-impact sectors to improve consistency and clarity in sustainability reporting. These 40 sectors were classified into 4 priority groups according to their impact on sustainability.

2.2. Triple Bottom Line Reporting (TBL)

Triple Bottom Line (TBL) reporting is a three-outcome approach to sustainability that integrates economic, environmental and social dimensions at the same level (Elkington, 1997). This is a more general approach and does not provide a framework like the GRI guidelines, but allows companies to choose how to balance the 3 dimensions. The author suggests that if this concept is used appropriately, it can help users assess how sustainable a business is. The main trends that make organizations consider sustainability are: markets, societal value, transparency, life cycle technology, time, partnerships and corporate governance (Elkington, 2004).

TBL emerged around 2000, when companies began to produce reports that contained economic, environmental and social aspects of their corporate performance (Buhr, Gray and Milne, 2014). Subsequently, companies wanted to provide an understanding of the social and ecological systems they provide and linking economic, environmental and social aspects of corporate performance could not be achieved in terms of sustainability (Milne and Gray, 2013); therefore, the link between these aspects was referred to as TBL reporting (Elkington, 1997).

2.3. Environmental accounting externalities

Externalities are considered to integrate "economic, social and/or environmental impacts arising from the activities of an entity that are borne by others, at least in the short term" (Unerman, Bebbington and O'Dwyer, 2018). These impacts could have long-term consequences for the initiating entity, but do not have direct or timely consequences in the short term and do not fall under financial reporting (Antheaume and Bebbington, 2021). Therefore, they are environmental costs imposed by an economic agent on a third party.

Ienciu (2009) considers that the GRI guidelines provide a framework and various indicators of economic, social and environmental performance, but the externalities caused by an entity are not reported, recorded or quantified.

To address externalities, Bebbington and Gray (2001) suggested that entities should incur a sustainable cost. This cost should include all inputs of an entity that do not have a negative impact on the environment. In addition, the sustainable cost should also include the cost required to prevent an environmental impact, even if the environmental impact contributions do not occur within an entity. From an economic perspective, externalities are divided into negative externalities and positive externalities.

Negative externalities are considered to "occur when a third-party person or organization incurs financial costs that arise from a transaction between other parties and for which there is no resource for the third party to recover the financial costs from the transacting parties" (Unerman, Bebbington, & O'Dwyer, 2018, p. 500). Therefore, a negative externality is the impact that an entity may have on its third parties and for which the third party cannot recover.

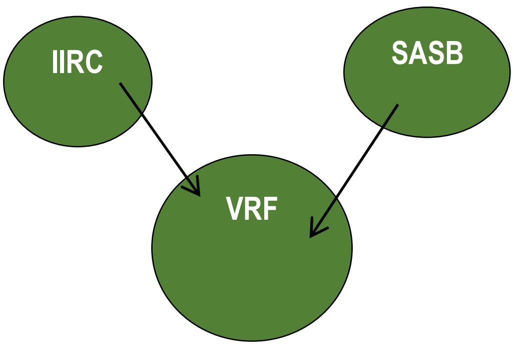
Positive externalities are considered to "result in financial benefits to third parties. Where financial reporting information is aggregated from underlying transaction records that use market-derived prices or values, this information for the transacting parties ignores these economic externalities" (Unerman, Bebbington, & O'Dwyer, 2018, p. 500). Therefore, a positive externality is the impact that an entity can have on its third parties and for which a third party can obtain financial benefits.

From a financial-accounting point of view, externalities are not recognized in financial statements (Ienciu, 2009), however, companies can implement environmental accounts in which they record an estimated value of the environmental costs generated by their activities. Furthermore, organizations can also be subject to the costs and risks incurred by the externalities of other organizations (e.g., risks related to climate change) (Unerman, Bebbington and O'Dwyer, 2018).

2.4. Value Reporting Foundation (VRF)

The Value Reporting Foundation (VRF) is an organization formed as a merger between the International Integrated Reporting Council (IIRC) and the Sustainability Accounting Standard Board (SASB) in 2021, reflected in **Figure no. 1**.

Figure no. 1. Strengthening the Value Reporting Foundation (VRF)



Source: author's projection

The organization was established to strengthen staff and resources to develop a sustainability disclosure framework for capital markets (IFRS, 2022). In developing sustainability disclosure standards, the VRF uses SASB and IIRC standards to establish connectivity between financial statements and sustainability-related financial disclosures.

During its short existence until consolidation into the IFRS Foundation, the VRF's goal was to help companies develop consistent and transparent sustainability (e.g. environmental) disclosures, allowing investors and stakeholders to compare and assess the value of a company (SASB, 2020).

In addition to the GRI standards, Tregidga and Laine (2021) considered the IIRC and SASB as conceptual frameworks for environmental reporting. In their opinion, there are other initiatives (e.g. Corporate Disclosure Project - CDP and Task-Force on Climate Disclosure - TCFD), but they are not sufficiently influential and widely recognized and focus on specific environmental aspects (e.g. climate, water and carbon information).

2.4.1. Integrated reporting

Integrated reporting (IR) began to develop in 2010, as sustainability reporting was considered a common approach at the time. The initiative was defined and promoted by the IIRC. The main goal of IR was for organizations to produce a single integrated report on how organizations create value over time (IIRC, 2021; Laine, Tregidga, & Unerman, 2021). This new report was developed based on the GRI guidelines and Triple Bottom Line reporting (Rimmel, 2021c).

Brown and Dillard (2014) argue that integrated reporting provides a more holistic approach to business by interconnecting social, environmental, and financial aspects of corporate performance and therefore going beyond conventional financial reporting.

According to Rimmel (2021c), the main objectives of the IR framework are as follows:

- Financial performance focuses on rebalancing key ratios and moving from a short-term to a long-term perspective
- Systematic social and environmental reporting tool for organizations
- Clear link between economic value and sustainability by interlinking economic, environmental, social and governance factors in the decision-making process
- Supporting long-term investor demands by presenting broader and longer-term consequences.

The main key concepts used by the IR Framework are value creation, integrated thinking and the six capitals (IIRC, 2021).

The six capitals component is defined according to IIRC (2021) by:

- Financial capital – funds generated from investments or businesses or obtained through financing
- Manufactured capital – physical objects (e.g. buildings, equipment) used to produce goods or services
- Intellectual capital – intangible assets: organizational (e.g. systems and procedures) and rights (e.g. patents, licenses)
- Human capital – people's skills, experience, and competencies; the capacity and motivation to innovate
- Social and relational capital – opportunity for information exchange to improve individual and

collective well-being across institutions and communities

- Natural capital – environmental resources and processes (e.g. air, land, forests, water, minerals, biodiversity, and environmental health) that support an organization's overtime prosperity.

IR has been present in many areas, but the main purpose of IR remains unclear (Brown and Dillard, 2014; Tregidga and Laine, 2021). Some organizations have published IR in certain national regulatory contexts, such as South Africa (Atkins and Maroun, 2015; Ahmed Haji and Anifowose, 2016; Wachira, Berndt, and Romero, 2020), although others have wanted to see a model (Gibassier, Rodrigue, and Arjaliès, 2018). IR involves the inclusion of capital necessary for the success of companies (Tregidga and Laine, 2021), and at the same time, the reaction of different types of stakeholders to this type of reporting remains uncertain (Flower, 2015; Rinaldi, Unerman, and de Villiers, 2018).

2.4.2. Sustainability Accounting Standards Board (SASB)

The Sustainability Accounting Standards Board (SASB) is an independent, US-based organization established in 2011 that creates sustainability reporting standards for organizations that produce material information for investors (Tregidga and Laine, 2021). SASB's goal is to limit environmental reporting to a smaller number of environmental aspects, so that investors will have comparable and concise information to help them make decisions (Laine, Tregidga and Unerman, 2021).

The environmental reporting framework developed by SASB is considered to be closer to the Integrated Reporting approach, as investors are the primary users of the information. In comparison, the GRI guidelines cover a wide range of stakeholders. SASB has published a reporting framework for 77 industries by 2018 (SASB, 2018), as a result of investors' demand for concise and comparable environmental information. Michelon, Rodrigue and Trevisan (2020) showed that there is openness on the part of the investment community to recognize the importance of environmental aspects for industries and firms.

The sustainability reporting standards developed by SASB are designed more for the investment community than for a broad range of stakeholders, such as the GRI guidelines. An important aspect that SASB had on the reporting framework was industry-specific regulation that could contribute to the current development of standards by the Global Sustainability Standards Board (GSSB) and the IFRS Foundation.

2.5. IFRS regulations in environmental reporting

Accounting in the EU is currently controlled by the International Accounting Standards Board (IASB). The IASB is a non-profit organization that approves International Financial Reporting Standards (IFRS) designed to provide a regulatory framework to achieve the objective of comparability in the accounting scheme. According to these standards, there is a path for convergence of national laws to international ones.

Currently, there is an organization, IFRS Foundation, formed as a merger in 2021 between 3 entities that develop environmental reporting standards in a more convergent way. Until these standards appear, we will first recognize the main international accounting standards (IAS), international financial reporting standards (IFRS) and the international financial reporting interpretation committee (IFRIC) that relate to environmental accounting.

IAS/IFRS standards dedicated to financial reporting that include advice on the presentation, measurement and recognition of environmental assets, liabilities and expenses are as follows: IAS 1, IAS 2, IAS 8, IAS 12, IAS 16, IAS 36, IAS 37, IAS 38, IAS 39, IAS 41, IFRIC 1, IFRIC 3, IFRS 6, IFRS 8.

Based on the analysis of these standards, we can highlight the presence of various elements related to environmental reporting, but at the same time, the lack of a standard dedicated to environmental reporting.

In response to this challenge, IFRS implemented in 2021 an International Sustainability Standard Board (ISSB) to develop IFRS sustainability standards (IFRS, 2021). The aim was to create a framework of sustainability-related disclosure standards for investors and capital market participants, which would help them make informed decisions (Stolowy and Paugam, 2023). In **Table no. 1**, we have focused on the standards that the ISSB has developed so far.

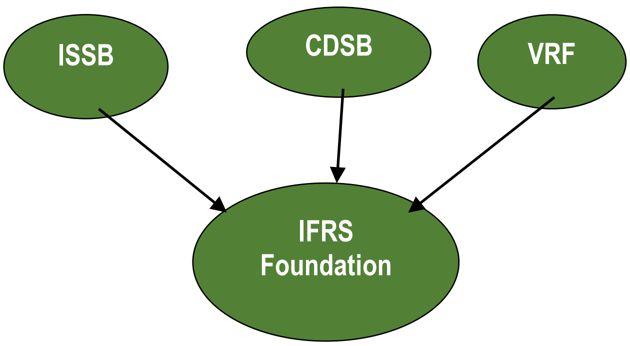
Furthermore, ISSB, CDSB and VRF merged at the end of 2021 to form the IFRS Foundation (**Figure no. 2**) to support ISSB and create connectivity between financial statements and sustainability disclosure (VRF, 2023).

Table no. 1. ISSB standards

IFRS/IAS Standards	Title and/or description	Promulgation
IFRS S1	General requirements for disclosure of financial information related to sustainability	2024
IFRS S2	Climate-related disclosures	2024

Source: IFRS (2021)

Figure 2 Consolidation of IFRS Foundation



Source: author's projection

Even though this merger came as an initiative to support companies to implement ISSB standards in the future (IFRS, 2021), there are some differences in approaches between the EU and the IASB in terms of scope, reporting boundaries, materiality and target audience (Giner and Luque-Vilchez, 2022).

Another observation is that the IFRS Foundation has a focused orientation on investors and creditors, while the GRI standards focus on all types of stakeholders.

In conclusion, national regulations can have a strong impact on IFRS reporting (Barbu et al., 2014); therefore, environmental disclosures can increase with firm size. However, the authors emphasized that the application of IFRS is affected by reporting practices before the adoption of IFRS standards. This compliance with IAS/IFRS regarding environmental disclosures may differ from one company to another due to different practices regarding voluntary disclosure of environmental information and from one country to another due to the lack of convergence between national regulations.

Another conclusion that can be drawn is that in the IAS/IFRS standards dedicated to financial reporting, various standards and interpretations of the standards mention environmental aspects. The main aspects analyzed are related to environmental assets, liabilities and expenses and deal with disclosure, measurement and recognition. However, the IASB conceptual framework faces constraints regarding environmental information disclosure due to the mismatch between natural environmental concerns and accounting norms and rules (de Aguiar and Bebbington, 2021).

2.6. Environmental management systems

For voluntary reporting, some regulations can provide guidance to companies in presenting non-financial information at the national level. These standards can identify and control the impact of companies on the environment and improve environmental performance.

An environmental management system is a system that monitors a company's environmental performance, just as a financial management system monitors a company's financial performance by controlling expenses and revenues (Ienciu, 2009). The motivations for organizations to adopt this type of certification are economic and institutional (Castka and Corbett, 2014). The first document that highlighted the need to internalize environmental costs was the Brundtland Report (Watson and Emery, 2004).

The main certifications with more visibility in the specialized literature are ISO and EMAS.

The International Organization for Standardization (ISO) is the competent body in regulating the impact on the environment and society at a global level. This organization is independent and non-governmental and has 162 national standardization bodies. The national body in Romania that represents ISO is the Romanian Standardization Association (ASRO).

Thus, ISO is trying to standardize on the topic of sustainability, which is considered to be discussed, controversial and complex (Rimmel, 2021b). ISO has developed three standards in the field of sustainability: Environmental Management Systems (ISO 14000), Sustainability Management Systems (ISO 26000) and Quality Management Systems (ISO 9000) (Tuczek, Castka and Wakolbinger, 2018; Rimmel, 2021b).

Among the standards promoted by ISO, the most popular is the ISO 14001 certification. The study prepared by Turk (2009) ranks Romania in seventh place globally with 702 ISO 14001 certifications issued by 2006. The first countries by the number of ISO 14001 certifications are: China (6159), Italy (2745), Spain (2505), Germany (975), South Korea (975) and South Korea (938).

The European Community Eco-Management and Audit Scheme (EMAS) is a widely requested and accepted voluntary certification scheme, based on EC 1221/2009. EMAS requires organizations to develop a public environmental statement on their environmental performance each year and to renew their registration annually in order to maintain their place in the EMAS public register (Albelda, 2011). Because EMAS is a voluntary certification, it is aimed at companies that intend to improve their overall environmental performance.

Since the 1990s, European companies have started to use voluntary certification schemes, until the emergence of regulations (e.g. ISO 14001 or the EU EMAS scheme) to show their commitment to sustainable development and, more specifically, to environmental issues (Albelda, 2011). As an argument, the authors suggested that companies intended to report, evaluate and improve their environmental performance through an environmental management system in order to control their environmental impact and extend their environmental improvements. Compared to ISO 14001, EMAS certification is not as popular among companies. Romanian companies have started to adhere to this certification since 2007, but there is still an important difference in the number of companies adhering to this type of certification compared to ISO 14001. The explanation is that, although both certifications are voluntary, the choice to adopt ISO 14001 certifications is influenced by external stakeholders, while EMAS by internal motivations (Neugebauer, 2012; Testa et al., 2014).

2.7. A qualitative progress – from EU Directive 95/2014 (NFRD) to EU Directive 2464/2022 (CSRD)

The Non-Financial Reporting Directive (NFRD) (EU, 2021) came as a proposal from the European Commission on non-financial and diversity disclosure for certain large companies and groups at the end of 2014 (EU, 2014). Larger organisations in the EU were required to disclose environmental and social policies and diversity on the board of directors, in line with the "comply or explain" principle (Krasodomska, Michalak and Swietla, 2020). In 2021, the European Union took an initiative in the field of sustainability reporting. The European Commission issued a proposal for a Corporate Sustainability Reporting Directive (CSRD), which amends the existing reporting requirements of the NFRD. The new directive:

- "Extends the scope to all large companies and all companies listed on regulated markets (except listed micro-companies)
- Requires audit (assurance) of reported information
- Introduces more detailed reporting requirements and a requirement to report in line with mandatory EU sustainability reporting standards
- Requires companies to digitally 'tag' reported information so that it can be machine-readable and fed into the European single access point provided for in the Capital Markets Union Action Plan".

The first companies must apply the new rules for the 2024 financial year for reports published in 2025. EU Directive 2464/2022 includes the adoption of European Sustainability Reporting Standards (ESRS). The work to develop these standards was undertaken by the European Financial Reporting Advisory Group (EFRAG).

The European Sustainability Reporting Standards (ESRS) have a "dual materiality" perspective for companies under the CSRD to report social and environmental information. Through this, companies must report their impact on people and the environment, as well as the social and environmental issues that create financial risks and opportunities for the company. EFRAG's activity is welcome because they have undertaken sustained efforts over two years to draft a series of sustainable reporting standards. By developing these standards on the specific dimensions of sustainability, a common vision on sustainable reporting was desired:

- Environment: (ESRS E1 Climate change, ESRS E2 Pollution, ESRS E3 Water and marine resources, ESRS E4 Biodiversity and ecosystems, ESRS E5 Resource use and circular economy)
- Social: (ESRS S1 Workforce, ESRS S2 Employees in the value chain, ESRS S3 Affected communities, ESRS S4 Consumers and users)
- Governance: (ESRS G1 Business conduct).

A conceptual framework (ESRS 1 General Requirements and ESRS 2 General Reports) has also been developed, contributing to better monitoring of the implementation of the Sustainable Development Goals (SDGs). In the next steps, ESRS will develop sector-specific standards for oil and gas, mining, coal mining and quarrying, road transport, textiles, accessories, footwear and jewelry. There are also early research projects for agriculture, farming and fishing, motor vehicles, energy production and utilities, and food and beverages. Finally, ESRS will develop standards for financial institutions starting in 2026.

Table no. 2. Comparison of the EU Directive 95/2014 and EU Directive 2464/2022

Category	EU Directive 95/2014 (NFRD)	EU Directive 2464/2022 (CSRD)
Enactment	2017	2024: for companies that already reported according to EU Directive 95/2014 2025: large reporting companies that are not subject to EU Directive 95/2014 until now 2026: listed SMEs, small and non-complex credit institutions and captive insurance companies
Applicability	Listed companies, banks and insurance companies with more than 500 employees	All listed or non-listed companies (which meet 2 out 3 criteria): • > 250 employees and/or • > 40 million euros and/or • > 20 million euros Total assets Small and medium-listed companies get an extra 3 years for compliance.
Number of companies subject to the directive	EU: 11,600	EU: 49,000
Scope of reporting requirements	Environmental protection Social responsibility and treatment of employees Respect for human rights Anti-corruption and bribery Diversity on company boards (age, gender, educational and professional background)	Overall requirements: • Inclusion in the Annual Report • External assurance • Reporting principles • Format and timing General disclosures: • Business model, strategy and policies • KPIs and targets • Company and sustainability governance • Double materiality assessment and due diligence • Risk and opportunity management Topic-specific disclosure: • Environmental (including EU Taxonomy) • Social • Governance • Sector-specific standards
Audit assurance	Not mandatory	Mandatory and level of assurance should include: • Integration in Auditor's Report • Key audit partner involvement • EU Taxonomy information and process to identify key relevant information
Reporting	In the Annual Report	In Management Report
Format	Online or PDF version	Electronic Format submission

Source: adapted from KPMG (2022)

Based on this study, it is estimated that this directive will result in a fourfold increase in the number of companies that will have to comply with this new regulation. The applicability will be extended from listed companies, banks and insurance companies with over 500 employees to all listed and unlisted companies with over 250 employees and after a threshold on either net turnover or total assets. The scope of the reporting requirements is also extended from general topics (environmental protection, social responsibility and treatment of employees, respect for human rights, anti-corruption and bribery and diversity on company boards) to less general topics (general requirements, general disclosures, subject-specific disclosures) and specific topics (e.g. environmental, social, governance, sector-specific standards). Furthermore, a new element is audit assurance, which was previously a voluntary tool and now must be included (integration into the auditor's report, involvement of the key audit partner and the EU taxonomy information and processes for identifying relevant information).

A mandatory audit assurance of environmental reports has been implemented under the new Corporate Sustainability Reporting Directive (CSRD) starting in 2024. The new directive includes the following aspects for the mandatory audit assurance:

- Integration into the Auditor's Report
- Involvement of the key audit partner
- Information and processes regarding the EU taxonomy to identify relevant key information.

In the following we will discuss the challenges faced by auditors based on the emergence of the new EU Directive 2464/2022 (CSRD).

2.8. Challenges for auditors in the context of the emergence of EU Directive 2464/2022

The credibility of information provided by a company should be ensured through an environmental audit to reduce information asymmetry (O'Dwyer and Owen, 2005). Through this type of audit, the environmental information disclosed provides more credibility to the users of the information and has the certainty that it can be replicated (Deegan and Rankin, 1996). On the other hand, a study by de Villiers and van Staden (2012) highlighted that users might be reluctant to do independent audits for environmental reporting due to the conflict between the cost and benefits of audits. Other works seem to ignore these conflicts, as they consider the assurance of environmental and sustainability reports more important (O'Dwyer and Owen, 2005; Simnett, Vanstraelen and Chua, 2009; Kolk and Perego, 2010). More recent studies consider audit assurance to be necessary, but question whether it should be performed by BIG4 or non-BIG4 audit firms (Caputo et al., 2020).

The Order of the Minister of Public Finance number 1938/2016 that transposed EU Directive 95/2014 does not provide as a necessary condition the assurance of the audit of non-financial information (environmental in our case). Therefore, Romanian companies requested the assurance of the audit (from the BIG4 companies) for more reliability on the environmental reporting voluntarily, without having a mandatory regulation. This can be explained by the fact that organizations with more resources want to invest more in their public image (Qiu, Shaukat and Tharyan, 2016), therefore they request the assurance of the audit from the top audit companies. However, after the entry into force of EU Directive 2464/2022, the assurance of the audit is a mandatory aspect of the regulation and in the national legislation.

In order to deepen the training of auditors in Romania in terms of audit assurance of these reports, we identified 2 studies that highlight the involvement of auditors in environmental and sustainability reports prepared according to Directive 2464/2022.

The study prepared by Bunget et al. (2024) highlights the fact that auditors are still not prepared to provide assurance analysis on environmental and sustainability reports. The authors emphasize a low degree of adequacy of audit systems, but also deficiencies in terms of knowledge and skills of the emanating factor as causes. Also, environmental protection activities are correlated with possible manipulation of results, thus diminishing the quality of the disclosed financial information. On the other hand, Afrăsinei, Carp and Georgescu (2024) consider the involvement of companies in sustainable actions as a means of enhancing financial performance. The authors highlight for sustainable reporting for general data an increase in the expression of an unmodified audit opinion, but in the case of more complex reporting that also includes social and environmental elements on quantitative and numerical data there is a higher probability of expressing an unmodified audit opinion.

Therefore, although Directive 2464/2022 has been promulgated, auditors are still not fully prepared to provide assurance services on environmental and sustainability reports. The causes are determined by the low degree of adequacy of audit systems or by deficiencies in the skills and knowledge of auditors. In this regard, the development of professional guides and training activities for auditors by Big4 companies would be a starting point that can help develop the mandatory audit assurance required by Directive 2464/2022.

3. Discussions

Various regulations have attempted to develop a conceptual framework for environmental reporting. The literature highlights some concerns regarding the abundance of regulations on environmental reporting (Cho et al., 2015; Stolowy and Paugam, 2023). Since there are various international standards, guidelines and certifications, a company can voluntarily or mandatorily adhere to any of them without appropriate legislation. Moreover, these regulations are in a continuous process of change, which generates more uncertainty regarding the environmental reporting presented by companies.

The GRI standards are the most representative for environmental reporting disclosures, as they are considered the most structured and detailed guidelines (Tregidga and Laine, 2021) and provide guidance on each environmental topic (e.g. climate, water, energy, material use) on how companies should report. Some studies question the comparability of environmental information disclosed based on the GRI standards in reports (Moneva, Archel and Correa, 2006; Michelon, Pilonato and Ricceri, 2015) or the quality and reliability of the information provided (Milne and Gray, 2013; Diouf and Boiral, 2017). However, the GRI standards are considered to be more representative than IR and SASB (for the type of stakeholders they address) and then Environmental Accounting Externalities and TBL (for the framework provided).

Furthermore, the GRI guidelines are under continuous development, as they have created an independent standards body, the GSSB, to develop industry-specific standards, based on which companies can disclose more specific environmental information on topics that concern them. To date, such standards have been developed for sectors such as oil and gas (enacted in 2023), coal and agriculture, aquaculture and fisheries (enacted in 2024).

Other mechanisms such as Triple Bottom Line Reporting and Environmental Accounting Externalities have been used over time to integrate economic, environmental and social dimensions at the same level (Elkington, 1997), respectively to "capture economic, social and/or environmental impacts arising from an entity's activities that are borne by others, at least in the short term" (Unerman, Bebbington and O'Dwyer, 2018, p.497). None of them provide a general framework for disclosure; but instead contain different types of costs. In this way, companies recognize their impact on society and if these tools are used properly, they could help users assess how sustainable a business is.

Next, we focused on integrated reporting; a new tool that emerged in 2010 as sustainability reporting became a mainstream approach. Integrated reporting (IR) includes economic, social and environmental aspects in a single report, taking into account both financial and non-financial information disclosed by a company. For the natural capital component, more specifically environmental aspects, IR focuses on disclosing "all renewable and non-renewable environmental resources that provide goods or services that support an organization's past, current or future prosperity" (IIRC, 2021). However, as we focus only on environmental disclosure, the GRI guidelines were more appropriate for our study.

The analysis of the IAS/IFRS regulation on environmental accounting highlighted the standards that address environmental accounting and the ongoing consolidation process of the IFRS Foundation (consisting of the VRF, ISSB and CDSB). There is a process to develop a framework of sustainability-related disclosure standards to assist investors and capital market participants in their decision-making process (the first standards were adopted in 2024).

Finally, we analyzed specific voluntary regulations (ISO and EMAS) and concluded that they are used by companies for more credibility and transparency towards stakeholders. However, the motivations for choosing the type of certification to adhere to can come from different influences and purposes.

Subsequently, we analyzed EU Directive 95/2014, which was considered to represent a transition from voluntary to mandatory disclosure of non-financial information for companies (Cordazzo, Bini and Marzo, 2020). The directive requires companies with more than 500 employees to disclose non-financial information (including environmental aspects) in order to understand how the companies have developed their business. The limitations of this directive are the focus on general environmental aspects that were required by companies, without mentioning the specific environmental aspects that companies must disclose and the fact that only a certain number of companies were mandated to disclose this type of information.

Next, we analyzed the new CSRD (2021) Directive (EU Directive 2464/2022), a directive drafted by the EU Commission with the aim of increasing the sustainability reporting disclosed by companies. Through this new directive, the number of companies would increase fourfold, audit assurance on the disclosed information would be provided, the framework for more details on reporting requirements would be provided and all information provided would be accessible to the capital markets. From our point of view, the general aspects to be disclosed, the number of companies that would disclose this type of information and its accessibility would increase. Since our study focuses on environmental disclosure, we can highlight that the disclosure of environmental information has been expanded, but this is not a sufficient improvement, as it is not mentioned what type of environmental information will be disclosed, which industrial sectors must disclose, what type of certification companies must obtain.

4. Conclusions

After analyzing the main international regulations for mandatory and voluntary disclosure, we wondered about the involvement of auditors in these regulations that involved environmental reporting.

We also considered Stolowy and Paugam's (2023) concern about the standard to follow, as there are various standards, with different focuses. The authors also suggested that it is difficult to establish convergence between them, as there is a diversity of reporting requirements among international standard setters, the most influential being EFRAG, ISSB and SEC. Moreover, there is an abundance of state regulations and voluntary initiatives, which makes it difficult for a given initiative to be attributed to state actors (legislators and executives) or non-state actors (epistemic communities, institutional entrepreneurs, carriers, regulators and reporters) and to conform to legislative characteristics (Larrinaga and Senn, 2021). The authors suggest that various European countries have made regulations on non-financial reporting based on mechanisms (GRI guidelines and sustainability assurance) produced by non-state actors after the transposition of EU Directive 95/2014 into national regulation.

To address the concern of Stolowy and Paugam (2023), a "Sustainability Reporting Navigator" platform was developed, which focuses on the main current regulations (CSRD, IFRS Sustainability Disclosure Standards and GRI standards) and provides standards and interpretation of standards for users to understand which standard best suits their disclosure. However, this navigator still needs some updates, as not all standards and regulatory authorities are included in this database. Soon, based on the inclusion of all specific regulations and certifications, it can help users and stakeholders to have a more complete reporting on environmental aspects.

The GRI Standards remain the most comprehensive reporting framework for environmental information. In most cases, it is not necessary to implement it in full, but rather to select the most representative indicators for the activity a company engages in. However, to increase the relevance and credibility of the information disclosed, companies could adhere to environmental management systems and audits (e.g. ISO 14001 or EMAS). Through its independent standardization body, the GSSB, which develops industry standards, the GRI Guidelines provide guidance to companies in each sector to recognize the environmental aspects that need to be disclosed more information. In addition, the GRI Guidelines also serve as a reduction from general information on international regulations to specific information that companies must disclose. However, the GRI Guidelines remain a voluntary regulation and for companies to disclose more complete, accurate and specific environmental information. In our opinion, collaboration between all state and non-state actors and convergence between regulations would be necessary. Otherwise, hybrid forms of environmental reporting regulation will continue to exist and it will continue to be a gray area where regulations cannot be attributed to state or non-state actors or mandatory or voluntary regulations (Larrinaga and Senn, 2021).

Sustainability reporting and assurance under the new CSRD directive represents a challenge for the audit profession. Auditors are not yet prepared to provide assurance services on environmental and sustainability reports. The causes are determined by the low degree of adequacy of audit systems or deficiencies in auditors' skills and knowledge. In this regard, the development of professional guides and training activities for auditors by Big4 companies would be a starting point that can help develop the mandatory audit assurance required by Directive 2464/2022.

As research limitations, the study investigates the main legislation in the field of environmental reporting, but due to the continuous flow of changes in this field it is difficult to follow or identify a specific standard for companies to use. As future research directions, with the entry into force of the CRSD in 2024, studies on its application can analyze and compare audit assurance for companies from various sectors of activity.

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Trends in Progressive Taxation within the European Union: A Research Overview

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Abstract

This research analyses trends in progressive taxation across the European Union (EU) from 2000 to 2024. Using the Web of Science (WoS) database, the methodological approach integrates a co-occurrence of keyword analysis processed through VOSViewer 1.6.20 (VOS), allowing for a structured mapping of dominant discussions in the field. Unlike previous studies, which primarily emphasise statistical modelling or comparative legal frameworks, this research provides an in-depth human-centred evaluation of the main topics. By carefully examining the evolution of scholarly discourse, the study uncovers nuanced shifts in taxation debates, emerging policy trends, and interdisciplinary linkages that may have been overlooked in automated assessments. The findings contribute to a more comprehensive understanding of how progressive taxation has evolved in response to economic crises, political shifts, and fiscal integration efforts within the EU in the last two decades. However, this study is limited by its reliance on author-defined keywords from the selected database, the interpretative nature of keyword co-occurrence analysis, and the inherent subjectivity of qualitative article review, without additional empirical validation to support the findings.

Key words: *progressive taxation; European Union; bibliometric analysis; academic trends;*

JEL Classification: *H31, O52*

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Introduction

The study of progressive taxation within the European Union (EU) has gained increasing relevance in recent years, particularly in the context of evolving fiscal policies and economic integration. Tax progressivity is crucial in shaping income distribution, ensuring social equity, and balancing economic growth with public welfare. Given the diverse taxation systems across EU member states, a comprehensive examination of existing literature is essential to identify key themes, policy trends, and research gaps. This study contributes to the field by providing a systematic analysis of tax progressivity literature within the EU, offering insights into dominant research topics and the intellectual structure of the field.

The objective of this study is to systematically map the academic discourse on progressive taxation in the EU by identifying major research themes and trends. Specifically, it aims to (i) analyse the existing body of literature on the topic, (ii) categorise the most relevant studies based on thematic clusters, and (iii) highlight key research directions that have shaped scholarly work on tax progressivity. The research addresses the following questions: What are the dominant themes in EU progressive taxation research? What are the key areas that require further exploration? Through this structured approach, the study contributes to the field by offering a consolidated perspective on taxation literature and by identifying research gaps that may guide future investigations.

The search for relevant manuscripts in the field of progressive taxation in the EU was carried out in the Web of Science Core Collection, using a carefully designed string of keywords outlined in section 2.1. Database formation.

The study's main findings indicate that progressive taxation research in the EU is structured around six primary themes, each reflecting distinct yet interconnected perspectives on fiscal policy. By synthesising these findings, this research enhances the understanding of tax progressivity dynamics and provides a foundation for future studies in the field. In brief, researchers are looking into novelty ways of thinking, sometimes questioning old ideas about how fair taxes work. This is because populations become more diverse and sophisticated regarding taxes. This study finds that no classical taxation method alone helps the economy grow. Even though higher taxes for the top earners help cut the gap between rich and poor better than flat taxes, both need adjacent measures to effectively address the rising inequality.

The paper is structured as follows: Section 1 outlines the importance of the research and includes a short preliminary literature review. Section 2 details the methodology, outlining the selection process, keyword standardisation, and co-occurrence analysis approach. Section 3 discusses the results, focusing on the six identified research clusters and their thematic significance. The last Section concludes the paper by summarising the key insights and suggesting avenues for future research.

1. Research Importance and Literature Review

Progressive taxation helps balance economic growth and social equity by taxing higher incomes at higher rates. It aims to reduce income inequality, fund public services, and support economic stability. However, tax policies vary widely across countries. The European Union (EU) is a unique case, as member states follow a shared economic framework but maintain independent tax policies, creating a complex fiscal environment.

Despite its importance, research on progressive taxation in the EU is fragmented, often focusing on individual countries or specific tax mechanisms rather than providing a comprehensive overview. Some studies analyse its impact on economic growth (Balasoiu, Chifu and Oancea, 2023), while others focus on redistribution (Cantante, 2020), investment (Alvarez and Koskela, 2008), and others on comparations (Vlad and Brezeanu, 2015). This makes it difficult to identify larger trends and unexplored areas. A structured review and thematic analysis can bridge this gap by mapping key research themes and offering a broader perspective. Most taxation studies take an economic or legal approach, using complex models (Moyes, 2003; Silvant, 2010; Arcarons and Calonge, 2015; David, 2019) that are often inaccessible to policymakers who need practical insights.

A thematic classification of research can simplify these findings and highlight patterns that might otherwise be overlooked. This study uses co-occurrence analysis of (author) keywords to organize the literature visually, facilitating a more straightforward observation of the research area, emerging trends, and its gaps.

The literature on progressive taxation has evolved over time, shaped by economic crises, globalisation, and policy changes (Ganghof, 2005). Earlier research focused on optimal tax theory, examining how taxation affects economic activity (Boeters, 2013). Over time, attention shifted to income redistribution and how tax policies impact social equity and economic growth (Joumard, Pisu and Bloch, 2012). Balancing national sovereignty with supranational coordination within the EU has made taxation even more complex (Działo, 2015).

Many studies examine how progressive taxation reduces income disparities (Vržina and Luković, 2023; Tjan, 2024). The debate often centres on the efficiency vs equity trade-off, questioning whether high tax progressivity slows growth by discouraging productivity and entrepreneurship (Baliamoune-Lutz and Garello, 2014).

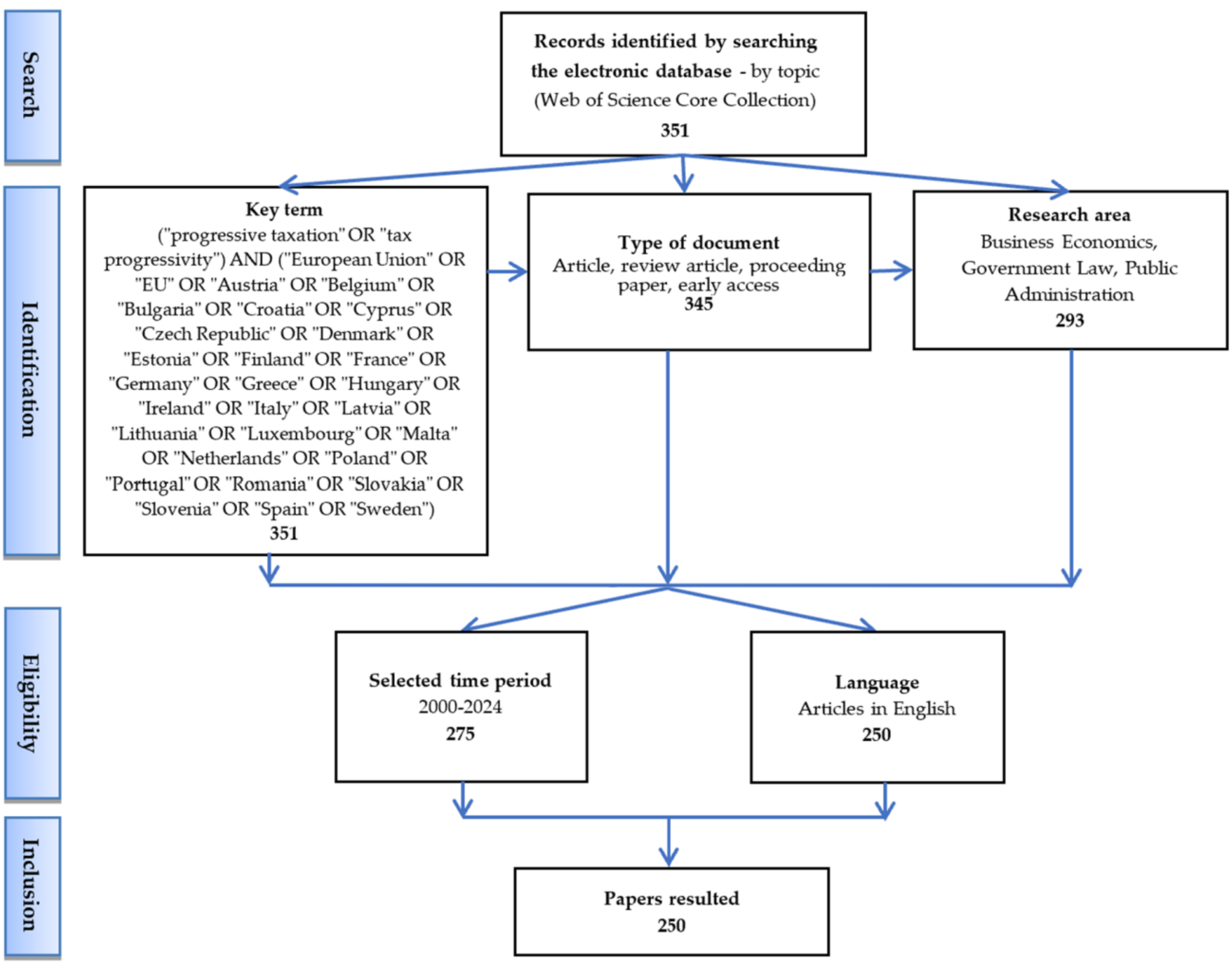
Beyond academia, this study provides practical insights for policymakers and financial institutions navigating EU taxation. Summarising key research findings lays the foundation for future studies and helps stakeholders better understand the shifting landscape of progressive taxation in the EU.

2. Research Method

2.1 Data Base Formation

The authors conducted a thematic analysis of articles published in the Web of Science (WoS) Core Collection during the period 2000-2024. To ensure the selection of relevant literature, the following procedure was implemented. The search was performed in the electronic database using a topic-based query, yielding 351 records.

Figure no. 1. Flow diagram of systematic selection of studies from WoS



Source: data processed by authors, 2025

The key terms used were included in the following boolean string: *("progressive taxation" OR "tax progressivity") AND ("European Union" OR "EU" OR "Austria" OR "Belgium" OR "Bulgaria" OR "Croatia" OR "Cyprus" OR "Czech Republic" OR "Denmark" OR "Estonia" OR "Finland" OR "France" OR "Germany" OR "Greece" OR "Hungary" OR "Ireland" OR "Italy" OR "Latvia" OR "Lithuania" OR "Luxembourg" OR "Malta" OR "Netherlands" OR "Poland" OR "Portugal" OR "Romania" OR "Slovakia" OR "Slovenia" OR "Spain" OR "Sweden")*. The selection was then refined based on the document type, which included articles, review articles, proceeding papers, and early access papers, reducing the number to 345 records.

Further filtering was applied by research area, focusing on Business Economics, Government Law, and Public Administration, narrowing the selection to 293 records. Articles were subsequently screened based on the publication period 2000-2024, leading to 275 records. The language criterion was then applied, restricting the selection to articles written in English, which resulted in 250 articles. After the multi-stage evaluation process based on the type of documents, time period and language, 101 articles were considered ineligible and subsequently excluded. This inclusion and exclusion process resulted in 250 research papers. This systematic approach ensured a comprehensive and methodologically sound selection of literature relevant to the study's objectives (**Figure no. 1**).

After downloading the database, the authors read each abstract, along with the corresponding keywords, and the full manuscripts. After summarising each paper, it was found that some articles did not focus on European Union countries but instead focused on foreign countries from other continents. The authors chose to retain in their selection those articles which, despite addressing other countries as well, made even minimal reference to EU countries, as they still offered valuable insights into the European context. Through this in-depth relevance assessment process, 56 manuscripts were additionally excluded. Such careful methodology guaranteed the inclusion of academic publications related to the purpose of the study. The final corpus of 194 relevant research papers was subject to an in-depth thematic analysis process, as illustrated in **Figure no. 2**.

Figure no. 2. Relevance assessment process

Source: illustrated by authors in Microsoft Word, 2025

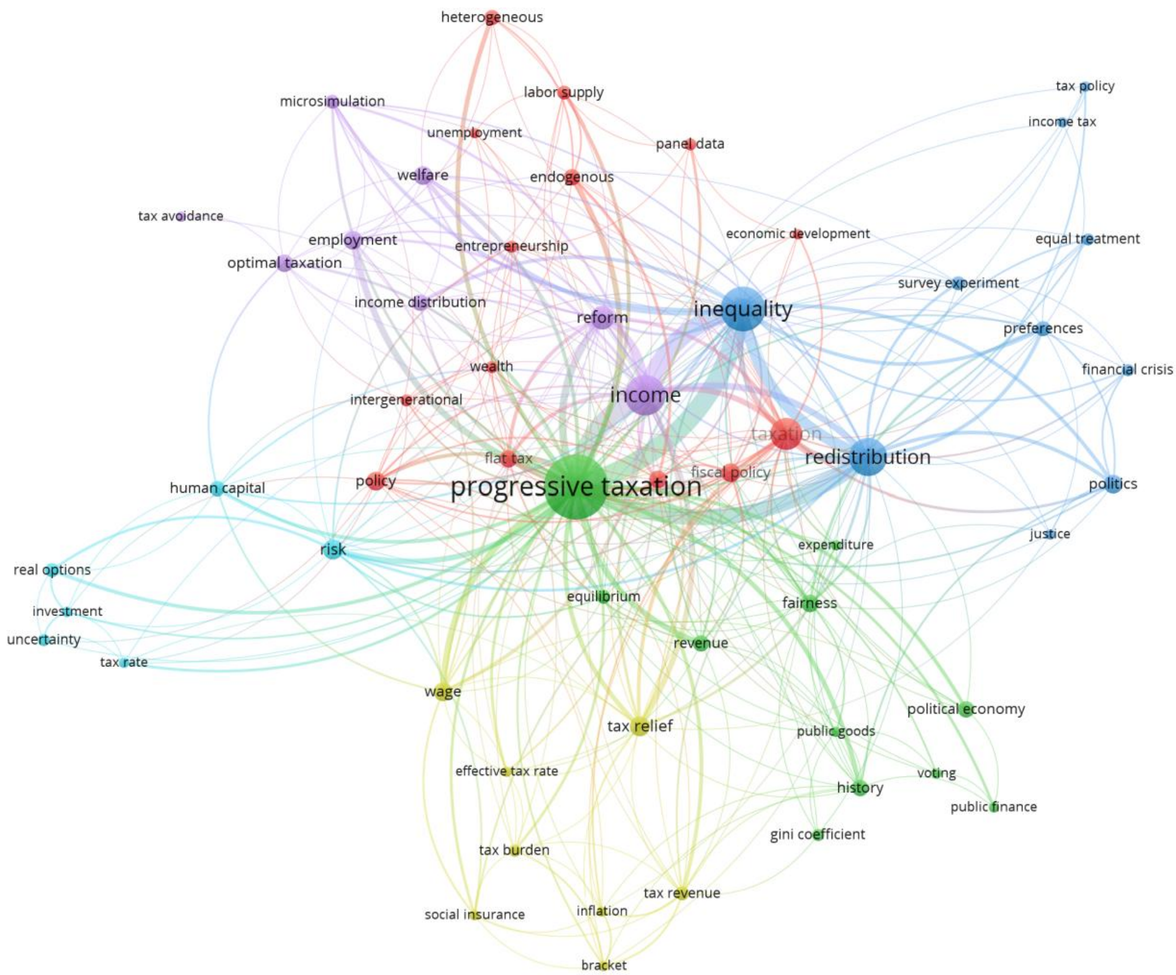
2.2 Keyword co-occurrence

The first step in constructing the author keyword co-occurrence map was standardising keywords to ensure consistency across the dataset. Singular forms were applied to selected words, such as reform, impact, response, lesson, expansion, cycle, transformation, deficit, transfer, strategy, income, tax reform, single earner, elite, household, wage, and interest rate, while preferences and consequences remained in their plural forms. This process eliminated inconsistencies caused by variations in singular and plural usage. Next, common keywords were grouped under a single term to consolidate similar concepts (e.g., tax reliefs, which included subcategories such as allowances, benefits, and incentives). Country names were removed from the keyword dataset. Any instance where "taxation" appeared alone was preserved, whereas instances of "taxation" followed by a specification (e.g., wage taxation) were split or removed to reduce redundancy.

Following the standardisation and refinement of keywords, the data was processed in VOSviewer to create a bibliometric-based co-occurrence map. The analysis was set to full counting, with a minimum occurrence threshold of three appearances applied to ensure that only recurring and relevant terms were included in the visualisation. Further, from the Analysis panel, the clustering algorithm was refined so that each cluster contained a minimum of four keywords.

As a result of this methodological approach, the analysis generated six distinct clusters, each representing a core thematic area within the literature on progressive taxation in the EU (**Figure no. 3**). These clusters serve as the foundation for the subsequent discussion and synthesis of the research findings.

Figure no. 3. Keyword co-occurrence cluster



Source: data processed by authors in VOSViewer, 2025

1.3 Main topics of clusters

After generating the visual keyword co-occurrence map, the 57 keywords identified in the clusters were compiled into a structured table (**Table no. 1**). The table was sorted primarily by Total Link Strength, which reflects the degree of connection between terms, although occurrences were also recorded to indicate the frequency of each keyword. This structured approach allowed for a clear hierarchical representation of dominant themes within the dataset.

By analysing the keywords and the corresponding articles, six thematic clusters were identified: Cluster 1 (Red): Focuses on taxation policies and market dynamics. Cluster 2 (Green): Provides an in-depth analysis of progressive taxation and elements of public behaviour related to tax compliance and perception. Cluster 3 (Blue): Explores economic disparities and political implications. Cluster 4 (Yellow): Centers on tax relief and fiscal burden. Cluster 5 (Purple): Covers welfare state policies and income security. Cluster 6 (Cyan): Highlights taxation challenges. These clusters provide a structured thematic framework, allowing for a comprehensive synthesis of progressive taxation research in the EU. The findings illustrate not only key areas of focus within the literature but also emerging research gaps, which will be further explored in the discussion and conclusion sections.

Table no. 1. Clusters and main topics

Cluster	Keywords	Occurrences	Total link strength	Main topic
Cluster 1 (Red)	taxation	25	65	Taxation policies and Market dynamics
	policy	9	27	
	flat tax	9	27	
	growth	8	23	
	fiscal policy	9	18	
	endogenous	7	18	
	labor supply	5	13	
	heterogeneous	6	12	
	intergenerational	4	11	
	entrepreneurship	4	11	
	wealth	4	7	
	panel data	4	7	
	economic development	3	7	
	unemployment	3	6	
Cluster 2 (Green)	progressive taxation	96	215	Progressive taxation and Public Behaviour
	fairness	8	26	
	revenue	7	24	
	history	7	20	
	equilibrium	5	19	
	expenditure	3	12	
	political economy	7	10	
	public goods	3	10	
	public finance	3	6	
	voting	3	6	
	gini coefficient	4	5	
Cluster 3 (Blue)	inequality	47	118	Economic Disparities and Politics
	redistribution	35	95	
	politics	9	21	
	preferences	6	22	
	survey experiment	5	12	
	equal treatment	4	8	
	financial crisis	4	9	
	justice	3	7	
	tax policy	3	6	
	income tax	3	4	
Cluster 4 (Yellow)	tax relief	10	36	Tax Relief and Fiscal Burden
	wage	9	30	
	tax revenue	5	21	
	tax burden	4	14	
	bracket	3	13	
	inflation	3	13	
	social insurance	3	13	
	effective tax rate	3	11	

Cluster	Keywords	Occurrences	Total link strength	Main topic
Cluster 5 (Purple)	income	39	112	Welfare and Income security
	reform	14	50	
	welfare	9	23	
	employment	9	21	
	microsimulation	5	19	
	optimal taxation	8	16	
	income distribution	7	14	
	tax avoidance	3	2	
Cluster 6 (Cyan)	risk	10	30	Taxation challenges
	human capital	6	18	
	investment	3	10	
	real options	5	11	
	tax rate	3	9	
	uncertainty	4	6	

Source: data processed by authors in Microsoft Excel, 2025

3. Results and Discussions

3.1 Cluster 1 – Taxation policies and Market dynamics

The first cluster presents articles that emphasise the effects of taxation policies across the EU. Alves and Coelho (2024) note that even if progressive taxation reduces inequality, it has mixed effects on growth across Europe. Focusing on economic development and growth, we found that papers discuss the effects of flat tax policies, in contrast to progressive ones. In countries with high corruption and weak legal systems, citizens support progressive taxation as a corrective measure. In contrast, richer post-socialist states favour it more than poorer ones, where flat taxes remain popular. Vlad and Brezeanu (2015) state that the flat tax failed to improve revenues or stability in post-communist EU countries, leading some even to abandon it. Studies revealed that, in Poland, a flat tax policy failed to reduce intergenerational income persistence, while in Italy, progressivity weakened income transmission at the top.

However, proportional taxation stabilises economies by eliminating endogenous cycles at high tax rates, while progressive taxation's impact depends on tax exemption levels, potentially creating instability (Koskela and Puhakka, 2006). In contrast to flat tax, progressive taxation can be justified as a means of distributing tax burdens based on uniform utility loss, balancing fairness and efficiency (Chambers and Moreno-Ternero, 2017). It was also found that if the taxes are highly progressive, they can slow development by discouraging work and education (Widmalm, 2001).

Studies from this cluster proved that Bulgaria's economic growth would benefit more from progressive taxation, contradicting the assumption that flat taxes drive development. In Switzerland, switching to a flat tax lowered business formation and jobs, particularly for small firms, suggesting that some progression supports stability. The downside of flat taxes is that even if they simplify taxation, they increase inequality by shifting the burden onto lower earners, with no clear evidence they boost revenue or growth (Vörös, Kodenko and Komáromi, 2010). In post-communist Europe, high pre-tax inequality has not led to greater demand for redistribution, weakening political pressure for progressive taxation.

Thus, it was found that even if none of the two fiscal policies implicitly help economic development and don't drive growth *per se*, progressive taxation is preferred because it was shown to improve equality to some extent. Brumm *et al.* (2022) also add that progressive taxation may be a better alternative to deficit spending. Adding on, other papers focused on the environment and proved that even if mission-oriented innovation policies support growth and inequality reduction, they require progressive taxation to address climate change effectively.

Inside this cluster, the research found recent debates about theories of taxation. Orain (2010) shows that progressive taxation has long been linked to economic stability, fairness, and redistribution, but early theorists like Forbonnais and Graslin argued that taxing luxury goods and urban elites could reduce inequality, support agriculture, and stabilise the economy. Similarly, Turgot, Condorcet, and Morellet viewed progressive taxation as a way to align tax burdens with public spending needs, ensuring fairness. From a broader perspective, Corado and Solari (2010) showed that Wagner saw the state as an organic entity, responsible for redistributing wealth to maintain social cohesion and growth, influencing modern European tax policies. It was also shown that Keynesian theory supports progressive taxation as a stabilising tool, ensuring income levels remain steady during downturns, particularly in EU economies focused on social equity (Husman and Brezeanu, 2021). Manuscripts propose that a shift away from strictly positivist approaches in economic policy is necessary, as tax decisions inherently involve ethical considerations and interpersonal utility comparisons.

Regarding utility comparisons, progressive taxation focuses on labour supply, unemployment, and entrepreneurial issues as the most important market segments. Building on this assumption, various authors prove that progressive taxation affects work incentives differently across income groups. It was found that higher progressivity reduces overall labour supply, especially among high-income earners and married women taxed jointly, while low-income workers may work more due to lower marginal rates at the bottom. An additional risk that can influence the labour supply, besides progressive taxation. Authors proved that even if robotisation boosts economic growth, it widens wage inequality, especially between skilled and unskilled workers. Progressive taxation and monetary policy can reduce disparities altogether, but public investment in social capital and worker support programs are necessary. It was also pointed out that tax incentives do not always drive behaviour. In competitive environments, workers are less influenced by financial incentives, as the "joy of winning" plays a stronger role in labour supply decisions.

Long-term labour supply also varies on a temporal dimension, as Bengtsson, Holmlund and Waldenström (2016) prove that progressivity is lower over a lifetime than it appears annually. *A lifetime* involves individual decisions, but beyond those, progressive taxation impacts macroeconomic stability. It raises real wages but reduces employment and output, requiring long-term economic adjustments. In some cases, it can even increase volatility by amplifying self-fulfilling expectations.

Consequently, when it comes to unemployment, it was found that higher tax progressivity reduces it in Germany (Boeters, 2013), but its effects vary across its regions. In European OECD countries, where tax burdens are highest, higher labour taxes increase unemployment (Zimčík, 2020). The impact also depends on tax structure, as higher payroll tax progressivity raises unemployment, while higher marginal income taxes lower it by moderating union wage claims and encouraging labour participation.

On the entrepreneurial side, progressive taxation reduces this activity at higher income levels by discouraging risk-taking, though its effects vary by country (Baliamoune-Lutz and Garello, 2013). While some policies increase the riskiness of after-tax income, affecting wealthy investors who dominate entrepreneurship, progressive taxation can also encourage self-employment by sharing income risks, as a safety net lost under a flat tax. A flatter tax schedule encourages self-employment, while progressive taxation increases risk but provides partial insurance.

“Working a lifetime” can contribute to wealth accumulation to some extent. However, wealth inequality is far more extreme than income inequality, with financial assets concentrated among the elite. Traditional inequality measures fail to capture polarization trends, requiring progressive taxation, financial regulation, and asset-building policies beyond simple redistribution (Fabiani, 2024).

Articles showed how in Germany, support for wealth taxes depends more on perceived fairness than income levels, with merit-based wealth seen as more legitimate. Meanwhile, middle-class wealth accumulation through housing and pensions has played a bigger role in reducing inequality than war or taxation, challenging traditional views on wealth distribution. In Italy, progressive taxation weakens intergenerational income persistence by reducing earnings inequality, particularly at the top, whereas Poland's quasi-flat tax has no such effect. Simulations confirm that lowering progressivity in Italy would increase intergenerational inequality.

Meanwhile, local governments must choose between reducing inequality (maximin policies) or preventing wealth clustering (utilitarian policies), as addressing both is impossible (Oddou, 2023). Progressive local taxation shapes income segregation, as wealthy households actively move to low-tax areas, while social factors and proximity to city centres further influence residential patterns. Fiscal decentralisation weakens progressivity, as wealthier households relocate to low-tax areas, reducing overall redistribution. It can be concluded that progressive taxation alone is insufficient to ensure intergenerational equity, requiring additional policy measures.

3.2 Cluster 2 – Progressive Taxation and Public Behaviour

Cluster 2 (Green) presents a more in-depth image of progressive taxation as a modern-day concept accompanied by risks. Andersen and Dogonowski (2002) emphasise the automatic stabiliser role of progressive taxation, reducing macroeconomic volatility even when tax distortions exist. However, its role in economic stabilisation is limited, as income tax primarily stabilises through employment sensitivity to GDP, not tax rate progression. In economies with steep tax progressions, monetary policy must respond more aggressively to maintain stability. Studies add that while it dampens economic instabilities, it cannot fully eliminate fluctuations. Fluctuations are different from circumstances that ask for fiscal consolidation measures. In these cases, austerity or tax increases worsen recessions in high-inequality economies, highlighting the need for inequality-aware policies.

In Greece, austerity deepened regional inequalities, harming the North and West while Athens and the South remained more stable, increasing the risk of long-term economic divergence (Monastiriotis, 2011). Those situations drive people to regions or even countries where their disposable income can be optimised. This is just an instance that shows how globalisation has created a trade-off between tax progressivity and redistribution, leading to a "social democracy curse" where high-income individuals' mobility undermines progressive taxation. As migration costs decline, wealthy individuals relocate to lower-tax jurisdictions, making redistribution less effective and shifting the tax burden onto the middle class. This explains why inequality has risen despite increased public spending in many advanced economies, weakening the traditional social democratic model. Trade liberalisation exacerbates inequality, weakening public spending unless tariff revenues support government programs, or unskilled workers hold political power.

History is also a central concern among the Cluster 2 papers. More specifically, post-communist and post-war countries. In Germany, the support for redistribution varies. East Germans favour progressivity more than West Germans due to perceived inequality. Post-communist EU countries saw little benefit from flat taxes, leading some to return to progressive systems for better fiscal balance (Vlad and Brezeanu, 2015). Countries affected by war destruction maintained lower tax progressivity to boost savings and investment, as seen in West Germany. Wartime inflation expanded tax bases, reducing progressivity while increasing redistribution.

Nowadays, authors have identified an actual challenge regarding political economies: the voting processes and everything it represents for a community. Progressive taxation is more politically viable when income distribution centres around the middle, as both the rich and the poor may oppose excessive tax burdens. Affluent left-wing voters resist tax cuts more than their low-income counterparts, suggesting the potential for a cross-class progressive coalition. Public support for taxing the rich depends more on their perceived fairness than on meritocratic factors like hard work.

The voting equilibria also influence the provision of public goods. This can lead to suboptimal growth in diverse societies, making certain policies unsuitable for direct democratic decisions (Borissov, Hanna and Lambrecht, 2019). Support for tax reductions often declines when people realise the trade-offs, such as reduced public spending or increased debt. If government spending benefits the wealthy, progressive taxation fails as a redistributive tool, making tax incidence alone an incomplete measure of fairness. In low-inequality societies, tax fairness is valued, fostering a progressive tax culture. In contrast, the elite in highly unequal societies favours regressive taxation unless external threats, like wars or revolutions, force higher public spending.

Lastly, this cluster showed a significant volume of research papers focusing on the statistical aspects of progressive taxation and related concerns. Arcarons and Calonge (2015) show that the Suits index is a strong measure of tax progressivity, but inflation-induced fiscal drag erodes progressivity over time. While the Gini coefficient is widely used to assess progressivity, data limitations can distort results, requiring corrections for small or skewed datasets. Alternative measures like the Kakwani and Suits indices provide more reliable assessments (David, 2019). Minimal equal sacrifice taxation can reduce inequality, but only under specific utility elasticity and concavity conditions (Moyes, 2003). Mathematical models confirm that progressive taxation aligns with both the benefit and ability-to-pay principles, challenging historical arguments for proportional taxation (Silvant, 2010).

3.3 Cluster 3 – Economic Disparities and Politics

The third cluster presents a more elaborate overview of the market inequalities and the role of redistribution. Overall, progressive taxation reduces income inequality, but broad-based progressivity is more effective than just raising top tax rates (Eydam and Qualo, 2024). However, taxation alone is not always enough, as additional conditions like consistency and revenue continuity must be met for redistribution to work. This is why social transfers significantly reduce inequality compared to taxation alone. Changes in tax policy and social transfer reductions have significantly contributed to rising inequality, even in countries with relatively low inequality levels by OECD standards.

Inequality and growth are impacted by fiscal policy, but not in the same way across different regions of the EU. In Eastern Europe, direct taxation and public spending boost growth, while in Western Europe, they tend to hinder it (Alves and Coelho, 2024). Studies also add that Stockholm's income inequality declined after 1920, driven by structural shifts and progressive taxation, with labour income becoming a key redistributive factor. Austerity measures worsen recessions in high-inequality economies, as income risk leads to more precautionary savings, reducing overall spending. Another issue seems to be the fact that modern poll taxes disproportionately harm small businesses and the self-employed, increasing financial distress and slowing economic recovery. It can be concluded that taxation corrects market failures, but balancing state intervention with market forces remains an ongoing challenge.

All these authors emphasise the role of redistribution in managing inequalities. However, some researchers have taken this role even further. This is why progressive taxation is optimal even without a redistributive goal, as wage inequality justifies higher taxes on skilled labour, whose work time is less. In the same light, Bucovetsky (2003) note that progressive taxation also supports efficient migration by redistributing productivity gains to non-migrants and low-skilled workers. Beyond its income redistribution role, progressive taxation enhances fairness and economic efficiency, ensuring that even low-productivity workers receive a fair share of the economic surplus.

In Slovenia and Croatia, for example, progressive tax structures reduce inequality and poverty, with Slovenia's model being more redistributive and Croatia's model better at poverty reduction. Screpanti (2014) points out that redistribution is also a matter of freedom and fairness. Income constraints limit opportunities more than time constraints, making progressive taxation a tool for ensuring fair access to economic participation. However, it is never an unjust redistribution, but a logical way to share economic risks and benefits fairly. In contrast, it was argued that redistributive policies can also cause macroeconomic instability, requiring careful implementation. While higher tax progressivity lowers income inequality, it can increase wealth inequality by shifting labour toward more productive workers.

At this stage, it can be concluded that the economic trade-offs of progressivity remain complex—while it reduces inequality and funds public services, it can also weaken employment and capital accumulation when labour supply is elastic. Also, even if people support wage equality, they resist costly redistribution, showing that inequality aversion is shaped by context and self-interest. Additionally, it was shown that exposure to unfair voting systems reduces support for progressive taxation, challenging conventional redistribution theories. These findings suggest that one-size-fits-all progressivity rules are ineffective, as tax schedules should reflect societal inequality perceptions.

The reviewed articles continue to present redistribution strategies ranging from laissez-faire to full egalitarian models. Threshold-based redistribution offers a flexible and mathematically consistent way to reduce inequality while maintaining efficiency. Preferences for redistribution vary across countries, shaped by economic self-interest, social beliefs, and historical factors. Support for EU-wide fiscal integration is stronger in regions hit by multiple crises, with COVID-19 exposure being the strongest predictor of pro-redistribution attitudes.

In the Nordic countries, tax policy has shifted from Comprehensive Income Taxation—which taxes all income equally under progressive rates—toward Dual Income Taxation, where capital income is taxed at flat, lower rates while labour remains under progressive taxation (Ganghof, 2005). This shift has intensified income inequality, as capital income is increasingly concentrated among the wealthy, with Sweden being a partial exception. This is why, in general, beyond income redistribution, people value tax progressivity as an independent fairness principle, challenging traditional models that prioritize efficiency over equity.

As stated earlier, tax policy is not just an economic decision but a political struggle, shaped by party structure, electoral incentives, and coalition dynamics. In Spain and Austria, wealth taxes increased when left-wing factions gained power, whereas in Germany, the cautious SPD (social democratic party) blocked major tax changes. Elsässer, Fastenrath and Rehm (2023) point that crises create opportunities for redistributive policies, but their success depends on elite perceptions of electoral viability. Governments strategically adjust tax progressivity to influence voter behaviour—leftist incumbents sometimes favour flatter taxation, while right-wing incumbents may increase progressivity to gain electoral support. Parliamentary debates in Spain framed progressivity as proportional rather than redistributive, contributing to the country's resistance to fiscal reform.

Political ideology influences tax preferences, with highly knowledgeable voters prioritising values over financial self-interest—sometimes leading the wealthy to support progressive taxation for the greater good (Stiers *et al.*, 2022). Fair taxation stabilises political systems by preventing economic exclusion, reducing misinformation-driven alliances, and reinforcing democratic agreements. Taxation also intersects with defence policy, as leftist governments rearm faster than conservatives, leveraging progressive taxation and economic controls to fund military expansion. Poor tax policy adjustments have directly reduced progressivity, and better management of deductions and thresholds could have counteracted rising inequality.

The authors have gone further and analysed how financial crises influenced progressive taxation. The 2008 financial crisis increased public support for progressive taxation by strengthening fairness concerns, particularly in countries that experienced severe economic downturns, as demonstrated through survey experiments. Țibulcă (2022) concludes that tax policy reforms are essential to prevent revenue volatility in future crises and ensure fiscal stability across the EU. Finally, financial crises are fuelled by rising inequality, but progressive taxation and social policies in Scandinavia and Europe could help reduce financial instability.

3.4 Cluster 4 – Tax relief and Fiscal burden

Cluster 4 (Yellow) seems to concentrate more on the way progressive taxation is felt by the taxpayer. Many authors point to its effect on wages, as progressive taxation is shown to reduce wage inequality by compressing pre-tax wages and discouraging skill accumulation (Guvenen, Kuruscu and Ozkan, 2014). Even without redistribution as a goal, taxing skilled labour at a higher rate is justified due to natural wage inequality. However, its impact on inequality varies—if high earners significantly cut their working hours, progressivity may lose its redistributive effect, and in some cases, proportional taxation could lead to similar post-tax income equality.

The wage effects of progressive taxation also depend on the labour market structure. In unionised settings, it moderates wages for middle-income workers but raises wages for high-income earners in competitive markets (Lockwood, Sløk and Tranaes, 2000). In the Visegrad Four, GDP growth and taxation strongly influence average wages, while minimum wages are largely political decisions (Meixnerová and Krajňák, 2020). Traditional tax progressivity measures may exaggerate the role of taxation while underestimating the impact of benefits in reducing inequality, requiring a more flexible redistribution.

A more elaborate analysis shows that, from the point of view of households and individuals, two main dimensions shape the fiscal burden: tax reliefs (incentives, allowances, benefits) and inflation. Household tax systems can mitigate inequality while preserving financial stability by combining progressive taxation on household income and financial profit taxes. In the Czech Republic, even with a flat tax rate, deductions maintained progressivity de facto, benefiting lower earners more than the previous system. Housing-related tax reliefs are often regressive, as wealthier households benefit disproportionately from mortgage tax relief, while low-income groups rely on housing benefits.

About the tax burden, it was shown that shifting it away from labour and onto capital or high-income earners can create a double dividend—reducing pollution while increasing social welfare. However, it is largely accepted that progressive taxation enhances redistribution at the cost of higher tax burdens, while flat taxes improve take-home pay but widen inequality. Effective tax-benefit systems, combining tax progressivity and generous social transfers, are key to reducing income inequality.

The second pillar is the inflation. Without automatic inflation adjustments, tax burdens rise significantly even at low inflation, pushing low-income earners into higher brackets and reducing progressivity. Countries with inflation-indexed tax systems (Netherlands, UK) avoid these distortions. Nam and Zeiner (2015) add that bracket creep further increases tax burdens on middle-income earners, reinforcing inequality unless tax systems adjust for inflation. Inflation is mostly felt through consumption. Consumption taxes like VAT are regressive, disproportionately impacting lower-income individuals and worsening inequality. Hauck and Wallossek (2024) propose something very interesting to combat another reason why low-earners feel a bigger tax burden than intended: in many countries, including Germany, employees avoid filing tax returns due to automatic withholding, but over-withholding leads to excess tax payments for low earners. Automatic refunds or pre-filled tax returns could improve fairness and efficiency. These automatic refunds, along with counter-inflation mechanisms, could make the low and middle-income earners feel a milder fiscal burden, the real one, that is foreseen by the governments.

3.5 Cluster 5 – Welfare and Income Security

Cluster 5 (Purple) presents a detailed image of how progressivity influences employment as a phenomenon, how reforms shape people's income and how tax avoidance erodes the state's revenue. Progressive taxation affects job creation differently depending on tax levels and market conditions. Progressivity can boost employment when initial tax rates are low, but when tax burdens are already high, it may reduce worker effort and productivity, leading to fewer jobs (Schöb and Koskela, 2009).

In Denmark, lowering tax progressivity increased wages for blue-collar workers but reduced their employment, while white-collar employment remained stable, suggesting union influence can balance out labour market effects. In some cases, progressive taxation can support employment by reducing wage pressures, but excessive tax burdens may slow productivity growth and investment, ultimately harming job creation. Optimal taxation should follow a U-shaped progressivity pattern, with higher taxes for young and old workers and lower rates for the middle-aged to balance incentives and equity. In Germany, increasing tax progressivity lowered the labour supply but resulted in an equal income distribution.

It is known that progressive taxation reduced unemployment in Germany, but Boeters (2013) argue that it offers minimal welfare gains, averaging just two euros per person per month. Social welfare programs play a crucial role in mitigating economic shocks, as tax progressivity alone is insufficient without social transfers. In strong welfare states, public acceptance of progressive taxation is higher because trust in redistribution is greater. In Europe, regressive VAT-based taxation funds larger welfare states, explaining why tax progressivity and welfare state size are inversely correlated.

Several studies highlight the limitations of proportional taxation and advocate for progressive tax reforms to improve equity and economic stability. Ledić, Rubil and Urban (2023) show that in Croatia, the personal income tax and the social insurance contributions are always progressive. At the same time, VAT and excises are only progressive under particular fairness views, highlighting the subjective nature of tax equity. In Romania, weak redistribution policies contribute to deep economic disparities, making progressive taxation a necessary reform (Georgescu, Cazacu and Cojocaru, 2020). Italy also gains from progressive income tax reforms, which could mitigate inequality's negative impact on consumption and growth. Hungary's flat tax reform reduced progressivity, benefiting high earners while increasing the burden on low-income, childless workers.

Additionally, revenue-neutral tax reforms can be designed to maximise employment without reducing government revenues, offering policymakers a framework for balancing growth and fairness. In Ukraine, reintroducing progressive taxation could increase revenues and reduce pension deficits. The 2021 Czech tax reform increased tax progressivity and eliminated income tax for minimum-wage earners but at the cost of reduced state revenues.

Some reforms aimed at fairness have been diluted or ineffective. In Poland, business lobbying and media pressure weakened the redistributive impact of the 2022 tax reform, favouring high-income, self-employed individuals. In Romania, fiscal incentives from 2013-2019 failed to generate sustainable growth, instead causing macroeconomic imbalances, higher imports, and weak corporate capitalisation. Despite the EU accession boosting economic potential, weak governance and poor EU fund absorption have hindered Romania's ability to reduce inequality. Reforming tax systems requires balancing fairness with economic efficiency. This is why Croatia's hybrid personal income tax system needs restructuring to improve fairness while maintaining competitiveness, mainly by adjusting tax brackets and non-taxable income levels.

Fair taxation seems to be challenged by many factors. Even when progressive taxation exists, other policies can undermine its impact. Sweden's tax system became increasingly regressive over time as VAT and payroll taxes offset income tax progressivity, shifting the tax burden onto lower-income groups. Similarly, Hungary's 2012 tax reform introduced a flat personal income tax to enhance wage competitiveness but kept a high, nearly flat VAT, disproportionately affecting low-income households. In Germany, tax reforms reduced progressivity, boosting income growth and inequality, with redistribution depending on social preferences.

Rising inequality is primarily driven by tax avoidance and capital income shifts, rather than productivity differences. Mass-marketed tax avoidance schemes increasingly benefit middle-income taxpayers, further eroding progressive taxation. While progressive taxation enhances redistribution and increases revenue, excessive progressivity can encourage tax avoidance, requiring a balanced approach for fiscal stability. In the EU-28, corporate income tax plays a progressive role in reducing inequality, but its effectiveness is undermined by globalisation and corporate tax avoidance. At the highest income levels, progressive taxation becomes unsustainable due to subadditive avoidance costs and international fiscal competition. Wealthy individuals engage in tax avoidance and risk shifting, reducing progressivity's impact. Since avoidance costs do not scale with income, optimal top-tier taxation cannot remain progressive. Furthermore, international tax competition drives the wealthy to migrate to low-tax jurisdictions, reinforcing a cycle of tax regressivity.

3.6 Cluster 6 – Taxation challenges

The last cluster consists of studies that emphasise the challenges of taxation, other than tax avoidance itself. Progressive taxation affects corporate decisions in mixed ways. It distorts liquidation choices but can either delay or accelerate investment depending on exemptions and volatility (Alvarez and Koskela, 2008). Higher taxes may sometimes encourage investment due to flexibility premiums or favourable loss offset rules. While it stabilizes the economy, progressive taxation does not prevent business cycles and may reduce private investment despite boosting public capital. Excessive tax progressivity discourages entrepreneurship and distorts firm structures. In these cases, firms adjust to tax increases by reducing hiring. In Bulgaria, a progressive capital tax would add complexity without major benefits.

Education and investments are seen as challenges that can impact fiscal policies. Progressive taxation can reduce human capital investment by lowering post-education income while keeping costs unchanged, discouraging immediate enrollment. Lower tax progressivity can enhance educational investment, while education subsidies help offset, but not eliminate, taxation's negative effects. Progressive tax systems and education subsidies are interdependent, requiring coordinated policy adjustments. Optimal tax policy should balance labour taxation with education spending to maintain efficiency. Progressive taxes discourage education investment by increasing post-graduation tax burdens, whereas a flat tax with deductible education costs remains neutral (Jacobs, 2007). Fiscal policies should adjust taxation levels to avoid suppressing skill accumulation, ensuring long-term economic growth. Poverty awareness increases high-income support for education spending, suggesting that redistribution efforts can be politically sensitive.

Tax morale is mainly derived from inequality perception. Doerrenberg and Peichl (2013) show that public support for progressive taxation is influenced by inequality aversion, with many individuals willing to sacrifice personal income for a fairer system. Moreover, countries with higher tax morale experience lower tax evasion, reinforcing that progressivity enhances compliance. People often misperceive their income status—those who realise they are poorer than expected tend to support progressive taxation, while the wealthy rarely adjust their tax preferences. While low-income groups generally favour progressivity, many high-income earners also support it, influenced by beliefs about effort, economic success, democracy, and social mobility. These findings challenge the assumption that tax preferences are driven purely by self-interest.

Another risk in implementing a one-fits-all progressive solution is the growing rate of tax evasion and the growing cost of enforcement. Stronger tax enforcement improves compliance without significantly increasing tax avoidance. Moreover, enforcement efforts are often less effective than regulatory interventions, which could offer a more sustainable solution. In high-evasion economies, progressive taxation is less effective at reducing inequality because wealthier taxpayers evade more, lowering their tax burden. Increased enforcement can mitigate this issue, but policymakers must account for evasion when designing tax policies.

Conclusions

Based on the reviewed manuscripts, we can now better understand the overall picture of the scholarly discourse on European progressive taxation, which topics get the most attention and which seek further research efforts. The findings highlight the main areas that researchers focus on which emerged from the analysis of the previous six clusters.

This study aimed to answer the following questions: *What are the dominant themes in EU progressive taxation research? and What are the key areas that require further exploration?*

The dominant themes that emerged from the cluster analysis are as follows: the role of progressive taxation in supporting economic growth; the search for new methods of calculation and forecasting to produce more accurate statistical results; the examination of both traditional and modern fiscal theories in today's economic contexts; the comparison between progressive and flat tax systems, especially in countries that have experienced both models; the impact of progressive taxation on labor and entrepreneurship; its role in reducing inequality, particularly wealth-based and intergenerational wealth accumulation; the influence of politics and public behavior on progressive tax policies; the historical and ideological legacies of communist regimes and how these continue to shape tax policies in some European countries; economic disparities and proven methods to reduce them; the emergence of modern redistribution policies and optimal combinations of tax relief and inflation control to ease the fiscal burden; the role of taxation in ensuring income security and general welfare; and finally, a close look at past, current, and future tax reforms, along with key challenges such as tax avoidance, evasion, globalization, migration, education, and other risks.

After carefully analysing all clusters and their component articles, it becomes clear that the scholarly discourse of the past 24 years increasingly highlights the limitations of progressive taxation in itself. While progressive tax rates were once considered sufficient, the rapid evolution of society, alongside globalisation, migration, and the growing sophistication of tax avoidance and evasion strategies, has made progressive taxation nearly as ineffective as proportional systems in many cases. As a result, scholars and policymakers are looking for new theories and practices that not only show statistical efficiency but also adapt to the emerging fiscal challenges of our time.

The key areas that require further reasearch derive from the main topics identified. However, certain areas of interest stand out more clearly, where active steps can be taken to improve fiscal policies and reduce inequality. As a result, there is a growing expectation for active state intervention rather than a laissez-faire approach. Both political leadership and effective administrative structures must play a role in shaping public opinion toward a more engaged, responsible form of tax contribution. Beyond behavioural aspects, states must design complementary fiscal policies that accompany progressive taxation—protecting low- and middle-income earners, actively supporting education through incentives, and reducing the bureaucratic burden in tax systems.

It has become evident that neither progressive nor flat tax systems alone can lead to sustainable economic growth, as their intended effects are increasingly challenged by new and complex risks that were virtually absent in the past.

A particularly important conclusion is drawn by Hauck and Wallossek (2024), who highlight the value of pre-filled tax returns, especially for low-income and wage earners. This approach not only reduces bureaucracy but also helps individuals retain more disposable income by the end of the fiscal year. Our conclusion is that, as logically derived from the analysis, this kind of automatic tax refund, when combined with anti-inflation measures, could significantly lighten the perceived fiscal burden for low- and middle-income groups, who usually choose not to fill tax returns and actively lose money. Hesami, Jenkins and Jenkins (2024) conducted a systematic literature review on this subject. This automatic refund system, especially when supported by inflation-mitigating policies, can help low and middle earners feel less financial pressure from taxation.

Finally, including in the corpus the studies that compare other countries' tax policies with those of the EU—even when they contain only minimal references to EU member states—was particularly relevant for several reasons. This should not be viewed as a limitation of the study, but rather as a strength. First, these articles offered valuable external perspectives, allowing researchers to identify patterns, contrasts, and transferable insights. The fact that authors still aimed to draw conclusions from such limited comparisons suggests a high level of academic interest in understanding the EU's position within a global context. The frequent focus on the United States and OECD countries highlights their role as benchmarks or points of reference, especially when discussing tax efficiency, equity, or reform potential. Secondly, this was important regarding the perceived authority and relevance of EU tax policies. In many cases, European fiscal models are treated as benchmarks, even if imperfect, suggesting that their structure and evolution remain highly influential in global tax discourse.

This reinforces the conclusion that, while diverse and sometimes inconsistent, EU policies continue to shape international debates on progressive taxation, redistribution, and equity—further validating their inclusion in broader analytical frameworks.

In summary, new ideas are being explored that challenge traditional views on how progressive taxation works. This comes as communities grow more diverse and complex. It has become clear that neither progressive nor proportional taxation alone leads to economic growth. While a progressive tax does reduce inequality more effectively than a flat tax, both systems need to be supported by additional policies to truly impact development. The focus is shifting toward fairness, with growing efforts to find new ways to rebuild equity in modern societies. In this context, transatlantic and OECD comparisons show that EU tax policies, despite their imperfections, continue to serve as a global point of reference.

Although this study offers an integrated perspective on the scientific literature regarding progressive taxation in the European Union—combining bibliometric analysis with an in-depth qualitative evaluation of the relevant articles—several limitations must be noted.

Firstly, the bibliometric analysis was based exclusively on the keywords extracted from the utilised database, which means that the study relies on how authors have indexed their work. As a result, certain relevant articles may have been omitted from the selection if they did not include the targeted keywords, even if they addressed essential topics related to progressive taxation. Secondly, the co-occurrence analysis of keywords highlights only thematic proximity, not the depth or quality of the arguments. This may lead to a limited interpretation of the relationships between concepts. Although this method was complemented with a detailed qualitative analysis of the article's content, the inherent subjectivity of qualitative reading cannot be entirely excluded, particularly regarding conceptual interpretation. Lastly, the study did not include additional empirical validation (e.g., through quantitative analysis of fiscal data or expert interviews), which limits the conclusions' direct applicability to public policy. Consequently, the findings remain predominantly conceptual and analytical, providing a solid basis for future research.

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Tax Compliance and Sanctions in the Field of Transfer Pricing. Romania's Position in the European Context

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Abstract

Sanctions for non-compliance with the arm's length principle represent a key instrument for ensuring tax compliance in intra-group transactions. In the European Union, where tax regulations are influenced by OECD guidelines and domestic legislation, national approaches to sanction enforcement vary significantly. These differences can impact the strategies of multinational companies and the overall level of tax compliance. This study provides a quantitative analysis of the regulations and sanctions imposed by EU countries for breaches of the arm's length principle, examining the severity, frequency, and impact of these measures. The aim is to identify regional trends and factors influencing the strictness of regulations, offering a foundation for understanding the fiscal behavior of European tax authorities.

Key words: *transfer price; related party transactions; tax compliance; European context;*

JEL Classification: *H26, H32, F23*

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1. Introduction

The reduction of tax liabilities through profit shifting, a practice adopted by multinational enterprises (MNEs), has become a top priority for international tax policy following the global financial crisis (Mooij & Liu, 2018). This issue has gained increased attention due to the G20/OECD initiative on Base Erosion and Profit Shifting (BEPS). Through this phenomenon, MNEs can shift profits from high-tax jurisdictions to low-tax jurisdictions, thereby minimizing their global tax obligations. Numerous empirical studies have confirmed the scope and frequency of this practice. For instance, research has shown that affiliated entities of MNEs in Germany paid, on average, 27% less in taxes than comparable locally owned German companies (Finke, 2013). These findings highlight the direct effects of tax planning strategies on national tax revenues.

One well-known method through which MNEs shift profits is the manipulation of transfer prices (TP), which are the prices set for transactions between affiliated parties. These TPs are necessary to determine the allocation of profits among the subsidiaries of a corporate group. Tax laws require that these prices be set in accordance with the arm's length principle (ALP), meaning they should reflect the prices that independent entities would use in comparable transactions. Despite the formal imposition of ALP compliance, its effectiveness largely depends on the rigor of tax authorities - both in terms of enforcement mechanisms and the extent to which they accept the documentation prepared by MNEs to justify their pricing decisions (Lohse et al., 2012).

The transfer pricing documentation (TPD) has been introduced into the legislation of each country, becoming a key tool for documenting and justifying compliance with the ALP. Its purpose is to provide tax authorities with a detailed view of intra-group transactions, including their economic structure, pricing methodology, and the comparability analysis used to demonstrate ALP adherence (OECD, 2022). Therefore, the existence of a well-prepared TPD serves as a safeguard for companies in the event of potential tax audits. Over time, however, TP legislation has evolved significantly, especially following the BEPS initiative. Countries have begun adopting increasingly strict documentation requirements for intra-group transactions and have implemented dispute resolution mechanisms such as Advance Pricing Agreements (APAs) and Mutual Agreement Procedures (MAPs).

APAs and MAPs are fundamental instruments within international tax regulations, contributing to the reduction of tax uncertainty and the promotion of compliance in intra-group transactions. Avi-Yonah (2016) argues that APAs provide clarity and predictability for MNEs, while Hines (2014) highlights the role of MAPs in preventing double taxation through cross-border cooperation between tax administrations. However, these mechanisms have been criticized for their lengthy resolution periods – approximately 30 months, according to the OECD (2022) – and the high costs involved, which may discourage smaller taxpayers. Nonetheless, the 40% increase in cases registered with the OECD between 2015 and 2021 (PwC, 2021) underscores the growing importance of these instruments in an increasingly complex global tax environment.

2. Literature review

Over the past decade, the international taxation of TP has undergone significant changes. Eden (2001) identifies three main factors that have driven these developments. First, although national tax systems have remained domestic, MNEs have become increasingly globalized, taking advantage of integrated opportunities across various jurisdictions. Second, the rapid pace of globalization has facilitated TP manipulation, prompting governments to introduce stricter regulations to protect their tax bases. Third, disparities among international tax rules have created challenges for MNEs, which must comply with multiple requirements simultaneously, amid increasingly severe penalties for non-compliance.These changes have significantly influenced the European legal framework, prompting the European Union to implement measures aimed at harmonizing national TP regulations. By adopting the ALP as a common standard, member states have been encouraged to reduce tax discrepancies between jurisdictions and to strengthen the protection of their tax bases. These initiatives support both the prevention of profit shifting to low-tax jurisdictions and the alignment with OECD guidelines, thereby contributing to the development of a fairer and more transparent fiscal environment across Europe (Chan et al., 2004).

As the complexity of international transactions has increased, the academic literature has emphasized the importance of the ALP as a central element in preventing

TP manipulation. Cristea and Nguyen (2016) argue that MNEs tend to adjust TP according to the tax regimes of different jurisdictions, reducing the taxable base in high-tax countries while maximizing profits in low-tax ones.

Lohse and Riedel (2013) examine the effectiveness of TP documentation regulations across Europe, concluding that the varying compliance measures among countries directly impact the protection of the tax base. Their findings suggest that regulatory harmonization at the EU level could significantly reduce compliance costs and the risk of tax disputes. Another notable contribution is the study by De Mooij and Liu (2018), which explores the impact of globalization on tax policy. The authors highlight that, in the context of new technologies and increasingly integrated capital flows, European countries must collaborate to avoid harmful tax competition.

According to the EY Tax Risk and Controversy Survey 2021, 79% of companies anticipate a substantial increase in the number and intensity of tax audits over the next two years. In this context, TP is identified as the main area of tax risk, with 53% of respondents expecting greater focus from tax authorities on cross-border issues (EY, 2021).

3. Methodology

The applied research method follows a quantitative-descriptive approach, aiming to analyze the legislation of each European Union Member State and identify the amount of sanctions imposed, with a focus on the strictness of regulations regarding the documentation of transactions between related parties. This analysis seeks to highlight legislative discrepancies and their impact on tax compliance in the context of TP.

The data used in this analysis were collected through a systematic process, based on diverse and credible sources designed to provide a detailed and relevant overview of TP regulations in the European Union. A central source was the country profiles published by the OECD in 2022/2023, which offered comprehensive information on each country's regulations, including applicable sanctions and compliance requirements. These well-structured and reliable data proved particularly useful for countries where language barriers limited direct access to the legislation. Additional information was obtained from national tax authority websites, European Commission reports, and specialized tax databases. Cross-referencing these sources ensured the accuracy and consistency of the information. The collected data were then categorized and analyzed to identify patterns, variations, and trends related to the severity of sanctions and the strictness of documentation requirements across Member States.

For a more detailed perspective, national tax codes were analyzed, allowing for the clear identification of applicable sanctions, whether related to the failure to submit the TP documentation file, errors, or incomplete documentation. This effort was complemented by the use of professional guidelines issued by leading companies from the Big Four group, such as Deloitte, PwC, KPMG, and EY. These sources provided additional insights into the practical application of the regulations, supplementing the legislative analysis with aspects of real-world implementation.

By combining these sources, the analysis was able to capture not only the specificities of each country but also general trends and existing discrepancies among national regulations. This approach enabled a deeper understanding of how sanctions are structured and applied, thereby contributing to the identification of areas where legislative harmonization could bring significant benefits.

4. European legislation. An analysis of the level of stringency and compliance

Starting from the premise that the OECD Guidelines (2022) represent a global consensus on TP, the following analysis explores the regulatory landscape across EU Member States. The aim is to assess where Romania stands in comparison to other EU countries in terms of documentation requirements and sanctions imposed for non-compliance.

A study conducted by EY Romania (2023) reveals that 52.9% of responding companies were subject to tax audits related to TP, and 33.3% of those experienced TP adjustments as a result. These figures highlight the importance of complying with applicable regulations and the need for thorough documentation to avoid sanctions.

This article focused on evaluating the sanctions imposed for non-compliance across EU Member States, with the objective of identifying the countries with the most stringent national regulations. The study compared criteria such as deadlines for submitting documentation, the severity of financial penalties, and the flexibility of retroactive adjustment mechanisms, highlighting both the convergences and divergences among national regulatory frameworks.

With regard to sanctions, Member States apply various penalties for failure to submit the TP documentation file, for incorrect or incomplete submissions, as well as for delays. These sanctions range from fixed fines to percentage-based penalties calculated on the additional tax assessed. **Table no. 1** presents the sanctioning regimes across EU Member States, divided into two main categories: penalties for non-submission of the file and specific penalties for incorrect or incomplete documentation.

Table no. 1. Sanctions applicable for non-compliance with transfer pricing regulations in European Union

Country	Penalties for non-submission of the transfer pricing documentation file	Special sanctions
Austria	Up to 5.000 EUR	25.000 EUR - 50.000 EUR
Belgium	1.250 EUR - 25.000 EUR	10% - 200%
Bulgaria	767 EUR - 2.600 EUR + 0,5% interest/transaction	100.000 BGN - 200.000 BGN (51.000 EUR - 102.000 EUR)
Cyprus	500 EUR	500 EUR - 20.000 EUR
Croatia	0	20.000 HRK - 500.000 HRK (2.650 EUR - 66.200 EUR)
Czech Republic	0	Up to CZK 1,500,000 (approx. EUR 61,000)
Denmark	0	250.000 DKK (approx. 33.500 EUR)/year
Estonia	0	0,06% (payment delay)
Finland	0	25.000 EUR
France	10.000 EUR + 0,5% interest/transaction	10.000 EUR - 100.000 EUR
Germany	Up to 10.000 EUR	5% - 10% or min. 5.000 EUR
Greece	500 EUR - 10.000 EUR	5% - 10%
Hungary	0	2.000.000 HUF - 20.000.000 HUF (49.000 EUR - 490.000 EUR)
Ireland	4.000 EUR - 25.000 EUR	100 EUR - 2.535 EUR/day
Italy	10.000 EUR - 50.000 EUR	100% - 200%
Latvia	1% interest/transaction	<100.000 EUR
Lithuania	0	1.820 EUR - 6.000 EUR
Luxembourg	0	25% - 50%
Malta	0	Information not identified in the available sources
Netherlands	Up to 5.278 EUR	870.000 EUR + 8% interest/adjustment
Poland	0	1.000.000 PLN (214.130 EUR)
Portugal	500 EUR - 10.000 EUR	375 EUR - 22.500 EUR + 5%/day of delay
Romania	700 EUR - 3.500 EUR	0,01% - 0,08% interest/day of delay
Slovakia	60 EUR - 3.000 EUR	20% /year
Slovenia	1.200 EUR - 30.000 EUR	30% - 45% + 0,0274%/day
Spain	1.000 EUR - 10.000 EUR	15%
Sweden	0	40%

Notes: 0= the country's legislation does not mention any special sanctions

Source: own processing, based on OECD Country Profiles – 2022/2023

The analysis presented in **Table 1** reveals significant diversity in the way EU Member States apply sanctions for non-compliance with TP regulations. It is observed that countries with higher penalties, such as Italy (up to EUR 50,000) or the Netherlands (up to EUR 870,000 for special sanctions), promote preventive behavior among taxpayers, encouraging thorough and timely preparation of TP documentation. In contrast, lower penalties, such as those in Romania (EUR 700 – 3,500), may pose higher non-compliance risks, particularly for SMEs. Greater convergence in sanction regulations is necessary to ensure a fair, consistent, and predictable tax framework that supports both taxpayer compliance and cooperation among national tax administrations.

The lack of a harmonized approach to TP within the EU has been emphasized by the European Commission, which has proposed a draft Directive aimed at establishing common TP rules at the EU level. According to KPMG (2023), this initiative seeks to reduce tax disputes and cases of double taxation, as well as to lower compliance costs for companies. Although a common directive could address many of the current issues, its implementation is not without challenges. Each Member State has its own economic and fiscal specificities, and the transposition of a European directive into national legislation may face resistance. Moreover, differences in administrative capacity and available resources could affect the uniform application of the new regulations.

5. APA and MAP – a comparative analysis across countries

Minimizing taxes is one of the most common objectives of MNEs. To ensure a fair TP system in each jurisdiction, an international standard is required. The OECD has promoted the ALP as the central theme in its TP guidelines. When governments adopt the ALP into their national legislation, they allow tax authorities to adjust a company's taxable income within their jurisdiction if they can prove that the ALP has not been respected.

Given that the OECD Guidelines represent a global consensus on TP, the following analysis explores the regulatory framework in the Member States of the European Union. The objective is to assess where Romania stands in comparison with other EU countries in terms of the strictness of documentation requirements and the sanctions applied for non-compliance. The data used in this analysis were manually collected from the official website of the European Commission, providing a factual and up-to-date basis for the comparisons made.

The questions considered relevant in analyzing the level of strictness are as follows:

A. Does the country's domestic legislation require taxpayers to prepare specific transfer pricing documentation?

B. Is there a deadline for submitting the transfer pricing file?

C. Can the deadline be extended?

D. Does the legislation allow for collaboration with tax authorities through APAs and MAPs?

The comparative **Table no. 2** presents the state of TP regulations in various European countries, showing the degree of alignment with OECD guidelines and the specific mechanisms applied in each jurisdiction. All the countries included have implemented a formal TP regime (indicated by "1" in column A), which demonstrates a general commitment to international standards.

Regarding the deadline for submitting documentation (column B), there are significant variations. For example, Romania allows a period of 30 or 60 days, depending on the type of request, similar to Germany or Ireland. However, other countries such as Hungary (3 days) or Poland (7 days) impose much stricter deadlines, which may increase pressure on taxpayers. On the opposite end, countries like Denmark, Estonia, and Finland offer extended deadlines of up to 60 days. It can be observed that countries such as Bulgaria and Croatia are at the top of the list where documentation must be available upon request from the tax authorities or during a tax audit. Romania ranks at the bottom, with a possible extension of 30 days, meaning that in the event of a tax inspection, taxpayers have a maximum of 90 days to submit the file.

Retroactive adjustments (column C) are allowed only under specific conditions in Romania, marked with "1". This indicates a certain degree of flexibility in the application of regulations, but also the need for additional justification. Other countries, such as Bulgaria and Malta, do not allow such adjustments at all, while states like Italy or Slovakia apply rules similar to those in Romania, specifying particular conditions.

Dispute resolution mechanisms (column D) include advance procedures such as APAs and MAPs, both of which are available in Romania. These mechanisms are used to prevent double taxation and facilitate cross-border compliance. Most European countries have implemented these mechanisms, highlighting their importance in managing transactions between related parties.

Table no. 2. Transfer pricing obligations and procedures in European Union Member States				
Country	A	B	C	D
Austria	1	30	0	APA and MAP
Belgium	1	30	1*	APA and MAP
Bulgaria	1	0*	0	MAP
Croatia	1	0*	0	APA and MAP
Cyprus	1	60	0	APA
Czech Republic	1	30	0	APA and MAP
Denmark	1	60	0	APA and MAP
Estonia	1	60	0	MAP
Finland	1	60	0	APA and MAP
France	1	30	0	APA and MAP
Germany	1	30/60	0	APA and MAP
Greece	1	30	0	APA and MAP
Hungary	1	3	0	APA and MAP
Ireland	1	28/60	0	APA and MAP
Italy	1	10	1**	APA and MAP
Latvia	1	30	0	APA and MAP
Lithuania	1	30	0	APA and MAP
Luxembourg	1	28	0	APA and MAP
Malta	1	0*	0	APA and MAP
Netherlands	1	30	1*	APA and MAP
Poland	1	7	0	APA and MAP
Portugal	1	10	0	APA and MAP
Romania	1	30/60	1**	APA and MAP
Slovakia	1	15	1***	APA and MAP
Slovenia	1	30	0	APA and MAP
Spain	1	10	0	APA and MAP
Sweden	1	30	0	APA and MAP

Abbreviations: MAP = Mutual Agreement Procedures, APA = Advance Pricing Agreement

1 = yes, 1* = extension period not specified, 1** = extension period is 30 days, 1*** = extension period is 1–2 weeks, 0 = no, 0* = must be available upon request from the tax authority.

Source: own processing, based on OECD Country Profiles

In conclusion, we can state that, from the perspective of submitting the file upon request by the tax authorities, it is advisable for the TPD to be prepared in advance. With a few exceptions, it can be said that the legislation of EU countries tends toward convergence – something that cannot be said in the case of sanctions. Romania aligns with European and international standards, having regulations that facilitate compliance and offer solutions for tax disputes. However, differences among European countries – such as documentation deadlines or the possibility of retroactive adjustments – highlight the challenges of achieving full and uniform coordination at the EU level.

APAs and MAPs are essential solutions for managing and preventing double taxation in international transactions. APAs provide companies with tax predictability by establishing the TP method in advance of the transactions, thereby reducing the risk of disputes with tax authorities and encouraging investment. MAPs, on the other hand, resolve conflicts between jurisdictions regarding tax adjustments, eliminating double taxation and ensuring fair treatment for taxpayers (Becker et al., 2014).

Table no. 3 summarizes the number of cases initiated, closed, and pending in 2023, reflecting the capacity of tax authorities to manage and resolve complex cross-border transactions.

Table no. 3. MAP and APA in the European Union in 2023

Country	No. of MAP cases initiated (2023)	No. of MAP cases closed (2023	No. of MAP cases at year-end	Average MAP resolution time (months)	No. of APA requests processed (2023)	No. of APA cases closed (2023)	No. of APA cases at year-end	Average APA completion time (months)
Austria	82	116	243	28.86	6	1	29	20
Belgium	462	422	887	22.47	17	7	51	17.19
Bulgaria	12	7	21	27.36	0	0	0	0
Cyprus	7	6	20	30.63	0	0	0	0
Croatia	0	0	0	0	0	0	0	0
Czech Republic	24	31	60	45.98	3	3	15	29
Denmark	91	90	206	21.01	15	19	39	23.29
Estonia	8	5	14	10.38	0	0	0	0
Finland	45	29	152	21.41	18	2	51	33.24
France	397	490	980	38.50	42	16	159	44
Germany	656	752	1332	25.16	82	46	375	44.5
Greece	14	5	65	10.47	0	0	12	n.a
Hungary	12	4	35	17.26	1	0	14	n.a
Ireland	85	53	177	17.27	16	1	68	71.97
Italy	350	405	874	30	68	39	244	41.91
Latvia	7	2	21	10.43	0	0	0	0
Lithuania	26	5	33	16.55	0	1	0	20
Luxembourg	157	134	251	24.81	7	1	51	21
Malta	4	1	23	2.69	3	0	7	n.a
Netherlands	318	361	494	18.50	39	36	110	34
Poland	57	65	192	42.93	11	14	59	48
Portugal	56	94	139	32.82	5	0	16	n.a
Romania	**1**	**7**	**66**	**6.76**	**12**	**6**	**28**	**40.53**
Slovakia	7	14	62	35.92	1	1	8	68.12
Slovenia	8	2	42	45	0	0	3	n.a
Spain	273	258	912	29.84	30	19	74	52
Sweden	114	126	316	30.04	14	21	83	38.86

Source: own processing, based on OECD – MAP and APA Statistics

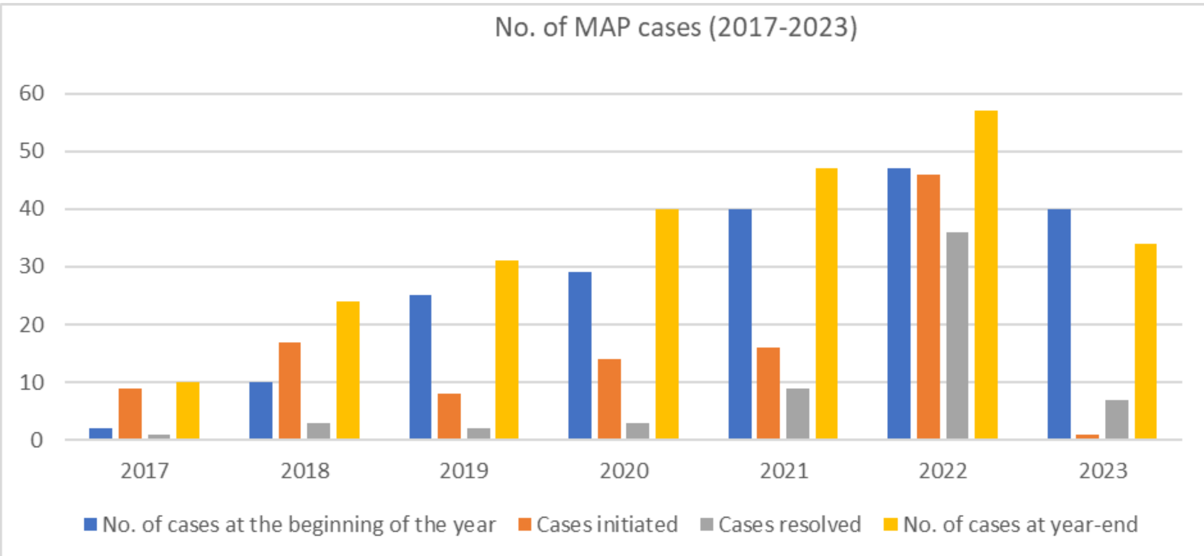
These data highlight both differences between jurisdictions and regional trends. For example, Germany and France report the highest number of MAP and APA cases processed, indicating a high volume of intra-group transactions. In contrast, countries such as Romania or Bulgaria manage significantly fewer cases, suggesting either lower levels of international economic activity or differing levels of resources allocated to this area.

Table no. 3 also emphasizes the challenges related to the average duration of case resolution. While countries such as Malta or Estonia complete MAP cases in a relatively short time, other jurisdictions – such as the Czech

Republic or Poland – report much longer timeframes, which may indicate increased procedural complexity.

To better understand Romania's position in the context of MAP mechanisms, we analyzed the evolution of these procedures over time (2017-2023), using data manually extracted from OECD-published statistics (MAP Statistics). This analysis enables the identification of specific trends and challenges related to the application of TP regulations and the use of international mechanisms to avoid double taxation. **Chart no. 1** presents data on the number of cases initiated, closed, and those remaining open at the end of each year, providing a clear perspective on the Romanian tax authorities' capacity to manage and resolve these complex transactions.

Chart no. 1. Evolution of MAP Cases in Romania (2017-2023)



Source: own processing based on OECD – MAP Statistics – Romania

The increased use of MAP between 2017 and 2022 reflects a rise in international economic activity and greater taxpayer awareness of the benefits of this mechanism for avoiding double taxation, which has led to a gradual increase in the number of cases initiated. However, the sharp decline in new cases in 2023 raises questions about possible legislative changes, improved taxpayer compliance, or operational limitations within the tax authorities. At the same time, the consistently high number of unresolved cases at the end of each year suggests ongoing pressure on the authorities, who must manage both new cases and those already in progress, which may impact the duration of the resolution process.

5. Conclusions

The results obtained from the analysis provide a clear and detailed overview of the diversity of transfer pricing regulations within the European Union. Although the arm's length principle and OECD guidelines offer a unified reference framework, their actual implementation varies considerably among Member States. These differences are reflected in the level of sanctions imposed for non-compliance, the strictness of compliance deadlines, and the flexibility of administrative procedures.

Romania, although formally aligned with European standards, applies lower financial penalties compared to other countries (EUR 700–3,500 versus up to EUR 870,000 in the Netherlands) and allows extended deadlines for submitting the transfer pricing file, which may lead to a lower level of compliance, particularly among small and medium-sized enterprises. This leniency can undermine the effectiveness of tax audits and encourages a reactive rather than preventive approach.

The article argues that the implementation of a unified directive at the European Union level is a necessary condition for reducing disputes, avoiding double taxation, and lowering compliance costs. However, the harmonization process is complicated by structural and administrative differences among Member States, as well as by unequal institutional capacities.

The comparative analysis of Mutual Agreement Procedures and Advance Pricing Agreements highlights significant differences in usage and effectiveness. Romania ranks at the bottom within the EU, with only one MAP case initiated in 2023 and a modest number of APA requests processed (12), in stark contrast to Germany (656 MAP, 82 APA) or Italy (350 MAP, 68 APA). Although the average resolution time for MAP in Romania is short (6.76 months), the average completion time for APA is among the longest (40.53 months), raising questions about the country's capacity and prioritization of these mechanisms.

These results underscore the need for enhanced fiscal coordination and investment in national institutional capacity to ensure a fair, coherent, and competitive tax framework. Better use of preventive mechanisms such as APA, and corrective tools like MAP, could strengthen taxpayer confidence and encourage proactive tax behavior within the Romanian business environment.

6. Future research directions

Future research in this field could further explore the complex dynamics of transfer pricing practices, particularly in the context of evolving regulatory landscapes and technological advancements. As business operations become increasingly globalized and digital transactions proliferate, it becomes ever more necessary to examine the implications of digitalization on transfer pricing strategies and compliance frameworks. Additionally, investigating the role of emerging technologies – such as blockchain and artificial intelligence – in facilitating or disrupting transfer pricing practices could offer valuable insights into future trends and challenges in this domain.

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Multi-dimensional Conceptual Approaches to Risk in Statutory Audit

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Abstract

Given the rapid advancement of technology, the growing interconnection of global economies, and the evolving challenges faced by contemporary independent auditors, the topic of audit risk has gained increasing attention and significance. From this perspective, the objective of the present research is to identify and analyze, from a multidimensional standpoint, the conceptual approaches to risks in statutory audit. By conducting a bibliometric analysis of articles published in the Scopus database between 1987 and 2024, the study identifies the main research directions in the specialized literature, the frequency and relevance of the topics addressed, as well as the authors and works with significant impact. The results highlight the growing interest in audit risks and their critical importance in the context of financial reporting. Considering both the role of risk in the audit process and its influence on the auditor's opinion, this study makes a substantial contribution to the existing body of literature. Furthermore, the dynamic nature of the current economic environment underscores the continued need for research focused on audit-related risks.

Key words: *statutory audit; audit risk; academic literature; bibliometric analysis; Scopus;*

JEL Classification*: M42, M48*

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Introduction

Audit risk research is a vital component of the audit process, serving as a fundamental mechanism for assessing and managing the risks that organizations face in their operations. This research aims to provide a comprehensive overview of the subject, integrating general explanations and conceptual clarifications with the analysis of relevant phenomena and significant scholarly studies. In addition, the study includes a rigorous bibliometric analysis, focused on identifying and examining research on audit risks selected from an accredited scientific database.

Auditing, as a professional practice, is closely intertwined with the concept of risk. In this context, risk refers to the potential occurrence of events that may negatively impact an organization's ability to achieve its objectives. Auditors – tasked with examining financial statements and ensuring their accuracy and reliability – must possess a thorough understanding of the real risks present within the entities they audit. Consequently, risk analysis has emerged as a specialized discipline within auditing, focused on identifying, assessing and addressing vulnerabilities that could affect an entity's financial health, operational efficiency and overall sustainability.

A critical analysis of audit risk involves a comprehensive examination of various facets inherent in the auditing process. This includes an in-depth evaluation of the methods and techniques employed by auditors to assess risk, the effectiveness of the risk management strategies implemented by organizations, but also the impact of identified risks on financial reporting and decision-making. It also explores the auditor's role in providing assurance regarding the adequacy and effectiveness of internal controls designed to mitigate risks. Furthermore, the analysis considers the evolution of the regulatory framework governing risk management practices and its influence on auditing standards and procedures.

The field of audit risk is characterized by dynamic developments and diverse approaches that influence both practice and outcomes. These include globalization, technological advancements, the increasing complexity of the business environment, regulatory reforms and the growing interconnectedness of financial markets. In this context, auditors face numerous challenges, such as identifying emerging risks, evaluating the sufficiency of risk-related information and integrating data analytics and artificial intelligence into the audit processes to enhance risk assessment capabilities.

Research conducted to date has significantly contributed to understanding audit risk and its implications for stakeholders. Over time, studies have addressed a range of topics, from the effectiveness of risk assessment methodologies to the influence of audit committees on risk management. Empirical research has also underscored the relationship between risk disclosures in financial statements and organizational performance, offering valuable insights for practitioners, regulators and decision-makers. Nonetheless, several aspects remain underexplored, highlighting the need for continued research to strengthen both the theoretical foundations and methodological approaches within the domain of audit risk.

The literature reflects a wide range of perspectives and approaches to audit risk. For instance, Martinov-Bennie (1998) and Dobler (2003) highlight the challenges and limitations of current auditing practices, with Dobler placing particular emphasis on regulatory concerns. Peters (1989) and Allen (2006) explore the process of inherent risk assessment, with Allen even advocating for its reconsideration. Meanwhile, Schultz (2010) and Khwaja (2011) focus on the integration of business risk into the audit process – Khwaja through the lens of risk-based tax audits and Schultz by emphasizing the value of a strategic, systems-based approach. Lastly, Steele (1995) and Vitalis (2012) examine how business risk and auditing intersect, offering broader insights into the evolving nature of the field.

The main aim of this paper is to explore the conceptual approaches to identifying risks in the audit of economic entities, using bibliometric analysis to review literature indexed in the Scopus database from 1987 to 2024. Through this analysis, the study seeks to highlight the main research trends in audit-related risks, the most frequently discussed topics, the journals most receptive to these issues and the authors who have made significant contributions to advancing this area of study.

This research builds on existing work in the field of audit risk, offering a more in-depth understanding of key concepts in today's dynamic context. It also serves as a foundation for future investigations into how audit risks affect financial reporting and decision-making.

The paper is structured as follows: the first section presents a review of the relevant literature; the second outlines the research methodology. The third section discusses the findings and provides a detailed analysis. Finally, the last section includes the conclusions, highlights the study's limitations and suggests directions for future research.

Audit Risks in Light of the International Standards on Auditing (ISAs)

Audit risk can be briefly defined as the risk that the auditor assumes when issuing an erroneous opinion on the audited financial statements. The identification and effective assessment of the risk factors that characterize the three components of audit risk – inherent risk, control risk and detection risk – directly contributes to rigorous audit planning.

Out of the need to determine a relationship between the main components of risk, the Accounting Principles and Auditing Standards proposed in 1988 a mathematical model, still well-known to contemporary auditors (Arens & Loebbecke, 2003):

$$\text{Audit Risk} = \text{Inherent Risk} \times \text{Control Risk} \times \text{Non-Detection Risk.}$$

In practice, it is recommended that the audit risk acceptance threshold not exceed 5%. Considering that the level of assurance (LoA) is inversely proportional to audit risk, the assurance level should therefore exceed 95% (ICAS & CAFR, 2019). Collecting a large volume of audit evidence, assigning the engagement to competent and experienced professionals and thoroughly monitoring the audit team's activities are among the key factors that can reduce audit risk.

Inherent risk represents the vulnerability of financial statements to material misstatements, even in the absence of internal control deficiencies. This risk depends on factors such as the nature of the entity's activities and the complexity of its economic operations. According to the existing literature, inherent risk refers to the susceptibility that a transaction class or account balance contains material misstatements – either individually or in combination with other balances or transactions – assuming that no related internal controls are in place (IAASB, 2018: ISA 200).

Control risk arises when internal control mechanisms fail to prevent or detect material misstatements in the financial statements. An ineffective internal control system can expose the entity to accounting errors and even fraud. It is important to note that the internal audit function plays a crucial role in enhancing the effectiveness of corporate governance and management processes, particularly in managing internal control risk. The financial auditor may obtain information from the internal audit department regarding risks of material misstatement due to error or fraud (ISA 610).

Detection risk refers to the possibility that the auditor may fail to identify material misstatements during the audit process. This risk can be influenced by the use of inappropriate audit procedures or by the auditor's lack of experience.

In addition to the risks mentioned above, an essential aspect of the audit process is the **risk of fraud**. Fraud poses a major threat to the integrity of the audit, typically involving the intentional manipulation of financial information.

Review of the specialized literature

Financial auditing plays a key role in ensuring the transparency and accuracy of accounting information. However, the audit process involves risks that can affect the objectivity and quality of financial reporting. This article examines the main types of audit risks, the factors that influence them and the methods by which they can be effectively mitigated.

Although the profession of auditing, in its current form, was not known in early historical periods, similar practices can be traced back to Antiquity. Archaeological discoveries from ancient Babylon and Egypt attest to the use of supporting documents for commercial transactions, thus enabling an early form of verification and accounting record-keeping (Bogdan, 2005).

As trade developed, the need to monitor transactions became increasingly urgent, prompting a shift from rudimentary methods to much more systematic and complex approaches. Advancements in the field of accounting and financial oversight facilitated the management of economic activities but also created opportunities for fraud and manipulation aimed at gaining unjustified advantages. In response, state authorities implemented control mechanisms designed to oversee the use and flow of financial resources.

Over time, these mechanisms have diversified and improved, laying the foundation for advanced financial control techniques applied to assets, liabilities, equity, expenses and revenues. Auditors, as independent experts representing the interests of shareholders, are responsible for ensuring the accuracy and compliance of financial statements prepared by management – thus assuming a particularly significant responsibility (Rodgers et al., 2019). Today, audit reports provide more detailed information to stakeholders compared to earlier formats.

Risk auditing involves identifying potential risks, analyzing their likelihood and impact, developing control measures to mitigate them and monitoring the effectiveness of these measures over time (Arens et al., 2017). This process includes both risks associated with financial reporting and those related to the operational aspects of organizations (Fleming, 2014).

A particularly important component is the identification of risks, which are reflected in audit reports as Key Audit Matters (KAMs) (Grosu, Robu & Istrate, 2020). Risk assessment, a fundamental element of modern audit practices, continues to evolve to address the dynamic nature of organizational risks. According to Arens et al. (2017), it is a structured process aimed at analyzing and managing the risks inherent in an organization's activities, with the goal of ensuring the achievement of strategic objectives and the protection of assets and resources. This definition highlights the proactive nature of risk auditing, emphasizing the importance of identifying, assessing and mitigating risks before they escalate into major threats.

Risk assessment holds a special place in the audit process due to its critical importance. One of the most debated challenges auditors face during engagements is audit risk. According to the specialized literature, the auditor's primary concern should be the proper assessment of audit risk. To evaluate the extent to which a company's financial statements fairly reflect its financial position and performance, the auditor must gather sufficient appropriate evidence to support the formation of an opinion. Effective management of the audit process requires an accurate assessment of audit risk, as this is an essential step in determining the methods, techniques, nature and extent of the procedures to be applied. "This approach begins in the early stages of planning, immediately after obtaining an understanding of the client and evaluating the internal control system" (Horomnea, 2014).

In the literature, the decision to accept and retain clients is considered a key aspect of the risk management process within audit firms. Johnstone (2000) proposes a conceptual model in which client acceptance is viewed as a dual process, involving both risk assessment and adaptation to those risks. Auditors evaluate factors such as financial viability and the quality of internal controls to estimate the likelihood that the audit firm might incur losses, whether through reduced engagement profitability or through future litigation. The model outlines three risk response strategies: selecting clients based on their risk profile, assessing the potential loss to the firm, and – at least theoretically – implementing proactive measures such as fee adjustments or changes to audit planning. However, empirical research suggests that audit partners, in practice, tend to favor risk avoidance over proactive adaptation.

This trend is confirmed by further research conducted by Johnstone and Bedard (2004), which examine client acceptance and continuance decisions in a large audit firm, providing clear evidence of systematic risk-avoidance behavior. The results show that the firm actively rejects clients deemed riskier and accepts new clients with lower risk profiles, leading to an increasingly conservative portfolio. Risk differences are more pronounced between retained and rejected clients than between retained and newly accepted ones.

The study also highlights that audit-related risk factors – such as the risk of material misstatement or control risk – play a more critical role than financial factors in client portfolio decisions. Interestingly, after controlling for risk and other client characteristics, audit fees do not significantly influence acceptance or retention decisions. This evidence suggests that audit firms adopt a conservative approach, largely oriented toward risk avoidance, both at the individual level (i.e., audit partners) and at the institutional level (i.e., portfolio strategies), reflecting an organizational culture marked by strong risk aversion (Johnstone, 2000; Johnstone & Bedard, 2004).

The risks identified during the audit primarily serve as the basis for directing the auditor's efforts toward those areas where potential misstatements could distort the true and fair view of the financial statements. In essence, acceptable audit risk reflects the extent to which the auditor is willing to accept the possibility of material misstatements in the financial statements, even after issuing an unqualified audit opinion. Given the inherent limitations of any audit process, a certain level of risk is inevitable. However, the auditor must keep this risk as low as possible to ensure that the level of assurance provided by the audit opinion remains high. This objective can be achieved through accurate identification of risk factors and by focusing audit procedures on areas with the highest likelihood of errors or fraud (Grosu & Mihalciuc, 2021).

It is generally accepted that as external users place greater reliance on audited financial statements, auditors should accept a lower level of audit risk. This implies that when the entity's going concern status is uncertain and management's competence and integrity are questionable, auditors must provide a higher level of assurance by reducing acceptable audit risk (Muñoz-Izquierdo, 2019).

According to the theoretical framework, several studies have explored the relationship between audit fees and subsequent financial statement restatements in the post-Sarbanes-Oxley (SOX) era, considering the substantial changes the Act imposed on audit practice. After evaluating internal control quality, research has shown a negative correlation between abnormal audit fees and the likelihood of subsequent restatements (Blankley, A.I., Hurtt, D.N., & MacGregor, J.E., 2012). This finding contradicts earlier studies, which reported a positive association between audit fees and future financial adjustments (Hoitash, R., Hoitash, U. & Bedard, J.C., 2008).

This discrepancy suggests that higher audit fees may not reflect a rigorous risk assessment but instead may indicate additional effort by auditors. Conversely, restatements may point to insufficient risk assessment in prior periods. From this perspective, the findings align with the hypothesis that financial statement revisions are not necessarily the outcome of improved risk assessment, but rather the result of low audit effort or risk underestimation in previous years.

These findings have significant implications for audit practice. They suggest that auditors should allocate greater time and resources to evaluating fraud and misstatement risks – especially in volatile economic conditions. Furthermore, they underscore the importance of transparency in audit fee determination and may prompt regulatory reforms to strengthen oversight of fee-setting practices (Blankley, A.I., Hurtt, D.N., & MacGregor, J.E., 2012).

The assessment of inherent risk is a critical step in the overall development of the audit plan. If the auditor concludes that there is a significant likelihood that the internal control system is deficient, they will consider inherent risk to be high. This conclusion directly impacts the extent of audit evidence that must be gathered, implying additional effort within the audit engagement.

Factors the auditor should consider when assessing inherent risk include results of previous audits; comparisons between initial engagements by former auditors and their outcomes; the degree of professional judgment required to establish account balances and record transactions; and the presence of unusual or complex transactions. Other considerations include assets susceptible to embezzlement, the structure and size of the population and sample, the nature of the entity's operations, changes in management and the entity's reputation. The auditor must also consider the nature of the data processing environment and the use of modern communication technologies.

Before assessing inherent risk, auditors should perform a comprehensive analysis of the entity's operating environment and identify the specific characteristics of its transactions. Evaluating the factors mentioned above enables the auditor to determine the inherent risk associated with each transaction cycle, account, and audit objective. Auditors generally express inherent risk quantitatively after completing a questionnaire based on both factual responses and professional judgment.

Professional judgment is fundamental to the assessment of inherent risk, as it allows the auditor to estimate factors influencing risk level – both at the financial statement level and at the level of specific accounts and transaction categories.

Inherent risk can be classified as general inherent risk or specific inherent risk. For financial statements, the auditor should consider factors such as management integrity, any changes in management during the audit period, unusual pressures faced by management, the nature of the entity's operations and broader industry-related risks. General inherent risk refers to these broader factors, while specific inherent risk pertains to the more detailed considerations outlined below.

When assessing account balances and transaction categories, the auditor evaluates which financial statement elements may be susceptible to misstatement, the complexity of major transactions, events requiring expert opinion, the degree of judgment applied in determining account balances, susceptibility to asset loss or misappropriation and the nature and purpose of highly complex or unusual transactions.

The literature also includes experimental studies assessing the extent to which the audit risk model reflects actual planning decisions, particularly regarding resource allocation and fee determination. The results suggest that when the probability of error is high, the audit risk model significantly influences investment decisions, and audit fees typically do not include a risk premium. However, when the probability of irregularities (e.g., fraud) is high, business risks become the primary factor in planning decisions, and audit fees often include an additional cost in the form of a risk premium.

These findings indicate that the usefulness of the audit risk model in explaining auditor behavior – and the tendency to include a risk premium in fees – depends on the nature of the identified risks. In the presence of errors, the model adequately explains auditor decision-making, while in cases of fraud or irregularities, it appears insufficient (Houston, R.W., Peters, M.F., & Pratt, J.H., 1999).

The preliminary assessment of control risk refers to the evaluation of the effectiveness of an entity's accounting and internal control systems in preventing and detecting material misstatements. It is generally understood that control risks are inherent, given the limitations of any internal control system. In this preliminary assessment, auditors typically assume a high control risk – unless they can identify relevant controls related to key assertions that can prevent or detect and correct material misstatements, or if they intend to perform and rely on tests of controls to support a lower assessed level of risk.

There is an inverse relationship between the combined level of inherent and control risk and detection risk. Thus, when inherent and control risks are high, detection risk must be kept low to ensure that overall audit risk remains within an acceptable range. A low assessment of inherent and control risk does not eliminate the auditor's obligation to perform substantive procedures. The auditor must perform substantive procedures on significant account balances and classes of transactions, regardless of the assessed levels of inherent and control risk. The higher the assessment of these risks, the greater the amount of audit evidence required from substantive procedures. When both inherent and control risks are high, the auditor must determine whether substantive procedures alone can provide sufficient audit evidence to reduce detection risk – and consequently, overall audit risk – to an acceptably low level.

As previously noted, the audit risk model provides a framework for understanding the relationship among overall audit risk, inherent risk, control risk, and detection risk. Research in the specialized literature seeks to determine whether this model accurately reflects real-world auditing practices. According to a 2008 study, audit fees tend to be significantly higher for companies with internal control deficiencies, even after controlling for variables such as company size, financial risk, and profitability. Moreover, fee levels appear to correlate with the severity of the identified control issues, suggesting a direct relationship between control risk and the additional effort required by the auditor. These findings indicate that audit firms adjust their fees in line with identified risks, thereby aligning with the audit risk model (Hogan & Wilkins, 2008).

Auditors must remain vigilant for red flags, such as unjustified changes in accounting policies or suspicious transactions. In today's environment, technological advancements have both enabled fraudulent activity and empowered auditors to detect irregularities more effectively. This dual effect has prompted auditors to investigate fraud risks more closely and pushed organizations to strengthen their internal control systems.

Recent studies highlight various emerging trends and challenges in risk auditing. Like other professions in the digital era, accounting professionals have integrated artificial intelligence (AI) into their workflows. Advances in data analytics and predictive modeling have significantly transformed how risks are identified and assessed. By leveraging big data technologies and advanced analytics, auditors can process large volumes of structured and unstructured data to detect patterns, trends, and anomalies that may indicate risk (Jones et al., 2022). For example, machine learning algorithms can uncover suspicious transactions, detect fraud, and predict future risk events with increased accuracy and efficiency (Zhang & Wang, 2023). This data-driven approach enables auditors to identify hidden risks that might go undetected through traditional audit techniques.

Another key theme in recent literature concerns the influence of disruptive technologies on audit risk – both at the audited entity level and within audit firms. A study conducted on companies in the FTSE 100 index and their corresponding Big Four auditors (2015–2020) revealed a strong correlation between the adoption of disruptive technologies and a reduction in audit risk. The findings show that such technologies contribute to lowering both inherent and control risks, as well as detection risk. These benefits were consistently observed across various industries, suggesting broad applicability and high potential for enhancing audit efficiency (Elnahass, Jia, & Crawford, 2024).

In parallel, Smith et al. (2023) emphasize the growing impact of technological risks – such as cyber threats and data breaches – on the modern business landscape. This underscores the need for auditors to adapt their risk assessment methods to manage these evolving threats effectively and safeguard organizational assets. At the same time, data analytics and AI have proven effective in enhancing risk assessment and detecting anomalies (Jones & Wang, 2022).

A notable example is Deloitte, one of the Big Four audit firms, which has been a pioneer in integrating AI into the audit process. Since 2016, Deloitte has used its proprietary "Deloitte Financial Robot" to optimize processes, reduce data processing time, lower labor costs, increase efficiency, and improve the understanding of client-specific financial risks (Müller & Bostrom, 2016). This integrated approach continues to evolve, offering auditors a deeper understanding of how different risk factors interact and affect organizational goals.

Leveraging advanced analytics allows auditors to rapidly analyze large datasets, identify trends and flag deviations from expected patterns – enabling more proactive risk management. Beyond technological advances, recent research also highlights the growing importance of incorporating Environmental, Social, and Governance (ESG) factors into risk auditing (Prodanova et al., 2023). As organizations face increasing pressure to demonstrate sustainability and corporate responsibility, auditors must assess how ESG risks affect organizational performance and reputation. This requires a holistic risk auditing approach that integrates both financial and non-financial risks, with substantial implications for long-term sustainability.

Fraud is one of the main causes behind numerous high-profile financial scandals in recent years, making it a key area of interest for financial stakeholders. In the modern era, technological advancements have facilitated the emergence of fraudulent activities within organizations. This evolution has simultaneously compelled auditors to investigate irregularities by applying risk identification and assessment methods, implementing internal control techniques, and performing substantive procedures to assess fraud risk, while also encouraging organizational management to establish effective control systems.

Fraud risk refers to the probability that an entity's financial statements contain material misstatements resulting from intentional acts of fraud. As an essential component of audit risk, it demands heightened attention from auditors, as fraud can severely undermine the credibility and reliability of financial reporting. In the literature, fraud risk is often evaluated through two principal lenses: inherent risk and control risk – both of which reflect the vulnerability of the accounting system and internal controls to deliberate manipulation or omission of relevant information.

In this context, the Fraud Triangle – comprising pressure, opportunity, and rationalization – serves as a foundational conceptual framework for understanding fraudulent behavior. However, modern approaches have extended this model by incorporating factors such as organizational culture, the degree of digitalization, and the dynamics of governance. Effectively assessing fraud risk thus requires not only a strong theoretical grasp of the phenomenon but also the application of rigorous audit procedures to detect red flags and evaluate the potential impact on financial statements.

Recent literature reexamines the Fraud Triangle, offering contemporary perspectives and contributions from the professional community to develop a meta-model of fraud – a tool that supports both academic research and educational training. Although the Fraud Triangle remains fundamental, it is now considered only one component of a broader framework for assessing audit risk (Dorminey, J., Fleming, A.S., Kranacher, M., & Riley, R.A., 2012).

Professional standards issued by the AICPA and PCAOB (2010) clearly emphasize the auditor's responsibility to identify risks of material misstatement due to fraud, in accordance with assurance service requirements. Therefore, identifying fraud risk is not merely a procedural step, but a critical element that necessitates the use of explanatory models aligned with current understandings of fraudulent behavior.

To further understand the motivations behind fraudulent actions and support the professional community in preventing, detecting, investigating, and addressing fraud, researchers and practitioners have expanded upon the conceptual foundations of the Fraud Triangle. These efforts are synthesized into a meta-model, which offers a robust theoretical base for educators and researchers engaged with fraud-related topics. This model holds significant didactic value in academic settings and empirical relevance in scientific investigations.

The COVID-19 pandemic has served as a major catalyst for reshaping risk auditing approaches, highlighting the need for auditors to revise their methodologies in response to global systemic disruptions (Noch, M.Y., 2024). It underscored the high degree of interconnection among supply chain risks, operational processes, and financial markets, reinforcing the importance of developing resilient risk management systems to mitigate systemic vulnerabilities.

In this evolving context, risk auditing is becoming a dynamic field, continually shaped by emerging trends and global economic challenges. Integrating classical audit principles with contemporary research empowers auditors with a consolidated framework for identifying, assessing, and managing risks effectively. However, sustaining the relevance and effectiveness of audit practices requires continuous innovation and adaptability to support organizational resilience and protect long-term strategic objectives.

Research methodology

To achieve the research objectives, we employed bibliometric analysis to identify and structure conceptual approaches related to audit risks. We analyzed articles indexed in the SCOPUS database, published between 1982 and 2024, with the intention of ensuring the study's relevance while acknowledging that auditing is a relatively young and continuously evolving field. Although SCOPUS includes sources dating back to 1982, we found that the first article referencing audit risk appeared in 1987. Therefore, the selected timeframe for our study spans 1987 to 2024.The current year (2025) was excluded from the final analysis due to an insufficient number of publications, which rendered it statistically irrelevant for a study considering full calendar-year data.

To identify relevant articles, we used the search filter phrase "audit risk", which yielded 914 results. After narrowing the document type to include only peer-reviewed journal articles, the dataset was reduced to 722 sources. The final filtering step involved selecting the relevant subject areas – "*Business, Management and Accounting*" and "*Economics, Econometrics and Finance*" – and limiting the results to articles published in English.

As a result, a total of 598 scientific research articles, published between 1987 and 2024, were selected for inclusion in the bibliometric analysis. The selection criteria are detailed in **Table no. 1**.

Table no. 1. Search criteria and results obtained

Search criteria	Result
Search key	Audit Risk
Time period	1987 – 2024
Area of interest	Accounting, Business, Economics, Finance
Document type	Scientific article
Language	English
No. of documents before filtering	914
No. of documents after filtering	598

Source: author's projection

The stages of bibliometric analysis include determining a literature review plan, centralizing the extracted data using preset search filters, graphically presenting the obtained data and, finally, detailing them.

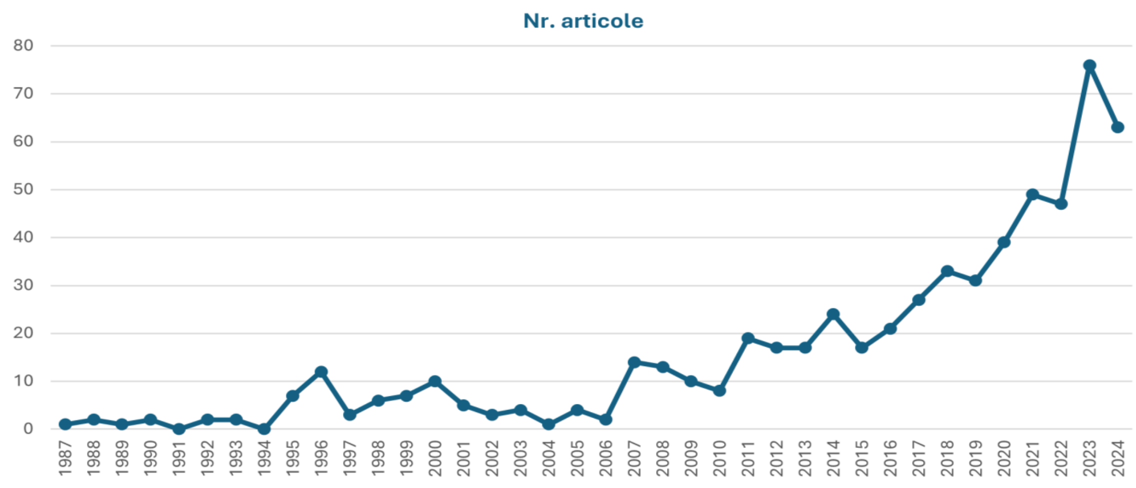
Results and discussion

The chronological evolution of publications on audit risk serves as an important indicator of the topic's relevance and growing academic interest. The distribution of articles published during the selected timeframe is illustrated in **Figure no. 1**, which shows a total of 598 articles published between 1987 and 2024, the reference period of this study.

The upward trend in the number of publications over time demonstrates the increasing significance of audit risk as a research topic. This growth reflects the subject's ongoing relevance and importance within the economic and financial fields, fueling both the demand for in-depth analysis and a heightened interest among researchers.

It is noteworthy that, at the beginning of the reference period, only one article was published on audit risk. By contrast, in 2024, the number of relevant publications has risen to over 60, highlighting a substantial increase in scholarly attention to this area.

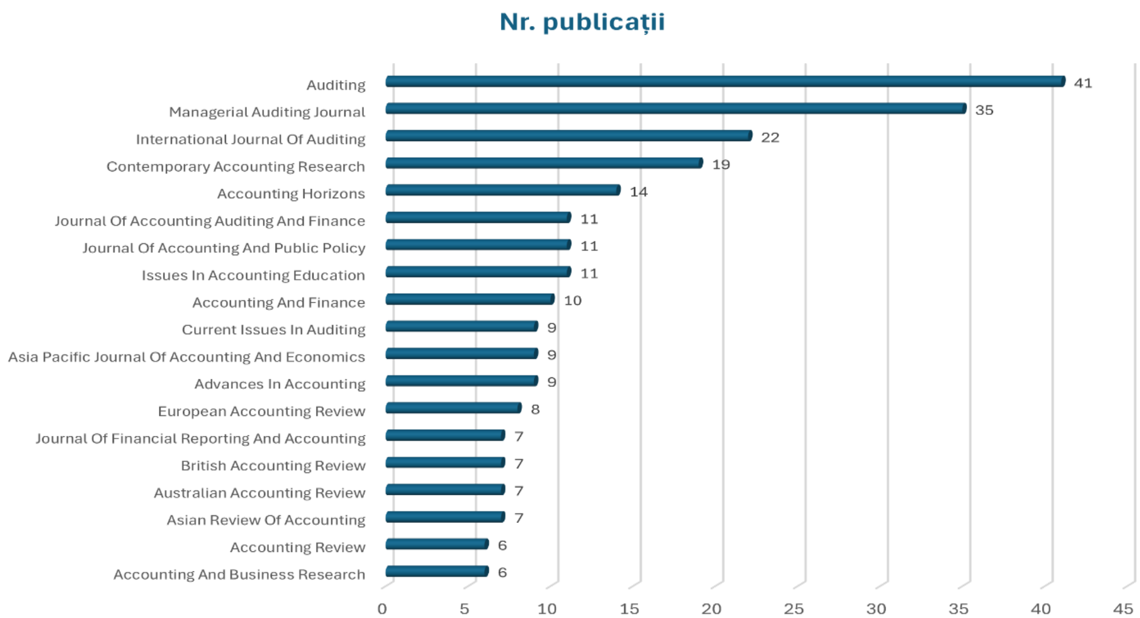
Figure no. 1. Number of articles published in the selected range



Source: author's projection

The initial part of the selected period shows an almost linear trend in publication volume, indicating minimal fluctuation and limited early interest in audit risk as a research topic. A noticeable increase begins around 1995, continuing into the 2000s – a time when the U.S. economy was affected by global financial crises in Mexico, Asia, Russia, and Argentina. This period also coincided with the technological boom, which introduced new challenges for auditors and contributed to a heightened focus on audit-related risks.

Figure no. 2. Journals in which articles on audit risk were published



Source: author's projection

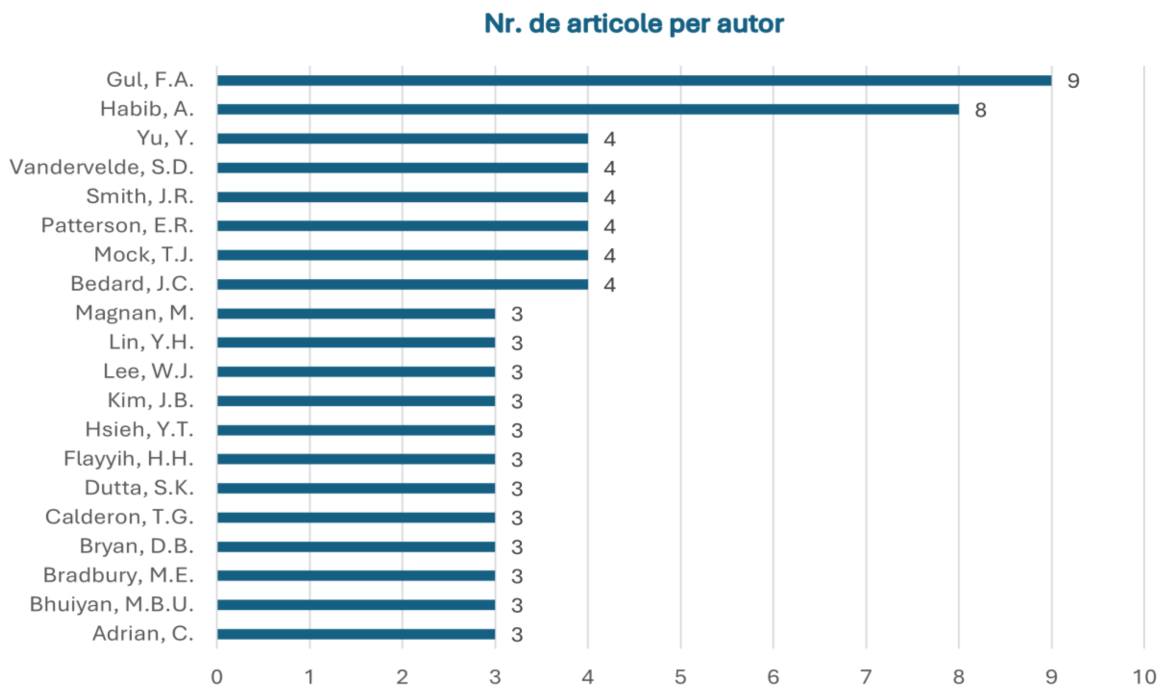
In the years leading up to the 2008 global financial crisis, the trend becomes relatively stable but slightly downward, corresponding to a pre-recession phase during which awareness of audit risk began to grow again.

In the years that followed, a generally upward trend is observed, with only minor fluctuations. This growth aligns with ongoing technological advancements and the increasing complexity of the global business environment. As such, the rising volume of publications confirms the growing attention of the academic community to audit risk, highlighting the continued relevance and importance of this field in contemporary research.

The bibliometric analysis of publications by journal reveals that most articles on audit risk are published in auditing-specific journals, as well as in journals focused on finance and accounting. The most prominent journals featuring audit risk research include *Auditing: A Journal of Practice & Theory*, *Managerial Auditing Journal* and the *International Journal of Auditing* – all of which specialize in auditing-related scholarship. In addition, journals such as *Contemporary Accounting Research*, *Accounting Horizons*, and the *Journal of Accounting*, *Auditing & Finance* also publish relevant articles, reflecting the intersection between auditing and broader accounting topics (**Figure no. 2**).

The most frequently represented journal is *Auditing: A Journal of Practice & Theory*, with 41 articles, followed closely by the *Managerial Auditing Journal*, which accounts for 35 articles.

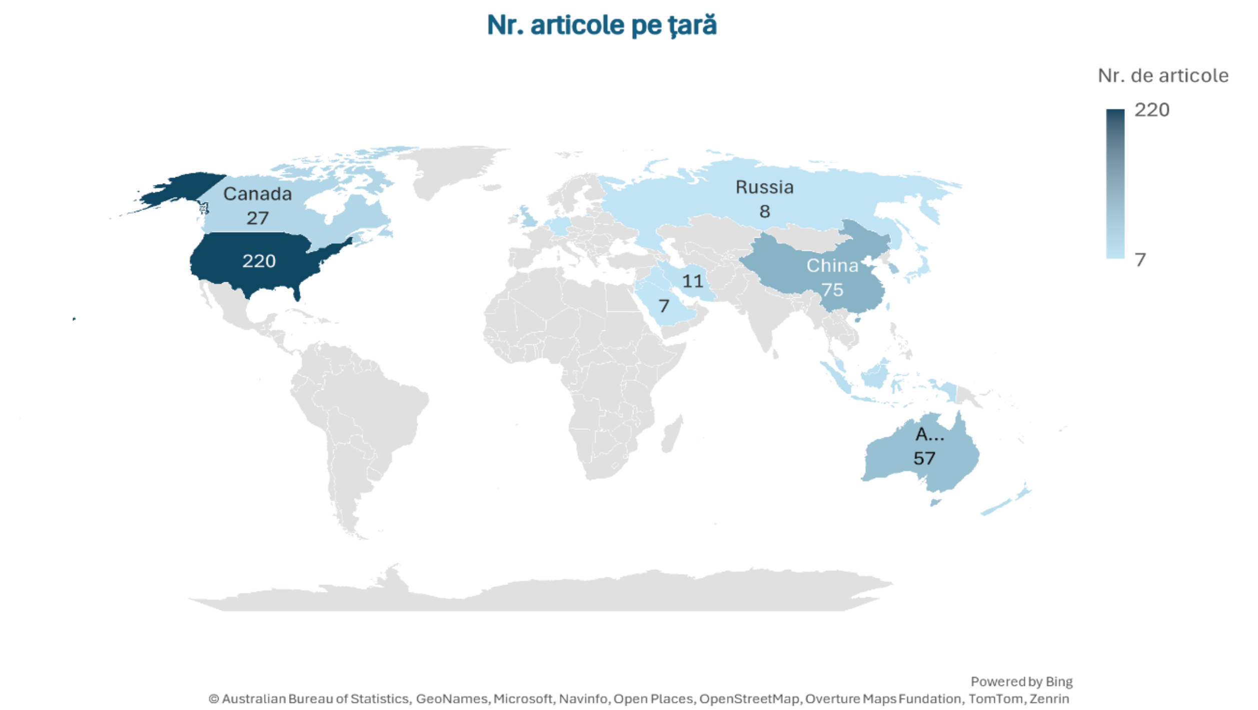
Figure no. 3. Authors who have published articles on the topic of risks



Source: author's projection

Figure no. 3 presents the authors who have published the most extensively on the topic of audit risk. The most prolific contributor is Gul, F.A., with 9 published articles, followed closely by Habib, A. A second tier of contributors includes six authors, each with four publications on the subject. Based on this data, and maintaining the same ranking order, it can be concluded that Gul, F.A. demonstrates the highest level of academic interest and output on audit risk.

Figure no. 4. Origin countries of journals featuring audit risk articles



Source: author's projection

Table no. 2. Most cited articles addressing audit risks

No. of documents	Article title	Author	Year of publication	Number of citations
1	Evidence on the audit risk model: Do auditors increase audit fees in the presence of internal control deficiencies?	Hogan CE; Wilkins MS	2008	411
2	The evolution of fraud theory	Dorminey J.; Scott Fleming A.; Kranacher M.-J.; Riley RA, Jr.	2012	256
3	Abnormal audit fees and restatements	Blankley AI; Hurtt DN; MacGregor JE	2012	235
4	Client-acceptance decisions: Simultaneous effects of client business risk, audit risk, auditor business risk, and risk adaptation	Johnstone, K.M.	2000	235
5	Audit firm portfolio management decisions	Johnstone Karla M.; Bedard, Jean C.	2004	186

No. of documents	Article title	Author	Year of publication	Number of citations
6	The audit risk model, business risk and audit-planning decisions	Krishnan G.; Visvanathan G.	1999	185
7	Internal control quality and audit pricing under the Sarbanes-Oxley Act	Hoitash R.; Hoitash U.; Bedard JC	2008	181
8	Do auditors value the audit committee's expertise? The case of accounting versus non-accounting financial experts	Krishnan G.; Visvanathan G.	2009	138
9	The effects of firm-initiated claw back provisions on earnings quality and auditor behavior	Chan LH; Chen KCW; Chen T.-Y.; Yu Y.	2012	138
10	Fear and risk in the audit process	Guénin-Paracini H.; Malsch B.; Paillé AM	2014	135

Source: author's projection

In terms of the country of origin of the journals analyzed (**Figure no. 4**), the majority of articles were published in the United States (220 articles), highlighting the strong interest of the American academic community in audit risk research. Following the U.S., the leading countries are China (75 articles), Australia (57 articles), South Korea (45 articles), and Canada (27 articles).

Within the European Union, the most prominent countries of origin for journals publishing on audit risk are the United Kingdom (28 articles), Germany (9 articles), and the Netherlands (7 articles). This geographic distribution of journal origins demonstrates notable diversity, underscoring the global significance of audit risk as a research topic.

Table no. 2 presents the articles with the highest number of citations according to the Scopus database. The article entitled "*Evidence on the Audit Risk Model: Do Auditors Increase Audit Fees in the Presence of Internal Control Deficiencies?*" stands out with the highest number of citations. It analyzes how audit firms respond to deficiencies in internal control systems, specifically investigating whether such deficiencies lead to increased audit fees.

Ranked second is "*The Evolution of Fraud Theory*", which examines the impact of disruptive technologies on audit risk levels – both within organizations and audit firms. Following this is "*Abnormal Audit Fees and Restatements*", which explores the relationship between audit fees and subsequent financial statement restatements in the years following the enactment of the Sarbanes-Oxley Act of 2002 (SOX).

The article *"Client-Acceptance Decisions: Simultaneous Effects of Client Business Risk, Audit Risk, Auditor Business Risk, and Risk Adaptation"* develops and tests a model that characterizes client acceptance as a process involving both risk assessment and adaptation. The model posits that auditors evaluate risks associated with client financial viability and internal control quality to estimate potential exposure to losses – whether from unprofitable engagements or future litigation.

This is followed by "*Audit Firm Portfolio Management Decisions*", which provides empirical evidence on client acceptance and retention strategies employed by a large audit firm, emphasizing the deliberate use of risk-avoidance techniques in portfolio management.

Additional influential works include "*The Audit Risk Model, Business Risk, and Audit-Planning Decisions*", which identifies the conditions under which the audit risk model does or does not explain investment and pricing decisions, and "*Internal Control Quality and Audit Pricing Under the Sarbanes-Oxley Act*", which builds on previous research by examining how internal control deficiencies influence audit pricing in the context of financial reporting.

Table no. 3. Word frequency

Word	Coincidence
Audit risk	214
Audit fees	153
Quality Audit	41
Corporate Governance	39
Audit fee	28
Audit Effort	27
Audit Pricing	25
Auditing	20
Risk Assessment	18
Audit Risk Model	18
Earnings Management	16
Audit Planning	16
auditor	16
Business Risk	15
Internal Control	13
Audit Committee	13

Source: author's projection

The final three articles in the ranking address themes related to audit fees in conjunction with various accounting concepts, as well as how perceptions of risk and auditor judgment interact in the audit process. Regarding the co-occurrence analysis presented in Table no. 3, five-word clusters were identified from the total set of keywords extracted after filtering the articles. The analysis was conducted using VOSviewer, which applies a minimum threshold of five occurrences per keyword, meaning that only terms appearing at least five times were included in the final analysis. Based on this criterion, a total of 49 keywords were identified, resulting in 694 co-occurrence links.

Each keyword cluster corresponds to one of the five identified thematic groups, representing distinct research directions within the audit risk framework. These word groups were constructed to facilitate analysis within the context of this study and will be examined both semantically and conceptually. Based on their content, a contextual interpretation of the conceptual approaches in the selected articles will be developed.

As shown in Figure no. 5, the five clusters are visually represented. For the purposes of analysis, the most frequently occurring and contextually relevant keywords from each group were selected and discussed.

Group 1: *Audit Risk and Fees* includes terms such as audit risk, audit fee, and global financial crisis, indicating a clear link between audit risk and financial aspects. An increase in audit risk often leads to higher audit costs for entities. Factors such as financial risk, tax avoidance, and political connections can influence the fees charged by auditors. Both inherent risk and control risk have been shown to positively affect audit fees (Xue & O'Sullivan, 2023).

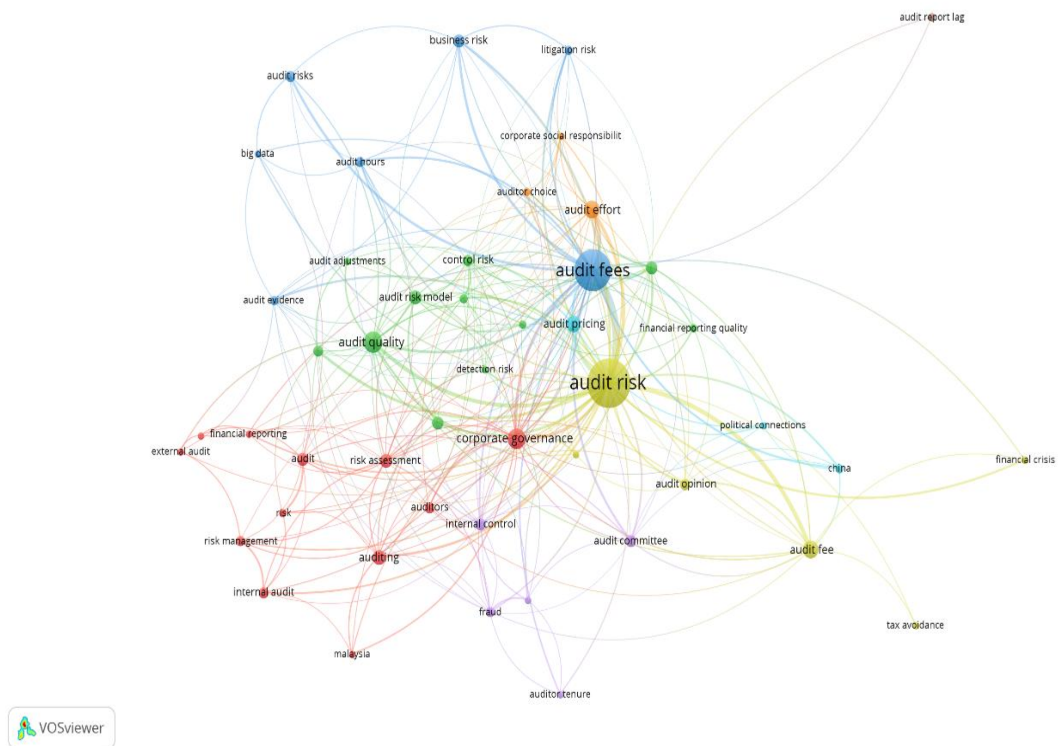
Group 2: *Audit Effort and Fees* focuses on the relationship between audit fees and the level of effort exerted by auditors, as well as the factors that influence the cost and workload of an audit engagement. Fees are affected by the complexity and risk associated with the audit and tend to increase proportionally with auditor effort. High-risk companies typically pay higher audit fees. For companies with litigation risk, auditor effort intensifies, while firms with strong corporate social responsibility (CSR) policies may incur lower audit fees.

Group 3: *Audit Quality and Financial Reporting* brings together two foundational components of a robust financial system. A high-quality audit enhances the credibility, transparency, and compliance of an organization's financial reporting with legal and accounting standards. Simultaneously, financial reporting serves as the primary means by which entities communicate their financial performance and position. The literature confirms a strong link between professional skepticism and audit quality; however, the association between audit planning and audit quality is less consistent, as outcomes are influenced by audit risk (Sujana & Dharmawan, 2023).

Group 4: Audit *and Corporate Governance* relates to both the audit process and the broader governance mechanisms that companies implement to enhance performance and ensure accountability. This includes the role of the board of directors, the integrity of financial statements, and the effectiveness of risk management systems. During client acceptance, auditors place significant emphasis on corporate governance factors, particularly in an international context (Cohen et al., 2002). Additionally, the literature highlights the importance of the audit committee as part of corporate governance, emphasizing its contribution to transparency and financial responsibility (CAFR, 2020).

Group 5: Fraud *and Internal Controls* includes two core concepts in risk management and organizational integrity. Internal controls consist of systems and procedures designed to safeguard assets, ensure operational integrity, and prevent fraud and error. Effective internal controls are essential for fraud detection and prevention, providing a framework that limits opportunities for undetectable misconduct. The Sarbanes-Oxley Act of 2002, which aimed to strengthen audit oversight and internal controls, succeeded in promoting stronger systems to reduce fraud risk. However, this does not necessarily imply a higher frequency of control testing (Patterson & Smith, 2007).

Figure no. 5. Coincidence of words and data groups



Source: author's projection

In the context of addressing fraud in auditing, **Table no. 4** presents the selected articles that, in addition to audit risk, also examine critical aspects of fraud and its impact on financial reporting.

The first three articles in **Table no. 4** address the impact of fraud risk on audit processes, particularly within the context of contemporary regulations such as the Sarbanes-Oxley Act (SOX), and the strategies auditors use to assess and manage such risks. These studies examine the role of auditing in detecting and preventing fraud, the regulatory influence of SOX on internal control testing and audit risk, and the effect of auditor tenure on audit strategy.

Dorminey et al. (2010) review and expand the Fraud Triangle model, a foundational tool in assessing fraud risks in audit practice. While the Fraud Triangle – comprising pressure, opportunity, and rationalization – remains central, it is viewed as only one component of a broader fraud risk assessment framework. In line with guidance from the AICPA and PCAOB (2010), the authors reaffirm that auditors have a clear responsibility to identify the risk of material misstatement due to fraud. Their proposed "meta-model of fraud" enhances the theoretical understanding of fraud motivation and strengthens auditors' ability to detect and respond to fraudulent behavior, drawing on recent academic contributions.

Table no. 4. Most cited articles addressing fraud risk				
No. of documents.	**Article title**	**Author**	**Year of publication**	**Number of citations**
1	The evolution of fraud theory	Dorminey J.; Scott Fleming A.; Kranacher M.-J.; Riley RA, Jr.	2012	260
2	The effects of Sarbanes-Oxley on auditing and internal control strength	Patterson ER; Smith JR	2007	52
3	The effects of auditor tenure on fraud and its detection	Patterson ER; Smith JR; Tiras SL	2019	27
4	The joint influence of the extent and nature of audit evidence, materiality thresholds, and misstatement type on achieved audit risk	Budescu DV; Peecher ME; Solomon I.	2012	25
5	Are auditors sensitive enough to fraud?	Makkawi B.; Schick A.	2003	18
6	Evidence of fraud, audit risk and audit liability regimes	Patterson E.; Wright D.	2003	17
7	Corporate employment, red flags, and audit effort	Cao J.; Luo X.; Zhang W.	2020	17
8	Satyam fraud: A case study of India's enron	Brown VL; Daugherty BE; Persellin JS	2014	13
9	"Problem" directors and audit fees	Habib A.; Bhuiyan MBU; Rahman A.	2019	11
10	Detecting asset misappropriation: A framework for external auditors	Kassem R.	2014	11

Source: author's projection

Patterson and Smith (2002) present a theoretical model analyzing the effects of SOX on audit intensity and internal control strength. Their findings suggest that while SOX successfully promoted stronger internal control systems and reduced fraud, it did not necessarily result in increased control testing. Interestingly, their research indicates that audit risk actually rose post-SOX due to the added complexity and volume of required control procedures, despite improvements in internal controls.

Patterson, Smith, and Tiras (2019) explore how auditor tenure influences audit strategy and managers' likelihood of committing fraud. While prior studies suggest longer tenure improves audit quality, critics argue it may impair auditor independence. This study finds that fraud risk – the likelihood that fraud exists and goes undetected – is lower when audits are performed by continuing auditors compared to newly appointed ones. This implies that auditor-client continuity enhances risk identification and fraud mitigation.

Budescu, Peecher, and Solomon (2012) challenge the assumption that expanding audit testing automatically reduces audit risk. Their study shows that under certain conditions, increased testing may even raise audit risk, highlighting the need for a more nuanced, contextdependent approach to audit planning. Understanding internal control quality not only improves audit integration but also helps form more accurate judgments regarding evidence reliability and the likelihood of being misled by client management.

In another study, Makkawi and Schick (2003) investigate how auditors adjust audit programs when faced with increased risk of financial fraud. Their findings indicate that auditors must re-evaluate audit procedures in high-fraud-risk situations, balancing audit efficiency and effectiveness. This underscores the importance of strategic responsiveness, especially during periods of economic or industry-specific volatility.

Patterson and Wright (2003) explore the effects of different legal liability regimes on fraud and audit risk. Their study suggests that a proportional liability system – which reduces auditors' marginal liability – can lower audit risk, but only when auditors invest sufficient effort. When auditors must also assess evidence quality, however, the benefits of such liability limitations diminish, illustrating the complexity of legal and strategic factors in audit decisions.

Cao et al. (2019) examine how abnormal employment changes can signal accounting irregularities and fraud. Their research reveals that sharp declines in hiring are correlated with a higher likelihood of financial restatements, irregularities, and litigation, all of which increase audit workload, audit fees, and delays in audit reporting. This highlights the importance of monitoring operational metrics as early fraud indicators.

Brown et al. (2014) focus on the challenges of auditing in a globalized environment, using the Satyam scandal as a case study. The authors emphasize the importance of collecting and validating audit evidence, particularly in confirming cash balances and receivables. The case raises broader issues of quality control and cultural differences, reinforcing the need for enhanced planning and fraud risk assessment in international audit settings.

In another study, Habib et al. (2019) explore the relationship between “problem directors” – individuals with questionable reputations serving on boards or audit committees – and audit fees. Their findings suggest that the presence of such directors leads to higher audit fees, as auditors perceive increased audit risk. The study underscores the need for organizations to carefully evaluate director appointments due to the associated implications for audit complexity and cost.

Kassem (2014) addresses a less frequently discussed fraud risk: “asset proximity” fraud. Focusing on the Egyptian context, the study proposes a framework for external auditors to better assess and respond to this specific risk area. Through a combination of questionnaires and semi-structured interviews, the research highlights the importance of identifying red flags and tailoring auditor responses to localized fraud risks.

Overall, the reviewed literature highlights the evolving challenges auditors face in managing fraud risk and financial irregularities. These studies emphasize the importance of context-aware risk assessments, strategic audit planning, and the incorporation of both operational and behavioral factors into audit procedures. As organizational structures and management behaviors evolve, auditors must adapt their strategies and pricing models to remain effective in identifying and mitigating risk.

Conclusions

The research findings confirm that audit risk remains a subject of significant interest among scholars in the field of economics. The existing literature presents a wide range of perspectives, from analyses of economic, social, and governance frameworks to issues related to the implementation or enhancement of corporate governance structures – particularly through the introduction of more robust internal controls to minimize risk and prevent fraud.

Furthermore, given the rapid evolution of technology, notable progress has been made in the audit process. Risk assessments are becoming more comprehensive, incorporating a wider range of factors about the audited entity and assisting auditors in efficiently gathering and analyzing data.

Audit risks have a direct impact on the quality and credibility of financial reporting. By managing these risks through appropriate strategies and methodologies, auditors play a crucial role in strengthening confidence in financial information. In light of increasing economic complexity and technological advancement, it is essential that audit practices continue to evolve to uphold high standards of transparency and compliance.

The literature confirms that the Fraud Triangle remains a foundational tool for assessing fraud risk. However, recent research calls for a deeper understanding of the motivations behind fraudulent behavior and how these evolve over time. The implementation of the Sarbanes-

Oxley Act (SOX) has improved internal control systems, yet it has also added complexity to the audit process, which may have increased overall audit risk compared to prior periods.

Studies examining auditor tenure suggest that long-term auditor-client relationships can enhance fraud detection and improve audit risk management, especially when compared to frequent auditor rotations, which may hinder continuity and institutional knowledge.

The body of research underscores the importance of dynamic and continuous fraud risk assessment, highlighting the influence of regulations, auditor-client relationships, and advancements in internal control testing techniques.

The bibliometric analysis also sheds light on major financial events that have spurred scholarly interest. The early 21st century saw a rise in economic scandals, which led to new regulatory standards for boards of directors and auditing firms. This was followed by the 2007–2008 global financial crisis, which catalyzed a surge in research focused on audit risk.

Given the ongoing changes in the global economy and rapid technological developments, the focus on audit risk analysis is expected to maintain its upward trajectory. Audit engagements are not linear processes with uniform outcomes; they are shaped by the auditor's expertise and the unique characteristics of each audited entity. Continued research and deeper investigation into audit risk can uncover methodological gaps and contribute to the refinement of audit practices.

This study also shows that audit risk research has a global reach. While the highest volume of publications originates from the United States, notable and diverse contributions are also observed across Asia and Europe.

One of the primary limitations of this research is that the bibliometric analysis relied on a single database (Scopus). Nevertheless, given the substantial number and relevance of the selected articles, this limitation is not deemed to have a significant impact on the validity of the findings.

Looking ahead, future research should continue to expand on audit risk assessment, especially in the context of financial instability, technological disruption, and geopolitical uncertainty, as these factors increasingly shape the modern audit landscape.

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Metamorphosis of Risks of Material Misstatement in Statutory Audit, from Identification to Canon, in the Context of Globalization

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Abstract

In a context marked by the intensification of concerns for sustainable practices and transparency in corporate communication, the analysis of the factors influencing companies' decision to publish sustainability reports becomes relevant. The study analyzes to what extent the organizational size, expressed by the number of employees, influences the probability that a company will prepare a sustainability report, in the context of the new reporting obligations introduced by the applicable European regulations from 2024. The analysis is based on a sample of the top 50 companies listed on the Bucharest Stock Exchange, providing a relevant perspective on their degree of compliance with the requirements imposed on companies with more than 500 employees. Also, a complementary direction of the research aims to identify a possible association between the sector of activity and the presence of sustainability reports in 2023, an analysis carried out by applying the Chi-square statistical test.

The authors focus their analysis on a period when sustainability reporting was not mandated by mandatory regulations, thus providing relevant context for investigating companies' voluntary behavior. The study compares companies that have chosen to publish sustainability reports with those that have not taken this step, aiming to identify the motivations and internal factors that influence the adoption of these practices. The results provide valuable insights into how organisations react in the absence of legislative pressures, contributing to understanding the mechanisms underpinning the transition to more transparent and accountable sustainable reporting.

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The study shows that large firms, especially those in sectors exposed to ESG risks, are more inclined to adopt sustainable reporting practices. It is also noted that Romania registers a growing interest in sustainability, reflected in the increase in the number of published reports, although this trend remains uneven.

The paper is relevant both for researchers, providing an up-to-date empirical basis for exploring the phenomenon of non-financial reporting in Eastern Europe and for practitioners, providing useful benchmarks in the development of ESG compliance strategies.

Key words: *ESG (Environmental, Social, Governance); sustainability report; Bucharest Stock Exchange; transparency; non-financial performance; internal factors; globalization;*

JEL Classification: *M42, M48*

Introduction

Economic globalization and the increasing complexity of the business environment have brought significant changes in the field of statutory audit. This article explores the metamorphosis of risks of material misstatement, from their identification to their implementation as standards (canon) within audit processes. Their applicability in practice will be a canon for audit firms both technically and financially.

The challenges associated with globalization, emerging technologies and the pressures of international regulations are analyzed, providing a comprehensive perspective on the adaptation of auditors to an ever-changing environment. The research addresses the topic of risks of material misstatement in statutory audit, given the impact of globalization and developments in ESG (Environmental, Social, and Governance).

Convergence between regulatory structures can serve the interests of global investment decision-making. However, it may also be important to raise the question of whether statutory audit regulation is in fact effective in protecting the broader public interest (C. Richard Baker, Jean Bédard, Christian Prat dit Hauret, 2014).

While sustainability reporting remains a voluntary act in the United States, the European Union has mandated that publicly traded companies, financial institutions, and public-interest entities comply with non-financial reporting standards (Stephen N. Hamilton and Richard D. Waters, 2022).

According to national and European law, certain large entities must meet non-financial reporting requirements, including information related to their environmental impact, human rights and corporate governance. "We are witnessing a profound change in the corporate reporting landscape, with ESG reporting evolving from a niche segment to a new valence, in which sustainability aspects are measured and reported with the same rigor as financial information. The independent assurance report issued by the financial auditor on sustainability reporting plays an essential role in building confidence on the robustness of non-financial information" (KPMG Romania).

Literature review

Sustainability reports play an increasingly important role in managing risks of material misstatement in audit, as they provide essential information about an entity's performance in areas that are not necessarily reflected in traditional financial statements, but which can have a material impact on the entity's risks and financial image. In the context of auditing, they can influence the identification and assessment of risks of material misstatement, and auditors need to integrate them into their audit process to get a full picture of the risks.

The importance of the sustainability report stems from the need for transparency and accountability towards stakeholders, including investors, customers, employees and local communities. The principles that underpin an effective sustainability report include integrity, accuracy, comparability and clarity (Rusu, T.M.; Odagiu, A.; Pop, H.; Paulette, L., 2024).

In Romania the legislative framework on sustainability ("ESG reporting") is represented by the Order of the Minister of Finance no. 85/2024 for the regulation of sustainability reporting aspects which entered into force in 2024 and partially transposes into national law Directive (EU) 2022/2464 of the European Parliament and of the

Council with regard to corporate sustainability reporting (CSRD Directive – Corporate Sustainability Reporting Directive).

Rule no. 4 of the FSA requires listed companies, except for micro-entities, to include in the directors' report information on the impact of the activity on sustainability, as well as the way in which sustainability aspects influence the performance and evolution of the company. The NBR issued Order no. 1/2024 which establishes the reporting requirements for credit institutions and insurance companies.

Romania is among the few countries in Europe that have a Sustainability Code.

The new sustainability reporting rules will start to apply gradually between 2024 and 2028, as follows:

- From January 1, 2024, for public interest companies with more than 500 employees, the reports being issued in 2025;
- From January 1, 2025, for large companies (exceeding two of the size criteria: over 250 employees and/or 40 million euros turnover and/or 20 million euros total assets), the reports being issued in 2026;
- From January 1, 2026, for listed SMEs, the reports being issued in 2027 (KPMG, 2024).

Statutory audit is an essential component of the global financial system, with the role of ensuring transparency and credibility of financial information. In a globalised context, auditors face increasingly complex risks of material misstatement, influenced by factors such as digitalisation, the diversity of national regulations and cross-border economic interactions.

In Romania, statutory auditing is regulated by a legislative framework that ensures compliance with European Union directives and regulations, adapting them to national specificity. Law no. 162/2017 on the statutory audit of the annual financial statements and the consolidated annual financial statements establishes the main rules in this area.

At the level of a regulated capital market, the reporting of a complete set of financial statements that include quality financial information is the desire of the main users for the purpose of making strategic or operational decisions (Grosu, M., Robu, I-B., Istrate, C., 2020).

The public interest role of statutory audit means that a broad community of individuals and institutions relies on the quality of the work of a statutory auditor or audit firm. A good quality audit contributes to the orderly functioning of markets by improving the integrity and efficiency of financial statements. As such, statutory auditors perform a particularly important social function (European Parliament, Council of the European Union, 2014).

The statutory audit is an important legal tool for controlling the legality of a company's registrations. The fundamental purpose of a statutory audit is to ensure objective, impartial, and expert oversight of the company's operations and its management to determine whether the company's operations were in compliance with the company's law, bylaws, and other acts (Aksamovic, Dubravka, 2024).

Methodology

Until 2024 Romanian legislation has not imposed a legal obligation on the submission of sustainability reports, leaving it up to companies to adopt such practices.

Analyzing the behavior of large companies in relation to sustainability reporting provides valuable insights into the relationship between organizational size and commitment to transparency. Sustainability reporting helps to identify and manage risks, both for companies and stakeholders, and for the general public, it increases confidence that companies comply with ethical, social and environmental principles, and for investors the reports reduce the risks of misrepresentation of financial and non-financial information. In the absence of a sustainability report, certain environmental, social or governance risks may not be reported or even underestimated. Example: Checking a company's carbon footprint can show the real level of engagement in the green transition.

The metamorphosis of risks of material misstatement involves an essential process within the audit, which starts with identifying them and continues with the implementation of appropriate standards to manage them effectively. This transformation represents a complex and strategic approach, with significant technical and financial implications for companies. As globalization continues to redefine the business environment, firms are facing new and diverse risks, which raises the question: is sustainability reporting an effective way to manage these risks?

Sustainability reporting facilitates effective risk management, starting with risk identification. The increase in international interdependencies amplifies vulnerabilities related to supply and logistics, the environmental impact can influence the operations and reputation of companies, adapting to international standards and legislation imposes new compliance requirements.

The sustainability report allows companies to identify and monitor these risks, providing a structured framework for collecting and analysing relevant data. For example, indicators such as greenhouse gas emissions (GHG Scope 1, 2 and 3) or renewable energy consumption can be used to assess environmental performance.

GHG Scope 1 includes direct emissions resulting from the company's activities, such as burning fuels in its own equipment.

GHG Scope 2 refers to indirect emissions from the consumption of electricity, heat or steam purchased.

GHG Scope 3 encompasses other indirect emissions in the value chain, such as transport or product use. Also, the consumption of energy from renewable sources is measured as a percentage of the total energy used, providing a clear perspective on the transition to sustainability.

The sustainability report is not only a transparency tool, but also a strategic mechanism for managing the risks generated by globalization. By adopting international standards and adapting to the demands of the global environment, firms can proactively address risks, thus ensuring long-term stability and growth.

Observing and analyzing the behavior of companies in Romania regarding sustainability reporting are essential for understanding their degree of preparedness in adopting responsible practices. In addition, promoting sustainability reporting, even in the absence of legal obligation, offers significant benefits both at the organizational level and for the Romanian economy and society. This practice contributes to the creation of a more responsible business environment, capable of meeting global demands and supporting the transition to a sustainable future.

It is interesting to note to what extent the number of employees of a company influences the probability that a company will submit the sustainability report, using as a case study the top 50 companies listed on the Bucharest Stock Exchange.

In particular, the research focuses on the period leading up to 2024, when sustainability reporting regulations were not yet mandatory. This period provides relevant context to understand factors such as corporate voluntarism and the social or economic pressures that drive the adoption of such initiatives. Data on the size of companies, measured by the number of employees, and the comparative analysis between companies that have submitted and those that have not submitted the sustainability report will be used to identify behavioral patterns and possible motivations.

Through this approach the study contributes to the literature on sustainability reporting, bringing empirical evidence on the influence of the organizational dimension on the adoption of this practice. The results obtained can provide valuable information for policymakers, private sector managers and researchers interested in corporate sustainability.

The sustainability report plays a key role in the audit process, contributing to a clearer and more detailed assessment of the organization's performance. The report provides auditors with an in-depth understanding of the environmental, social and governance (ESG) risks associated with the firm's business. The sustainability report helps to assess the correlation between financial performance and sustainability. For example, reducing costs through energy efficiency or resource management. The auditors verify the correctness and transparency of the information in the report, assuring the public and investors that the data is accurate and complete, this facilitates the identification of areas of vulnerability and possible opportunities for improvement.

A thorough understanding of environmental, social and governance (ESG) risks is essential for companies, investors and other stakeholders, having a direct impact on long-term sustainability and financial performance (**Chart no. 1**).

These risks refer to the critical aspects that can affect organizations in various and complex ways.

1. **Environmental risks (E - Environmental):** refers to the impact of the company's activities on the environment, as well as how environmental changes affect the company.

   Examples: climate change, natural resources, environmental regulations, biodiversity degradation, etc.

   A robust environmental risk assessment helps companies develop mitigation strategies, such as investing in green technologies or adopting the circular economy.

Chart no. 1. ESG risks

Source: authors' processing

2. **Social Risks (S – Social):** These focus on the company's relationships with employees, communities, customers, and other stakeholders.

   Examples: employee rights, community relations, health and safety, diversity and inclusion.

   Responsible management of social risks can improve the company's reputation, boost customer loyalty and attract quality workforce.

3. **Governance (G) risks refer to the way an organization is run and managed, with transparency, ethics and accountability in mind**.

   Examples: corruption and fraud, transparency, governance structure.

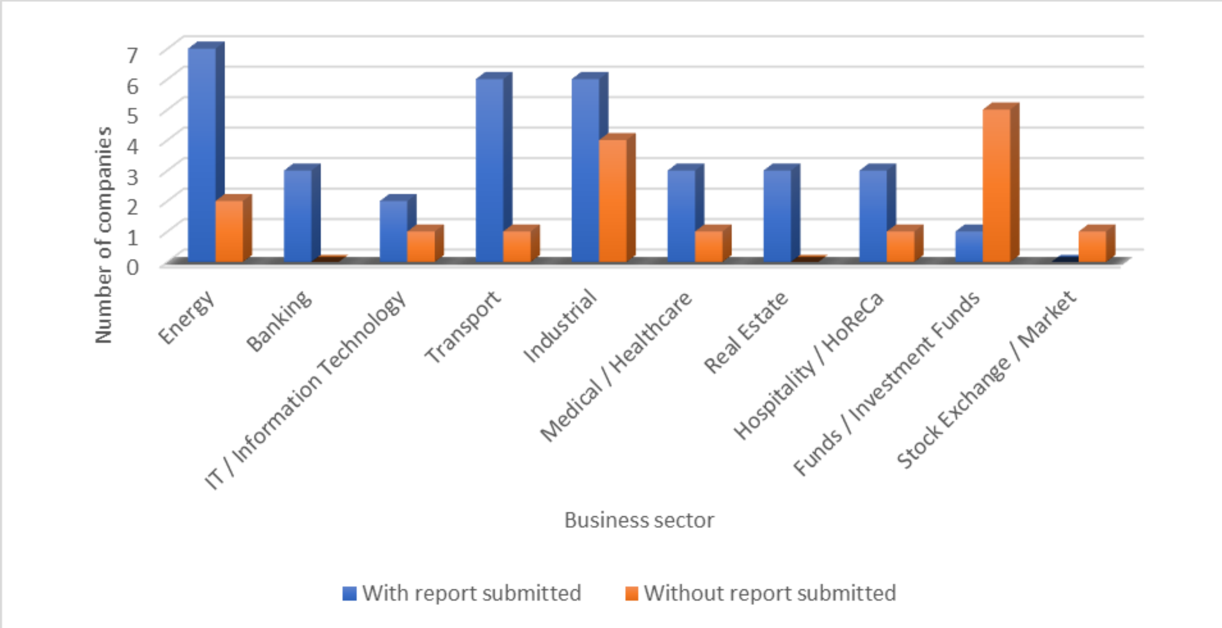
Failure to comply with local or international regulations can expose the organization to penalties and reputational losses.

We analyzed the top 50 companies listed on the BVB on the regulated market, in order of capitalization. The data was collected from the official websites of the companies (sustainability reports), the BVB website, the Trade Register (number of employees).

This last criterion was essential in the context of the new European requirements on sustainability reporting: as of January 1, 2024, public-interest companies with more than 500 employees are required to publish such reports, starting with the 2025 financial year. Therefore, the inclusion of this indicator allowed us to more accurately assess the compliance and readiness of the entities concerned in relation to the new regulations.

1. The objective of the research: to analyze the relationship between the sector of activity of companies and the existence of sustainability reports in 2023, using the Chi-square test.
2. Data collection: the data was taken from an excel file, containing information about the companies, the sector of activity, the existence of sustainability reports and the number of employees.
3. Quantitative analysis: creating a contingency table between the sector of activity and the existence of sustainability reports. Application of the Chi-square test to determine if there is a statistically significant association between the two variables.
4. Interpretation of results: evaluation of observed and expected frequencies to identify specific patterns, as well as interpretation of the p-value to establish statistical significance.

Chart no. 2. Distribution of the existence of sustainability reports by sectors of activity



Source: authors' processing based on data collected from www.bvb.ro

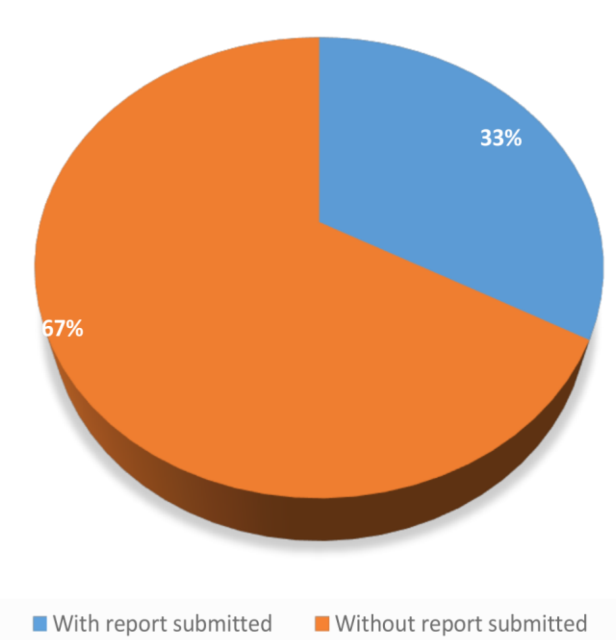
Chart no. 2 shows how companies in different sectors of activity, listed on the Bucharest Stock Exchange, were involved in sustainability reporting in 2023.

The data show that the ENERGY sector stands out for the highest number of companies that publish sustainability reports (7 companies), reflecting both the pressure of regulations in the field and the high exposure to environmental, social and governance risks. Also, the BANKING and TRANSPORT sectors register high reporting rates (over 75%), signaling an increased concern for transparency and compliance with ESG standards.

On the other hand, the BURSA and FUNDS sectors have a low number of companies reporting, and the BURSA sector did not register any companies with a published report, which may indicate a lack of prioritisation of reporting in these areas or a reduced perception of the relevance of sustainability for their respective activities.

This unequal distribution highlights the differences in ESG maturity and engagement between sectors, highlighting the need for incentives, legislative clarifications or support for less active sectors, so that reporting becomes a standardised and relevant practice across the market (**Chart no. 2**).

Chart no. 3. Proportion of reporting listed companies vs. non-reporting companies (2023)

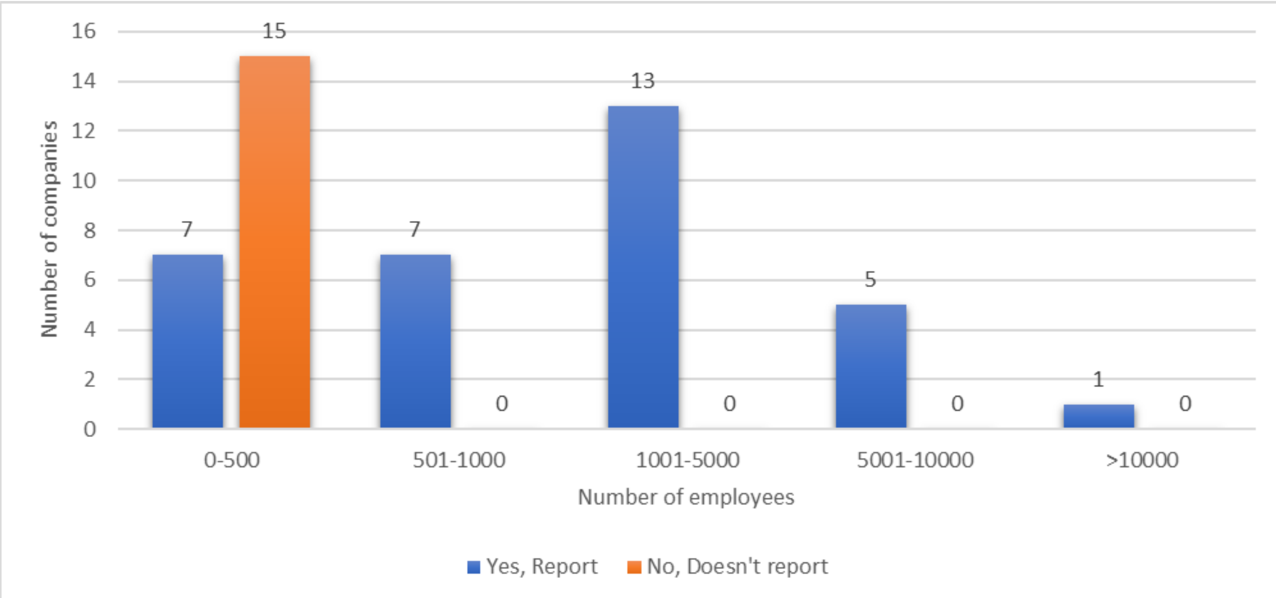


Source: authors' processing, based on data collected from www.bvb.ro

Chart no. 3 highlights the fact that in 2023 approximately 67% of companies listed on the Bucharest Stock Exchange (BVB) chose to publish sustainability reports, while 33% did not.

This distribution reveals a clear trend of increasing transparency among companies, reflecting a progressive adaptation to the requirements of the market, investors and the European legislative framework on sustainable development (**Chart no. 3**).

Chart no. 4. Sustainability reporting by average number of employees: reporting vs. non-reporting companies (2023)



Source: authors' processing, based on data collected from www.bvb.ro

Chart no. 4 highlights a significant difference between companies that report sustainability and those that do not, depending on the average number of employees. According to the data, companies that publish sustainability reports have on average a much higher number of employees, which suggests that the size of the company is a determining factor in the adoption of non-financial reporting.

This trend is correlated with European and national regulations in the field, in particular with the entry into force, starting with 2024, of the new sustainability reporting requirements for companies with more than 500 employees, according to the CSRD (Corporate Sustainability Reporting Directive). Thus, large companies are either already subject to these obligations or are actively preparing to comply, which partly explains the high level of reporting among them.

On the other hand, firms with a smaller number of employees – often in the SME category – are less represented in the reporting area, either due to a lack of legal obligations to date, or due to limited resources or a lower level of awareness (**Chart no. 4**).

Results and discussions

The Chi-square test is used to check if there is a statistically significant association between two categorical variables. In this case, the variables analyzed are:

a) **Existence of the sustainability report (2023):** Categorical variable with two values: "Yes" and "No".

b) **Number of employees (grouped into categories):** Categorical variable divided into employee ranges:

- 0-500
- 501-1000
- 1001-5000
- 5001-10000
- >10000

1. Data preparation

- The data in the column (number of employees) has been divided into **categories** to turn this numeric variable into a categorical one.
- A contingency table **has been created** showing the frequencies of each combination of the two variables. The table shows, for example, how many companies that report sustainability have between 0-500 employees and how many do not (**Table no. 1**).

Table no. 1. Contingency table

Employee category	Yes (Report)	Not (Does not report)
0-500	7	15
501-1000	7	0
1001-5000	13	0
5001-10000	5	0
>10000	1	0

Source: authors' processing, based on data collected from www.bvb.ro

2. Expected frequencies (Eij)

For each cell in the table, the expected frequencies (Eij) are calculated as follows:

$$Eij = \frac{(\text{Row Sum i})x\ (Column\ Sum\ j)}{\text{Total Observations}}$$

Total observations: Total amount = 48

Amounts per row:

"Yes" (Report): 7+7+13+5+1 = 33

"No" (Does not report): 15+0+0+0+0=15

Amounts per column (Categories of employees):

- 0−500 → 7+15=22
- 501−1000 → 7+0=7
- 1001−5000 → 13 +0=13
- 5001−10000 → 5+0=5
- >10000 → 1+0=1

Now we calculate each Eij:

For cell $E_{Yes,0\text{-}500} = \frac{33x22}{48}$=15.13

For cell $E_{No,0\text{-}500} = \frac{15x22}{48}$=6.88

We continue this process for all cells. The results can be found in **Table no. 2**.

Table no. 2. Expected frequencies obtained

Employee category	Yes (Expected)	No (Expected)
0-500	15.13	6.88
501-1000	4.81	2.19
1001-5000	8.94	4.06
5001-10000	3.44	1.56
>10000	0.69	0.31

Source: authors' processing based on data collected from www.bvb.ro

3. Calculating the Chi-square value

The formula for the Chi-square value is:

$$x^2 = \sum \frac{(\text{Oij} - \text{Eij})^2}{Eij}$$

For each cell, we calculate:

- Oij: the observed frequency,
- Eij: the expected frequency.
- Formula: $(Oij - Eij)^2/Eij$

Example for *Yes,0-500:*

$x^2_{Yes,0\text{-}500} = \frac{(7-15{,}13)^2}{15{,}13} = \frac{(-8{,}13)^2}{15{,}13} = \frac{66{,}09}{15{,}13}$ = 4,37

Repeat for all cells and sum the values:

x^2 = 4.37 +.....= 25.79

4. Degrees of Freedom (DOF):

DOF = (Number of rows - 1) x (Number of columns - 1)

Number of rows: 2 (Yes, No)

Number of columns: 5 (Employee categories)

DOF = (2-1) x (5-1) = 4

5. P-Value

Using the value x^2 = 25.79 and DOF = 4, the p-value is determined from a Chi-square table or with a statistical function.

D=3.5 x 10^{-5}

6. Interpretation

- **x^2=25.79:** The statistics indicate a significant difference between the observations and the expected frequencies.
- **p-value = 3.5 x** 10^{-5}**:** Being well below the threshold of 0.05, the results are statistically significant.
- **DOF =4:** Reflects the complexity of the contingency table.

Conclusions

The distribution of sustainability reports by sector is not significantly different from a random distribution. However, certain sectors such as ENERGY and TRANSPORT seem to have a greater involvement in reporting, while others, such as BURSA and FUNDS, are less involved.

A positive trend in sustainability reporting, most sectors demonstrate an increased commitment to reporting.

Clear sectorization: sectors such as ENERGY and TRANSPORT are leaders in reporting, while sectors such as BURSA and FUNDS lag behind.

Correlation with the size of the organization: There is a link between the size of the company (measured by the number of employees) and the probability of publishing reports.

These observations could guide policies or initiatives that encourage sustainability reporting in less involved sectors.

Conclusions on the application of the Chi-square test

1) **There is a statistically significant association between the number of employees and sustainability reporting:**
    - The p-value (3.5×10^{-5}) is well below the standard significance threshold (0.05). This indicates that the variable "number of employees" significantly influences the likelihood that a company will report sustainability.
2) **Companies with a large number of employees are more likely to report sustainability:**
    - In the 501-1000, 1001-5000, 5001-10000 and >10000 categories, all companies reported sustainability.
    - The 0-500 employee category is the only one where most companies did not report (15 out of 22).
3) **According to the expected frequencies:**
    - Small companies (0-500 employees) should have reported more often according to the general distribution, but they did not.
    - Larger companies significantly exceeded reporting expectations.
4) **Practical involvement of results:**
    - Large companies may have more resources (financial, human) to prepare sustainability reports.
    - Small firms may require additional support to comply with future reporting regulations, especially in the context of the legal obligation that will apply from 2024.
5) **Limitations of the analysis:**
    - The contingency table includes a few cells with low expected frequencies (<5), which may affect the validity of the Chi-square test.
    - The sample includes only the top 50 listed companies, which limits generalization to other organizations.

The study highlights a growing interest in sustainability reporting among Romanian companies, especially large, listed ones. This positive trend is encouraging and aligns with the pressures exerted by investors, business partners and recent European regulations, particularly the CSRD (Corporate Sustainability Reporting Directive), applicable from 2024 to companies with more than 500 employees.

However, the distribution of sustainable reporting remains uneven. Sectors such as ENERGY and TRANSPORT demonstrate greater involvement in reporting, while others – such as STOCK EXCHANGE and FUNDS – are significantly less active. In addition, the analysis highlights a statistically significant association between the size of the company and the probability of reporting, which suggests that large companies have more resources (financial, human, technical) necessary for compliance. Small companies, on the other hand, require additional support to meet the new requirements, including methodological assistance and accessible digital infrastructure.

The limitations of the research include the small sample size – only 50 companies listed on the Bucharest Stock Exchange being analyzed – and the presence of low frequencies in the contingency table, which may affect the robustness of the Chi-square test. Also, the exclusive focus on the Romanian market limits the degree of generalization of conclusions at regional or international level.

Directions for future research aims to expand the database at European level, by including companies listed on other EU stock exchanges, in order to carry out a comparative analysis on the adoption of sustainable reporting.

In conclusion, sustainable reporting is becoming an essential tool for transparency and governance in the Romanian economy. The transition to a responsible economy, aligned with the principles of sustainable development, depends not only on legal obligations, but also on building an organizational culture oriented towards responsibility, performance and trust.

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