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# Sustainability Reporting and Assurance: A New Challenge for the Audit Profession in Europe

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## Abstract

*This study investigates the familiarity of auditors with sustainability reporting and assurance concepts across different sizes of audit firms in Europe. Utilizing extensive literature and quantitative surveys deployed at auditors and audit firms in Europe, the research reveals that auditors associated with international audit networks and larger audit firms demonstrate a greater familiarity with sustainability reporting and assurance concepts and practices compared to auditors associated with smaller, local audit firms. The findings suggest that this familiarity gap stems from the predominant involvement of larger audit firms in providing sustainability reporting services and assurance for their clients. To narrow this familiarity gap, the study proposes collaborative efforts involving academia and professional audit associations to deliver training on sustainability reporting and assurance concepts and practices. Recognizing auditor proficiency and knowledge as crucial factors in ensuring the quality of assurance services in this domain, the study emphasizes the importance of enhancing external auditors' competencies in sustainability reporting and assurance. Furthermore, the study advocates for the implementation of stringent regulations by national authorities to secure the market for sustainability reporting and assurance, aligning with previous scholarly calls for clearer regulatory frameworks in this sphere. However, the study underscores the need for further research to assess the impact of such regulations on the professional market for sustainability reporting and assurance.*

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### **Implications for the European audience:**

*For the European audience, the study underscores the significance of collaborative training initiatives led by academia and professional audit associations to equip external auditors with the requisite skills necessary for delivering assurance services on sustainability reporting of satisfactory quality. The study recommends the adoption of stringent regulatory frameworks to safeguard the sustainability reporting and assurance market. These measures are essential for ensuring credibility and reliability in sustainability reporting practices.*

**Key words:** audit profession; sustainability assurance; sustainability reporting;

**JEL Classification:** Q56, M49

## **1. Introduction**

Over the last decade, sustainability in business activities has garnered significant attention in scholarly discourse. In this context, organizational business models are evolving to include sustainability issues, addressing stakeholder needs for comprehensive and reliable non-financial disclosures to enable informed economic decision-making. Benvenuto et al. (2023) highlighted the growing importance of incorporating sustainability reporting into corporate strategies, driven by entrepreneurial and institutional factors, with organizations aiming to provide stakeholders with a transparent and reliable perception of the sustainability of their business models. Their study underscored the potential of sustainability reporting to bridge the gap between financial and non-financial reporting, enhancing internal and external communication while recognizing the need for further research on the quality of sustainability reporting and addressing concerns like “greenwashing” (Benvenuto et al., 2023).

However, within the European context, the importance of credibility, transparency, and standardization in reporting, both in financial and non-financial disclosures, was recognized much earlier. On 26<sup>th</sup> June 2013, the European Parliament and European Council enacted Directive 2013/34/EU, focusing on the annual financial statements, consolidated financial statements, and associated reports of specific organizations, such as banks, insurance and reinsurance undertakings, listed companies and large organizations. This Directive

recognized the multifaceted objectives of annual financial statements within European Union (EU) organizations, emphasizing their role in not only providing information for capital market investors but also in documenting past transactions and strengthening corporate governance. Its primary objective was to standardize accounting practices across EU member states, thereby facilitating comparability between disclosed financial and non-financial data and information among organizations operating within the EU common market.

Convergence in sustainability reporting is limited in the short term due to several factors, such as the heterogeneity of sustainability concepts and definitions, the large number of organizations involved in sustainability reporting standard-setting, diverse reporting requirements among standard setters, and varying objectives of these standard-setting organizations (Stolowy and Paugam, 2023), which introduces the need for regulatory frameworks to enhance consistency in financial and non-financial reporting. Hence, without policy intervention, the disparity between the information requirements of users and organizational sustainability disclosures was projected to widen (De Villiers et al., 2014). Moreover, the lack of reliable sustainability data and information impairs the ability of stakeholders to hold organizations accountable for their impacts on society and the environment, creating an accountability deficit and potentially eroding stakeholder trust in businesses (Mohammed, 2013).

To further strengthen consistency and comparability in disclosed non-financial data and information throughout the EU, on 15<sup>th</sup> November 2015, the European Parliament and European Council enacted Directive 2014/95/EU, amending Directive 2013/34/EU relating to the disclosure of non-financial data and information by specific organizations and groups, including banks, insurance and reinsurance undertakings, large organizations, and large listed entities (European Parliament, 2014). Under this Directive, these organizations must produce non-financial disclosures encompassing information on environmental, societal, and employee-related matters, human rights, as well as anti-corruption and bribery issues. Affected organizations were required to describe their policies, outcomes, and risks related to these issues. Additionally, this Directive required affected organizations to provide information about their due diligence processes, including over their supply and subcontracting chains, aimed at identifying, preventing, and mitigating existing and potential adverse impacts.

The lack of universally accepted metrics and methods for assessing sustainability-related risks obstructs organizational efforts to ensure the sustainability of their business models and activities (Mähönen, 2020). Moreover, the inadequacy of sustainability data and information limits stakeholders, including civil society actors and trade unions, from engaging in meaningful dialogues with organizations on sustainability matters (Mähönen, 2020). The European Commission recognized that this gap carries significant adverse ramifications, including the inability of investors to adequately consider sustainability-related risks and opportunities in their investment decisions (European Commission, 2018). Furthermore, EU policymakers recognized the inability to direct financial resources towards sustainable endeavors undermines the objectives of initiatives like the European Green Deal (European Commission, 2019), the Action Plan on Financing Sustainable Growth (European Commission, 2018), and the Paris Agreement (European Commission, 2019).

To narrow these gaps, on 16<sup>th</sup> December 2022 the European Parliament and European Council enacted Directive (EU) 2022/2464 relating to sustainability reporting and assurance, aimed at enhancing the transparency and accountability of affected organizations' sustainability-related disclosures (European Parliament, 2022). This Directive amended Directive 2013/34/EU (the so-called "accounting directive"), Directive 2004/109/EC (the so-called "transparency directive"), Directive 2006/43/EU (the so-called "statutory audit directive"), and Regulation No. 537/2014 (the so-called "regulation for statutory audits on public interest entities").

Directive (EU) 2022/2464 revised and strengthened the reporting requirements over sustainability matters for organizations subjected to mandatory non-financial reporting under Directive 2014/95/EU (the so-called "non-financial reporting directive"). In addition, Directive (EU) 2022/2464 incorporates the key elements of the European Green Deal, aimed at elevating sustainability reporting obligations for affected organizations operating in the EU to the same declarative legal level as mandatory financial reporting obligations. EU member states were obliged to transpose Directive (EU) 2022/2464 into their national legal systems by 6<sup>th</sup> July 2023 (European Parliament, 2022).

Elaiwu et al. (2024) suggest that corporate integrity and external assurance significantly enhance sustainability reporting quality, despite sustainability disclosures

remaining predominantly qualitative. Further, as Elaiwu et al. (2024) conclude, this enhancement in sustainability reporting quality may be achieved through regulatory changes. In addition, Liu et al. (2023) found that external corporate governance beneficially impacts an organization's assurance choices, enhanced by strong financial performance, effective internal controls, and adequate government subsidies. Ultimately, Alshali et al. (2024) explain that although sustainability reports help organizations build legitimacy, sustainability reporting assurance instills trust in the financial and non-financial performance data disclosed relating to effective sustainability risk management. As Alshali et al. (2024) postulate, certain features of the board of directors, such as board size, how often they meet, whether the roles of chief executive officer and chair are separate, the number of women on the board, and having a sustainability committee, affect the choice of sustainability reporting assurance providers. Moreover, the relationship between the choice of assurance provider and the board's ability to monitor the organization's sustainability reporting varies according to the sustainability context, which may challenge the legitimacy of adopted sustainable business models (Alshali et al., 2024).

Under Directive (EU) 2022/2464, all public interest entities, large business and medium-sized listed entities in the EU, as well as subsidiaries and branches of non-EU organizations operating within the EU, which may be classified as public interest entities, large organizations, large listed entities or medium-sized listed entities, are subject to mandatory sustainability reporting (European Parliament, 2022). Further, sustainability reports issued by these entities must be "reviewed" by a "competent" external auditor (i.e. registered audit firm) or another competent "provider" of assurance on sustainability reporting matters (European Parliament, 2022). Currently, affected organizations operating in the EU have the option to choose between registered audit firms, or other competent providers of sustainability reporting assurance services, to "review" their sustainability report and provide "limited" assurance on presented sustainability data and information. Affected organizations must report on three sustainability dimensions, namely (European Parliament, 2022):

- Environmental;
- Social responsibility and human rights; and
- Corporate governance.

Since diverse sustainability reporting standard-setters affect the quality of non-financial reporting (Stolowy and Paugam, 2023), Directive (EU) 2022/2464 requires affected organizations to prepare their sustainability report by applying the European Standards for Sustainability Reporting (ESRS), as adopted by the European Commission, on the proposal of the European Financial Reporting Advisory Group (EFRAG) (European Parliament, 2022). In July 2023, the European Commission adopted the first set of twelve ESRS (EFRAG, 2023). The general framework under which EFRAG developed the first set of ESRS is based on the requirements of the International Sustainability Standards Board (ISSB) (EFRAG, 2023). ESRS introduced the sustainability reporting concepts of metrics and double materiality which impact the conduct of affected organizations in all sustainability matters. Directive (EU) 2022/2464 introduced the concepts of “limited” and “reasonable” assurance on sustainability reporting (European Parliament, 2022) which additionally affect the quality of sustainability reporting resulting from diverse definitions of key sustainability concepts in sustainability reporting and sustainability assurance (Stolowy and Paugam, 2023). In addition, the literature notes certain dilemmas or challenges to achieving quality sustainability and financial reporting, when affected organizations appoint the same assurance provider for an assurance engagement covering both their financial and sustainability reports (Lu et al., 2023).

The primary objective of our study is to investigate the level of familiarity of external auditors and audit firms operating in Europe, with sustainability reporting and assurance concepts. The study aims to identify potential disparities in familiarity levels of external auditors across different sizes of audit firms in Europe about sustainability reporting and assurance concepts, as well as to establish the underlying reasons for any observed disparities. Additionally, our study seeks to determine whether external auditors in Europe require additional training on sustainability reporting and assurance that will enable them to provide quality sustainability reporting assurance services.

With these objectives, the overarching purpose of our study is to propose strategies to mitigate observed disparities and to identify the key stakeholders that should be involved in this process. By identifying solutions to narrow the familiarity gap and by engaging relevant stakeholders, our study contributes to advancing sustainability reporting and assurance practices in Europe.

This study’s unique contribution lies in identifying potential disparities in familiarity with sustainability reporting and assurance concepts, among external auditors and audit firms in Europe, establishing the reasons for these potential disparities, and proposing alternative solutions to narrow the familiarity gap. To that end, our study aims to identify key stakeholders that should be involved in narrowing the familiarity gap.

Our study utilizes extensive literature and survey responses from audit firms in Europe. To draw the study’s conclusions, gathered data and information from extensive literature and deployed surveys are triangulated, to corroborate the research findings, thereby establishing a solid platform to address recommendations for further research.

The paper is organized into eight sections, systematically presenting the research process and drawing conclusions based on the emerging study observations. The introduction provides essential information on this study, including its background, contributions, research methodology, and key findings. The literature review presents relevant findings from previous studies. The methodology explains the research approach employed, followed by the presentation of the empirical results. The fifth section discusses and interprets the empirical findings regarding the literature. The discussion on the study’s limitations and delineations follows before areas for further research are proposed and concludes with a synopsis of the key findings.

## **2. Literature review**

When discussing sustainability reporting concepts and standards, de Villiers et al. (2022) identify the Global Reporting Initiative (GRI) as one of the premier sustainability reporting standard-setting bodies. These scholars identify the GRI’s primary objective as focusing on formulating sustainability reporting standards, to facilitate the disclosure of environmental and societal data and information by diverse organizations (de Villiers et al., 2022). In addition, the GRI standards have played a pivotal role in steering voluntary sustainability reporting practices, predating the establishment of mandatory reporting requirements for non-financial disclosures (Carungu et al., 2022).

However, Mahboob Hossain and Salat (2023) highlighted the diversity of global sustainability reporting frameworks, by various standard-setting

bodies around, as outlined in **Table no. 1**. In addition to this table, as already discussed above, the European Commission has taken steps to adopt the

first set of twelve ESRS proposed by EFRAG in compliance with Directive (EU) 2022/2464 (EFRAG, 2023).

Table no. 1. Diverse standard-setting bodies concerning sustainability reporting	
Abbreviation	Standard-setting body
SASB	Sustainability Accounting Standards Board
TCFD	Task Force for Climate-Related Financial Disclosure
GRI	Global Reporting Initiative
UN SDGs	United Nations Sustainable Development Goals
IR	Integrated Reporting
CDP	Carbon Disclosure Project
CDSB	Climate Disclosure Standards Board
PRI	The Principles for Responsible Investment
DJSI	Dow Jones Sustainability Indices
EFRAG	European Financial Reporting Advisory Group

Source: Adapted based on Mahboob Hossain and Salat, 2023

Erin et al. (2024) postulate the lack of tools and standardized procedures is the biggest challenge in tracking and measuring performance against sustainability and sustainable development goals. They noted three key implications:

- Public-private partnerships are essential to advancing sustainability, especially in developing economies;
- International standard-setters should create a global framework to standardize sustainable development goals and sustainability reporting; and
- Stakeholder theory is well-situated to sustainable development goals and sustainability practices, as it aligns with representing stakeholders' interests.

Acknowledging the growing investor demand for sustainability-related data and information, it is important to emphasize that the International Financial Reporting Standards Foundation (IFRS Foundation) are actively engaged in developing sustainability reporting standards. To this end, the IFRS Foundation established the International Sustainability Reporting Board (ISRB) and, in 2022, collaborated with the GRI to streamline the development of a widely acceptable sustainability reporting framework (IFRS Foundation, 2022).

The World Business Council for Sustainable Development (WBCSD) categorized sustainability reporting stakeholders into three groups: internal stakeholders (e.g., employees of affected organizations), external stakeholders (e.g., governmental authorities), and

connected stakeholders (e.g., suppliers, customers, etc.). These stakeholder groups encompass a wide array of individuals and entities, including investors, employees, non-governmental organizations, suppliers, customers, competitors, media, academia, and governmental authorities (WBCSD, 2019).

Hristov and Searcy (2024) provide a structured framework for sustainability reporting by affected organizations, encompassing five phases:

- Phase I: Readiness assessment, involving the establishment of sustainability reporting programs, practices, and internal systems to identify relevant data sources;
- Phase II: Establishment of an appropriate governance structure to ensure internal awareness of sustainability reporting goals and user demands;
- Phase III: Inventory and assessment of data collection and governance practices to ensure data quality;
- Phase IV: Decision-making regarding the inclusion of data and information in the sustainability report; and
- Phase V: Determination of communication channels for distributing relevant data and information.

However, despite global endeavors to introduce a uniform sustainability reporting framework for broader (i.e. global) application, variations in sustainability reporting practices also exist across Europe. This research considers the sustainability reporting requirements or guidelines on the Bucharest Stock Exchange, Nasdaq Stock Exchange, and

Macedonian Stock Exchange, all within the European sustainability reporting context. The rationale for these sustainability reporting requirements lies in the divergent economic development levels of the respective jurisdictions in which these stock exchanges operate: Romania, a member of the EU with a developing economy; The Nordic and Baltic states, with advanced capital-market economies, and robust sustainability reporting frameworks supported by Nasdaq, illustrating its influence in the European sustainability reporting context, including the Netherlands as an EU member state with advanced capital-market economy, illustrating Nasdaq's influence on sustainability reporting of Dutch listed entities on the Nasdaq Stock Exchange; and

North Macedonia as aspiring to join the EU with a developing economy. In this view, **Table no. 2**, **Table no. 3** and **Table no. 4** respectively illustrate the sustainability reporting requirements of the Bucharest, Nasdaq, and Macedonian Stock Exchanges.

The divergence among sustainability reporting requirements across European jurisdictions, as illustrated in **Table no. 2**, **Table no. 3** and **Table no. 4**, primarily concerns sustainability metrics. These metrics dictate the scope and relevance of data and information that affected organizations in Europe must disclose in their sustainability reports.

Table no. 2. Sustainability reporting requirements of the Bucharest Stock Exchange	
Sustainability matters	Sustainability metrics
General data and information	Business model; Sustainability integration; Sustainability governance.
Environmental matters	Environmental policies; Energy consumption; Greenhouse gas emissions; Climate changes; Water consumption; Waste management; Adverse environmental impacts.
Social responsibility and human rights	Employee turnover; Freedom of unions; Employee healthcare and safety; Human rights policies and due diligence processes.
Corporate governance matters	Compliance with corporate governance codes; Gender equality in boards; Boards independence; Code of ethics; Anti-bribery policies; Whistle-blower procedures.

Source: Adapted based on Bucharest Stock Exchange, 2022

Table no. 3. Sustainability reporting requirements of the Nasdaq Stock Exchange	
Sustainability matters	Sustainability metrics
Environmental matters	Greenhouse gas emissions and intensity; Energy consumption, intensity, and mix; Water consumption; Environmental operations; Climate management and oversight boards; Climate-related risk mitigations.
Social responsibility and human rights	Pay ratios of management board members and gender equality; Employee turnover; Gender diversity; Temporary worker ratio; Non-discrimination; Injury rate; Employee health and safety; Child-forced labor; Human rights.
Corporate governance matters	Board diversity and independence; Incentivized payments; Collective bargaining; Supplier code of conduct; Ethics and anti-corruption; Data privacy; Sustainability reporting and assurance including disclosure practices.

Source: Adapted based on Nasdaq Stock Exchange, 2019

Table no. 4. Sustainability reporting requirements of the Macedonian Stock Exchange	
Sustainability matters	Sustainability metrics
Environmental matters	Greenhouse gas emissions and intensity; Energy consumption, intensity, and mix; Water consumption; Environmental operations; Climate management and oversight boards; Climate-related risk mitigations.
Social responsibility and human rights	Employee turnover; Employee unions, safety, and healthcare; Human rights policies.
Corporate governance matters	Shareholders' rights; Board members' rights and diversity; Conflicts of interest; Code of Ethics; Anti-corruption policies; Whistle-blower procedures.

Source: Adapted based on Macedonian Stock Exchange, 2022

To address the challenge of comparability between sustainability data and information across divergent European jurisdictions, Directive (EU) 2022/2464 introduced the concept of double materiality (European Parliament, 2022).

Double materiality is a concept within the realm of sustainability and corporate responsibility that has gained traction due to its recognition of two distinct dimensions: impact materiality and financial materiality (Deloitte, 2023). This paradigm emphasizes the interconnectedness of financial and non-financial factors, particularly environmental, societal, and governance (ESG) factors, in assessing the risks and opportunities of affected organizations (Deloitte, 2023).

In contrast to traditional approaches, which often view these aspects of materiality as overlapping or focus primarily on financial materiality (Deloitte, 2023), double materiality acknowledges that sustainability matters can hold dual significance: from both an impact and financial perspective (Deloitte, 2023); or independently from one perspective (Deloitte, 2023). This nuanced understanding of materiality encourages affected organizations to broaden their decision-making and reporting frameworks to encompass a wider array of factors.

Impact materiality focuses on the consequences of affected organizations' operations and policies on the environment and society (Deloitte, 2023). This includes factors such as greenhouse gas emissions, labor practices, and community engagements (Deloitte, 2023). On the other hand, financial materiality pertains to how these factors affect the financial performance and value of affected organizations, encompassing assessments of sustainability-related risks and opportunities that influence profitability, financing capacity, reputation, regulatory compliance, and long-term viability (Deloitte, 2023).

Recent regulatory developments within the EU on sustainability reporting and assurance, notably Directive (EU) 2022/2464, have set the stage for the development of ESRS. These standards are mandated for application by affected EU organizations in preparing their sustainability reports, marking a significant shift towards mandatory sustainability reporting requirements in the EU. ESRS recognize the concept of dual materiality and offers guidance to affected organizations to determine which data and information their sustainability reports should include. ESRS can be categorized into four groups (EFRAG, 2023):

- Group 1 Cross-cutting standards:
  - ESRS 1 General requirements
  - ESRS 2 General disclosures
- Group 2 Environmental:
  - ESRS E1 Climate change
  - ESRS E2 Pollution
  - ESRS E3 Water and marine resources
  - ESRS E4 Biodiversity and ecosystems
  - ESRS E5 Resources and circular economy
- Group 3 Social responsibility and human rights:
  - ESRS S1 Own workforce
  - ESRS S2 Workers in the value chain
  - ESRS S3 Affected communities
  - ESRS S4 Customers and end-users
- Group 4 Corporate governance:
  - ESRS G1 Business conduct

This categorization and guidance provided by ESRS assists affected organizations in Europe in structuring their sustainability reports, ensuring comprehensive coverage of relevant sustainability issues across all ESG dimensions. *Figure no. 1* illustrates the application of the ESRS when preparing sustainability reports by affected organizations in Europe.

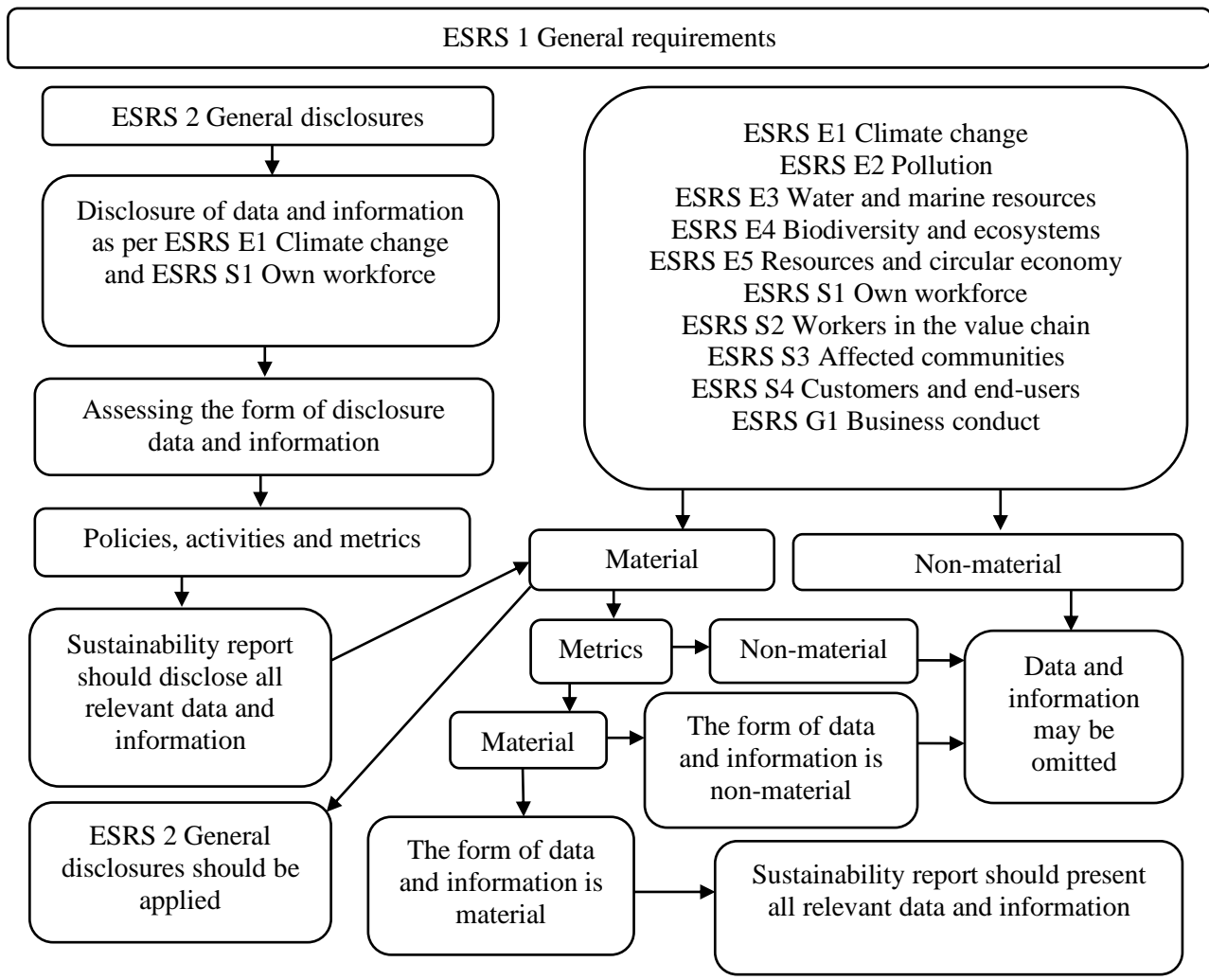
*Figure no. 1* illustrates the obligation of affected organizations to disclose all relevant ESG data and information that are of material significance to the external environment and society, as well as to their financial performance. ESRS require the metrics and disclosures to be evaluated by affected organizations.

According to Directive (EU) 2022/2464, all sustainability reports must be “reviewed” by an independent external auditor (i.e. audit firm) or another competent “provider” of assurance services on sustainability reporting. Additionally, this Directive introduced the concepts of “limited” and “reasonable” assurance on sustainability reporting (European Parliament, 2022). However, shifting towards a circular economy to achieve sustainable development goals requires changes in how financial audits are done (Deliu, 2024). As Deliu (2024) notes, auditors must look beyond just financial numbers and include sustainability measures that show how affected organizations impact the environment and society. In

addition, emerging technologies like blockchain, the “Internet of things”, and artificial intelligence can help

auditors collect and analyze this important data more effectively (Deliu, 2024).

**Figure no. 1. Application of ESRS in sustainability reporting by affected organizations in Europe**



Source: Authors' projection

Barna et al. (2024) noted that enterprise resource planning systems improve organizational efficiency by integrating new technologies like big data, artificial intelligence, and machine learning, providing clearer insights and reducing human errors. Their research highlighted that these systems significantly influence decision-making, corporate reporting, and sustainability (Barna et al., 2024). However, there is a varying relationship between non-financial information and the financial performance of affected organizations,

suggesting the necessity for further research to better understand the factors influencing the quality of ESG scores (Fometescu and Hațegan, 2024). Despite the challenges of utilizing advanced digital technologies, such as protecting data privacy, ensuring different systems work together, and creating standard practices, as Deliu (2024) concludes, it is important to consider the ethical and social impacts of these technologies on the workforce



and the environment. In this view, additional research and teamwork among researchers, affected organizations, and regulators is required, to make these advanced technologies useful for the audit profession, especially in the sustainability assurance context (Deliu, 2024). As Deliu (2024) explains, by embracing these technologies, auditors can better verify claims about sustainability and help affected organizations follow circular economy principles and sustainability requirements. Ultimately, utilizing advanced digital technologies is crucial for creating a more sustainable and resilient future for affected organizations and society as a whole (Deliu, 2024).

In September 2022, the International Auditing and Assurance Standards Board (IAASB) launched a pilot project concerning the development of a potential International Standard on Sustainability Assurance 5000 (ISSA 5000) to address challenges facing the audit profession on assurance of sustainability reporting (IAASB, 2023). This ISSA 5000 is expected to be adopted by the end of 2024 and should be applicable across various sustainability reporting dimensions (IAASB, 2023):

- Scope of sustainability topics: Information related to all sustainability topics and their associated aspects, thus offering a comprehensive framework for reporting;
- Compliance with reporting frameworks: Prospective ISSA 5000 can be utilized for information prepared in alignment with any sustainability reporting framework, standard, or relevant criteria, ensuring flexibility and adaptability across diverse reporting mechanisms;
- Reporting mechanisms: All forms of sustainability information regardless of the reporting mechanism employed, providing a broad scope for assurance engagements; and

- Assurance engagements: Prospective ISSA 5000 facilitates “limited” and “reasonable” assurance engagements, offering a structured approach to assessing sustainability disclosures.

Prospective ISSA 5000 is expected to be inclusive and accessible to all assurance practitioners, contingent upon adherence to pertinent ethical requirements and the implementation of robust quality management systems (IAASB, 2023). These systems must adhere to standards at least as rigorous as those outlined in the International Code of Ethics for Professional Accountants, including International Independence Standards, issued by the International Ethics Standards Board for Accountants (IESBA), and the suite of quality management standards established by the International Auditing and Assurance Standards Board (IAASB, 2023). In addition, prospective ISSA 5000 is anticipated to include a principle-based nature, emphasizing outcomes over procedural intricacies (IAASB, 2023). This principle-based approach should empower assurance practitioners to exercise their professional judgment during the planning and execution of assurance engagements (IAASB, 2023). Such flexibility not only supports the scalability of the standard but also enhances its comprehensiveness by minimizing potential exceptions while demonstrating how its requirements apply uniformly to all organizations (IAASB, 2023). This uniformity should extend across various organizational types, industries, and sectors, irrespective of their complexity, thereby ensuring consistency and efficacy in the application of the standard (IAASB, 2023).

Considering the evolving concepts and practices of sustainability reporting and assurance, and the increasing demand of various stakeholders for transparent ESG reporting, **Table no. 5** was prepared for this research to illustrate the challenges for the audit profession in providing assurance services in the realm of sustainability reporting.

Table no. 5. Summary of sustainability reporting and assurance challenges for the audit profession	
Challenge	Description
Diversity of reporting frameworks	Divergent sustainability reporting frameworks exist globally, complicating the assurance process as different metrics and methodologies are applied, affecting the consistency of sustainability disclosures (Mahboob Hossain and Salat, 2023).
Lack of standardized procedures	There is a significant lack of tools and standardized procedures for tracking and measuring sustainability and sustainable development goals, making it challenging for auditors to assess compliance and performance accurately (Erin et al., 2024).
Data quality and comparability	Variations in sustainability reporting practices across different jurisdictions lead to challenges in ensuring data quality and comparability between sustainability metrics disclosed by affected organizations (Deliu, 2024).

Challenge	Description
Double materiality concept	The introduction of the double materiality concept requires auditors to assess the impact and financial materiality, expanding the scope of their work and necessitating new skills and methodologies for evaluating sustainability claims (Deloitte, 2023).
Technological integration	The audit profession must adapt to emerging digital technologies (e.g., blockchain, artificial intelligence, etc.) for data collection and analysis, while also addressing concerns about data privacy, system interoperability, and ethical implications on stakeholders (Deliu, 2024).
Regulatory compliance	Compliance with new regulatory requirements, such as Directive (EU) 2022/2464 and the development of ESRS, imposes additional responsibilities on auditors to ensure that sustainability reports meet prescribed standards (EFRAG, 2023).
Necessity for assurance of non-financial information	The requirement for external auditors to assure sustainability reports demands a new set of skills and expertise in non-financial information, challenging traditional auditing practices (IAASB, 2023).
Professional judgment and ethical standards	Auditors must navigate a principle-based standard (ISSA 5000) which emphasizes outcomes over processes, requiring them to apply professional judgment while adhering to strict ethical and quality management standards (IAASB, 2023).
Limited research	The audit profession requires more research and collaboration among various stakeholders to develop effective practices and frameworks for sustainability assurance, especially in the context of evolving sustainability metrics and technologies (Deliu, 2024).

Source: Authors' presentation

**Table no. 5** effectively illustrates the challenges for the audit profession in the realm of sustainability reporting and assurance. While the necessity for achieving sustainable business goals and transparent sustainability reporting by affected organizations exponentially increases (Kandpal et al., 2024), auditors must appropriately adapt to this necessity to add credibility to reported sustainability metrics. In this context, the logical question that arises is related to the auditor's proficiency and competence in providing sustainability assurance. This research aims to provide an answer to this question by assessing whether auditors and audit firms are familiar with sustainability reporting and assurance concepts and practices, whether any disparities in this realm exist, and how identified disparities in familiarity with sustainability reporting and assurance concepts and practices may be addressed.

### 3. Research methodology

Based on the complexities inherent in sustainability reporting and assurance outlined above, it becomes evident that auditors must possess a thorough knowledge and understanding of these concepts. Our study acknowledges that sustainability reporting and assurance knowledge and expertise are critical factors that can significantly impact the quality of sustainability assurance services registered auditors and audit firms provide to their clients.

Our study endeavors to comprehend the extent to which registered auditors and audit firms in Europe are familiar with sustainability reporting and assurance concepts. It seeks to establish whether any disparities exist in this domain across auditors and audit firms in Europe, and if so, to identify the reasons for these disparities, how this familiarity gap can be narrowed, as well as the key stakeholders that should be involved to narrow this familiarity gap.

The proposition advanced in our paper is that auditors associated with large audit firms and international audit networks will exhibit greater familiarity with sustainability reporting and assurance concepts when compared to auditors at small and medium-sized (local) audit firms. We postulate that universities, governmental authorities, and professional audit associations should be actively engaged to narrow this familiarity gap, enabling all auditors, regardless of the size of the audit firms with which they are associated, to deliver high-quality sustainability reporting assurance services.

We utilize a mixed-method approach drawing on a combination of primary and secondary data and information sources. Secondary sources include sustainability reporting and assurance-related extant literature and regulatory frameworks. Primary sources comprise empirical data emerging from quantitative surveys distributed to potential respondents at audit firms in Europe.

We use secondary data to identify and describe the literature relating to pertinent sustainability concepts as well as the requirements for sustainability reporting and assurance. Specifically, the literature explains the complexity of sustainability reporting and assurance.

The primary data reflects the quantitative component of our study involving the answers of respondents at audit firms in Europe, to survey questions. Taherdoost (2016) argues that a sufficient sample size is essential to allow the findings derived from a simple random sample to be generalized and to alleviate potential sampling errors or biases. We, therefore, utilize Taherdoost's (2016) statistical sampling model, reflected below, to maintain the representativeness and sufficiency of the quantitative sample:

$$n = \frac{N \cdot p \cdot (100 - p) \cdot \frac{z^2}{e^2}}{p \cdot (100 - p) \cdot \frac{z^2}{e^2} + N - 1}$$

where,

'n' is the required sample size;

'N' is the total population size;

'p' is the proportion of the population;

'e' is the margin of error; and

'z' is the confidence interval.

The structure of deployed surveys is presented in **Table no. 6**.

Table no. 6. Survey population, sample and size				
Respondent group	Total population	Sample size	Received responses	Percentage of received responses
Audit firms	10,000	264	169	64%

Source: Authors' own presentation

Although utilizing larger samples may reduce the likelihood of bias, the principle of diminishing returns means that samples become excessively large while only yielding incremental benefits (Gill et al., 2010). In other words, despite larger sample sizes reducing the potential for sampling error, this reduction occurs at a significantly diminishing rate (Taherdoost, 2016). To ensure that the sample is sufficiently representative, we utilized a 90% confidence level, corresponding to a 1.645 confidence interval, a 5% margin of error, and assumed a 50% proportion of the population.

To ensure a sufficiently representative sample we used Taherdoost's (2016) statistical sampling model to randomly select a total of 264 audit firms in Europe from a population of approximately 10,000 audit firms. Only audit firms/respondents officially registered as providers of audit services were invited to participate in the survey. The respective auditors/audit firms had to be listed in the publicly available registers of auditors and audit firms maintained by national audit institutes and professional audit associations in European countries. Our survey yielded 169 responses (a 64% response rate, with respondents including audit partners and audit managers.

The survey questionnaires were administered between December 2023 and June 2024. Customized survey questions (disclosed in **Appendix 1**) were informed by the literature review and distributed to the potential respondents. All randomly selected respondents received an email inviting them to participate in the study and containing a link to the online administered survey. Respondents required ten to fifteen minutes to respond to the survey questionnaire. The survey responses were analyzed using descriptive statistics. To identify relationships between the research variables and their impacting and affecting determinants, we applied Pearson's correlation coefficient for simple linear correlation as outlined in Taraldsen's (2021) model:

$$r = \frac{n \cdot \Sigma xy - \Sigma x \cdot \Sigma y}{\sqrt{n \cdot \Sigma x^2 - (\Sigma x)^2} \cdot \sqrt{n \cdot \Sigma y^2 - (\Sigma y)^2}}$$

where,

'r' is the Pearson's ratio;

'n' is the number of series; and

'x' and 'y' are the research variables.

The model described above reflects the simple linear correlation between the research variables, in terms of which the minimum value may be negative, and the maximum value may be positive (Taraldsen, 2021). We utilized the Student's T-distribution with two degrees of freedom, outlined below (Taraldsen, 2021), to establish the significance of the obtained ratio:

$$t = \frac{r}{s_r}, \text{ and } S_r = \sqrt{\frac{1-r^2}{n-2}}$$

where,

'r' is the Pearson's ratio;

'Sr' is the standard deviation ratio;

'n' is the number of series; and

't' is the significance test.

A Pearson's correlation coefficient of zero indicates that no simple linear correlation exists, with a positive value revealing a positive correlation, and a negative value, a negative correlation (Taraldsen, 2021). Since the magnitude of Pearson's correlation coefficient does not signify the strength of the correlation (Taraldsen, 2021), we conducted a significance test by considering the Student's T-distribution with two degrees of freedom, according to the obtained significance test value. We developed the following two hypotheses for the quantitative analysis (Taraldsen, 2021):

- H<sub>0</sub>, indicating no existence of a simple linear correlation; and
- H<sub>1</sub>, indicating the existence of a simple linear correlation.

Where the critical value of t(Sr/2; n-2) is greater than the calculated value of t, then H<sub>0</sub> applies, but where it is less than the calculated value of t, H<sub>1</sub> applies (Taraldsen, 2021). Gradual scaling of the x variable is established as outlined in **Table no. 7**, with five series. The critical values of the Student's T-distribution are presented in **Appendix 2**.

Table no. 7. Gradual scaling of x variable	
Variable	Grade
Strongly agree	100%
Agree	75%
Uncertain	50%
Disagree	25%
Strongly disagree	0%

Source: Authors' own theorizing

To differentiate between respondent perspectives, survey responses were divided and analyzed into two groups – large audit firms (international audit networks) and small and medium-sized (local) audit firms. The aim was to establish whether disparities exist between respondents based on the size of the audit firms in Europe, with which they were associated, and if so, to determine the extent of the disparity, and the underlying causes. We received 63 responses from large audit firms (international networks), representing 37% of total responses, and 106 responses from small and medium-sized (local) audit firms, representing 63% of total responses.

To validate the research results, a triangulation approach was employed, integrating data and information obtained from deployed surveys and existing literature. This process allowed us to link the resultant survey responses to pertinent extant literature, enabling the identification of familiarity gaps related to sustainability reporting and assurance, among auditors and audit firms in Europe.

Our study proceeded in three separate phases. In the first phase, we comprehensively reviewed secondary data sources, including relevant regulations relating to sustainability reporting and assurance. In the second phase, we utilized the responses to a survey questionnaire to assess the observations from the first phase, with the study concluding in the third phase by triangulating the data and information from all sources.

## 4. Results

This heading presents the empirical results from deployed surveys. Our study expects large audit firms to exhibit greater familiarity with the concepts of sustainability reporting and assurance when compared to small and medium-sized audit firms. To assess this assertion, we rely on the data obtained from the second survey question directed at audit firms in Europe, with detailed responses presented in **Table no. 8**.

**Table no. 8. Familiarity with the concepts of sustainability reporting and assurance**

Familiarity with the concepts of sustainability reporting and assurance	Frequency of received responses by large audit firms		Frequency of received responses by local audit firms		Total response frequency	
	Quantity	In %	Quantity	In %	Quantity	In %
Very familiar	22	35%	6	6%	28	17%
Familiar	17	27%	12	11%	29	17%
Uncertain	10	16%	21	20%	31	18%
Unfamiliar	7	11%	37	35%	44	26%
Very unfamiliar	7	11%	30	28%	37	22%
<b>Total received responses</b>	<b>63</b>	<b>100%</b>	<b>106</b>	<b>100%</b>	<b>169</b>	<b>100%</b>
Pearson's ratio	0.803		(0.770)		(0.660)	
Standard deviation ratio	0.344		0.369		0.434	
Significance test	2.334		(2.087)		(1.520)	
<b>Critical value of t-distribution</b>	<b>t(0.10;2)=</b>	<b>1.886</b>	<b>t(0.10;2)=</b>	<b>1.886</b>	<b>t(0.10;2)=</b>	<b>1.886</b>

Source: Authors' presentation

The third and fourth survey questions are designed to investigate whether auditors and audit firms in Europe provide sustainability reporting and sustainability assurance services for their clients in Europe. In this way, the research intends to examine whether familiarity with sustainability reporting and assurance concepts and practices relates to the auditor, i.e. audit firm involvement

in delivering such services to their clients. **Tables no. 9 and 10** respectively present the results from the third and fourth survey questions, providing a basis to examine the connection between auditor familiarity with sustainability reporting and assurance concepts and practices and auditor involvement in delivering sustainability reporting and assurance services.

**Table no. 9. Providing sustainability reporting services by audit firms in Europe**

Audit firms in Europe provide sustainability reporting services for their clients	Response frequency of large audit firms		Response frequency of local audit firms		Total response frequency	
	Quantity	In %	Quantity	In %	Quantity	In %
Yes	31	49%	9	8%	40	24%
Uncertain	19	30%	6	6%	25	15%
No	13	21%	91	86%	104	61%
<b>Total received responses</b>	<b>63</b>	<b>100%</b>	<b>106</b>	<b>100%</b>	<b>169</b>	<b>100%</b>

Source: Authors' presentation

**Table no. 10. Providing sustainability assurance services by audit firms in Europe**

Audit firms in Europe provide sustainability reporting assurance to their clients	Response frequency by large audit firms		Response frequency by local audit firms		Total response frequency	
	Quantity	In %	Quantity	In %	Quantity	In %
Yes	22	35%	2	2%	24	14%
Uncertain	19	30%	6	6%	25	15%
No	22	35%	98	92%	120	71%
<b>Total received responses</b>	<b>63</b>	<b>100%</b>	<b>106</b>	<b>100%</b>	<b>169</b>	<b>100%</b>

Source: Authors' presentation

The fifth survey question is designed for dual purposes. Firstly, it explores the proficiency of external auditors in Europe regarding sustainability reporting and assurance. Secondly, it identifies whether external auditors in Europe require additional training to provide their clients with quality sustainability reporting assurance services. The obtained results are presented in **Table no. 11**.

In addition to the fifth survey question, the sixth survey question, directed at audit firms in Europe, aims to discern the sustainability reporting matters for which auditors seek training. These results are presented in **Table no. 12**.

Insights into the organizations from which auditors seek training for sustainability reporting matters are provided by responses to the seventh survey question posed to audit

firms in Europe. These insights are summarized in **Table no. 13**.

To reach the study's ultimate aim, which is to determine how auditors and prospective auditors should receive the requisite training on sustainability reporting matters, we considered the results from the eighth, ninth, and tenth survey questions. The responses to these survey questions are presented in **Tables no. 14, 15, and 16**, respectively. These tables detail the responses from audit firms regarding the training on sustainability reporting by higher education institutions, professional audit associations and institutes, and the role of governmental authorities in securing the market for sustainability reporting and assurance, respectively.

<b>Table no. 11. External auditors' proficiency and knowledge regarding sustainability reporting and assurance</b>						
<b>Auditors in Europe should receive sustainability reporting training to deliver quality assurance services</b>	<b>Response frequency by large audit firms</b>		<b>Response frequency by local audit firms</b>		<b>Total response frequency</b>	
	<b>Quantity</b>	<b>In %</b>	<b>Quantity</b>	<b>In %</b>	<b>Quantity</b>	<b>In %</b>
Strongly agree	27	43%	81	76%	108	64%
Agree	29	46%	17	16%	46	27%
Uncertain	5	8%	6	6%	11	7%
Disagree	2	3%	2	2%	4	2%
Strongly disagree	-	-	-	-	-	-
<b>Total received responses</b>	<b>63</b>	<b>100%</b>	<b>106</b>	<b>100%</b>	<b>169</b>	<b>100%</b>
Pearson's ratio	0.763		0.694		0.761	
Standard deviation ratio	0.373		0.416		0.374	
Significance test	2.044		1.671		2.033	
<b>Critical value of t-distribution</b>	<b>t(0.10;2)=</b>	<b>1.886</b>	<b>t(0.15;2)=</b>	<b>1.386</b>	<b>t(0.10;2)=</b>	<b>1.886</b>

Source: Authors' presentation

<b>Table no. 12. Sustainability reporting matters for which auditors seek training</b>						
<b>Audit firms in Europe provide their clients with sustainability reporting assurance</b>	<b>Response frequency by large audit firms</b>		<b>Response frequency by local audit firms</b>		<b>Total response frequency</b>	
	<b>Quantity</b>	<b>In %</b>	<b>Quantity</b>	<b>In %</b>	<b>Quantity</b>	<b>In %</b>
Environmental	51	81%	93	88%	144	85%
Social responsibility and human rights	49	78%	89	84%	138	82%
Corporate governance	31	49%	70	66%	101	60%
Uncertain	2	3%	2	2%	4	2%
<b>Maximum frequency of responses</b>	<b>63</b>	<b>100%</b>	<b>106</b>	<b>100%</b>	<b>169</b>	<b>100%</b>

Source: Authors' presentation

**Table no. 13. Organizations which auditors recommend to deliver training concerning sustainability reporting matters**

Organizations for sustainability reporting and assurance training	Response frequency by large audit firms		Response frequency by local audit firms		Total response frequency	
	Quantity	In %	Quantity	In %	Quantity	In %
Universities, colleges and other tertiary education institutions	55	87%	88	83%	143	85%
Professional audit associations and institutes	51	81%	90	85%	141	83%
Governmental institutions	37	59%	66	62%	103	61%
Uncertain	2	3%	2	2%	4	2%
<b>Maximum frequency of responses</b>	<b>63</b>	<b>100%</b>	<b>106</b>	<b>100%</b>	<b>169</b>	<b>100%</b>

Source: Authors' presentation

**Table no. 14. Training for sustainability reporting by higher education institutions**

Higher education institutions should upgrade their curricula by including sustainability reporting material	Response frequency by large audit firms		Response frequency by local audit firms		Total response frequency	
	Quantity	In %	Quantity	In %	Quantity	In %
Strongly agree	32	51%	45	42%	77	46%
Agree	31	49%	44	42%	75	44%
Uncertain	-	-	12	11%	12	7%
Disagree	-	-	3	3%	3	2%
Strongly disagree	-	-	2	2%	2	1%
<b>Total received responses</b>	<b>63</b>	<b>100%</b>	<b>106</b>	<b>100%</b>	<b>169</b>	<b>100%</b>
Pearson's ratio	0.736		0.785		0.766	
Standard deviation ratio	0.391		0.358		0.371	
Significance test	1.881		2.193		2.064	
<b>Critical value of t-distribution</b>	<b>t(0.15;2)=</b>	<b>1.386</b>	<b>t(0.10;2)=</b>	<b>1.886</b>	<b>t(0.10;2)=</b>	<b>1.886</b>

Source: Authors' presentation

**Table no. 15. Training for sustainability reporting by professional audit associations and institutes**

Professional audit associations and institutes should train auditors and prospective auditors on sustainability reporting matters	Response frequency by large audit firms		Response frequency by local audit firms		Total response frequency	
	Quantity	In %	Quantity	In %	Quantity	In %
Strongly agree	28	44%	46	43%	74	44%
Agree	31	49%	49	46%	80	47%
Uncertain	4	6%	8	8%	12	7%
Disagree	-	-	2	2%	2	1%
Strongly disagree	-	-	1	1%	1	1%
<b>Total received responses</b>	<b>63</b>	<b>100%</b>	<b>106</b>	<b>100%</b>	<b>169</b>	<b>100%</b>
Pearson's ratio	0.748		0.757		0.753	
Standard deviation ratio	0.383		0.377		0.380	
Significance test	1.950		2.007		1.985	
<b>Critical value of t-distribution</b>	<b>t(0.10;2)=</b>	<b>1.886</b>	<b>t(0.10;2)=</b>	<b>1.886</b>	<b>t(0.10;2)=</b>	<b>1.886</b>

Source: Authors' presentation

Table no. 16. Securing the market for sustainability reporting and assurance						
National authorities should upgrade or adopt national regulations to secure the market for sustainability reporting and assurance	Response frequency by large audit firms		Response frequency by local audit firms		Total response frequency	
	Quantity	In %	Quantity	In %	Quantity	In %
Strongly agree	29	46%	56	53%	85	50%
Agree	30	48%	48	45%	78	46%
Uncertain	4	6%	2	2%	6	4%
Disagree	-	-	-	-	-	-
Strongly disagree	-	-	-	-	-	-
<b>Total received responses</b>	<b>63</b>	<b>100%</b>	<b>106</b>	<b>100%</b>	<b>169</b>	<b>100%</b>
Pearson's ratio	0.758		0.756		0.759	
Standard deviation ratio	0.377		0.378		0.376	
Significance test	2.012		2.002		2.017	
<b>Critical value of t-distribution</b>	<b>t(0.10;2)=</b>	<b>1.886</b>	<b>t(0.10;2)=</b>	<b>1.886</b>	<b>t(0.10;2)=</b>	<b>1.886</b>

Source: Authors presentation

## 5. Discussion

This heading examines the empirical results from deployed surveys and justifies these results based on existing literature. The refinement of research findings is achieved through the triangulation of insights obtained from the extensive literature review, thereby corroborating our study's outcomes.

In **Table no. 8** the familiarity of audit firms with sustainability reporting and assurance concepts and practices is examined as the tested variable against the concepts of sustainability reporting. The significance test of the tested variable suggests a higher value than the t-distribution for large audit firms (international audit networks), lower (negative) than the t-distribution for local audit firms (small and medium-sized), and lower than the t-distribution for all audit firms. This reveals that larger audit firms and international audit networks exhibit greater familiarity with sustainability reporting and assurance concepts and practices compared to local (small and medium-sized) audit firms. Consequently, our study identifies a disparity in familiarity with sustainability reporting and assurance concepts among audit firms and auditors. Auditors affiliated with larger audit firms and international audit networks tend to be more familiar with these concepts than those associated with smaller, local audit firms.

**Tables no. 9 and 10** provide additional insights concerning the reasons why such disparity exists among

auditors and audit firms. These tables reveal that international audit networks and larger audit firms frequently engage in providing sustainability reporting and sustainability assurance services for their clients. Such involvement may potentially introduce conflicts of interest for external auditors and audit firms, posing threats to their independence – self-interest, and self-review (Boiral et al., 2019). In this view, the involvement of auditees in sustainable activities, such as social and environmental protection, is linked to a potential manipulation of their financial results, which reduces the quality of the financial information and increases the likelihood of auditors issuing a modified opinion (Afrăsinei et al., 2024). This suggests that handling both sustainability assurance and financial auditing for the same auditee could compromise the auditor's ability to maintain high audit quality (Afrăsinei et al., 2024). In addition, Article 25c of Directive (EU) 2022/2464 prohibits external auditors and audit firms from auditing the financial statements of an auditee when they provide sustainability reporting services to the same auditee (European Parliament, 2022). Consequently, the audit profession and national authorities must adopt additional ethical guidelines and regulations for external auditors and audit firms to prevent such conflicted scenarios. However, international audit networks are expected to deliver assurance services of higher quality compared to small and medium-sized (local) audit firms due to their global reach, access to expert pools, and sophisticated technical tools (Fernandez-Feijoo et al., 2017). Our study associates large audit firms with



international audit networks, and smaller audit firms with local audit firms. The results in **Tables no. 9 and 10** further suggest that larger audit firms exhibit greater familiarity with sustainability reporting and assurance concepts than local audit firms since they are more involved in providing their clients with sustainability reporting and/or assurance services.

In **Table no. 11** sustainability reporting training is the tested variable against the delivery of quality assurance on sustainability reporting by external auditors and audit firms. The significance test of the tested variable in **Table no. 10** is higher than the t-distribution at all types of audit firms (international audit networks and local audit firms). This result reveals that external auditors in Europe require training concerning sustainability reporting to deliver quality assurance services for their clients. However, despite the greater familiarity of external auditors who work for international audit networks (larger audit firms) with sustainability reporting and assurance concepts compared to those who work for local audit firms (small and medium-sized), as shown in **Table no. 11**, they also require training related to sustainability reporting to deliver assurance services on sustainability reporting of higher quality. Hence, it appears that a direct correlation exists between the proficiency and knowledge of external auditors in sustainability reporting and the quality of assurance they provide in this domain. As external auditors become more adept and knowledgeable in sustainability reporting practices and matters, they are better equipped to conduct thorough assessments, identify key issues, and provide valuable insights and assurance for their clients.

**Table no. 12** reveals that auditors in Europe, irrespective of the size of their audit firm, seek training across all sustainability reporting matters. This training is aimed at enhancing their competence to deliver quality assurance services on sustainability reporting for their clients. Notably, in **Table no. 12**, training for environmental reporting matters appears to be the most sought-after, surpassing the other sustainability reporting matters, such as social responsibility, human rights, and corporate governance.

The results in **Table no. 13** suggest that auditors primarily recommend high-education institutions, and professional audit associations and institutes for providing training on sustainability reporting matters. Further, in **Table no. 14**,

the delivery of training concerning sustainability reporting represents the tested variable against the curricula of higher education institutions – including universities, colleges, etc. The significance test of the tested variable exceeds the critical value of the t-distribution across all sizes of audit firms. This result reveals that external auditors in Europe, regardless of the audit firm size for which they work, recommend higher education institutions to upgrade their curricula by including additional modules related to sustainability reporting. Hence, higher education institutions are expected to enhance their curricula by incorporating subjects or modules on sustainability reporting for students. However, this insight requires further refinement to evaluate the curricula of higher education institutions across Europe and identify the most critical aspects of sustainability reporting and assurance concepts. Future research should focus on assessing this aspect of higher education.

In **Table no. 15** the delivery of training concerning sustainability reporting represents the tested variable against the curricula of professional audit associations and institutes. The significance test of the tested variable exceeds the critical value of the t-distribution across all sizes of audit firms. This result further reveals that external auditors in Europe, regardless of the audit firm size for which they work, also recommend professional audit associations and institutes in Europe to upgrade their curricula by including additional modules related to sustainability reporting. From this perspective, professional audit associations and institutes in Europe are expected to enhance their curricula by incorporating additional modules on sustainability reporting for prospective auditors who seek to join the audit profession in the future. In addition, registered auditors expect professional audit associations and institutes across Europe to deliver additional training concerning sustainability reporting that would ensure the quality of assurance services that audit firms and external auditors provide for their clients in this domain. However, similarly to higher education institutions, this result requires further refinement to evaluate the curricula of professional audit associations and institutes across Europe and identify the most critical aspects for the practical application of sustainability reporting and assurance concepts. Future research should focus on assessing this aspect of training for external auditors and prospective auditors.

**Figure no. 2. Triangulation of study results**

A notable disparity exists in the level of familiarity with sustainability reporting and assurance concepts among audit firms and auditors. Auditors affiliated with larger audit firms and international audit networks demonstrate a higher level of familiarity with these concepts compared to auditors who are associated with smaller, local audit firms.



Auditors affiliated with larger audit firms and international audit networks exhibit a greater familiarity with sustainability reporting and assurance concepts. This heightened familiarity can be attributed to their frequent engagement in providing sustainability reporting services and offering assurance on sustainability reporting, a practice less common among local and smaller audit firms.



International audit networks are expected to deliver assurance services of higher quality compared to small and medium-sized (local) audit firms due to their global reach, access to expert pools, and sophisticated technical tools.



The audit profession and national authorities must adopt additional ethical guidelines and regulations applicable to external auditors and audit firms. These measures are essential to secure further external auditor independence and mitigate the risk of potential conflicts of interest, particularly concerning sustainability reporting services and assurance, including external audit engagements.



While external auditors affiliated with international audit networks tend to possess a higher level of familiarity with sustainability reporting and assurance concepts, both they and external auditors working for local (smaller) audit firms require additional training on all matters of sustainability reporting.



**Conclusion 1:** A direct correlation exists between the proficiency and knowledge of external auditors in sustainability reporting and the quality of assurance they deliver in this domain. As external auditors enhance their skills and knowledge in sustainability reporting practices, they are more proficient in conducting comprehensive assessments, identifying critical issues, and delivering valuable insights and assurance for their clients.



**Conclusion 2:** To address the disparity in familiarity levels with sustainability reporting and assurance concepts, external auditors recommend higher education institutions enhance their curricula. This enhancement should involve the incorporation of additional modules focused on sustainability reporting matters.



**Conclusion 3:** To ensure the delivery of quality assurance on sustainability reporting matters by external auditors and audit firms, professional audit associations and institutes need to enhance their curricula. This enhancement should involve the addition of additional examination modules for prospective auditors focusing on sustainability reporting matters. Additionally, registered auditors should receive training from these professional associations and institutes to upgrade their competence in the realm of sustainability reporting and assurance.



**Conclusion 4:** External auditors expect that national authorities will adopt or enhance national regulations on sustainability reporting and assurance. This proactive measure is essential to secure the professional market in this domain.

Source: Authors' theorizing

Ultimately, as presented in **Table no. 16**, external auditors and audit firms in Europe, expect national authorities to upgrade or adopt national regulations that will secure the market for sustainability reporting and assurance. In this table, the external auditors' expectation for governmental authorities to secure the market for sustainability reporting and assurance is assessed as a variable against the enhancement or adoption of national regulations in this sphere. The significance test of this variable exceeds the critical value of the t-distribution across all sizes of audit firms. This outcome underscores the necessity for European national authorities to either implement or enhance existing regulations to secure the market for sustainability reporting and assurance. Nevertheless, the process of adopting or enhancing national regulations to secure the sustainability reporting and assurance market remains a subject of ongoing debate and legislative efforts in numerous countries, particularly across Europe (Hummel and Jobust, 2024). Various scholars (Afolabi et al., 2022) advocate for clearer and more stringent regulations to ensure consistency, transparency, and credibility in sustainability reporting and assurance practices. However, the degree to which specific regulations have been embraced or augmented varies across different countries and jurisdictions (Afolabi et al., 2022). Consequently, future research should examine the latest legal and regulatory frameworks in European countries to determine the present status of regulations related to sustainability reporting and assurance.

*Figure no. 2* is designed to triangulate the data and information derived from existing literature alongside surveys conducted among audit firms in Europe. Its primary objective is to refine the research findings, thereby facilitating the formulation of conclusive insights for our study.

## 6. Research limits

The primary limitation of our study pertains to the geographical location of the survey sample, which predominantly focuses on Europe/the EU. Consequently, the results derived may possess relevance primarily within the EU common market and Europe.

To delineate this limitation, our study acknowledges the existence of diverse sustainability reporting frameworks globally and recognizes the efforts of global stakeholders in harmonizing these frameworks on a universal scale, thereby rendering them applicable to all affected organizations worldwide.

The second limitation of our study revolves around its specific focus on sustainability reporting and assurance concepts, i.e., non-financial reporting and assurance on non-financial reporting. In this context, we consider the proficiency and knowledge of auditors in sustainability reporting and assurance constitute factors to influence the quality of assurance services on sustainability reporting rendered by auditors and audit firms.

To delineate this second limitation, we advocate for collaborative engagement involving academia, professional audit associations and institutes, as well as national authorities to narrow the familiarity gap among auditors and audit firms regarding sustainability reporting and assurance concepts. Furthermore, we consider the adoption of ISSA 5000, which is expected to be globally applicable, mandating all auditors and audit firms to adhere to its provisions when providing assurance services on sustainability reporting, notwithstanding the heterogeneous nature of sustainability reporting and assurance frameworks across different countries.

## 7. Areas for further research

To secure the market for sustainability reporting and assurance, we acknowledge the need for substantial governmental intervention in revising or implementing national regulations concerning this domain. Scholars such as Afolabi et al. (2022) advocate for clearer and more stringent regulations to ensure consistency, transparency, and credibility in sustainability reporting and assurance practices. However, the extent to which specific regulations have been embraced or bolstered varies across different countries and jurisdictions (Afolabi et al., 2022), necessitating a future feasibility study to examine the diversity of legal systems among nations relating to sustainability. Thus, future studies should delve deeper into this limitation to furnish a more comprehensive understanding of the impact that stringent regulations may exert on the professional sustainability reporting and assurance market.

Moreover, our study identifies the need for academia and professional audit institutes and associations to deliver sustainability reporting and assurance training. Auditors suggest enhancing the curricula in accountancy education and assurance by incorporating additional modules or subjects to address this aspect. This finding warrants further refinement, with additional studies focusing on evaluating the curricula of higher education institutions, as

well as professional audit associations and institutes, to identify the most crucial aspects relating to the theoretical and practical application of sustainability reporting and assurance that should be included. In essence, future studies should concentrate on assessing the efficacy of training programs for external auditors and prospective auditors in these specific areas.

## 8. Conclusion

Our study finds that auditors associated with international audit networks and larger audit firms exhibit greater familiarity with sustainability reporting and assurance concepts compared to auditors who are associated with smaller and local audit firms. This disparity among auditors arises because auditors associated with larger audit firms are often engaged in providing sustainability reporting and assurance services when compared to auditors associated with smaller audit firms.

To narrow the familiarity gap, our study advocates for involvement by academia, and professional audit associations and institutes, in delivering training for auditors in sustainability reporting and assurance concepts. Auditors, regardless of audit firm size, require additional sustainability-related training to enable them to provide high-quality sustainability reporting assurance services. Hence, we acknowledge that auditor sustainability reporting and assurance proficiency and knowledge are factors influencing the quality of sustainability reporting assurance services to their clients. In this way, auditors are expected to add greater credibility to their clients' sustainability reports

(Auliani et al., 2023). Moreover, this aligns with Articles 6 and 7 of Directive (EU) 2022/2464, requiring auditors to undergo specific training on sustainability reporting and assurance concepts and practices to enable them to provide satisfactory quality sustainability assurance services. Ultimately, our study findings are consistent with Bunget et al. (2024) highlighting that auditors were not yet prepared to provide sustainability report assurance services due to process, systems, and skills gaps. In this regard, equipping auditors with the necessary knowledge and expertise to meet the new sustainability reporting and assurance demands is vital for delivering reliable audit outcomes, i.e. credible assurance opinions over sustainability reports. However, shifting paradigms towards global social, environmental and governance issues, require university curricula to be adapted and continuous professional development programs to holistically incorporate sustainability issues, thereby enhancing accounting and auditing performance (Niculescu and Burlaud, 2023).

Our study advocates for stringent regulations to be adopted by national authorities in the countries that will secure the market for sustainability reporting and assurance. Scholars such as Afolabi et al. (2022) advocate for clearer and more stringent regulations in this domain. However, adopting such regulations remains an ongoing process (Hummel and Jobust, 2024), with future studies focusing on assessing the effect that such regulations would have on the professional market for sustainability reporting and assurance if these regulations are adopted and implemented.

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## Appendix 1. Survey questions for audit firms/auditors in Europe

1. Please indicate the size of your audit firm:
  - Small and medium (local) audit firm
  - Large audit firm (international audit network)
2. Is your audit firm familiar with the concepts of sustainability reporting and assurance?
  - Very familiar
  - Familiar
  - Uncertain
  - Unfamiliar
  - Very unfamiliar
3. Does your audit firm provide sustainability reporting services?
  - Yes
  - Uncertain
  - No
4. Does your audit firm provide assurance on sustainability reporting?
  - Yes
  - Uncertain
  - No
5. Do you agree that auditors should receive training for sustainability reporting to preserve quality while delivering assurance services on sustainability reporting?
  - Strongly agree
  - Agree
  - Uncertain
  - Disagree
  - Strongly disagree
6. If your response to question number 5 above is strongly agree or agree, in which sustainability matters you will recommend auditors receive training? You may tick more than one response.
  - Environmental
  - Social responsibility and human rights
  - Corporate governance
  - Uncertain
7. If your response to question number 5 above is strongly agree or agree, by whom should auditors receive such training? You may tick more than one response.
  - Universities, colleges, faculties and other institutions which provide higher education
  - Professional audit associations and institutes
  - Governmental institutions
  - Uncertain
8. Do you agree that universities, colleges and other high-education institutions should upgrade their curricula by including subjects (modules) related to sustainability reporting?
  - Strongly agree
  - Agree
  - Uncertain
  - Disagree
  - Strongly disagree
9. Do you agree that professional audit associations and institutes should upgrade their curricula by including subjects (modules) related to sustainability reporting enabling prospective auditors to receive training before their official public registration?
  - Strongly agree
  - Agree



- Uncertain
  - Disagree
  - Strongly disagree
10. Do you agree that national authorities should upgrade or adopt national regulations to secure the market for providing assurance on sustainability reporting by registered auditors?
- Strongly agree
  - Agree
  - Uncertain
  - Disagree
  - Strongly disagree

**Appendix 2. Critical values of Student's t-distribution with two degrees of freedom**

**t Table**

cum. prob	$t_{.50}$	$t_{.75}$	$t_{.80}$	$t_{.85}$	$t_{.90}$	$t_{.95}$	$t_{.975}$	$t_{.99}$	$t_{.995}$	$t_{.999}$	$t_{.9995}$
one-tail	<b>0.50</b>	<b>0.25</b>	<b>0.20</b>	<b>0.15</b>	<b>0.10</b>	<b>0.05</b>	<b>0.025</b>	<b>0.01</b>	<b>0.005</b>	<b>0.001</b>	<b>0.0005</b>
two-tails	<b>1.00</b>	<b>0.50</b>	<b>0.40</b>	<b>0.30</b>	<b>0.20</b>	<b>0.10</b>	<b>0.05</b>	<b>0.02</b>	<b>0.01</b>	<b>0.002</b>	<b>0.001</b>
df											
1	0.000	1.000	1.376	1.963	3.078	6.314	12.71	31.82	63.66	318.31	636.62
2	0.000	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	22.327	31.599
3	0.000	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	10.215	12.924
4	0.000	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	7.173	8.610
5	0.000	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	5.893	6.869
6	0.000	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.208	5.959
7	0.000	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	0.000	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	4.501	5.041
9	0.000	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.297	4.781
10	0.000	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.144	4.587
11	0.000	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.025	4.437
12	0.000	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	3.930	4.318
13	0.000	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	3.852	4.221
14	0.000	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	3.787	4.140
15	0.000	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	3.733	4.073
16	0.000	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	3.686	4.015
17	0.000	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.646	3.965
18	0.000	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.610	3.922
19	0.000	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.579	3.883
20	0.000	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.552	3.850
21	0.000	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.527	3.819
22	0.000	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.505	3.792
23	0.000	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.485	3.768
24	0.000	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.467	3.745
25	0.000	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.450	3.725
26	0.000	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.435	3.707
27	0.000	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.421	3.690
28	0.000	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.408	3.674
29	0.000	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.396	3.659
30	0.000	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.385	3.646
40	0.000	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.307	3.551
60	0.000	0.679	0.848	1.045	1.296	1.671	2.000	2.390	2.660	3.232	3.460
80	0.000	0.678	0.846	1.043	1.292	1.664	1.990	2.374	2.639	3.195	3.416
100	0.000	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.174	3.390
1000	0.000	0.675	0.842	1.037	1.282	1.646	1.962	2.330	2.581	3.098	3.300
<b>Z</b>	0.000	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.090	3.291
	0%	50%	60%	70%	80%	90%	95%	98%	99%	99.8%	99.9%
	<b>Confidence Level</b>										

Source: Beyer, 1968