

FUTURE OF ENVIRONMENTAL, SOCIAL AND GOVERNANCE AUDITING IN THE CZECH REPUBLIC – EVIDENCE FROM STATUTORY AUDITORS

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ABSTRACT

This paper analyses the attitudes and opinions of statutory auditors regarding the issue of Environmental, Social and Governance reporting and its verification in the Czech Republic. The research examines auditors' willingness to perform ESG assurance, their attitudes towards ESG issues, and their views on key skills and training needs. A questionnaire survey was conducted among Czech statutory auditors, and the results were analysed using statistical methods. The findings reveal differing attitudes between auditors employed in audit firms and self-employed auditors. Auditors from larger companies are more likely to perceive ESG reporting as a meaningful tool for responsible business and demonstrate greater interest in its verification, whereas self-employed auditors tend to be more sceptical and regard ESG as more of a formal obligation. Although the study focuses on the Czech Republic, it is based on European legislation, and the results can be generalised across the EU.

KEY WORDS

ESG assurance, ESG auditing, ESG reporting, European Corporate Sustainability Reporting Directive

JEL CODES

M14, Q56, M42

1 INTRODUCTION

Over the last decade, environmental, social, and governance (ESG) factors have become critical components of corporate practices and investor decision-making. There is an increasing emphasis on transparent and credible corpo-

rate sustainability reporting, which has led to introducing new regulatory frameworks at the European Union level. The Corporate Sustainability Reporting Directive (CSRD) imposes an obligation to externally verify ESG reports

starting in 2024, with verification conducted only by statutory auditors or other independent verification service providers. This new requirement represents a fundamental change in auditing practices and presents challenges for both auditors and companies that will disclose ESG information. While auditors must adapt to new competency requirements and methodologies for verifying ESG reporting, companies face increased administrative and financial burdens related to data collection and verification. The quality of verification standards, which are still under development, will also be a key factor.

The CSRD has introduced ESG reporting obligations at the EU Member State level for various groups of entities in several phases. First, entities under the Non-Financial Reporting Directive will begin mandatory reporting for the first time in 2024. The next phase will include large entities and groups not participating in the first wave. These entities will report for the first time in 2025. The following group will consist of small and medium-sized entities that are issuers of securities, as well as small, non-complex credit institutions and captive insurance companies. These units will report for the first time in 2026. After exceeding the turnover criteria, the final group will include third-country enterprises with a subsidiary or establishment in the European Union. ESG reporting will be mandatory for these companies for the first time in 2028. With the initial reporting period under the CSRD starting in 2024 and the first verification by auditors occurring in 2025, examining this issue is particularly relevant. This research, therefore, focuses on the attitudes of statutory auditors towards ESG reporting and its verification in the Czech Republic. Particular attention is given to the perception of the benefits of ESG reports, the auditors' willingness to verify these reports, and their readiness for the new legislative requirements.

However, the legislative framework is changing. On 26 February 2025, the European Commission adopted a new package of proposals (Omnibus I and Omnibus II) to simplify EU rules, including modifications to the CSRD and the EU Taxonomy. According to these proposals, the timeline for the phased introduction of

ESG reporting obligations would be extended. The second reporting wave, which includes large undertakings and groups not covered in the first wave, would be postponed from 2025 to 2028, and the definition of an enormous undertaking for the purposes of CSRD would be amended by increasing the employee threshold from 500 to 1,000. The third wave, covering listed small and medium-sized enterprises, small non-complex credit institutions and captive insurance undertakings, would also be postponed from 2026 to 2028. As a result, only entities currently subject to the Non-Financial Reporting Directive would be required to report for the first time in 2024, with a significant number of companies entering the reporting regime only in 2028 (European Commission, 2025).

Existing literature in the field of ESG reporting and verification has primarily focused on the importance of ESG report verification (e.g., Del Giudice and Rigamonti, 2020; Wang et al., 2022; Moalla and Dammak, 2025; Knechel, 2021; or Friske et al., 2024). Other studies emphasise using modern technologies, such as advanced data analytics and artificial intelligence applications, to verify ESG reports (Gu et al., 2023 or Vasilyeva and Makarenko, 2017). A further group of papers has examined the impact of the presence of an audit committee and its characteristics, such as size, expertise, length of tenure, or independence, on the quality of ESG reports (Pozzoli et al., 2022; Umar et al., 2024; de Almeida and de Sousa Paiva, 2022 or Suttipun, 2021). Other studies have tackled specific research topics, including the impact of a negative ESG reputation on audit quality (Asante-Appiah, 2020), factors affecting ESG auditor remuneration (Kammoun and Khoufi, 2025), the influence of non-audit service provision on ESG risk and firm value (Asante-Appiah and Lambert, 2023), the distinction between mandatory and voluntary assurance of ESG reports (Chung et al., 2024), and assurance by the auditor along with another independent assurance service provider (Bakarich et al., 2023).

In the context of our research, we also highlight, in particular, studies that addressed the importance of external auditor verification of ESG reports. Del Giudice and Rigamonti

(2020) examined whether companies that have their ESG reports audited by an independent third party possess higher ESG scores. They conducted an analysis that investigated the change in ESG scores after disclosing a specific corporate misconduct or scandal. They concluded that the results differed significantly between audited and unaudited reports. Companies with audited ESG reports do not exhibit significant changes in ESG scores after a scandal, which the authors suggest indicates that rating agencies are likely to provide an accurate initial interpretation of sustainability. In contrast, unaudited companies were found to have a significant deterioration in ESG scores after the scandal was revealed. The results of the multivariate analysis confirmed that external audits can considerably enhance the credibility of ESG scores and ESG reports.

The study by Vaihekoski and Yahya (2025) investigates whether audit quality influences the relationship between ESG scores and firm valuation. Results show that companies with high ESG scores audited by Big Four firms have higher market valuations, likely due to greater credibility and investor confidence. At the same time, no significant link is found for firms audited by non-Big Four auditors. High-quality audits appear to enhance the reliability of ESG disclosures, reduce information asymmetry and improve transparency.

Wang et al. (2022) test the effect of ESG performance on investment activity using regression analysis on a sample of Chinese companies listed on the A-share (shares of companies incorporated in mainland China, traded in renminbi, and listed on the Shanghai or Shenzhen Stock Exchange) from 2011 to 2020. ESG scores from the Bloomberg database measure ESG performance. The results show that high ESG performance significantly increases investment activity, and audit quality partially mediates the relationship between ESG performance and investment efficiency. According to the study, ESG performance is lower in state-owned firms, underdeveloped regions, and firms with low accounting information quality. Friske et al. (2024) investigated the factors influencing compliance with Global Reporting Initiative

(GRI) standards in sustainability reporting. They concluded that one of the key factors is independent third-party verification. According to the authors, external verification of ESG reports by auditors positively impacts compliance with reporting standards.

In their study, Moalla and Dammak (2025) examined the effect of audit quality on ESG information transparency in US companies and the relationship between firms' media exposure, audit quality, and ESG information transparency. They concluded that high audit quality positively affects ESG information transparency. They also found that firms with higher media exposure are viewed as riskier from the external auditor's perspective. Consequently, audit procedures are more extensive, leading to more transparent ESG disclosures. Knechel (2021) also confirms the role of external auditors in verifying ESG reports. ESG factors are becoming increasingly important to investors and stakeholders. According to Knechel (2021), auditors can improve the quality of ESG disclosures. In their study, Aly and Badawy (2024) highlight that external audits independently verify sustainability information and increase stakeholder confidence in reported information. Hirsch and Heichl (2025) examined the effect of different disclosure formats and the presence of independent auditors on the quality and reliability of ESG reports. The authors used panel regression to analyse these factors. One conclusion of the study regarding the importance of audited ESG reports is that these reports have higher credibility and reliability. The study also shows that external verification of reports increases transparency and trust in the information provided.

Training auditors in ESG is essential to ensuring high-quality verification of non-financial information following new EU legislation, particularly the CSRD Directive and ESRS standards. This demands entirely new competencies – from comprehending the principle of double materiality and regulations such as the EU taxonomy to implementing international standards for the verification of non-financial data, such as the International Standard on Assurance Engagements (ISAE) 3000

(Revised) or the International Standard on Sustainability Assurance (ISSA) 5000. ESG auditing is a highly specialised activity that necessitates multidisciplinary knowledge in the areas of law, ecology, social sciences, and risk management, alongside specific soft skills and personal qualities. Auditors require training to apply standards for the verification of non-financial information, such as the International Standard on Assurance Engagements (ISAE) 3000 (Revised), the International Standard on Assurance Engagements (ISAE) 3410 on Greenhouse Gas Statements, or the new International Standard on Sustainability Assurance (ISSA) 5000). High-quality and systematic training is therefore crucial to enabling auditors to provide relevant and credible services, mitigate the risk of greenwashing, and safeguard the public interest (Rawat et al., 2025). Simultaneously, it allows them to cultivate new professional avenues and adapt to the evolving demands of a market that increasingly expects responsible and transparent behaviour from companies. Insufficient training can result in doubts about audit quality, reputational risk, and potential non-compliance with legal requirements.

Mandatory external verification of ESG reports in the European Union was introduced by Directive 2022/2464 of the European Parliament and of the Council on 14 December 2022, amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC, and Directive 2013/34/EU regarding corporate sustainability reporting (hereinafter referred to as the Corporate Sustainability Reporting Directive, CSRD). This mandatory verification can be conducted by the statutory auditor or by another independent provider of assurance services. The requirements for statutory auditors are outlined in Directive 2006/43/EC of the European Parliament and the Council on statutory audits of annual and consolidated accounts. In the Czech legal system, this Directive is transposed into Act No. 93/2009 Coll., on auditors, as amended (Czech Republic, 2009), which defines the general requirements for applicants seeking an auditor's licence, the framework content of the auditor's examination, and the obligation of supervised practice.

The binding reporting framework for sustainability information is the Sustainability Reporting Standards (ESRS), adopted by the European Commission on 31 July 2023, and Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020. This regulation establishes a framework to facilitate sustainable investments and amends Regulation (EU) 2019/2088 (the Taxonomy Regulation), which includes a classification of economic activities considered sustainable concerning the Statutory Environmental Objectives (EU, 2023).

The European Commission has not yet issued verification standards to confirm sustainability information. Therefore, national verification standards can currently be applied to assess ESG reports until the European Commission adopts its verification standards. The most commonly used standard in member countries is the International Standard on Assurance Engagements (ISAE) 3000 (Revised), which is not dedicated to audits or reviews of historical financial information, and is presently utilised to verify voluntary ESG reporting compiled based on GRI standards. This standard is also employed in the Czech Republic and pertains to verification engagements at the limited assurance level. The International Standard on Assurance Engagements (ISAE) 3410 on Greenhouse Gas Statements is used for verifying greenhouse gas (GHG) reporting engagements. This separate standard allows auditors to validate the GHG emissions section of an ESG report.

This paper aims to verify the sufficient capacity in the ESG assurance services sector in the Czech Republic and empirically validate the so-called "Matrix of Professional Competencies and Personal Assumptions of ESG Auditors," compiled based on the legislative and theoretical background in Popelková and Svoboda (2025). This matrix provides a comprehensive overview of the requirements for ESG auditors (listed in Tab. 1 below), including legal requirements, technological skills, ethical standards, and soft skills necessary for the ESG audit profession. The 17 professional competencies and personal prerequisites were selected based

on a content analysis of the available literature. The following sources served as the primary basis for developing the matrix (Popelková and Svoboda, 2025):

- Article 8 of Directive 2006/43/EC of the European Parliament and the Council;
- § 4 of the Czech Act on Auditors, as amended from 1 January 2024;
- overview of ESG modules within the CPD (Continuous Professional Development) programme of the Chamber of Auditors of the Czech Republic;
- the International Code of Ethics for Professional Accountants and the draft International Ethics Standards for Sustainability Assurance (International Ethics Standards Board for Accountants);
- ČSN EN ISO 19011:2019 – Guidelines for Auditing Management Systems (international standard providing guidance on auditing principles, managing audit programmes, and conducting management system audits);
- IFAC (2024): A Literature Review of Competencies, Educational Strategies, and Challenges for Sustainability Reporting and Assurance (study summarising global research

on the skills and knowledge required for professionals engaged in sustainability reporting and assurance).

The following research questions were identified in the context of the present research:

- Does the ESG Auditor Professional Competencies and Personal Attributes Matrix include only the competencies and personal attributes deemed relevant to the profession of ESG auditor?
- Is there a relationship between auditors' willingness to audit ESG reports and the nature of audit work?
- Is there a relationship between auditors' willingness to audit ESG reports and how they acquire additional knowledge of ESG issues?
- Is there a relationship between auditors' views on ESG issues and the nature of audit practice?
- Is there a relationship between auditors' views on ESG issues and their willingness to audit ESG reports?

2 MATERIALS AND METHODS

The data required to achieve the objectives of this study were gathered through a questionnaire survey of statutory auditors, i.e., individuals who have been issued an audit license. All auditors with an email address published in the official register of auditors were contacted; specifically, 427 auditors were reached out to of 1061 active auditors as of 31 January 2024. The sample survey was conducted from May to July 2024. The questionnaire was sent to the auditors by email twice: the initial invitation was distributed in May 2024, followed by one reminder in June 2024. This was the period during which the CSRD was transposed into the Czech legal system, and statutory auditors were mandated to verify ESG reports. During this timeframe, statutory auditors received training in ESG reporting and verification to ensure

they could perform external verification of these reports in 2025 for the 2024 reporting period. The sample survey was executed using Google Forms. The complete questionnaire is included in Appendix A. The questionnaire is linked to the research questions as follows: the first research question is addressed in question 6; the other research questions involve willingness to conduct an ESG audit (question 3 in the questionnaire), attitude towards ESG audits (questions 1 and 2), auditor training (questions 4 and 5), all in combination with the legal status of the auditor (question 7).

The questionnaire was completed by 82 out of the 427 auditors contacted. This response rate is comparable to similar surveys targeting specific professional groups, e.g., Eulerich et al. (2022) or Rossi and Hampel (2024).

To verify the sample's representativeness, the proportion of self-employed auditors in the sample was checked to determine whether the proportion of self-employed auditors in the population corresponds to the proportion of self-employed auditors. For this purpose, the Bernoulli distribution parameter test was used with H_0 parameter equal to 0.35, which is the proportion of self-employed auditors in the population (sourced from the official register of auditors). The relevance of the data in the ESG auditor's Professional Competencies and Personality Assumptions Matrix was again assessed using the Bernoulli distribution parameter test. The proportion of the sum of the frequencies for the response options 'rather important' and 'important' and the number of respondents serves as the estimate of this parameter. Testing the substantive significance of the items in the Professional Competence Matrix is possible using the H_0 parameter equal to 0.5 and the alternative hypothesis that the parameter is greater than 0.5. An analogous approach was used in Lee et al. (2016) for the case of testing the effects of auditors' self-efficacy and professional development.

The dependence between responses to each question was assessed using a contingency table test of independence (we tested the test assumptions about theoretical frequencies, which required them to be at least 5 in 80% of cases and greater than 2 in the remaining 20%). In the event of a statistically significant dependence, the strength of the dependence was evaluated using Cramer's coefficient, which ranges from 0 (weak dependence) to 1 (strong dependence). The nature of any detected dependence was explained through Haberman's residual analysis. This approach was used, e.g. in Gajanová and Nadányiová (2018), where correspondence analysis is employed instead of Haberman's residual analysis. A description of the methods mentioned above is given in Agresti (2007). Finally, hierarchical cluster analysis was applied (various distance measures between objects and clusters were employed), resulting in a dendrogram and characteristics of the detected clusters, similar to those in Lamboglia and Mancini (2021); a mathematical description can be found in Martinez and Martinez (2016). The calculations were conducted at a significance level of 0.05 and were executed in the MATLAB R2024b computational system.

3 RESULTS

Firstly, the hypothesis was tested regarding whether the proportion of self-employed auditors in the sample corresponds to the proportion of self-employed auditors in the population, i.e., 35%. Based on $p = 0.088$, we do not reject the null hypothesis; therefore, the proportion of self-employed auditors in the sample is not statistically significantly different from the proportion in the population. Since the practice of auditing is significantly influenced by the personality of the auditor, we can conclude that the results obtained from the sample survey can be generalised to the entire population of auditors.

The first question addressed whether ESG should be part of corporate strategies and if it should be prioritised over the objective of maximising value for owners/shareholders. A total

of 46.3% of auditors believe that ESG should be integrated into corporate strategy and should also take precedence over the goal of maximising value. In contrast, 11% of auditors contend that ESG should be part of corporate strategies but should be subordinate to the objective of maximising value. The perspective that ESG should be regarded with equal importance to value maximisation is held by 42.7% of auditors. The results indicate that most auditors (89%) believe that ESG should be prioritised above the objective of value maximisation or held on the same level of consideration.

When asked whether the auditors believe that the ESG report is merely a formal document with no impact on CSR, 48.8% of auditors responded that the ESG report is not just a formal document and does have an impact on

CSR. A total of 34.1% of auditors think that it is solely a formal document without any real influence. Additionally, 17.1% of auditors provided different responses in the open-ended section. Among these auditors, a significant proportion assert that the true impact of ESG reports cannot be currently assessed. Some indicate that most companies will likely regard them more as formal documents with no tangible impact. These auditors also emphasise that the effect of ESG reports will depend on management's moral integrity and the company's overall attitude towards sustainability. The auditors observe that current legislation artificially enforces the impact of ESG reporting, and the high administrative burden may reduce its effectiveness. Some respondents emphasise that future developments and global cooperation on ESG will be crucial, as will the significance that users place on ESG reporting.

A total of 28 auditors responded to the follow-up question and shared their views on making the ESG report more than just a formal document, allowing it to have a real impact on corporate social responsibility. Some auditors believe that ESG documentation is primarily a formal matter with no substantial impact on sustainability, as companies tend to produce it merely to fulfil a legal obligation. Others see the potential for its meaningful use if companies recognise its importance and the public begins to actively value responsible business practices. One suggestion is to simplify and integrate ESG reports into annual reports, where companies would include relevant information at their discretion. Additionally, there is a need to raise awareness of the meaning of ESG among the professional and lay public so that companies do not view ESG as an administrative hurdle.

Some auditors warn against excessive regulation and call for more freedom in corporate disclosures or looser rules that emphasise recommendations rather than strict legislation. Other suggestions include reducing the cost of report production by simplifying administrative processes, for example. Some auditors question whether ESG will genuinely contribute to responsible business practices unless there are stricter sanctions or a global consensus on

standards. Others emphasise that ESG must be economically viable – reporting costs should be lower than the benefits, such as improved financing. There are also sceptical views that it will not bring about fundamental changes without a global approach and consistent ESG rules. Its implementation will be gradual, and improvements will occur rather slowly. The general consensus is that 'reason should prevail' – protecting nature is essential, but regulation should not be excessive and reflect the real possibilities of businesses and individual economies.

The next question asked about auditors' interest in verifying Sustainability Reports. The majority of auditors (57.3%) believe that they will definitely audit these reports. Only 14.6% of auditors said they definitely will not audit ESG reports. A relatively significant proportion of auditors (28%) do not yet know whether they will audit these reports, which may reflect that auditors are just starting to become familiar with this area and are unsure whether they will be able or willing to do so.

A follow-up question mapped the channels and sources from which auditors plan to obtain ESG knowledge and information for ESG report verification. Most auditors responded that their main source of information will be courses and training at the Chamber of Auditors of the Czech Republic (72 respondents, i.e., 87.8%). This is, of course, related to the fact that webinars and courses at the Chamber of Auditors of the Czech Republic are designed to cover all required areas of ESG issues, and these courses are automatically counted toward the mandatory Continuing Professional Education (CPE) that auditors must complete. A total of 58.5% of respondents also plan to choose a form of self-study. Additionally, 30.5% of auditors plan to undertake internal training within their audit firm. Furthermore, 14.6% of auditors intend to complete only the mandatory CPE and do not plan to pursue further training in this area. This percentage corresponds to the share of auditors who do not plan to audit ESG reports. Other sources of information cited by auditors include educational agencies, university courses, guidance notes for auditors, and training provided by an international network of consultancies.

The open-ended response also included the view that auditors planning to audit sustainability reports should attend ongoing training or conferences with an international focus: “Given the rapid developments and changes in this area, it will be very difficult to maintain the quality of audit reports without continuously updating information and ideally sharing different views.” The supplementary question also identified the ESG issues that auditors believe should be part of education. According to Article 8 of Directive 2006/43/EC of the European Parliament and of the Council, the following should be included in auditors’ training: standards for reporting Sustainability Reports, standards for verifying these reports, sustainability analysis, and due diligence procedures.

The majority of auditors (92.7%) believe that standards for verifying sustainability reports should be included in training. Additionally, 75.6% of auditors feel that training should cover standards for reporting on sustainability reports, while 61% think sustainability analysis should also be part of the training. Some auditors (43.9%) believe that training should also encompass due diligence procedures, which are regulated by the Corporate Sustainability Due Diligence Directive (CSDDD) of 13 June 2024 (EU, 2024). Member States must transpose the CSDDD into national legislation by 26 July 2026. Only a draft of this directive existed at the time of the research. However, Article 8 of Directive 2006/43/EC of the European Parliament and of the Council has already addressed this area in the mandatory training of auditors before adopting this Directive (EU, 2006).

Next, we will verify the ESG Auditor Professional Competence Matrix and Personality Assumptions. The basis is the assessment shown in Tab. 1. The distribution of relative frequencies and medians demonstrates that auditors deem all the core competencies and personality assumptions of the constructed matrix relevant. A more rigorous assessment using the test identified competencies that were not rated as important or rather important by the majority of respondents.

Based on a combination of median scores and p -values, the competencies and personality attributes of ESG auditors can be categorised into three groups based on their perceived importance and statistical significance. The core competencies that were statistically significant as necessary ($p < 0.05$) and also reached a median of 4 or 5 include adherence to ethical principles, systems thinking, adaptability and flexibility, critical thinking and problem solving, decisiveness, independence, openness to improvement, open-mindedness, the ability to perceive the specifics of the organisation, and mindfulness. These competencies are deemed essential for the ESG audit profession across the sample of respondents and should form the core profile of this new professional field.

The second group comprises competencies that, while they achieved a median score of 4, indicating they are generally considered important, had their significance not confirmed statistically ($p \geq 0.05$). These include technological competence, versatility, sensitivity to corporate culture, and diplomacy. The results indicate that these skills are not universally perceived as key but may be important depending on the context of a particular audit engagement or auditor specialisation. The third group consists of competencies that demonstrate both a lower median (3 or 3.5) and statistical insignificance ($p \geq 0.05$). Specifically, these include interpersonal skills, resilience, and the capacity to act bravely (moral courage). Respondents do not perceive these qualities as necessary and therefore do not consider them essential for pursuing the ESG auditing profession.

Overall, the results confirm that the proposed Matrix of Professional Competencies and Personal Attributes encompasses the core key skills for ESG auditors. However, they also indicate that some soft skills may not be widely perceived as necessary and should, therefore, be considered more individually. In the open response, it was expressed that the ESG auditor should also be able to outsource. Given the complexity of the ESG topic, collaboration with external experts may be necessary.

The majority of respondents are employees of the audit firm (76.8%). Among self-employed

Tab. 1: Evaluation of professional competencies and personal prerequisites needed for ESG auditors. The column Test includes p -values from the test of the sample proportion

Competency	Importance level (%)					Median	Test
	1	2	3	4	5		
Adherence to Ethical Principles	3.7	6.1	14.6	17.1	58.5	5	< 0.001
Systems Thinking	3.7	4.9	15.9	32.9	42.7	4	< 0.001
Adaptability and Flexibility	1.2	6.1	15.9	45.1	31.7	4	< 0.001
Critical Thinking and Problem-Solving	3.7	2.4	13.4	31.7	48.8	4	< 0.001
Technological Competence	2.4	12.2	32.9	36.6	15.9	4	0.329
Interpersonal Skills	1.2	12.2	39.0	37.8	9.8	3	0.329
Versatility	2.4	6.1	40.2	39.0	12.2	4	0.413
Resilience	6.1	9.8	40.2	32.9	11.0	3	0.135
Moral Courage	8.5	6.1	35.4	34.1	15.9	3.5	0.500
Decisiveness	2.4	3.7	22.0	40.2	31.7	4	< 0.001
Independence	2.3	8.5	23.2	42.7	32.9	4	0.002
Openness to Improvement	1.2	4.9	28.0	37.8	28.0	4	0.002
Sensitivity to Corporate Culture	6.1	11.0	31.7	37.8	13.4	4	0.413
Diplomacy	3.7	8.5	31.7	32.9	23.2	4	0.135
Open-Mindedness	1.2	3.7	19.5	41.5	34.1	4	< 0.001
Awareness of Organisational Specifics	2.4	1.2	14.6	34.1	47.6	4	< 0.001
Attentiveness	3.7	1.2	11.0	37.8	46.3	4	< 0.001

auditors, there is a significantly higher proportion of auditors who will definitely not audit ESG reports (42.1%) compared to all respondents, where this proportion was 14.6%. A total of 26.1% of self-employed auditors do not yet know whether they will audit these reports. Additionally, there is a significantly higher proportion of auditors in this group (52.6%) who believe that the ESG report is merely a formal document and has no real impact on CSR. Given the nature of the audit engagements of interest to sole auditors, it is expected that these auditors will audit Sustainability Reports to a lesser extent. Public interest entities, large entities, or small and medium-sized entities issuing securities subject to the CSRD are predominantly audited by medium and large audit firms.

When testing the dependence between the selected questions, the requirements for theoretical frequencies were consistently verified with positive results. A statistically significant relationship was identified with $p < 0.001$ between the nature of audit practice and whether auditors plan to audit ESG reports in the

future. A Cramer's coefficient of 0.44 indicates a moderately strong relationship. Haberman residuals revealed that auditors employed by audit firms are more likely to plan to audit ESG reports than self-employed auditors. The association between the nature of audit practice and auditors' belief that the ESG report is merely a formal document was confirmed with $p = 0.008$. The Cramer's coefficient of 0.34 indicates a weak to moderate relationship. We can conclude that auditors who perceive the Sustainability Report as merely a formal document do not plan to audit the ESG report in the future, while auditors who believe the ESG report has a real CSR impact are inclined to audit these reports in the future.

A moderately strong relationship was also confirmed between auditors' willingness to audit ESG reports and their plan to attend only mandatory continuing professional education at the Chamber of Auditors of the Czech Republic (independence rejected with $p < 0.001$; Cramer's coefficient is 0.42). Auditors who intend to attend only mandatory continuing professional education on ESG at the

Chamber of Auditors of the Czech Republic do not plan to verify ESG reports. In contrast, those who plan to utilise multiple information channels to gain knowledge of ESG issues do intend to verify these reports. A weak to moderate dependence was confirmed regarding questions on the nature of audit practice and the formality of ESG reports (independence rejected with $p = 0.040$; Cramer's coefficient is 0.23). Self-employed auditors are more likely to view the ESG report as merely a formal document, whereas auditors employed by audit firms regard it as significant in terms of its impact on corporate social responsibility.

The distribution of respondents according to their answers was conducted using cluster analysis. The hierarchical agglomerative procedure with standardised Euclidean distance between objects and Ward's distance between clusters yielded the most reliable results. Utilising the dendrogram, four clusters of respondents were identified, as shown in Tab. 2. Cluster 4 cannot be considered relevant for the interpretation of the results, as it includes only three respondents. These respondents did not show any consistent pattern of responses; therefore, it was not possible to determine the characteristics of this group. For this reason, the fourth cluster was excluded from further analysis and interpretation.

Tab. 2: Distribution of respondents into clusters

Cluster	Count	Proportion (%)
1	54	66
2	12	15
3	13	16
4	3	4

Cluster 1 contains the vast majority of audit firm employees who place greater importance on ESG reports and recognise their real impact on corporate social responsibility. Respondents in this cluster confirmed that they consider all the skills and personal characteristics listed in the Professional Competency Matrix to be essential for the ESG audit profession. Most members of this group are actively preparing to audit ESG reports and plan to expand their expertise

on ESG issues through additional information sources. They also agree that ESG auditor training should encompass all areas defined in Article 8 of Directive 2006/43/EC of the European Parliament and the Council.

Cluster 2 primarily consists of auditors operating as sole proprietors who view ESG reports as formal documents with little actual impact on corporate social responsibility. This group has the highest proportion of auditors who only intend to participate in mandatory continuing education through the Chamber of Auditors and do not plan for any additional ESG training. In terms of training program content for ESG auditors, most respondents believe that auditing standards for ESG reports should be included. Half of them also consider the inclusion of sustainability analysis to be significant, while a smaller portion of this group supports training on ESG reporting standards and due diligence procedures. Respondents in this group also affirmed that they regard all the skills and personal characteristics outlined in the professional competency matrix as important or quite important for the ESG audit profession.

Cluster 3 consists solely of auditors working for audit firms. An interesting aspect of this group is its ambivalence on specific issues. While the majority of respondents in this cluster plan to pursue extended ESG training, a notable proportion (40%) believes that the ESG report is merely a formal document with no genuine impact on corporate social responsibility. Regarding preferences for ESG auditor education, this group agrees that it should encompass assurance and reporting standards. Additionally, half of the respondents regard sustainability analysis and due diligence practices as important. These auditors, although not entirely optimistic about ESG, can be expected to participate in the verification of ESG reports due to their employment relationship. Concerning professional competencies, these respondents view most skills as quite important for the ESG audit profession. However, they are neutral about certain qualities, such as the ability to act bravely or exercise diplomacy.

4 DISCUSSION

We are aware that questionnaire surveys can have weaknesses that affect the quality and reliability of the data collected. One of these weaknesses is that many respondents do not complete the questionnaire, leading to low return rates and a potentially unrepresentative sample. To reduce the risk associated with low return rates, we have added an optional final response to the questionnaire where auditors can provide their email if they wish to receive the survey results. This option has been included to encourage auditors to complete the survey. The structure and questions in the questionnaire are designed to be understandable to all respondents, and it does not take much time to complete. To complete and submit the questionnaire, all questions must be answered except question 2b, which is logically linked to and elaborates on the previous question.

Another potential weakness is self-selection bias, where auditors with strong opinions on ESG issues are more likely to answer the questionnaire. To reduce self-selection bias, we emphasised in the introductory email the importance of having auditors who are sceptical or undecided about the issue complete the questionnaire, as well as the opportunity to gather views from other colleagues in the profession regarding its development. Professional education on ESG is part of the mandatory educational topics for all members of the Chamber of Auditors, so we believe that developments on this matter are important for all auditors, including those who will not be auditing ESG in the future. To avoid biased results, we added a question to the questionnaire to determine the nature of the respondent's activities - whether they are an employee of the audit firm or a self-employed auditor. This information will allow us to compare the composition of respondents with the structure of the audit profession in the Czech Republic, and in the case of significant deviation, we can apply data weighting. The possibility of obtaining survey results also helps to mitigate the risk of self-selection bias to some extent. The sample of auditors contacted consists of all with

a published email address in the Register of Auditors, regardless of their specialisation. For this reason, the questionnaire distribution was deliberately not conducted at conferences or training sessions, where auditors with already defined positions are present. We rejected the distribution of questionnaires by post to the published addresses of auditors listed in the register. This is because the address is typically the registered office of the audit firm where the auditor is employed or the registered office of the auditor's sole proprietorship. Thus, it may not be linked to a specific auditor, and there is a risk that the respondent is not the statutory auditor but another employee. We also believe that distribution by post would result in very low returns, with costs not justifying the benefits, and this method could introduce bias in the results. The selected distribution of questionnaires via auditors' email addresses yields a representative sample that can be generalised to the entire population of auditors.

The results of the study show the diversity of opinions among auditors regarding ESG. While auditors employed by audit firms demonstrate greater interest in verifying ESG reports and recognise their importance for corporate social responsibility, self-employed auditors tend to be more sceptical and view ESG reports as more of an administrative formality. This difference may stem from the nature of the audit engagements that interest sole practitioner auditors, leading to the expectation that they will audit ESG reports to a lesser extent. Public interest entities, large entities, or small and medium-sized entities issuing securities subject to the CSRD are predominantly audited by medium or large audit firms. This assertion was affirmed by a study conducted by Bakarich et al. (2023), which examined the ESG reports of companies in the "Top 100 Sustainable Companies" rankings of The Wall Street Journal and Investor's Business Daily. They concluded that ESG verifications were performed at most international companies by BIG 4 audit firms (57%).

5 CONCLUSIONS

An important finding is that, although most auditors recognise the significance of ESG reporting, approaches to continuing education differ among groups. Those preparing to audit ESG reports often prefer broader training that covers not only auditing and reporting standards but also sustainability analysis and due diligence practices.

Many auditors working as employees of audit firms, despite planning extended training in ESG reporting and verification, along with most intending to verify ESG reports, often hold a negative view of ESG. Many believe that the ESG report serves merely as a formal document without real impact on corporate social responsibility. This group of auditors includes many who are not entirely convinced of the benefits of these reports, even though they will receive further education in this area, and most will also audit these reports. These sentiments may arise from their employment situation, wherein audit firms encourage staff to pursue extended ESG training to remain competitive and meet client demands. However, auditors may perceive ESG reporting as a tool introduced mainly for regulatory purposes rather than for its genuine value to investors or the public. Some auditors also see ESG reporting as an underdeveloped tool still in its formative stages. Consequently, they may regard it as merely a formality today, simultaneously acknowledging that their role will evolve in the future, necessitating preparation for changes within their profession.

The results of our research have highlighted the potential impacts on ESG regulators themselves, auditors and audit firms, and companies with ESG reporting obligations. ESG regulators should assess, considering the concerns of statutory auditors, whether the new requirements and mandatory reporting standards place a disproportionate administrative and financial burden on companies relative to the anticipated benefits. The most significant risk seems to be for listed SMEs, which will engage in ESG reporting in the third wave of CSRD implementation, with their first reporting period beginning in 2028 under the Omnibus I and

II proposal, which postpones the original 2026 start date by two years.

For companies subject to the CSRD, mandatory ESG reporting and its verification by an auditor pose a significant challenge due to high data collection requirements, costs for staff training, and the need for personnel resources, as well as the use of external experts and modern technology. According to a survey conducted among statutory auditors in the Czech Republic, 42.1% of statutory auditors definitely will not verify ESG reports, and 26.1% of statutory auditors are still uncertain about whether they will confirm these reports. Suppose a large number of statutory auditors exit the market, and medium and large audit firms primarily handle the verification of ESG reports. In that case, competition will diminish, leading to increased prices for verification services.

In the Czech Republic and in most other EU countries that have been obliged to implement the CSRD Directive into national legislation, only statutory auditors are authorised to verify ESG reports. Thus, the verification of ESG reports presents a significant opportunity for auditors to expand their services. At the same time, the verification of ESG reports brings challenges in the form of high demands on qualifications and other skills related to the issue. Verification of ESG reports is a complex discipline that often involves specific technical areas, such as the verification of carbon footprint calculations. Additionally, auditors are required to possess specific soft skills. These skills and personal attributes have been defined based on the literature (Popelková and Svoboda, 2025), and research conducted among statutory auditors has confirmed these skills as crucial for the profession of ESG auditors. The skills and areas of learning can guide future ESG auditors on what areas to focus on in their learning and development. They can also inform professional chambers and educational institutions about including courses related to these areas and skills in ESG assurance within their training programmes.

We believe that the results of the research will contribute to filling gaps in current research and may have practical implications for audit services, ESG regulation, and the implementation of the CSRD in Europe. The study has mapped the views and attitudes of statutory auditors towards ESG reporting and assurance, and analysed their willingness to engage in the assurance of ESG reports in the context of new regulatory requirements. Identifying the key competencies and training needs of auditors concerning ESG assurance enables the professional community to be better prepared for the upcoming changes. A comparison of the

approaches of auditors employed by audit firms and self-employed auditors revealed differences in their perceptions and approaches to this new area of assurance. The results of this research thus contribute to the professional discussion on the implementation of the CSRD and its impact on the audit profession in the European Union, while the specific view of the situation in the Czech Republic may inspire other Member States. The results of this study can serve as a valuable source of information for regulators, auditors, academics, professional chambers, and companies themselves as they prepare to meet the new ESG reporting requirements.

6 ACKNOWLEDGEMENTS

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7 REFERENCES

- AGRESTI, A. 2007. *An Introduction to Categorical Data Analysis*. 2nd ed. Hoboken: Wiley-Interscience. ISBN 978-0-471-22618-5.
- ALY, A. W. N. and BADAWY, H. A. E. S. 2024. External Assurance on Sustainability Reporting of Listed Companies in the Context of Egypt Vision 2030. *The Scientific Journal of Business and Finance*, 44 (2), 263–277. DOI: 10.21608/caf.2024.372939.
- ASANTE-APPIAH, B. 2020. Does the Severity of a Client's Negative Environmental, Social and Governance Reputation Affect Audit Effort and Audit Quality? *Journal of Accounting and Public Policy*, 39 (3), 106713. DOI: 10.1016/j.jaccpubpol.2019.106713.
- ASANTE-APPIAH, B. and LAMBERT, T. A. 2023. The Role of the External Auditor in Managing Environmental, Social, and Governance (ESG) Reputation Risk. *Review of Accounting Studies*, 28 (4), 2589–2641. DOI: 10.2139/ssrn.3864175.
- BAKARICH, K. M., BARANEK, D. and O'BRIEN, P. E. 2023. The Current State and Future Implications of Environmental, Social, and Governance Assurance. *Current Issues in Auditing*, 17 (1), A1–A21. DOI: 10.2308/CIIA-2022-012.
- CHUNG, R., BAYNE, L. and BIRT, J. L. 2024. Determinants of ESG Disclosure among Listed Firms under Voluntary and Mandatory ESG Disclosure Regimes in Hong Kong. *Journal of Applied Accounting Research*, 25 (4), 812–836. DOI: 10.1108/JAAR-07-2022-0179.
- Czech Republic. 2009. *Act No. 93/2009 Coll., on Auditors, as Amended* [online]. Available at: <https://www.zakonyprolidi.cz/cs/2009-93>. [Accessed 2024, January 20].
- DE ALMEIDA, M. G. and DE SOUSA PAIVA, I. C. 2022. Audit Committees and its Effect on Environmental, Social, and Governance Disclosure. In *2022 17th Iberian Conference on Information Systems and Technologies (CISTI)*, 1–6. DOI: 10.23919/CISTI54924.2022.9820167.
- DEL GIUDICE, A. and RIGAMONTI, S. 2020. Does Audit Improve the Quality of ESG Scores? Evidence from Corporate Misconduct. *Sustainability*, 12 (14), 5670. DOI: 10.3390/su12145670.
- EULERICH, M., BONRATH, A. and LOPEZ KASPER, V. I. 2022. Internal Auditor's Role in ESG Disclosure and Assurance: An Analysis of Practical Insights. *Corporate Ownership & Control*, 20 (1), 78–86. DOI: 10.2139/ssrn.4070755.

- European Commission. 2025. *Commission Proposes to Cut Red Tape and Simplify Business Environment (Omnibus I and II Simplification Package)* [online]. Available at: https://ec.europa.eu/commission/presscorner/detail/en/ip_25_614. [Accessed 2025, August 13].
- European Union. 2006. *Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on Statutory Audits of Annual Accounts and Consolidated Accounts, amending Council Directives 78/660/EEC and 83/349/EEC and Repealing Council Directive 84/253/EEC* [online]. Available at: <https://eur-lex.europa.eu/legal-content/CS/TXT/PDF/?uri=CELEX:32006L0043>. [Accessed 2024, July 19].
- European Union. 2022. *Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as Regards Corporate Sustainability Reporting (CSRD)* [online]. Available at: <https://eur-lex.europa.eu/legal-content/CS/TXT/PDF/?uri=CELEX:32022L2464>. [Accessed 2024, January 20].
- European Union. 2023. *Commission Delegated Regulation (EU) 2023/2772 of 31 July 2023 supplementing Directive 2013/34/EU of the European Parliament and of the Council as Regards Sustainability Reporting Standards* [online]. Available at: https://eur-lex.europa.eu/legal-content/CS/TXT/PDF/?uri=OJ:L_202302772. [Accessed 2024, January 20].
- European Union. 2024. *Directive (EU) 2024/1760 of the European Parliament and of the Council of 13 June 2024 on Corporate Sustainability Due Diligence and amending Directive (EU) 2019/1937 and Regulation (EU) 2023/2859* [online]. Available at: https://eur-lex.europa.eu/legal-content/CS/TXT/HTML/?uri=OJ:L_202401760. [Accessed 2024, July 10].
- FRISKE, W., NIKOLOV, A. N. and MORGAN, T. 2024. Making the Grade: An Analysis of Sustainability Reporting Standards and Global Reporting Initiative Adherence Ratings. *Corporate Social Responsibility and Environmental Management*, 31 (3), 2098–2108. DOI: 10.1002/csr.2686.
- GAJANOVÁ, L. and NADÁNYIOVÁ, M. 2018. Dependence of Brand Loyalty on Customer Relationship Management. *Littera Scripta*, 11 (2), 20–34. ISSN 1805-9112.
- GU, Y., DAI, J. and VASARHELYI, M. A. 2023. Audit 4.0-based ESG Assurance: An Example of Using Satellite Images on GHG Emissions. *International Journal of Accounting Information Systems*, 50 (2), 100625. DOI: 10.1016/j.accinf.2023.100625.
- HIRSCH, S. and HEICHL, V. 2025. Analyzing the Impact of Disclosure Format and Auditing. *Journal of Corporate Accounting & Finance*, 36 (3), 275–298. DOI: 10.1002/jcaf.22784.
- IAASB. 2013. *International Standard on Assurance Engagements ISAE 3410: Assurance Engagements for Greenhouse Gas Emissions Statements* [online]. Available at: <https://www.kacr.cz/file/7620/isae-3410cz-amend-isqm-20022023.pdf>. [Accessed 2024, January 20].
- IAASB. 2015. *International Standard on Assurance Engagements ISAE 3000 (Revised): Assurance Engagements That Are Not Audits or Reviews of Historical Financial Information* [online]. Available at: <https://www.kacr.cz/file/7617/isae-3000cz-amend-isqm-20022023.pdf>. [Accessed 2024, January 20].
- KAMMOUN, I. and KHOUFI, W. 2025. Sustainable Performance, Conditional Conservatism and Audit Fees. *Journal of Financial Reporting and Accounting*, 23 (6), 2484–2513. DOI: 10.1108/JFRA-10-2022-0396.
- KNECHEL, W. R. 2021. The Future of Assurance in Capital Markets: Reclaiming the Economic Imperative of the Auditing Profession. *Accounting Horizons*, 35 (1), 133–151. DOI: 10.2308/HORIZONS-19-182.
- LAMBOGLIA, R. and MANCINI, D. 2021. The Relationship between Auditors' Human Capital Attributes and the Assessment of the Control Environment. *Journal of Management and Governance*, 25, 1211–1239. DOI: 10.1007/s10997-020-09536-8.
- LEE, S.-C., SU, J.-M., TSAI, S.-B., LU, T.-L. and DONG, W. 2016. A Comprehensive Survey of Government Auditors' Self-Efficacy and Professional Development for Improving Audit Quality. *SpringerPlus*, 5, 1263. DOI: 10.1186/s40064-016-2903-0.
- MARTINEZ, W. L. and MARTINEZ, A. R. 2016. *Computational Statistics Handbook with MATLAB*. 3rd ed. Chapham and Hall/CRC. ISBN 978-1-4665-9274-2.
- MOALLA, M. and DAMMAK, S. 2025. Do Media Coverage and Audit Quality of US Companies Affect Their Environmental, Social and Governance Transparency? *Journal of Financial Reporting and Accounting*, 23 (5), 2007–2026. DOI: 10.1108/JFRA-09-2022-0353.

- POPELKOVÁ, V. and SVOBODA, P. 2025. Profesní kompetence a osobnostní předpoklady ESG auditorů. *Český finanční a účetní časopis*, 20 (1), 27–43. DOI: 10.18267/j.cfuc.607.
- POZZOLI, M., PAGANI, A. and PAOLONE, F. 2022. The Impact of Audit Committee Characteristics on ESG Performance in the European Union Member States: Empirical Evidence Before and During the COVID-19 Pandemic. *Journal of Cleaner Production*, 371, 133411. DOI: 10.1016/j.jclepro.2022.133411.
- RAWAT, P., NANDA, S. K., RAO, V. D., PANKAJAM, A., RUPANI, J. and DHIMAN, R. 2025. Sustainability Reporting and Assurance: The Role of Auditors in Verifying Corporate Environmental and Social Performance. *Journal of Informatics Education and Research*, 5 (1), 440–448. DOI: 10.52783/jier.v5i1.2017.
- ROSSI, R. and HAMPEL, D. 2024. Indirect Cost in Should Cost Calculations – How Carmaker's Cost Engineers See It. *European Journal of Business Science and Technology*, 10 (1), 96–106. DOI: 10.11118/ejobsat.2024.006.
- SUTTIPUN, M. 2021. The Influence of Board Composition on Environmental, Social and Governance (ESG) Disclosure of Thai Listed Companies. *International Journal of Disclosure and Governance*, 18 (4), 391–402. DOI: 10.1057/s41310-021-00120-6.
- UMAR, U. H., FIRMANSYAH, E. A., DANLAMI, M. R. and AL-FARYAN, M. A. S. 2024. Revisiting the Relationship Between Corporate Governance Mechanisms and ESG Disclosures in Saudi Arabia. *Journal of Accounting & Organizational Change*, 20 (4), 724–747. DOI: 10.1108/JAOC-01-2023-0011.
- VAIHEKOSKI, M. and YAHYA, H. 2025. Environmental, Social, and Governance (ESG) and Firm Valuation: The Moderating Role of Audit Quality. *Journal of Risk and Financial Management*, 18 (3), 148. DOI: 10.3390/jrfm18030148.
- VASILYEVA, T. A. and MAKARENKO, I. A. 2017. Modern Innovations in Corporate Reporting. *Marketing and Management of Innovations*, 1, 115–125. DOI: 10.21272/mmi.2017.1-10.
- WANG, W., YU, Y. and LI, X. 2022. ESG Performance, Auditing Quality, and Investment Efficiency: Empirical Evidence from China. *Frontiers in Psychology*, 13, 948674. DOI: 10.3389/fpsyg.2022.948674.

8 ANNEX: ESG QUESTIONNAIRE FOR AUDITORS

1. In your opinion, ESG should be the main focus of companies and should be subordinated to the goal of maximising value for owners/shareholders.
 - YES
 - NO
 - ESG should be at the same level of interest as value maximisation
2. In your opinion, the ESG/Sustainability Report is only a formal document with no real impact on CSR.
 - YES
 - NO
 - Other:
- 2b. If, according to the previous question, the ESG report is, in your opinion, only a formal document, is there any way to make it not a formal document? Please write your opinion.
3. Do you plan to audit sustainability reports in addition to financial statements in the future?
 - Definitely YES
 - Absolutely NOT
 - I don't know
4. Where do you plan to acquire the necessary knowledge for sustainability verification? (multiple check boxes)
 - Self-study
 - Webinars and courses at the Chamber of Auditors of the Czech Republic
 - Internal training within the audit company
 - I plan to take only the compulsory CPV, and I do not plan any further training in this area
 - Other:
5. Auditor training should include: (more than one option can be ticked)
 - Standards for sustainability reporting
 - Standards for verifying sustainability reports
 - Sustainability analysis
 - Due diligence procedures in relation to sustainability issues

6. In your opinion, what skills or personality traits are important for the ESG auditor profession? (Likert scale 1–5; where one means ‘not definitely crucial to the profession’, and five means ‘definitely important to the profession’)
 - Adherence to ethical principles
 - Systems Thinking
 - Adaptability and flexibility
 - Critical thinking and problem-solving skills
 - Technological capability
 - Interpersonal skills
 - Versatility
 - Toughness
 - The ability to act bravely
 - Decisiveness
 - Independence
 - Openness to improvement
 - Consideration for the company culture/corporate environment
 - Diplomacy
 - Open mind
 - Ability to perceive the specifics of the company
 - Mindfulness
7. You perform auditing activities as:
 - Self-employed
 - Employee of the auditing company
8. I am interested in receiving the results of this research and would like to receive the results of this research and would like to send them to the following email address (please specify the email address to which you would like to send the research results – optional):

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