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Role of Audit Committees and Internal Audit in the Context of the Evolution of ESG Indicators

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Abstract. *The purpose of this research is to analyze the role and correlation between audit committees and internal audit within companies, in the context of environmental, social and governance (ESG) evolution of indicators in the information industry.*

Design/methodology/approach - This paper aims to understand whether there is a correlation between these 3 indicators (audit committee, internal audit and ESG indicators) and what is the impact on ESG score. The reported data is collected from a sample of companies included in the Refinitiv Eikon database and analyzed using a panel data analysis at both regional and industry levels.

The sample is composed of the number 889 companies, from Europe, most of them members of the European Union and covers a period of 4 years, from 2019 to 2022.

The results of this study show that AC and internal audit have a significant positive impact on sustainability disclosure, highlighting the positive impact of reporting according to GRI guidelines, the efficiency of internal audit and the independence of the audit committee.

This research contributes to the literature on sustainability reporting by information industry companies, in which regulators do not play a dominant role in determining the degree of disclosure. In the future, it will be necessary to have more involvement in determining these companies to have a greater responsibility regarding the transparency of reporting.

Keywords: ESG (Sustainability Reporting - Environment, Social and Governance), Audit Committee (AC), Internal Audit (IA), Information Industry, GRI Standards

Introduction

Corporate governance is one of the key issues in the business environment as good governance improves corporate success and performance. Among the most important pillars of a good corporate governance framework are audit committees (ACs), which are expected to improve the quality of financial reporting, improve the performance, independence and objectivity of auditors and the risk management function, and improve financial decision making. In addition, the presence of internal controls, namely, AC activities, helps mitigate information asymmetry between companies and market participants (Pozzoli et al., 2022).

This period represented a transition period towards an awareness of the importance of incorporating ESG and business development strategies. However, there are not many authors who

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have studied the impact of audit committees and internal audits on sustainability, ESG implementation and how they are interconnected.

The objective of this research is to observe the role of Audit Committees (AC) and Internal Audit (IA) within companies in Environmental, Social, and Governance (ESG) reporting over 4 years, from 2019 to 2022, across a diverse sample of companies selected from the information industry in all European regions.

Our chosen sample includes companies from 34 European countries, from both Tier 1 and Tier 2 countries. This selection ensures geographic diversity, enabling us to capture regional variations in ESG reporting practices and regulatory environments. Operating within various segments of the information industry, including technology, telecommunications, media, and data management, these companies offer a comprehensive understanding of ESG practices across the sector. Since all of the chosen companies are openly traded on stock markets, investors and market forces have a greater say over their ESG reporting procedures. Through this research, we aim to provide a holistic view of the relationship between AC and IA in the evolution of ESG reporting, offering recommendations to enhance reporting within the information industry.

Data for this study were extracted from the reputable Refinitiv Eikon database, with our main criteria of being included in the information industry in Europe. This industry, despite its size and growth potential, has been relatively under-researched compared to others, making it an opportune focus area. Additionally, the information industry faces with various ESG challenges such as energy consumption, e-waste generation, data privacy concerns, and ethical implications of Artificial Intelligence (AI) and automation, which necessitate attention and resolution.

By analyzing the role of AC and IA in ESG reporting within this context, we aim to contribute valuable insights that can inform strategies for improving sustainability practices and governance frameworks across the information industry in Europe.

In the framework of our research, we analyzed by means of a linear regression model the linear relationship between the dependent variable ESG Score, and the independent variables internal audit department reporting score, audit committee independence score, audit committee expertise score, gri report guidelines score. Research hypotheses that were the basis of the analysis are:

- Null hypothesis (H0): There is no significant correlation between ESG score and independent variables (Internal Audit Department Reporting Score, Audit Committee Independence Score, Audit Committee Expertise Score, GRI Report Guidelines Score).
- Alternative hypothesis (H1): There is at least one independent variable that has a significant correlation with ESG score.

With the increasing importance given to risk management and internal control systems in the process of assessing the reliability of the sustainability reporting process, the role of divine internal audit is more important (O'Dwyer et al. 2011). Thus, it is found that entities can use internal auditors as suppliers of sustainability assurance. At the same time, internal audit engagements are used to increase stakeholder confidence in sustainability reporting (DeSimone, S., 2021).

In addition, the uncertain market context, accentuated by the recent global financial crisis, imposes on companies the need to adopt sustainable options in crucial organizational decisions. As a result, proactive organizations are making significant efforts to improve business models and reporting systems, adapting to meet the increasingly complex requirements of stakeholders, and responding to the challenges posed by the uncertain business environment.

The European Commission has further recommended that European listed companies provide a AC composition that can guarantee an adequate level of independence and technical competence (EC, 2005), providing general directives in many cases integrated through specific guidelines, such as those adopted by the European Central Bank (ECB, 2018), through Recommendation 2005/162/EC. Thus, external, and internal audits have the role of reducing the asymmetry of information contributing to protecting the interests of stakeholders by presenting financial statements that do not contain significant distortions, prejudices, or fraud, contributing to adequately informing the capital providers.

Reporting information on environmental management, corporate social responsibility (CSR) and compliance with corporate governance best practices (often referred to as ESG-environment, social and governance) have become a significant concern for business managers. They turn their attention to communicating the direction and amplitude of their efforts toward a sustainable environment and a fair society. In particular, companies active in industries considered environmentally sensitive, such as the exploration and distribution of coal, oil and gas, are making sustained efforts to improve the reporting of ESG information. This approach is designed to preserve its legitimacy and counteract the inherent stigma associated with these industries, which are perceived as polluting (Arif, et. al., 2020).

SOH, D.S.B. and Martinov-Bennie, N. (2015) indicate divergences in the use of standards by internal auditors when performing ESG engagements compared to those used by external suppliers.

Ridley, J., et al., (2011) recommend giving importance to independent assurance in sustainability programs and reporting (both internally and externally). They should receive a much higher profile in guidance by international bodies that promote their visions for sustainable good practices worldwide.

There is a significantly positive relationship between the involvement of internal auditors in risk assessment programs and their involvement in sustainability audits. In the case of organizations in environmentally sensitive industries, as well as those that have adopted the internal audit activity for a longer period, there was a high level of involvement of internal audit departments in sustainability audits. (DeSimone, S., 2021)

Literature review

The role of audit committees and internal audits on ESG reporting

The previous literature agrees that internal and external controls reduce the risk of managers publishing false information to shareholders and allow shareholders to make decisions considering reliable information, Watts, and Zimmerman (1986). According to the perspective of the agency's theory, internal control mechanisms help align the interests of shareholders with those of managers, FAMA and Jensen (1983).

Thus, AC is expected to contribute to greater oversight of both financial and non-financial information in assessing the company's performance. The role of the AC is to support the board in fulfilling its responsibilities.

As a result of the COVID-19 pandemic, companies have had to make drastic adjustments, which include controlling the complexity of financial reporting processes and increasing risk and uncertainties, leading to internal control operations and audit engagement through virtual operations, Al-Sartawi et al. (2021). The effects of the COVID-19 pandemic have been perhaps the toughest challenge for auditors and their clients since the global financial crisis of 2007–2008. They have generated additional pressure on companies to assume Sachin and Rajesh's social and ethical responsibilities (2021).

The credibility of management disclosures is strengthened by regulators, standard-setters, auditors and other capital market intermediaries.

In other cases, research has recognized an association between AC and governance effectiveness, internal audit function, and sustainability reporting practices (Tumwebaze et al., 2021; Amran et al., 2013). At the same time, another minority body of literature found a negative influence of AC and CEO compensation on ESG disclosure.

AC features have an impact on voluntary sustainability assurance. Specifically, it has also been demonstrated that members of the Internal Audit Committee who are independent and expert and who attend committee meetings improve the quality of sustainability assurance Zaman et al., (2021). In other research, AC activism and independence, at the compliance level, have been linked to sustainability standards (GRI guidelines), which emphasize that activism and audit attributes positively affect ESG reporting and environmental disclosures (Muhammad Arif et al., (2021).

According to Bronson et al. (2009), one of the main features that can positively affect AC's ability to oversee and monitor is its independence. The demand for independence arises from the need to deal with asymmetric information and conflicts of interest between management and stakeholders, especially shareholders; in this way, independent professional directors mitigate agency costs related to the financial statement prepared by managers (Pozzoli, Pagans, Paolone, 2022).

According to the study by B. Marx and A Van Der Watt, "Integrated Sustainability and Reporting: An Analysis of the Role of Audit Committees in Survival" shows "that most audit committees in the largest listed companies in South Africa do not assume supervisory responsibility for sustainability reporting on behalf of their boards, although they deal with some ethical and social reporting issues". Thus, they found that the companies' reporting in their annual reports on the corporate governance, social and sustainability oversight responsibilities of the audit committee did not reflect the actual state of affairs. These findings are significant as they provide support for King III's recommendations (effective March 1, 2010) that companies should provide integrated reporting on both finance and sustainability in the future, and that the audit committee should assume supervisory responsibility for this.

According to the theory of the agency, the composition of the Board of Directors is an important tool for controlling corporate governance, since the existence of non-executive directors ensures the monitoring of the actions of the corporate manager and certifies that the interests of shareholders are protected.

Previous studies investigated the role of internal audits on ESG issues. According to Hammami and Zadeh (2019), a high-quality audit is to help managers convey to different stakeholders the authenticity and credibility of their voluntary ESG disclosures.

Recent studies have highlighted the evolution of the role of internal audit at the level of organizations, as well as the increasing importance and confidence in internal audit work by various stakeholders SOH and Martinov-Bennie, (2011). Despite evidence of internal audit work in the ESG areas, there is limited research into the nature and extent of internal audit engagement. Instead, previous studies have investigated specific aspects of ESG, such as environmental audits or health and safety audits of SOH and Martinov-Bennie, (2011).

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The role of audit committees on the quality and quantity of ESG information disclosure

Globally, 93% of large corporations include sustainability measures in their annual reports; however, only 59% of them have obtained assurance for sustainability reporting. However, the literature highlights the absence of a common standardized sustainability reporting framework, leading to inconsistent reporting worldwide. This inconsistency makes it difficult to consistently implement the results of the different sustainability reporting models Arif, Sajjad, Farooq, Abrar, Joyo (2020).

International organizations and institutional investors have stressed, especially in the wake of the global financial crisis, the importance of companies integrating social and environmental responsibilities into their key decision-making processes. In 2001, the European Commission defined Corporate Social Responsibility (CSR) as "the voluntary integration of social and environmental concerns into the operations and interactions of companies with stakeholders".

Addressing environmental, social and governance issues has become essential for business strategies and corporate regulations. Therefore, the study of the characteristics of the audit committees about ESG disclosures is particularly important for companies, having a significant impact on regulations and academic research.

ESG reporting practices indicate a real corporate commitment to environmental responsibility and are a significant mechanism for protecting stakeholders' interests. In this regard, disclosure of information related to ESG aspects has become crucial for stakeholders' decisions. Disclosure of ESG information helps minimize asymmetries between investors and information intermediaries, reducing uncertainty and thereby helping improve access to finance and valuation of firms (Almeida, Paiva, 2022)

Transparent sustainability reporting has become a primary responsibility for business organizations, requiring audit committees to monitor sustainability reporting to build shareholder confidence.

As a result, many researchers have looked at the role of management control systems in extending and improving the quality of sustainability disclosures in various samples. For example, regarding the impact of corporate governance mechanisms on ESG reporting, Bravo and Reguera-Alvarado (2019) found that the diversity of audit committees has a positive association with the quality of ESG reporting, also helping to increase the completeness and relevance of ESG disclosures.

Sajjad, Farooq, Abrar, Joyo, (2020) in their paper entitled "The impact of audit committee attributes on the quality and quantity of environmental, social and governance (ESG) disclosures" found that there is a positive relationship between the number of audit meetings and the quality of ESG reporting (according to GRI) but also between the number of audit meetings and the amount of ESG reporting. They also concluded that there is a positive relationship between the number of independent directors in a AC and the quality of ESG disclosures (according to the GRI).

As well as a positive relationship between the number of independent directors in an AC and the amount of ESG disclosures.

Interest in the role of audit committees has expanded in recent years in terms of their role in the preparation of financial statements. An effective audit committee helps to improve the quality of the presentation of the information and the revenue reported to Vafeas, (2005). Martinez and Fuentes (2007) found that an audit committee is more dynamic in reviewing financial statements and reducing differences between managers and external auditors. This diminishes the likelihood that a company will have qualified opinions from an external auditor resulting from accounting errors and failure to commit to accounting standards. According to them, audit committees play a crucial role in corporate governance practices. They monitor the internal control system by associating with internal auditors so that external reporting and compliance are completed by external auditors. Thus, audit committees play a crucial role Saibaba and Ansari, (2011) in all aspects of relations between internal auditors, external auditors, and the board of directors.

Audit committees play an extremely important role in corporate governance practices. They monitor the internal control system by associating with internal auditors, as external reporting and compliance are completed by external auditors. In the relationship between internal auditors, external auditors and the board of directors, audit committees play a crucial role Saibaba and Ansari, (2011).

Although both male financial experts (MEF) and female financial experts (EBF) influence sustainability performance, the EBF is statistically more influential than the MEF. The results also show that EBF has a greater influence on all three pillars of environmental, social and governance (ESG) performance. Further analysis suggests that if a AC has single-gender financial expertise (MEF or MEF only), this is at the expense of the firm's sustainability performance. The results also show that although a gender-diverse AC is beneficial, the benefit is greater if the women in the AC are financial experts, Yorke, Donkor, Appiagyei et al, (2023).

The role of internal audit in ESG reporting

ESG reporting practices indicate an effective corporate commitment to environmental, social and governance responsibility and are a significant mechanism for protecting stakeholders. In this regard, disclosure of information relating to ESG aspects has become essential for stakeholders in the decision-making process. Disclosure of ESG information minimizes asymmetries between investors and information intermediaries and reduces uncertainty, thereby helping to improve access to finance and the valuation of firms. Despite the increasing number of debates on ESG issues and their significance in capital markets, the role played by directors, in particular by audit committees, in ESG reporting practices remains an open question in the literature.

Despite various initiatives globally, such as the UN Global Principles, the OECD Guidelines for Multinational Enterprises, the GRI, and ISO 26000 standards, there is a significant discrepancy in the standardization of non-financial reporting. This issue is related to data canalization, standardization of qualitative data, comparability of results and standardization of reporting principles. Companies have almost complete freedom in terms of how they prepare the report and the scope of information it contains, causing difficulties in evaluating and comparing the level of social responsibility of individual companies (Almeida, Paiva, 2022)

Sustainability reporting according to GRI standards is an essential tool through which companies can gain increased self-awareness and improve their communication on their sustainability performance. As sustainability reporting evolves into a “nice to have” option in an imperative need, the use of GRI standards allows companies to integrate sustainability into annual risk assessments and transparency efforts aimed at investors, customers, and B2B partners.

GRI provides a modular reporting system with criteria tailored to different sectors and relevant topics. It requires companies to focus on specific material topics, thus making it easier to compare their performance with others in their sector. Succinctly, the GRI is a superior tool through which companies can assess whether their sustainability objectives are consistent with implemented practices. (Global Reporting Standards 2022)

Organizations' management recognizes both opportunities and risks associated with ESG aspects. This involves undertaking due diligence to integrate ESG measures into the organizational structure. To make decisions, executives must have solid confidence in the effectiveness of ESG management. Issues considered are ESG governance, risk assessment, monitoring and reporting of key performance indicators (KPIs). This trust should be strengthened through an internal audit. Internal audit should extend to identifying root causes, i.e. developing potential risk management strategies and assessing the effectiveness of preventive controls, not be limited to the simple identification of risks. In addition, it is essential to ensure that governance, risk management and internal controls are effective in all aspects of the organization. In the assessment process, internal auditors should consider the key elements that characterize the company's ESG policy, including high-level supervision, risk assessment, due diligence procedures, as well as awareness and implementation efforts. Management teams within organizations recognize the opportunities and risks that ESG presents. (KPMG, 2021)

Accountability of firms' actions and conduct towards shareholders and transparency in the form of disclosure of financial and non-financial information are two of the basic principles of corporate governance. Thus, transparency allows owners to ensure that companies are well managed and to be able to hold both boards of directors and directors accountable. Sustainability reporting has become a serious research issue and has focused on presenting non-financial information since the emergence of Global Reporting Intuitive (GRI).

An essential element of sustainability reporting is that stakeholders in these disclosures are not strictly limited to a firm's investor base, as is the case with financial reporting. By submitting a sustainability report, companies want to inform stakeholders about a range of environmental, social and governance objectives, actions, and performance. Sustainability advocates believe that promoting sustainable reporting will benefit both businesses and stakeholders.

Sustainability has been presented as a moral principle of the 21st century and an important source of opportunities, but also of risks for companies.

Thus, companies should behave and offer citizens the image of environmental responsibility and existing resources in the economy. Therefore, there is a need for honest, reliable and credible stakeholder reporting. In these reports, both the internal audit should have a significant role, and the audit committees that operate efficiently should be able to harmonize and determine all the actors involved in the reporting in assuming honest and realistic reports.

There is a significantly positive relationship between the involvement of internal auditors in risk assessment programs and their involvement in sustainability audits. In the case of organizations in environmentally sensitive industries and those that have adopted the internal audit activity for a longer period, there was a high level of involvement of internal audit departments in sustainability audits. (DeSimone, S., 2021).

From the point of view of the evolution of emerging risks, it turns out that the scope of internal audit is extended by including at the request of the executive management (such as the Board of Directors, and Audit Committee) non-financial assurance and consultancy missions. (Protiviti and Institute of Internal Auditors Australia (IIA Australia), 2011).

ESG footprint in the information industry

The information industry is the pillar of modern communications and information, playing an essential role in the development of the Internet economy. It has established itself as a key infrastructure provider, providing services such as telephony and broadband internet. Information services have helped to increase efficiency and stimulate innovation in the public and private sectors by reducing costs and improving the speed and diversity of the means of communication.

Over the past few years, the expansion of wireless communications and broadband internet has led to the expansion of the network spectrum and the development of physical infrastructure, including wireless towers, data centers, and switching equipment. However, the information industry faces various sustainability challenges and opportunities, both in terms of physical infrastructure and the transmission of user data.

Problems with poor material sustainability management have the potential to affect the valuation of companies by impacting profits, assets, liabilities and cost of capital. Information industry companies reporting on sustainability risks and opportunities in accordance with relevant regulations will provide investors with a more comprehensive and comparable perspective on their performance. This would include both positive and negative externalities as well as the non-financial forms of capital that the industry relies on for value creation.

Between sustainability issues that will boost competitiveness in the information industry we can mention:

- Environmental Footprint Management: Addressing the expansion of networks and infrastructure to minimize environmental impact.
- Data Privacy: Implement effective data privacy policies and manage government relationships in this context.
- Cyber Risks: Manage the increased risk of cyber attacks, with a focus on cloud-based services and customers in sensitive sectors.
- Responsible end-of-life: Responsible management of information equipment and devices at the end of their life cycle.
- Manage network and operations risks: Identify and manage risks that could create systemic or social disruption.
- Balancing revenue growth and competition: Maintaining a balance between expanding revenue and avoiding anti-competitive practices.

The issue of coverage in ESG/ sustainability reporting is still insufficiently defined in both the CSRD and the GRI reporting frameworks. Some elements raise difficulty in reporting, such as, for example, greenhouse gas emissions, which are reported very closely, as Orange states "You do not know how the totals were calculated, who are the third parties, why they are included, what is IT Network, what is included in the total emissions related to the use of the network (approx. 16 million tons of CO_2e), etc.", Another example refers to the buy-back program without detailing "how the collection rate is calculated, how the target of 29% (why not 89%?) was set, which are the performance indicators for the recycling and reconditioning components for 2022 and in relation to the targets, etc. ".

Therefore, considering the aspects covered in the literature review, we can say that there are still uncertainties in the reporting modalities, and AC and AI can contribute to a better reporting of these indicators. In the framework of our research, we analyzed by means of a linear regression model the linear relationship between the dependent variable ESG Score, and the independent variables internal audit department reporting score, audit committee independence score, audit committee expertise score, gri report guidelines score. Research hypotheses that were the basis of the analysis are:

- Null hypothesis (H0): There is no significant correlation between ESG score and independent variables (Internal Audit Department Reporting Score, Audit Committee Independence Score, Audit Committee Expertise Score, GRI Report Guidelines Score).
- Alternative hypothesis (H1): There is at least one independent variable that has a significant correlation with ESG score.

Methodology

Given the theoretical framework, as well as the fact that there is currently a great interest in the evolution of ESG indicators in the context of mechanisms that ensure their effectiveness, the general objective of the research is to identify and analyze the role of audit committees and internal audit in the evolution of ESG indicators. Thus, through a quantitative research methodology, we analyzed the information presented in the Refinitiv Eikon database.

In this regard, we resorted to selecting a sample of all companies in Europe in the information industry, namely 889 companies, which published data on Refinitiv Eikon, between 2019 and 2022.

Therefore, we analyzed the correlation between the ESG score and the score of the Internal Audit Committee, that of the Internal Audit Reporting Department, Global Reporting Intuitive (GRI), for a period of 4 years, respectively, 2019 – 2022, based on data published by 889 companies in the information industry.

This approach was chosen to ensure a thorough representation of the industry across the specified period.

Encompassing all companies in the European information industry and utilizing data from Refinitiv Eikon ensured comprehensive representation as well as the reliability of the analysis.

The selected variables are relevant for assessing key aspects such as corporate governance, sustainability, and audit effectiveness, providing valuable insights into industry performance.

The sample consisting of 889 companies encompasses all companies in Europe that have published information regarding the analyzed variables during the period 2019 – 2022, while also highlighting a varied distribution within the sample. Some countries, such as Poland, Sweden, the United Kingdom, Germany, and France, have a significantly larger number of included companies, presumably reflecting their size and importance in the European information industry. On the other hand, there are countries with a reduced number of companies in the sample, which may indicate a smaller presence or relatively lower importance within the sector. Overall, the distribution of companies suggests considerable geographic diversity in the sample, thus reflecting the complexity and variety of the European information market. The detailed composition of the sample used to test the two hypotheses is presented below.

- Poland : 160 company
- Sweden: 153 company
- Norway: 28 company
- Denmark, Finland: 22 company
- Netherlands, Spain: 17 company
- Republic of Serbia, Switzerland: 11 company
- Romania: 9 company
- Belgium, Greece, Slovenia: 8 company
- Estonia, Iceland, Portugal, Republic of Montenegro: 5 company
- Austria, Cyprus: 4 company
- Bulgaria: 3 company
- Ukraine: 2 company
- Czech Republic, Ireland, Lithuania, Luxembourg : 1 company

On the other hand, analyzing the sample from the point of view of the number of companies that published figures between 2019 and 2022, it was found that the data suggest a consistent decrease in scores in terms of corporate governance, sustainability and audit effectiveness. The detailed situation for each individual variable is detailed in the table below.

Table 1. The distribution of the sample by variable

Variables	Number of companies			
	2019	2020	2021	2022
GRI Report Guidelines Score	182	180	163	101
ESG Score	203	202	183	114
Audit Committee Independence Score	181	179	148	109
Audit Committee Expertise	203	202	183	114
Internal Audit Department Reporting	194	195	174	108

Source: Authors' own research.

Analyzing data from 2019 to 2022 allows for the identification of trends over time, while the distribution of the sample across various European countries reflects geographic diversity within the industry.

It was decided to analyze the last 4 years based on the idea of observing the changes that occurred following the Covid-19 pandemic within companies regarding ESG reporting, having as reference base 2019, before the outbreak of the pandemic. We considered that reporting to the pandemic period is essential to understand the global impact on the information industry, the changes in human behavior and the necessary adaptations, thus providing relevant insights and information for the management of future similar events.

To highlight the correlation between independent variables such as: The Internal Audit Department Reporting Score, Audit Committee Independence Score, Audit Committee Expertise Score, GRI Report Guidelines Score and the ESG Score dependent variable, this research focuses on a linear regression model, which was run through the SPSS application. The linear regression model, is of the form: $Yi=\beta 0 +\beta 1X1i+\beta 2X2i+\beta 3X3i+\beta 4X4i+\varepsilon i$

Where:

- Yi= ESG Score dependent variable for observation i;
- β0 = model intercept.
- β1, β2, β3, β4 = coefficients associated with independent variables (Internal Audit Department Reporting Score, Audit Committee Independence Score, Audit Committee Expertise Score, GRI Report Guidelines Score)
- εi = random error associated with observation i.

Therefore, Regression (1): $ESGi = \beta_0 + \beta_1 X_1 i + \beta_2 X_2 i + \beta_3 X_3 i + \beta_4 X_4 i + \varepsilon i$

Where the independent variables are:

- **X_1** i Internal Audit Department Reporting Score
- **X_2** i Audit Committee Independence Score
- **X_3** i Audit Committee Expertise Score
- **X_4** i GRI Report Guidelines Score

Results and discussions

To analyze both the null hypothesis and the alternative hypothesis, for the analyzed period 2019-2022, for each year, a distinct regression analysis was performed, respectively the linear regression model was ruined within the SPP application 4 times. The centralized results of the 4 regression models, related to the 4 years analyzed, are presented centrally in Table no. 1 – Results of Regression Models.

Table 2. Results of Regression Models

Year)	.	R Square	Adjusted R Square	Std. Error of the Estimate
2019	.691[a]	477	463	13.022402416378810
2020	.710[a]	505	492	14.098885183582958
2021	.754[a]	569	555	14.421987500712570
2022	.754[a]	568	548	14.001036621028419

Source: Authors' own research.

The correlation coefficient Person (R) measures the strength and direction of the relationship between two variables. In this case, the value of 0.691 recorded at the level of the first year analyzed, respectively 2019, indicates a positive, moderate to strong correlation between the independent variables and the independent variable.

The coefficient of determination (R Square), which determines the proportion of the variability of the dependent variable that can be explained by the independent variables included in the model, indicates that at the level of 2019, about 47.7% of the variability of the ESG Score can be explained by the independent variables, the difference up to 100% indicating the variation that remains unexplained, which can be attributed to other factors or variables that have not been taken into account in this research.

During the period 2019-2021, an increase in the 2 correlation coefficients, namely R and R Square, was observed, which indicates a stronger correlation between the dependent variable and the independent variables, as well as the fact that from year to year, the model becomes more efficient in explaining the ESG Score variation as it evolved over time. Except for 2023, when the situation remained constant in the case of the Person coefficient.

At the same time, given the associated value in the first year analyzed to the Adjusted R Square coefficient of 0.463, we can say that the analyzed model indicates a significant correlation between the variables in the model, but about 52.3% of the variation of the dependent variable remains unexplained by the independent variables included in the model.

On the other hand, during the entire analyzed period, an increase in the coefficient of determination can be observed, which records values of over 50% starting with the second year, determining an improvement in the ability of the model to explain the variation in the dependent variable (ESG Score).

To assess the performance of the regression model and determine whether the independent variables contribute significantly to the explanation of variability in the ESG Score, we will present centrally in the following table, Anova results - Analysis of Variance.

Table 3. Analysis of Variance

Year)	F	Sig.
2019	35,336	<.001b
2020	39,500	<.001[b]
2021	41,201	<.001[b]
2022	28,912	<.001[b]

Source: Authors' own research

At the same time, through the ANOVA results, an assessment could be obtained if the variation explained by the factors is significantly different from the unfulfilled variation (error). Test F evaluates whether the regression explains a significant amount of variation compared to unexplained (residual) variation. A small significance value indicates that the model is significant. Significant F-value indicates that at least one of the independent variables has a significant influence on the dependent variable.

At the same time, by comparative analysis of the Sig coefficient value < 0.01, with 0.05, it is found that during the entire period under review, 2019 - 2022, the null hypothesis is rejected and accepts that there is a significant correlation between ESG score, Internal Audit Score, Independent Audit Committee Score and GRI Scores.

In order to highlight the relative contribution of each independent variable to the dependent variable (probably ESG Score), we will present the results on the situation of B and Beta coefficients in a centralized manner.

Table 4. Coefficients

year)	Variables	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
2019	(Constant	23,388	3,380		6,920	<.001
	GRI Report Guidelines Score	211	0.030	**428**	6,922	<.001
	Audit Committee Independence Score	155	041	224	3,823	<.001
	Audit Committee Expertise Score	119	0.035	207	3,422	<.001
	Internal Audit Department Reporting Score	168	.036	285	4.666	<.001
2020	(Constant	19,623	3.602		5,448	<.001
	GRI Report Guidelines Score	.134	.043	182	3,148	0.001
	Audit Committee Independence Score	252	0.033	462	7,676	<.001
	Audit Committee Expertise Score	151	038)	229	3,927	<.001
	Internal Audit Department Reporting Score	162	0.037	**258**	4,327	<.001
2021	(Constant	18,403	4,333		4,247	<.001
	GRI Report Guidelines Score	322	0.037	**535**	8,695	<.001
	Audit Committee Independence Score	100	0.050	.122	2,001	048
	Audit Committee Expertise Score	0.106	.049	137	2 162	0.001
	Internal Audit Department Reporting Score	239	046.	322	5,165	<.001
2022	(Constant	15,169	4,837		3,136	0.001
	GRI Report Guidelines Score	306	(0.044)	**510**	6,986	<.001
	Audit Committee Independence Score	153	,056	0.198	2,743	0 007
	Audit Committee Expertise Score	0,074	0.020 0.055	100	1,358	178
	Internal Audit Department Reporting Score	298	065	347	4,617	<.001

Source: Authors' own research.

The interpretation of standardized beta coefficients in a regression analysis provides information about the independent variable contribution to the dependent variable - ESG Score. The standardized beta coefficient for each independent variable shows how much the dependent variable (ESG Score) changes for a change from a standard deviation to the respective independent variable, taking into account the other variables in the model.

In this case, the highest standardized beta coefficient is associated with the GRI Report Guidelines Score for the first year analyzed, as well as for the second and third years, indicating that this variable has a relatively greater influence on the ESG Score compared to the other variables. On the other hand, the standardized beta for the Internal Audit Department Reporting Score variable and the Audit Committee Independence Score variable also indicate a positive but lesser influence.

By analyzing the coefficient t, a positive value can be observed throughout the period, thus determining the existence of a direct relationship between the ESG-dependent variable and the independent variables (audit committee, internal audit, GRAY).

Also, in cases where Sig < 0.001 results the ESG score is influenced by the other indicators, which leads to the rejection of the null hypothesis, namely the one that says that there is no link between the indicators.

In order to check for autocorrelation of the residuals in the present regression model, we conducted the Durbin-Watson statistic. The Durbin Watson statistic is a test for autocorrelation in the residuals from a statistical model or regression analysis. The Durbin-Watson statistic will always have a value ranging between 0 and 4. A value of 2.0 indicates there is no autocorrelation detected in the sample. Values from 0 to less than 2 point to positive autocorrelation and values from 2 to 4 means negative autocorrelation.

Table 5. Durbin-Watson

2019	2020	2021	2022
1.874	1.888	1.834	1.410

Source: Authors' own research.

Throughout the analyzed period, it can be observed that values recorded below 2 suggest a hint of positive autocorrelation. The decreasing trend in Durbin-Watson values from 2019 to 2022 suggests a potential increase in positive autocorrelation in the residuals over time.

Collinearity between the predictor variables in a multiple regression was achieved by means of the Variance Inflation Factor (VIF). Generally, VIF values below 5 or 10 are considered acceptable, indicating low multicollinearity.

Table 6. Collinearity Statistics (VIF)

Variables	2019	2020	2021	2022
GRI Report Guidelines Score	1.132	1.135	1.097	1.087
Audit Committee Independence Score	1.018	1.047	1.086	1.066
Internal Audit Department Reporting Score	1.104	1.113	1.126	1.151
Audit Committee Expertise Score	1.080	1.061	1.161	1.103

Source: Authors' own research.

Analyzing the collinearity among predictor variables during the period 2019-2022, the following aspects were observed:

- GRI Report Guidelines Score: VIF values are consistently low across the years (between 1.087 and 1.132), indicating low multicollinearity for this variable.
- Audit Committee Independence Score: VIF values are consistently low (between 1.018 and 1.066), suggesting low multicollinearity for this variable.
- Internal Audit Department Reporting Score: VIF values are generally below 1.2, indicating low multicollinearity for this variable.
- Audit Committee Expertise Score: VIF values are generally below 1.2, indicating low multicollinearity for this variable.

The stable and low VIF values for all variables across the years suggest that there is no significant increase in multicollinearity. This is a positive sign as it indicates that the independent variables are not highly correlated with each other, which is important for the reliability of regression analysis results.

Conclusion

The paper presents the results of an empirical investigation on the role of audit committees and internal audit in the level of ESG reporting by companies in the information industry in the period 2019-2022, based on a sample of 899 companies in Europe. The analysis found that some countries, such as Poland, Sweden, the United Kingdom, Germany and France, have a significantly higher number of companies included that report on ESG, perhaps reflecting their size and importance in the European information industry. On the other hand, there are countries with a small number of companies in the sample, which may indicate a smaller presence or relative importance in the sector. As expected, there is a large variation between the information levels of the environmental indicators. Analyzing the sample in terms of the number of companies that published figures between 2019 and 2022, the data was found to suggest a consistent decline in scores for corporate governance, sustainability, and audit effectiveness.

Over time, the model has become more effective, highlighting the increasing relevance of sustainability and corporate governance measures for some countries. The results validate the importance of further ESG research and guidelines to improve governance and reporting practices, to support social responsibility and sustainability in the business environment, especially in countries that have not yet aligned themselves with these requirements globally.

Given the positive associations between sustainability reporting and the existence of CA, we recommend that companies in the information industry focus more on CA attributes to ensure more sustainable transparency for stakeholders.

In addition, internal audits play an extremely important role within companies, providing a filter for reported information, information to be presented to audit committees and external audits.

At the same time, we recommend that regulators begin to give greater importance to audit committees and internal audit in terms of their role in sustainability disclosures. Despite the increase in the number of published studies on sustainability reporting, information industry companies are at the beginning of their journey, especially in countries undergoing modernization.

This is partly related to the unavailability of data for an acceptable range and the limited interest of companies, regulators and other users. This paper aims to motivate more research in the field, to reform their economies and markets, to increase the role of the private sector in their economies in order to attract foreign investment and, last but not least, to make the harmful effects on the environment more transparent in order to make the best decisions on ensuring the sustainability of livestock globally. The analysis conclusion shows a significant correlation between ESG Score variables. However, the results obtained are strictly correlated with the information industry in Europe. Therefore, generalizing the results is not possible, however, there is a possibility that, outside the chosen sample, the results will come out differently. Studying how technology such as artificial intelligence and big data can support audit committees in evaluating and reporting ESG indicators, as well as detailing how audit committees manage each ESG aspect and identifying the most effective practices in each area are among our future research directions.

Studies specifically conclude that the effectiveness of AC is based on the characteristics of their members (Samaha et al., 2015; Akhtaruddin and Haron, 2010). Current literature on the specific role of ESG performance during crisis, such as the COVID-19 crisis, is limited (Broadstock et al., 2021; Takahashi and Yamada, 2021).

Although this study is important, it has its limitations, which may be overcome by other studies on the same topic. Thus, ESG data is collected from the Refinitiv Eikon database and presented a main limitation (Del Giudice and Rigamonti, 2020) as ESG performance is presented annually, while a monthly basis may provide a more accurate proxy. It could be explored in the future if our results hold in future years after the COVID-19 crisis. It is important to note that these limitations do not affect, but future research may include some related features of CA and AI. In other words, the paper examines only the 2019-2020 period and only the European part.

Therefore, future research could address a longer and extension to other regions of the globe. At the same time, with the passage of time, changes caused by the pandemic can be observed in people's awareness of the importance of increasing transparency in reporting, which in some countries have gained or greater transparency compared to others where the level of reporting has decreased overall. The presentation work and some methodological subliminals, given that the data set is limited to a specific region, that of Europe, and the econometric models used may lead to biases regarding the use of variables that may be important, but have been omitted. Beyond all this, the use of robustness checks can mitigate these limitations.

In conclusion, future research can inform regulatory processes and provide policy-making guidance to EU and world leaders in leveraging the role of CA and internal audit in ESG reporting.

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