audit FINANCIAR

Camera Auditorilor Financiari din România

Year XXIII, No. 178 - 2/2025

Important for Authors!

The articles are submitted to the editor by e-mail at: revista@cafr.ro, written in MS Word format.
The authors are kindly requested to comply with the following:
- the articles submitted by non-Romanian authors must be written in English language;
- the article must include: the title; the authors and their professional and/or scientific affiliation, as well as their e-mail addresses; abstract; 4-5 key-words; JEL Classifications; introduction; the research methodology used; results and discussions; bibliography;
- the Abstract is compulsory, and must be written at the 3rd person, presenting the subject of the research, the main approaches and authors' contributions.

Tables and graphs/figures should be prepared in an editable/visible format and must be accompanied by its source specification.
The review of the articles is performed by members of the Scientific Assessment Council of the „Audit Financiar" Journal, by the „double-blind review" method, that is, the reviewers do not know the names of the authors, nor the authors know the names of the reviewers.
Assessment criteria for articles are: innovative input, topicality, importance and relevance for the subject matter, the quality of the research methodology, clarity and pertinence of the presentation and argumentation, the relevance of the bibliographic sources used, the contribution made to the research in the area.
The resolution of the Scientific Assessment Council of the journal can be: acceptance; acceptance with revisions; rejection.
The results of the assessments are communicated to the authors and only the articles approved by the Scientific Assessment Council are published.
More details can be found on our website: auditfinanciar.cafr.ro, section „For Authors Only".

Journal published by the
Chamber of Financial Auditors of Romania
67-69 Sirenelor Street, District 5, Bucharest, OP 5, CP 83

Scientific Director:
Professor **Pavel NĂSTASE**, Ph.D.

Editorial Director:
Corneliu CÂRLAN, Ph.D.

Editor in Chief:
Cristiana RUS

Editorial Assistant:
Cristina RADU

DTP: **Nicolae LOGIN**

The Scientific Editorial Board and the editorial technical team shall take no responsibility for the content of the articles published in the journal.

International Databases:
Cabell's;
Deutsche Zentralbibliothek für Wirtschaftswissenschaften;
DOAJ;
Ebsco;
ERIH PLUS;
Global Impact Factor;
Google Scholar;
Index Copernicus;
ProQuest;
Research Papers in Economics (RePEc);
Ulrich's

OSIM Trademark
no. M2010 07387

ISSN on-line: 1844-8801

E-mail: revista@cafr.ro

Journal's Site: auditfinanciar.cafr.ro

Archive Site: revista.cafr.ro

Facebook:
facebook.com/revistaauditfinanciar

Audit Financiar, XXIII, Nr. 2(178)/**2025**, *327-344*
ISSN on-line: 1844-8801

Testing the Going Concern Assumption in Financial Audit Engagement using Duration Models

Prof. Habil. Costel ISTRATE,
Faculty of Economics and Business Administration, "Alexandru Ioan Cuza" University of Iasi, Romania,
e-mail: istrate@uaic.ro

Assoc. Prof. Maria GROSU, Ph.D.,
Faculty of Economics and Business Administration, "Alexandru Ioan Cuza" University of Iasi, Romania,
e-mail: maria.grosu@uaic.ro

Prof. Habil. Ioan-Bogdan ROBU, Ph.D.,
Faculty of Economics and Business Administration, "Alexandru Ioan Cuza" University of Iasi, Romania,
e-mail: bogdan.robu@feaa.uaic.ro

Abstract

The role of the financial audit in testing the going-concern assumption is always evolving, being updated in response to events as diverse as financial and health crises and financial scandals. Normally, a company's management is responsible for preparing and reporting financial statements on the assumption that it will continue as a going concern within a foreseeable time horizon without going into liquidation or significantly winding down its operations. Thus, the financial auditor expresses a going concern opinion based on sufficient appropriate audit evidence. The purpose of this study is to estimate the probability of a situation occurring over time in which the entity can no longer continue its activity based on the auditor's observations in the audit report, under the influence of the determining factors on the financial position and performance, as well as those on the earnings management, under the conditions of IFRS application. The study is conducted at the level of Romanian entities listed on the regulated market - Bucharest Stock Exchange (BSE), for the period 2012-2023. The research results indicate a direct and significant influence of the liquidity ratio, as well as of the earning management operations on the probability of occurrence over time of the situation in which the entity can no longer continue its activity based on the auditor's observations on the going concern.

Key words: *financial auditing; going concern; duration models; survival analysis; financial indicators; Bucharest Stock Exchange;*

JEL Classification: *B23, C01, M42, M48*

To cite this article:
Istrate, C., Grosu, M., Robu, I.-B. (2025), Testing the Going Concern Assumption in Financial Audit Engagement using Duration Models, *Audit Financiar*, vol. XXIII, no. 2(178)/2025, pp.327-344, DOI: 10.20869/AUDITF/2025/178/008

To link this article:
http://dx.doi.org/10.20869/AUDITF/2025/178/008
Received: 25.03.2025
Revised: 30.03.2025
Accepted: 9.04.2025

1. Introduction

As a fundamental principle of accounting, *going concern* assumes that, when preparing and reporting financial statements, management expects that the entity will continue in operation for a foreseeable period without the intention to liquidate or curtail its operations, with a direct impact on asset measurement, liability recognition and financial reporting (Istrate, 2021). If the going concern assumption is not met, then the entity's management must disclose a number of adjustments in the financial statements, precisely to allow predictability of the business and of how the entity's resources are managed (Bunce & Clayton, 2011).

In respect of going concern, the financial auditor is responsible for assessing the entity's ability to continue as a going concern and for considering whether there are any material going concern uncertainties to be disclosed in the audit report (Geiger & Raghunandan, 2002). The reputational as well as litigation risks that financial auditors take in their assignments (Kausar *et al.*, 2017) lead them to be more careful to identify as accurately as possible the problems that client entities might have. There is evidence to support the fact that auditors often refer to audited companies' going concern issues precisely as a preventive action to limit audit risk (Kaplan & Williams, 2013). This requires the financial auditor to obtain sufficient and relevant audit evidence, which may include analysing financial projections, verifying financing plans, assessing contractual commitments and examining risk management policies, using signal indicators of significant financial losses, insufficient liquidity, difficulties in accessing finance or meeting payment obligations and, last but not least, possible legal issues (Nogler, 2008; Carson *et al.*, 2013).

It is often argued that the adoption of *International Financial Reporting Standards* (IFRS) leads to increased transparency in financial reporting, including the quality of going concern disclosures, providing users with more relevant information (Ali *et al.,* 2019). This information may refer to the profitability of the entity, leverage, and utilization of earnings management operations. (Alqam *et al.*, 2022).

The purpose of this study is to estimate the probability that the audited entity will not be able to continue as a going concern with the application of IFRS over time, based on the Going Concern Opinion (GCO) expressed in the audit report, using survival analysis and duration models, the influence of the determinants of financial position and performance, and the influence of the determinants of earnings management operations. Specifically, the study investigates the length of time since first-time application of IFRS that the audited entity is unable to continue as a going concern, given the matters that the auditor reports in the audit report as going concern issues. The probability of going concern issues arising over time may be affected by operational factors (profitability and performance indicators), accounting distortions (discretionary accruals), as well as the financial structure of the company (debt, equity). The study is conducted on Romanian entities listed on the Bucharest Stock Exchange, on the regulated market, in the period 2012-2023. The results of the study indicate a direct and significant influence of liquidity ratios as well as earnings management operations on the probability of going concern issues over time, starting from the auditor's observations on going concern in the IFRS period.

The study is structured in five sections, including the introduction and conclusions. Section two provides a review of the literature that follows the issue under analysis, section three proposes the research methodology, emphasizing survival analysis and duration models, and section four presents and discuss the research results.

2. Literature review and research hypothesis development

Stakeholders also judge the quality of companies' reporting in terms of the transparency of disclosure by those responsible for preparing the financial statements, but also by those who guarantee their credibility, namely the financial auditors. Thus, the auditor's detection and reporting of events and evidence that may affect the going concern of the entity can be interpreted as an important issue for users of financial reporting. However, the number of GCOs is not expected to be very large. In this regard, Tagesson & Öhman (2015) find ample evidence in the literature that auditors are reluctant to express such opinions.

Providing a GCO is primarily a matter of professional judgment and auditors use a range of quantitative and qualitative tools to justify their judgment. (Hossain *et al.,* 2020).

2.1. The role of the financial auditor in testing the application of the going-concern principle

Audit quality, closely related to the quality of financial reporting, although difficult to measure, is proxied in the literature using many variables (each with its advantages and disadvantages). DeFond & Zhang (2014) identify, among these proxies, the modified going-concern justified opinion (GCO). They characterize this opinion as follows: it is a current, relatively straightforward, fairly blatant measure, the measurement error is average, it demonstrates auditor independence but does not capture subtle variations in audit quality, it can only be applied to firms in difficult situations (the limited number of such firms reduces the statistical power of models that use it), and it can sometimes indicate an excess of caution on the part of the auditor. Moreover, issuing a modified opinions (with or without reference to going concern issues) is generally used as a measure of auditor independence (Garcia-Blandon & Argiles, 2015) and it is useful to separate modified opinions with reference to going concern problems from other modified opinions, as the impact may be different.

The literature proposes to compare the accuracy of audit reports by measuring two errors, in the case of GCO and/or bankruptcy of the firm for which the opinion was issued. Koh (1991) tells us that the type I error rate is the proportion of bankrupt firms that received unmodified opinion (no GCO), and the type II error rate is the proportion of firms that survived despite receiving modified opinion (GCO). The results reported in various studies are not entirely convergent in terms of using GCO, per se, as a proxy for audit quality. Chu *et al.* (2022) claim that, in general, GCO is not a sign of audit quality, but that it may only fit here when auditors issue more GCOs to clients who deserve this qualification by being in serious financial difficulty (Type I error mitigation) and fewer GCOs to those who do not necessarily fall along these lines - even if they are in financial difficulty, the measures taken by management seem to ensure continuity - (Type II error mitigation).

In turn, Guo *et al.* (2020) find a link between firm financial distress and GCO only when audit quality, as measured by discretionary accruals, is high. A quality audit requires competence and independence of the auditor (DeAngelo, 1981). The results reported by Ruiz-Barbadillo *et al.* (2004) show that the issuance of a GCO depends on the audited firm's financial problems, but also on the auditor's independence rather than on the auditor's competence.

The financial difficulties of listed firms also create an unpleasant situation for them in the perception of financial market stakeholders. Investors and others may make important decisions that penalize firms in such situations. Signs of financial distress come from analysts, perhaps even from the reporting firm, in public communications, including financial statements, or from auditors. However, the entry of a firm in a serious financial situation that would justify questioning its ability to continue as a going concern rarely results in actual bankruptcy. Gutierrez *et al.* (2020) find that only 1.8% of distressed firms go bankrupt the following year. With respect to GCO, Gutierrez *et al.,* (2020) count 50% of firms entering bankruptcy that received GCO in a previous year, while 90% of firms that received GCO do not enter bankruptcy in the following year. Along the same lines, DeFond & Zhang (2014) find many studies in the literature analysing the extent to which GCO is useful in predicting bankruptcy, identifying many more type I errors (90%) than type II errors (50%). On the other hand, stakeholders analyse GCO as a confirmation of firms' difficulties, as the auditor's opinion is a delayed signal, however (Myers *et al.,* 2018), which makes survival analysis necessary based on data accessible earlier than the audit report.

The GCO does not necessarily result in bankruptcy (type II error). However, the auditor must exercise caution and take into account the information he or she acquires regarding the difficulties of the firm he or she is auditing. Ittonen *et. al.* (2014), analysing US firms - with their specificities in terms of GCOs - gets to results suggesting that auditors should issue GCOs when there is a one in twelve chance for the client's bankruptcy entry.

It should not be forgotten that auditors base their opinion on public information, i.e. accessible to other users, but that they (the auditors) may have access to private information that is not accessible to the public (Carson *et al.,* 2012). This private information may be decisive in determining the type of opinion expressed by the auditor in assessing going concern (Grout *et al*., 1994).

Qualified opinions can have effects on user perception. In this sense, however, research results are divergent. For example, Pucheta Martinez *et al*. (2004) found, for the Spanish financial market, that qualified opinions do not influence investors' decisions; even GCOs have no effect on possible changes in market prices. On the contrary, Casterella *et al.* (2020) find evidence that stock market participants increasingly trust audit opinion, while Menon & Williams (2010), find significant negative effects of GCOs on stock prices quoted on US stock exchanges, especially from institutional investors, but also depending on the content of the GCO. Likewise, Kausar *et al.* (2017) show that US and UK investors react negatively to the signal given by the GCO, which demonstrates that this opinion contains relevant information for the financial market. These results demonstrate how much the institutional context in which audited firms operate matters. In turn, Chen *et al.,* (2020), on a sample of Chinese firms, find that the market reacts negatively in the short-run to modified opinions, regardless of whether they are going concern or not, and the magnitudes of this reaction depend on factors related to the information disseminated by the firm before the opinion is published or the severity of the qualified opinion. Khan *et al.* (2017) even analyse the effects of announcements in which, after the financial statements are released, firms again make users aware that they have received GCOs. Khan *et al.* (2017) find that there is a positive and significant relationship between these announcements and the volume of shares traded, as well as with the volatility of the prices of these shares, implying that there are investors who consider these announcements about GCOs to be relevant. Sometimes, in studies on GCOs, it is assumed that such an opinion is sticky, which makes the analysis more relevant when a GCO is issued for the first time, i.e., it follows an unqualified opinion (Hossain *et al.,* 2020; Geiger *et al.,* 2022).

Issuing a GCO is uncommon for listed firms, especially in mature financial markets. However, for firms entering the financial markets and seeking funds for new business development, Foster & Shastri (2016) find 46.8% GCOs in a sample of 1,025 U.S. firms that qualify for what related accounting rules call development stage enterprises. For companies in financial distress that receive modified audit opinions, Tahinakis & Samarinas (2016) find that the market perceives these opinions as relevant if they are given by Big4 auditors and if the firms in question are small.

Extending the analysis from modified opinions to the paragraph emphasizing certain matters is common in the literature: Moalla (2017), on the case of Tunisia, considers both components of the audit report in researching the impact of going concern observations. At the same time, the introduction of mandatory key audit matters (KAM) reporting has also made it possible to find references to business continuity in this paragraph of the audit report. Mareque *et al.* (2017) analyse audit reports, looking for references to going concern in all their paragraphs. Segal (2018) is even of the opinion that, when expressing a GCO, the auditor should always put going concern as KAM.

2.2. Factors affecting the going concern of the entity

In the literature on the rationale for qualified opinions, Moalla (2017) finds that most studies have been interested in the relationship between audit opinion and going concern and that financial variables (found in a greater or lesser number of financial indicators) are the most used in this analysis. This analysis confirms the separation in the study of modified opinion between modified going concern and other modified opinions (Tsipouridou & Spathis, 2014). Bava & di Trana (2019) summarize and present the indicators most commonly used in the literature to indicate going concern issues: liquidity indicators (current assets/current liabilities, interest expense/EBIT, cash and cash equivalents/current liabilities, working capital/total liabilities, operating cash flow/total liabilities); leverage indicators (market value of the firm/book value of debts, equity/book value of debts, long-term debts/assets, total debts/assets); profitability indicators (net profit/assets, equity/equity/assets, EBIT/assets, gross profit/sales revenues, current losses and losses carried forward).

Xu *et al.,* (2018) find a significant and positive relationship between Real Earnings Management (REM) and the probability of financially distressed firms to receive a GCO, suggesting that abnormal firm activities influence auditor prudence and auditor effectiveness. A long list of determinants of GCOs is provided by Averio (2021): firm size, audit quality, firm financial condition, audit lag, some financial indicators. Dhaliwal *et al.* (2020) also adds the dependence of a distressed firm on one or more major clients as a determinant of the GCO given by the auditor.

Gutierrez *et al.*, (2020) analysed the extent to which GCO has additional predictive value over bankruptcy risk determination scores based on financial indicators, market variables and credit ratings. The results reported by Gutierrez et al. (2020) show that the number of predicted bankruptcies is 4.4% higher when GCO is taken into account, without increasing the number of type II errors. In the case of Belgium, Vanstraelen (2002) finds that GCO is significantly correlated with factors related to the possible consequences of expression such an opinion. On the other hand, Vanstraelen (2022) finds that GCO is not significantly influenced by the auditor's period of engagement or the type of auditor. Viana Jr.*et al.* (2022) finds that firms in financial distress apply earnings management techniques in emerging countries. Thus, the auditor's opinion is put, in various econometric models, in relation to discretionary accruals-DA (Berglund *et al.,* 2018). In fact, in studying the impact of audit opinion, the use of discretionary accruals is quite common as a variable measuring the quality of financial reporting (Tsipouridou & Spathis, 2014). For the case of Greece, Tsipouridou & Spathis (2014) do not identify empirical evidence establishing any correlation between GCO and DA; in this context, GCO is best explained by the financial characteristics of the firms involved: poor performance in the current year, loss in previous years.

To determine whether an auditor should have expressed a qualified opinion (GCO), some articles have used indicators specific to bankruptcy risk (Lennox, 1999); such indicators have also been used to measure the accuracy of audit reports. Casterella *et al.* (2020) assures us that there are numerous studies on the differences between Big4 and non-Big4 auditors, in the sense that it has been shown that it is more likely that Big4 auditors issue a GCO for firms in financial distress; also, the literature suggests that investors have greater confidence in financial statements audited by Big4. On the contrary, Hossain *et al.* (2020) find no difference between Big4 and non-Big4 in the association between reporting tone and GCO. Lennox (1999) applies a model to determine bankruptcy risk and finds that it is easier to predict bankruptcy risk for Big4 audit clients than for small audit clients. Lennox (1999) finds that large (Big4) auditors are more likely to express opinions that contain going concern (GCO) references for financially distressed companies and to express unqualified opinions for non- distressed companies. The same sense of the relationship is found by Ruiz-Barbadillo *et al.* (2024). For a number of emerging countries, Viana Jr *et al.* (2022) find that the auditor's membership in the Big4 mitigates the propensity of distressed firms to manipulate earnings compared to non-Big4 audited firms.

Lennox (1999) uses the indicators proposed by Altman to identify firms in financial distress firms: cash flows, firm size, leverage and profitability. Gutierrez *et al.* (2020) compares the predictive ability of GCO with four models: one based on financial indicators and firm size, the second based on market data, the third based on client information and estimates from external sources, and the fourth based on client information and credit rating. Carson *et al.* (2012) find in the literature a large set of indicators that measure a firm's financial distress: low profits or losses, high leverage, low liquidity, small size.

Gutierrez *et al.* (2020) argue that GCO takes into account a complex set of variables that bankruptcy prediction models cannot account for, variables that are related to the private information to which the auditor has access, but also the fact that the auditor takes into account qualitative variables that cannot be incorporated in models based on financial or market indicators.

In analysing the determinants and consequences of GCOs, it is important to take into account the geographic, institutional, economic, economic, financial and even political context in which the firms under study operate. For example, Syofyan & Vianti (2021) find, for listed Indonesian firms, that leverage (along with audit report lag, opinion shopping and firm size) does not influence GCO. Similarly, Zuhroh *et al.* (2023), for the same context, find that leverage has insignificant influence on GCO, while prior year modified opinion and firm growth percentage affect GCO significantly and positively. Cipriano *et al.* (2017) conclude that auditors of US firms rarely resort to expressing modified opinions. In fact, it is good to keep in mind that the GCO represents the only modified opinion that auditors of firms supervised by the Securities and Exchange Commission (SEC) in the U.S. can issue (DeFond & Zhang, 2014). This characteristic of the U.S. financial market leads to a strong limitation on the generalizability of the results (Garcia-Blandon & Argiles, 2015). It is for this reason that international comparisons involving Romania would do well to limit themselves to the GCO, leaving aside the other justifications for the modified views.

Also, from the literature reviewed by Foster & Shastri (2016), it appears that GCO is strongly correlated with financial structure (leverage, low working capital) and could be influenced by audit fees or litigation risk. The latter aspect should be analysed in the context of the specific economic and legal environment of each context. In the USA, for example, the litigation risk is high, while in continental Europe this risk becomes much more limited (Vanstraelen, 2002). Hossain *et al.,* (2020) find that firms that receive GCO are smaller in size, have scores indicating a higher probability of bankruptcy, are more volatile and are more likely to have significant internal control weaknesses.

Zdolšek *et al.* (2022), after finding an 8% share of qualified going-concern opinions for the period 2005-2013 – with an evident increasing trend over time – for companies from Slovenia, an emerging country in Central and Eastern Europe, establishes the probability of expressing such an opinion using a set of 20 independent variables, including 15 financial indicators, to which are added audit report lag, auditor's busy season, firm age, total assets and the existence of loss in the current year, without market data.

Moalla (2017) finds that liquidity and the existence of losses in the current and prior year are associated with modified opinions, as is leverage. However, during periods of financial crisis, Moalla (2017) identifies a significant decrease in qualified opinions.

The length of an auditor's tenure or auditor rotation may influence the audit opinion. Garcia-Blandon & Argiles (2015) find that the longer the tenure, the less likely it becomes to express a modified opinion, but justified for reasons other than going concern: on the contrary, the GCO is not influenced by the auditor's tenure, due to the litigation risks to which the auditor would be exposed.

2.3. Research hypothesis development

For the identification of risks to going concern, the auditor's application of specific benchmarks may not be sufficient. Even if a list of the elements signaling uncertainty about the going concern of companies is presented in the standards (ISA 570), a hierarchy of these elements is not established (Bava & di Trana, 2019).

Due to the various crises - financial, health, political, energetic, military - financial auditors have to be more careful/cautious in issuing opinions, especially when they are in the situation of expressing a GCO (Beams & Yan, 2015). Geiger *et al.* (2014) find that after the 2008 crisis, auditors (Big4 or non-Big4) became more inclined to provide GCOs for firms in financial distress. But, after a period of growth in the number of such opinions, the post-crisis situation returned to pre-crisis levels (Read & Yezegel, 2018)

In the situation where managers sell out of the entity's shares, they might put pressure on the auditors not to express a modified opinion due to going concern issues (Chen *et al.,* 2013). Managers are rather optimistic about the entity's going concern, even in unfavourable situations. Auditors, on the other hand, need to be cautious and not necessarily discount managers' estimates (Feng & Li, 2014; Kim M., 2021). However, there have also been situations in which managers' optimism has carried over to auditors, such that cases have been identified in which firms that did not receive previous GCOs went bankrupt in the subsequent period - even more than half (Mareque *et al.,* 2017).

Although the provision of non-audit services can sometimes affect the independence of auditors, it is assumed that in such cases, auditors are more knowledgeable about the client entities and the opinions expressed will be better informed and, by implication, the expression or not of GCO (Geiger *et al.,* 2022; DeSimone *et al.*, 2015).

Table no. 1 lists the influencing factors of GCO, the causalities generated and the source of the studies. These are of interest to our study in supporting the research hypothesis.

Table no. 1. The influencing factors of GCOs, the source and implications of occurrence or non-occurrence

Influence factors	Source	Implications
Women – auditors and firms in financial difficulties	(Hardies *et al.*, 2016)	GCO(+)
Big4 Auditors	(Lennox, 1999; Geiger *et al.*, 2014; Casterella *et al.*, 2020; Ruiz-Barbadillo *et al.*, 2024)	
Financial difficulties	(Barbadillo *et al.*, 2004; Aguilar *et al.*, 2018; Guo *et al.*, 2020)	
Financial structure: High debt	(Averio, 2021; Foster & Shastri, 2016; Bava & di Trana, 2019)	GCO (+)
Low liquidity	(Moalla, 2017; Bava & di Trana, 2019)	GCO (+)
Higher profitability	(Averio, 2021)	GCO (-)
Real Earnings Management (REM)	(Chan *et al.*, 2021; Xu *et al.*, 2018)	GCO (+)
Management pressures	(Chen *et al.*, 2013)	GCO (-)
Failure to respect the going concern presumption in preparing annual financial statements	(Robu *et al.*, 2012)	GCO (+)
Dependence of a firm in difficulty on one or more major customers	(Dhaliwal *et al.*, 2020)	GCO (+)
Modified opinion from previous year	(Zuhroh *et al.*, 2023)	GCO (+)
Weaknesses in internal control	(Hossain *et al.*, 2020)	GCO (+)

Note: GCO (+) is the formulation of the modified going concern opinion; GCO (-) is a non-formulation of the modified going concern opinion
Source: own processing according to the literature studied

Considering the figures already stated in the literature on the studied issue, the following hypothesis is proposed for testing and validation in this paper:

Research Hypothesis: In the context of IFRS application, leverage, operating and financial performance, as well as earnings management operations have a significant influence on the emergence of going concern risk over time, at the level of Romanian firms listed on the BVB.

3. Research methodology

Based on the research hypothesis, the objective of the study is to estimate the probability of the occurrence over time of the situation in which the entity can no continue the activity, based on the auditor's observations presented in the audit report, under the influence of the determinants of financial position and performance, as well as those of earnings management. In order to test and validate the hypothesis, the variables identified in the literature and used in this study are both quantitative and qualitative and are subjected to statistical processing using survival models (Robu *et al*., 2012). More specifically, the statistical approach followed to test and validate the research hypothesis is applied on a representative sample of the population under study, using advanced statistical methods of data analysis (Robu *et. al*., 2012; Robu, 2021).

3.1. Studied population and analysed sample

The population studied is represented by firms listed on the Bucharest Stock Exchange (BVB) on the Regulated Market, which are also subject to the Law no. 162/2017, and subject to statutory audit. Banking and non-banking financial institutions as well as insurance-reinsurance companies were eliminated from the total number of firms listed on the BVB between 2012 and 2023, so that the sample distributed by year comprises a total of 875 observations, as can be seen in **Table no. 2**. The sample is not balanced, with some firms included in the analysis for the full 12 years, others only for a shorter period. The period analysed is 2012-2023, the starting year (2012) being justified by the fact that it is the first year of mandatory application of IFRS in individual financial statements.

In the next sub-section, we describe the variables identified in the literature and used in the study, as well as the models analysed.

Table no. 2. Number of observations analysed – Sample description

Year	Number of observations
2023	71
2022	71
2021	69
2020	69
2019	70
2018	72
2017	74
2016	75
2015	75
2014	75
2013	77
2012	77
Total	**875**

Source: own processing

3.2. Description of variables, data source and econometric model analysed

For the firms included in the sample, data were collected from annual financial statements, including the financial audit reports available. The analyse of these data is made using SPSS 25.0 statistical software. The variables are described in **Table no. 3**, categories and explanations are detailed.

From **Table no. 3**, it can be seen that some variables are categorical and others are numerical scaled variables, either being financial indicators or accounting distortions (discretionary accruals). **Tables no. 4** and **no. 5** summarize the situation of nominal variables by year.

Table no. 4 shows that out of the 875 observations, 282 audit reports are issued by Big4 auditors and 593 audit report by non-Big4 auditors. However, 178 audit reports are signed by Non-Big4 internationally affiliated financial auditors. It can also be seen that of the total opinions expressed, 685 are unqualified opinions and 190 are modified opinions (qualified opinions, adverse opinions or disclaimer of opinion).

References to going-concern matters, either in modified opinions, in the emphasis of matter paragraph or in the key audit matter paragraph, are found in 207 cases, as shown in the data in **Table no. 5**.

Table no. 3. Description of the variables used in the proposed econometric models

Variable	Categories	Explanations/Description
Auditor Type	B4 = 1	Big 4
	NB4I = 2	Non Big 4 International affiliate
	NB4L = 3	Non Big 4 Local
Audit Opinion	OP.M = 0	Modified Opinion (Qualified Opinion, Adverse Opinion, Disclaimer of Opinion)
	OP.U = 1	Unqualified Opinion
References to going concern in modified opinions (GCO)	Yes = 1	Occurrence
	Not = 0	Non-occurrence
References to going concern in emphasis of matter paragraph (GC-EMP)	Yes = 1	Occurrence
	Not = 0	Non-occurrence
References to going concern in KAM (GC-KAM)	Yes = 1	Occurrence
	Not = 0	Non-occurrence
ROA	-	Return on Assets (Operating Income/Total Assets - 100)
ROE	-	Return on Equity (Net Income/Equity · 100)
FL	-	Financial Leverage (Total Debt/Equity)
ILR	-	Immediate Liquidity Ratio (Cash assets/Current liabilities)
Abs(DAC) (*Absolute value of the discretionary accruals*)	-	The working methodology proposed in Grosu M. *et al.* (2022) was used to calculate Abs(DAC), scaled by the operating income

Source: own projection

Table no. 4. Auditor category and type of opinion

Year	Auditor category			Type of opinion	
	B4	NB4I	NB4L	OP.M	OP.U
0	1	2	3	4	5
2023	25	16	30	6	65
2022	22	20	29	8	63
2021	21	20	28	12	57
2020	19	19	31	14	55
2019	19	18	33	17	53
2018	21	16	35	13	59
2017	24	12	38	17	57
2016	24	14	37	15	60
2015	27	9	39	19	56
2014	26	12	37	20	55
2013	27	11	39	22	55
2012	27	11	39	27	50
Total	**282**	**178**	**415**	**190**	**685**

Source: own projection

Table no. 5. Going concern justifications in modified opinions, referring to going concern in the emphasis of matter paragraph and the key audit matter paragraph						
Year	References to going concern in modified opinions		References to going concern in emphasis of matter paragraph		References to going concern in KAM	
	GCO (n)	GCO (%)	GC-EMP (n)	GC-EMP (%)	GC-KAM (n)	GC-KAM (%)
(0)	(1)	(2)=(1)/(1) (from table 2) (%)	(3)	(4)=(3)/(1)(fromtable 2) (%)	(5)	(6)=(5)/(1)(fromtable 2) (%)
2023	2	2,82	6	8,45	4	5,63
2022	2	2,82	8	11,27	3	4,23
2021	4	5,80	7	10,14	5	7,25
2020	7	10,14	9	13,04	8	11,59
2019	7	10,00	6	8,57	7	10,00
2018	4	5,56	10	13,89	9	12,50
2017	5	6,76	7	9,46	12	16,22
2016	7	9,33	4	5,33	10	13,33
2015	5	6,67	7	9,33	0	0,00
2014	3	4,00	9	12,00	0	0,00
2013	6	7,79	10	12,99	0	0,00
2012	4	5,19	10	12,99	0	0,00
Total	**56**	**6,40**	**93**	**10,63**	**58**	**6,63**

Source: own projection

Of the total of 207 cases, 56 modified opinions contain references to going concern (6.4% of total observations), 93 audit reports refer to going concern in the emphasis of matter paragraph (10.63% of total observations), and in 58 cases the auditor refers to going concern in the key audit matters - KAM (6.63% of total observations).

To test and validate the proposed research hypothesis, the following Cox regression model based on survival analysis will be used in the study (Robu *et al.,* 2012):

$$h(t) = [h_0\ (t)] \cdot e^{\beta_0+\beta_1 FL+\beta_2 ROE+\beta_3 ROA+\beta_4 RLI+\beta_5 DAC} \quad (1)$$

or in logarithmic form:

$$ln\, h(t) = ln\, h_0(t) + \beta_0 + \beta_1 FL + \beta_2 ROE + \beta_3 ROA + \beta_4 RLI + \beta_5 DAC \quad (2)$$

where,

$h_0(t)$ is the reference hazard rate when the value of all predictor variables equals 0;

$\beta_{i=0,\dots,5}$ are the parameters of the regression model, which measures the influence of the predictor variables on the probability of non-going risk. In the study, non-going concern risk means that at a given point in time (in the period analysed), a firm may be aware of this event when the financial auditor makes a number of going concern observations in the audit report.

In order to estimate and test the influence of factors on the probability of going-concern, the Cox model is proposed in the study, corresponding to equations (1) and (2). This model allows the analysis of duration data, similar to regression models, but it is used to estimate the hazard rate, *h(t)*, i.e. the probability of knowing the event under study as a function of a linear combination of explanatory factors. (Robu *et al.,* 2012).

4. Results and discussions

The period analysed in this study starts in 2012, the year of mandatory application of IFRS in individual financial statements. Thus, the period does not include the crisis that started in 2008, the effects of which - predictably - led to an increase in references to going concern in audit reports as a result of the caution shown by auditors (Geiger *et al,* 2014; Tsipouridou & Spathis, 2014; Beams & Yan, 2015; Mareque *et al.,* 2017; Read & Yezegel, 2018). This feature of our study means that auditors' opinions are not decisively influenced by the immediate effects of the crisis, except to the extent that the prudence they showed during the crisis was maintained on the long term. We can therefore attribute the difficulties in going-concern reported by auditors over the period 2012-2023 to factors other than the global crisis. However, we do have a crisis - the health crisis generated by covid-19 - and it is interesting to isolate, as far as possible, its effect on the auditors' opinions and comments, as well as on the KAM list included in the audit report.

In the sample analysed (875 observations), out of 190 modified opinions, only 56 (29.5%) refer to going concern matters. This percentage could be compared with data for the US market, reported by Foster & Shastri (2016), according to which, for those between 15,000 and 19,000 public firms, GCOs appeared between 14% and 20%; it should be noted that the share of GCOs is much higher for small firms and decreases significantly as firm size increases. Carson *et al.* (2012) report weights with the same trend for US firms over the period 2000-2010: from 36.70% for small firms to 0.33% for firms with market capitalizations above USD 500 million, for an average of 15.91%. Ruiz-Barbadillo *et al.* (2004), on a sample of Spanish firms, also find that the larger the customer, the less likely it is to receive GCO, even if objective circumstances would justify such a view.

For US firms that received GCO, the survival rate for the period 2000-2010 is 98.31% (Carson *et al.*, 2012), while of the firms that went bankrupt, 60.10% received GCO in the previous year.

Descriptive statistics on the financial indicators analysed as predictor variables of interest are presented in **Table no. 6**.

Table no. 6. Descriptive statistics on the financial indicators analyzed

	Var	FL		ROA		ROE		ILR		DAC	
Year	N	Medie	Dev.std.	Medie	Dev.std.	Medie	Dev.std.	Medie	Dev.std.	Medie	Dev.std.
2012	77	0.1760	5.5255	0.0115	0.1034	0.2029	0.8747	1.1974	4.4387	-2.2913	13.1207
2013	75	0.2496	3.5842	0.0002	0.1195	0.0983	0.4302	0.9742	3.5786	0.1543	0.3293
2014	75	0.4140	3.3742	0.0257	0.1028	0.0573	0.3265	1.3509	3.9090	0.2147	0.4121
2015	75	2.4461	16.1099	0.0668	0.4113	-0.2467	1.7392	1.2851	3.5806	0.1738	1.6517
2016	75	-0.5724	7.0892	0.0147	0.1661	0.1848	1.2990	1.2416	3.1343	0.2550	0.2519
2017	73	-0.3678	4.2648	0.0480	0.2639	-0.0753	2.0857	1.0046	2.1056	0.2374	0.3597
2018	70	-0.9410	6.1230	0.0250	0.1818	0.9816	6.4398	1.0348	2.1548	0.2957	0.2464
2019	72	0.1622	2.4461	0.0413	0.1225	0.0753	0.1978	1.0719	2.3527	0.2850	0.1955
2020	69	1.2704	8.7874	0.0303	0.1110	0.0346	0.2533	1.3172	2.7583	0.1426	0.3339
2021	69	-6.5647	59.2438	0.0552	0.1723	0.5772	4.1893	1.0446	2.0960	0.2694	0.6606
2022	70	-0.0265	4.5034	0.0850	0.3507	0.1107	0.3842	1.2031	2.6502	0.3327	0.5400
2023	69	0.5011	1.8561	0.0509	0.1404	0.0839	0.2052	0.9267	1.4999	0.0914	0.9102
Total	**875**	**-0.2410**	**17.9201**	**0.0374**	**0.2114**	**0.1706**	**2.3882**	**1.1384**	**2.9863**	**0.0000**	**4.0000**

Source: own processing in SPSS 25.0

The data in **Table no. 6** shows that financial leverage (FL) averages -0.2410 across the sample analysed for the period 2012-2023, indicating negative equity as a result of losses carried forward. High values of leverage were recorded in the financial years 2015 and 2020, with supra-unitary values of FL, indicating that the analysed firms are financed predominantly from foreign resources and less from own resources. Also, a high but negative FL value was recorded in financial year 2021, indicating very high values of losses carried forward relative to debt in this period, probably justified by the covid crisis.

In terms of return on assets (ROA), at the level of the analysed sample, it can be observed that a firm registers on average ROA values of 0.0374, which implies that for every 100 active monetary units used in the operating activity, they will generate 3.74 monetary units in the form of future economic benefits.

For the return on equity (ROE), we observe that at the level of the analysed sample, a BVB listed firm registers on average ROE values of 0.1706. This implies that for every 100 monetary units of capital made available by the shareholders, they will be remunerated by dividends (as part of the net income) with 17.06 monetary units. Average negative values of this indicator, for the financial years 2015 and 2017, reflect the recording, on average, of net losses.

The immediate liquidity ratio (ILR - Cash Assets/Current Liabilities) records an average of 1.1384 in the sample analysed, which indicates the firm's ability to repay immediately due debts instantly. It can be seen that in each period analysed, the immediate repayment capacity ratio is higher than 0.3, which is considered adequate.

For the indicator that measures the level of discretionary accruals, in absolute value, in relation to the operating income - *Abs(DAC)*, at the level of the analysed sample, it can be observed that, on average, a BSE listed firm registers values of this indicator of 0.0000. This value indicates a lack of discretionary accruals in relation to the value of the operating income. However, when analysing by year the discretionary accruals, in absolute value, in relation to the operating income, it can be observed that the highest values are recorded in the financial years 2016, 2018, 2019, 2021 and 2022, when the value of discretionary accruals represents more than 25% of the operating income.

Descriptive statistics on the financial indicators analysed by categories of auditors can be seen in **Table no. 7**.

Table no. 7. Descriptive statistics on financial indicators analysed by category of auditors

Variable	Auditor category	N	Mean	Dev.std.
FL	B4	282	0.4302	2.2474
	NB4 International	178	-0.0581	7.3383
	NB4 Local	415	-0.7756	25.5124
	Total	**875**	**-0.2410**	**17.9201**
ROA	B4	282	0.0589	0.1864
	NB4 International	178	0.0361	0.2303
	NB4 Local	415	0.0233	0.2181
	Total	**875**	**0.0374**	**0.2114**
ROE	B4	282	0.0795	0.4096
	NB4 International	178	0.0351	1.4300
	NB4 Local	415	0.2906	3.3204
	Total	**875**	**0.1706**	**2.3882**
ILR	B4	282	1.3277	2.9612
	NB4 International	178	1.9457	4.3634
	NB4 Local	415	0.6634	2.0505
	Total	**875**	**1.1384**	**2.9863**
DAC	B4	282	-0.0704	3.1566
	NB4 International	178	0.2054	0.6002
	NB4 Local	415	-0.0411	5.1840
	Total	**875**	**0.0000**	**4.0000**

Source: own processing in SPSS 25.0

Table no. 7 shows that the firms audited by Big4 are generally characterized by: positive equity, being favourably rated in terms of leverage (below average FL); for every 100 monetary units of assets used in operating activities, they will generate 5.89 monetary units in the form of future economic benefits; for every 100 monetary units of capital made available by shareholders, they will be remunerated by dividends (as part of net income) with 7.95 monetary units; they have the ability to instantly repay immediately due debts, and the amount of discretionary commitments represents only 7% of operating loss.

The distribution of the analysed sample according to the type of auditor and the occurrence of the studied event is presented in **Table no. 8**.

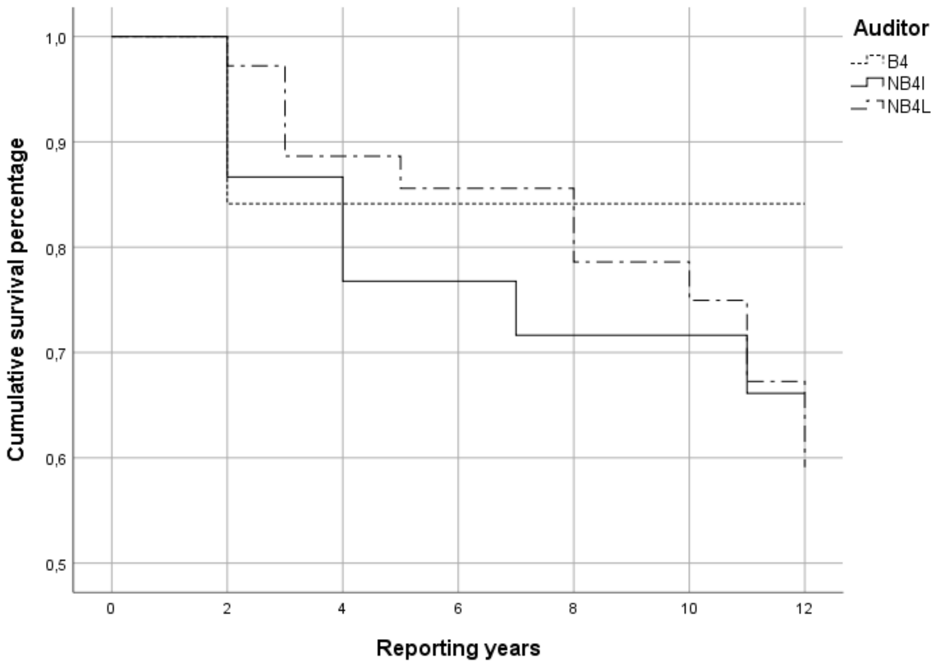
Table no. 8. Distribution of the analysed sample by type of auditor and occurrence of the event studied

Category	Auditor Type	Individual firms with reported events (going concern problems)	Individual firms that did not experience the event (survived)	Survival rate (%)
1	B4	5	27	84.40%
2	NB4 International	7	16	69.60%
3	NB4 Local	12	23	65.70%
Total		**24**	**66**	**73.30%**

Source: own processing in SPSS 25.0

From the data presented in **Table no. 8**, we see that most of the firms that received going concern observations were audited by auditors from local NB4 (local audit firms), both in terms of number of cases (12 unique firms) and percentage (100% - 65.70% = 34.30%). They were followed by firms audited by auditors from international NB4 (foreign audit firms), respectively 7 unique firms and a percentage of 30.40% (100% - 69.60%). In addition, the fewest cases of going concern were reported by firms audited by auditors from B4 (*Big 4*), i.e. 5 unique cases and 15.60% (100% - 84.40%). This may be explained by the fact that Big4 audits large firms, generally too big to fail.

Figure no. 1. Survival function of firms in the analyzed sample to the event studied (observations on going concern)



Source: own processing in SPSS 25.0

The distribution of the values of the survival functions, *h(t)*, by auditor type is shown in **Figure no. 1**, over the 12 years of reporting at the BSE, 2012-2023.

Figure no. 1 shows the survival functions for the firms in the analysed sample with respect to the knowledge of the event (the going concern observations in the audit report), the time interval at which this event was reported by the auditors, and the percentage of survival of this event (i.e. how many unique firms remained in the analysis after the going concern issues were reported).

For all firms analysed, going concern problems were reported after two years of reporting. At the same time, the firms audited by Non Big 4 Local (NB4L) auditors show a much higher survival rate (i.e. a number of firms that did not experience the analysed event in time, relative to the number of firms analysed) than the firms audited by Big 4 (B4) and Non Big 4 International (NB4I) auditors.

For the analysed firms included in the sample, **Table no. 9** presents the information on the risk of occurrence of the event (problems in financial reporting related to going concern), the percentage of survival, over time, in relation to the number of firms, depending on whether the auditor belongs to the B4, NB4I or NB4L group of firms.

Table no. 9. Distribution of the sample of firms analysed by type of auditor and by reporting year in which they experienced and survived the event studied

Auditor Type		Number of years of reporting	Number of firms included in analysis	Number of firms removed from the sample	Number of firms who knew the event	Share of firms that knew the event	Share of firms that survived the event	Cumulative survival rate
(0)		(1)	(2)	(3)	(4)	(5) = (2)/4	(6)=1-(5)	(7)
Auditor	B4	0	32	0	0	0.00	1.00	1.00
		1	32	1	5	0.16	0.84	0.84
		2	26	1	0	0.00	1.00	0.84
		3	25	4	0	0.00	1.00	0.84
		4	21	1	0	0.00	1.00	0.84
		5	20	1	0	0.00	1.00	0.84
		6	19	0	0	0.00	1.00	0.84
		7	19	1	0	0.00	1.00	0.84
		8	18	1	0	0.00	1.00	0.84
		9	17	2	0	0.00	1.00	0.84
		10	15	0	0	0.00	1.00	0.84
		11	15	0	0	0.00	1.00	0.84
		12	15	15	0	0.00	1.00	0.84
	NB4I	0	23	0	0	0.00	1.00	1.00
		1	23	1	3	0.13	0.87	0.87
		2	19	1	0	0.00	1.00	0.87
		3	18	1	2	0.11	0.89	0.77
		4	15	0	0	0.00	1.00	0.77
		5	15	0	0	0.00	1.00	0.77
		6	15	0	1	0.07	0.93	0.72
		7	14	0	0	0.00	1.00	0.72
		8	14	1	0	0.00	1.00	0.72
		9	13	0	0	0.00	1.00	0.72
		10	13	0	1	0.08	0.92	0.66
		11	12	0	0	0.00	1.00	0.66
		12	12	12	0	0.00	1.00	0.66

	NBFL	0	36	0	0	0.00	1.00	1.00
		1	36	0	1	0.03	0.97	0.97
		2	35	2	3	0.09	0.91	0.89
		3	30	1	0	0.00	1.00	0.89
		4	29	0	1	0.03	0.97	0.86
		5	28	1	0	0.00	1.00	0.86
		6	27	2	0	0.00	1.00	0.86
		7	25	1	2	0.08	0.92	0.79
		8	22	0	0	0.00	1.00	0.79
		9	22	1	1	0.05	0.95	0.75
		10	20	1	2	0.10	0.90	0.67
		11	17	1	2	0.12	0.88	0.59
		12	14	14	0	0.00	1.00	0.59

Source: own processing in SPSS 25.0

According to the data presented in **Table no. 9**, BSE listed firms audited by Big 4 auditors had the most going concern problems after the first reporting year (16%, from column 5). Subsequently, over the 12 reporting years, firms audited by NB4I and NB4L auditors had the most going concern issues raised by the auditors, with survival rates of 66% and 59% respectively. The number of firms removed from the sample over the 12 years of reporting refers to firms that no longer reported financial information by the time the event was known or the survey was completed.

In order to test the influence of determinants on the probability of occurrence over time of auditors' observations of going concern, the Cox regression model in equation (2) will be used in the study. The correlation coefficients between these variables are presented in **Table no. 10**.

Based on the estimated correlation coefficients, it can be concluded that there are significant causal links between the influence of leverage ratio (FL) and return on assets (ROA) on the return on equity (ROE), as a signal indicator of going concern problems. At the same time, the link between DAC and the immediate liquidity ratio (ILR) indicates the existence of high discretionary accruals, i.e. possible earnings management operations, in highly liquid listed firms, with a direct impact on going concern.

Table no. 10. Coefficients of correlations between predictor variables included in the analysis

	FL	ROE	ROA	ILR
ROE	0.588			
ROA	0.022	0.646		
ILR	-0.158	-0.275	-0.303	
DAC	-0.097	-0.143	-0.140	0.528

Source: own processing in SPSS 25.0

The parameter estimates of the regression model for equation (2) are presented in **Table no. 11**.

Table no. 11. Parameter estimates of the regression models for equation (2)

Variable	B	SE	Wald	df	Sig.	Exp(B)
FL	-0,034	0,035	0,931	1	0,335	0,967
ROE	-0,030	0,043	0,484	1	0,487	0,970
ROA	-1,797	1,643	1,196	1	0,274	0,181
ILR	-0,835	0,537	2,415	1	0,120**	0,452
DAC	-0,126	0,055	5,386	1	0,020*	0,882

* significant values for a 15% risk; ** significant values for a 5% risk

Source: own processing in SPSS 25.0

In **Table no. 11** we see that the most significant influences on the probability of going concern issues reported in the audit reports over time are determined by DAC and RLI. Thus, at the firm level, the existence of discretionary accruals (in the form of differences between cash and accruals accounting) indicates the presence of possible earnings management operations with a direct impact on both the firm's liquidity and, more importantly, on the probability of being able to continue as a going concern within a foreseeable time horizon. In this line, reducing discretionary accruals will increase the probability over time that a firm will continue to operate, with the auditor expressing an unmodified opinion on whether the application of this principle is in accordance with IFRS. Furthermore, our findings are in line with results reported in other studies (Moalla, 2017; Bava & di Trana, 2019; Chan *et al.*, 2021; Xu *et al.*, 2018), which tested the influence of determinants on the likelihood of occurrence over time (since first-time adoption of IFRS) of auditor's observations on going concern issues mentioned in the audit report.

5. Conclusions

By analysing the situation of Romanian non-financial companies listed on the regulated market of the BSE, during the period of application of IFRS in their individual accounts (2012-2023), we aimed to estimate the probability of occurrence going concern difficulties, based on the observations found in the audit reports that refer to this element. We focused both on the modified opinions with reference to (non)going concern, as well as on what the auditors included in the emphasis of matter paragraphs or in the key audit matters part (the latter, only since 2016). From the literature, we found it most appropriate to hypothesize that the going concern difficulties for Romanian non-financial firms listed on the regulated market of the BSE (where IFRS is applied) is significantly influenced by operating and financial performance, as well as by the application of earnings management techniques. The variables used were processed by applying survival analysis based on Cox regression models.

The results of our analyses show that going concern problems were generally reported two years after such an issue was reported in the audit report. At the same time, companies audited by auditors from the Non Big 4 local group (NB4L) have a much higher survival rate (i.e. the number of companies that did not experience the analysed event in time, compared to the number of companies analysed), compared to companies audited by auditors from the Big 4 (B4) and Non Big 4 international (NB4I).

We identified significant causality in the influence of leverage ratio (FL) and return on assets (ROA) on the return on equity (ROE), as a signalling indicator of going concern problems. At the same time, the link between discretionary accruals (DAC) and the immediate liquidity ratio (ILR) indicates the existence of high discretionary accruals, i.e. possible earnings management operations, in highly liquid listed firms, with a direct impact on going concern. The reduction in discretionary accruals over time increases the probability that a firm will continue as a going concern and the auditor express an unqualified opinion on whether the firm is in compliance with this principle under IFRS.

Limitations of the study result in particular from the limited sample size analysed, as well as from the lack of a robustness check of the data by applying alternative models to test the likelihood of firm survival. In future research, it might also be interesting to study the market reaction to the GCO (following Myers *et al.,* 2018) or to the presence of mentions of going concern in emphasis of matter paragraph or in the KAM. It is also useful to see the extent to which the issuance of an GCO by the auditor of Romanian firms leads to the auditor's change in the following year(s) (Lennox, 2000), as auditors may consider that the issuance of an GCO creates the risk of being replaced by dissatisfied clients who consider the GCO to be unjustified (Svanberg & Öhman, 2014). The Romanian audit market has not had to go through turning points such as the implementation of SOX in the USA (DeFond & Lennox, 2011); however, it is interesting to see to what extent the inclination of audit firms to express modified opinions (with or without GCOs) changes following events such as financial or health crises. The analysed population can be extended to other firms listed on the BVB (on the alternative AeRo market) and even, if information can be obtained, to other audited firms, i.e. state-owned firms, for example, or private firms that exceed the thresholds set by the regulations on financial auditing. Hardies *et al.* (2018), for example, obtain interesting results analysing such private (Belgian) firms.

To the extent that the information would be available, it is useful to analyse the link between GCO and the results of the audit firms' verification by the specific body (ASPAAS, CAFR), following the model proposed by Song & Ye (2014), for non-US audit firms expressing opinions for US firms that have been verified by the PCAOB (Public Company Accounting Oversight Board). The literature also suggests effects of ownership and trading of shares by members of the firm's management on the auditor's opinion on going concern (Chen et al., 2013). Another research direction involving GCOs is to analyse the tone of discourse in the annual reports of Romanian firms, with the idea of testing how this tone is correlated with GCO risk, following the model proposed by Hossain et al., (2020).

References

1. Ali, M. N., Almagtome, A. H., & Hameedi, K. S. (2019), Impact of accounting earnings quality on thegoing-concern in the Iraqi tourism firms, *African Journal of Hospitality, Tourism and Leisure*, 8(5), 1-12
2. Alqam, M. A., Owais, W. O., Ali, H. Yve Hamshari, Y. M. (2022), Earnings quality determinants in the Jordanian service sector (The financial crisis during Corona crisis), *Cogent Business & Management*, Taylor & Francis Journals, 9(1), 1-14
3. Altman, E. (1986), Financial ratios, discriminant analysis and the prediction of corporate bankruptcy, in Johnson. R. (ed.). *Issues and reading in managerial finance*, New York; Dryden Press.
4. Averio, T. (2021), The analysis of influencing factors on the going concern audit opinion – a study in manufacturing firms in Indonesia, *Asian Journal of Accounting Research*, vol. 6, no. 2, pp. 152-164
5. Bava, F., di Trana, M. G. (2019), ISA 570: Italian Auditors' and Academics' Perceptions of the Going Concern Opinion, *Australian Accounting Review*, vol. 29, no. 1, pp. 112-123
6. Beams, J., Yan, Y. C. (2015), The effect of financial crisis on auditor conservatism: US evidence, *Accounting Research Journal*, vol. 28, no. 2, pp. 160-171
7. Berglund, N. R., Herrmann, D. R., Lawson, B. L. (2018), Managerial Ability and the Accuracy of the Going Concern Opinion, *Accounting and the Public Interest*, vol. 18, no. 1, pp. 29–52
8. Bunce, M., & Clayton, M. (2011), *Corporate Financial Reporting*, Pearson Education
9. Carson, E., Fargher, N. L. Geiger, M. A., Lennox, C. S., Raghunandan, K., Willekens, M., (2013), Audit Reporting for Going-Concern Uncertainty: A Research Synthesis, *Auditing: A Journal of Practice & Theory*, vol. 32, suppl. 1, pp. 353-384
10. Casterella, J. R., Desir, R., Stallings, M, A., Wainberg, J. S. (2020), Information Transfer of Bankruptcy Announcements: Examining the Impact of Auditor Opinions, *Accounting Horizons*, vol. 34, no. 1, pp. 45-66
11. Chen, C., Martin, X., Wang, X. (2013), Insider Trading, Litigation Concerns, and Auditor Going-Concern Opinions, *The Accounting Review*, vol. 88, no. 2, pp. 365-393
12. Chen, S., Hu, B., Wu, D., Zhao, Z. (2020), When Auditors Say 'No,' Does the Market Listen?, *European Accounting Review*, vol. 29, no. 2, pp. 263-305
13. Chu, L., Fogel-Yaari, H., Zhang, P. (2022), The Estimated Propensity to Issue Going Concern Audit Reports and Audit Quality, *Journal of Accounting, Auditing & Finance*, vol. 39, no. 2, pp. 589-613
14. Cipriano, M., Hamilton, E. L., Vandervelde, S. D. (2017), Has the lack of use of the qualified audit opinion turned it into the "Rotten Kid" threat?, *Critical Perspectives on Accounting*, vol. 47, pp. 26-38
15. DeAngelo, L. E. (1981), Auditor size and audit quality, *Journal of Accounting and Economics*, vol. 3, no. 3, pp. 183-199
16. DeFond, M. L., Lennox, C. S. (2011), The effect of SOX on small auditor exits and audit quality, *Journal of Accounting and Economics*, vol. 52, no. 1, pp. 21-40
17. DeFond, M. L, Zhang, J. (2014), A review of archival auditing research, *Journal of Accounting and Economics*, vol. 58, no. 2-3, pp. 275-326
18. De Simone, L., Ege, M. S., & Stomberg, B. (2015), Internal control quality: The role of auditor-provided tax services, *The Accounting Review*, vol. 90, no. 4, pp. 1469-1496
19. Dhaliwal, D., Michas, P. N., Naiker, V., Sharma, D. (2020), Greater Reliance on Major Customers and

Auditor Going-Concern Opinions, *Contemporary Accounting Research*, vol. 37, no. 1, pp. 160-188

20. Feng, M., Li, C. (2014), Are Auditors Professionally Skeptical? Evidence from Auditors' Going-Concern Opinions and Management Earnings Forecasts, *Journal of Accounting Research*, vol. 52 no. 5, pp. 1061-1085
21. Foster, B. P., Shastri, T. (2016), Determinants of going concern opinions and audit fees for development stage enterprises, *Advances in Accounting, incorporating Advances in International Accounting*, vol. 33, pp. 68-84
22. Garcia-Blandon, J., Argiles, J. M., (2015), Audit firm tenure and independence: A comprehensive investigation of audit qualifications in Spain, *Journal of International Accounting, Auditing and Taxation*, vol. 24, no. pp. 82-93
23. Geiger, M.A., & Raghunandan, K. (2002), Auditor Tenure and Audit Reporting Failures. *Ear and Hearing, 21*, pp. 67-78
24. Geiger, M. A., Raghunandan, K., Riccardi, W. (2014), The Global Financial Crisis: U.S. Bankruptcies and Going-Concern Audit Opinions, *Accounting Horizons*, vol. 28, no. 1, pp. 59-75
25. Geiger, M. A., Basioudis, I. B., DeLange, P. (2022), The effect of non-audit fees and industry specialization on the prevalence and accuracy of auditor's going-concern reporting decisions, *Journal of International Accounting, Auditing and Taxation*, vol. 47, 100473
26. Grosu, M., Robu, I.-B., Istrate, C., Istrate, M. (2022), Influence of Gender Differences on the Quality of Financial Audit Engagements for Listed Companies, *Audit Financiar*, vol. XX, no. 2(166)/2022, pp. 304-319,
27. Grout, P., Jewitt. I., Pong. C., Whittington. G, (1994). Auditor professional judgement: Implications for regulation and the law, *Economic Policy*, vol. 19: pp. 307-344
28. Gutierrez, E. Krupa, J., Minutti-Meza, M., Vulcheva, M. (2020), Do going concern opinions provide incremental information to predict corporate defaults?, *Review of Accounting Studies*, vol. 25, no. 4, pp. 1344-1381
29. Guo, Y., Delaney, D. Ahmed, A. (2020), Is an Auditor's Propensity to Issue Going Concern Opinions a Valid Measure of Audit Quality?, *Australian Accounting Review*, vol. 30, no. 2, pp. 144-153
30. Hardies, K. Vandenhaute, M. L., Breesch, D. (2018), An Analysis of Auditors' Going-Concern Reporting Accuracy in Private Firms, *Accounting Horizons,* vol. 32, no. 4, pp. 117-132
31. Hossain, M., Raghunandan, K., Rama, D. V. (2020), Abnormal disclosure tone and going concern modified audit reports, *Journal of Accounting and Public Policy*, vol. 39, no. 4, 106764
32. Istrate, C. (2021), *Contabilitatea nu-i doar pentru contabili – 2021, Ediția a II-a, revăzută și adăugită*, Ed. Evrika Publishing, București
33. Ittonen, K., Tronnes, P. C., Wong, L. (2017), Substantial doubt and the entropy of auditors' going concern modifications, *Journal of Contemporary Accounting & Economics*, vol. 13, no.2, pp. 134-147
34. Kaplan, S. E., Williams, D. D. (2013), Do Going Concern Audit Reports Protect Auditors from Litigation? A Simultaneous Equations Approach, *The Accounting Review*, vol. 88, no. 1, pp. 199-232
35. Kausar, A., Taffler, R. T., Tan, C. E. L. (2017), Legal Regimes and Investor Response to the Auditor's Going-Concern Opinion, *Journal of Accounting, Auditing & Finance*, vol. 32, no. 1, pp. 40-72
36. Khan, S. A., Lobo, G., Nwaeze, N. T. (2017), Public re-release of going-concern opinions and market reaction, *Accounting and Business Research*, vol. 47, no. 3, pp. 237-267
37. Koh. H, (1991), Model predictions and auditor assessments of going concern status, *Accounting and Business Research*, vol. 21, no. 84, pp. 331-338
38. Lennox, C. (1999), Are large auditors more accurate that small auditors?, *Accounting and Business research*, vol. 29, no. 3, pp. 217-227
39. Lennox, C. (2000), Do companies successfully engage in opinion-shopping? Evidence from the UK, *Journal of Accounting and Economics*, vol. 29, no. 3, pp. 321-337
40. Mareque, M., López-Corrales, F., Pedrosa, A. (2017), Audit reporting for going concern in Spain during the global financial crisis, *Economic Research-Ekonomska Istraživanja*, vol. 30, no. 1, pp.154–183
41. Menon, K., Williams, D. (2010), Investor reaction to going concern audit reports. *The Accounting Review*, vol. 85, no. 6, pp. 2075-2105.

42. Moalla, H. (2017), Audit report qualification/modification: Impact of financial variables in Tunisia, *Journal of Accounting in Emerging Economies*, vol. 7, no. 4, pp.468-485
43. Myers, L., Shipman, J. E., Swanquist, Q. T., Whited,R. L. (2018), Measuring the market response to going concern modifications: the importance of disclosure timing, *Review of Accounting Studies*, vol. 23, no. 4, pp. 1512-1542
44. Nogler, G.E. (2008), Going concern modifications, CPA firm size, and the Enron effect, *Managerial Auditing Journal*, Vol. 23 No. 1, pp. 51-67
45. Pucheta Martínez, M. C., Martínez, A. V., Garcia Benau, M. A. (2004), Reactions of the Spanish capital market to qualified audit reports, *European Accounting Review*, vol. 13, no. 4, pp. 689-711
46. Read, W. J., Yezegel, A. (2018), Going-concern opinion decisions on bankrupt clients: Evidence of longlasting auditor conservatism?, *Advances in Accounting*, vol. 40, pp. 20-26
47. Robu, I.B., Balan, C.B., Jaba, E. (2012), The estimation of the going concern ability of quoted companies, using duration models, *Procedia – Social and Behavioral Science*, 62, pp 876-880.
48. Robu, I.B. (2021), *Calitatea informației financiare: fundamentări contabile, modelări econometrice și analize statistice*, Ed. Performantica, Iași
49. Ruiz-Barbadillo, E., Gómez-Aguilar, N., De Fuentes-Barberá, C., García-Benau, M. A. (2004), Audit quality and the going-concern decision-making process: Spanish evidence, *European Accounting Review*, vol. 13, no. 4, pp. 597-620
50. Segal, M. (2017), ISA 701: Key Audit Matters - an exploration of the rationale and possible unintended consequences in a South African, *Journal of Economic and Financial Sciences*, vol. 10, no. 2, pp. 376-391
51. Song, H. J., Ye, Z. (2014), The Impact of PCAOB Reports Containing Audit Deficiencies on Non-U.S. Audit Firms: Initial Evidence, *Current Issues in Auditing*, vol. 8, no. 1, pp A12-A25
52. Svanberg, J., Öhman, P. (2014), Lost revenues associated with going concern modified opinions in the Swedish audit market, *Journal of Applied Accounting Research*, vol. 15, no. 2, pp. 197-214
53. Syofyan, E., Vianti, K. O. (2021), Going Concern Audit Opinion: The Role of Audit Delay, Opinion Shopping, Financial Distress, Leverage and Size of Company, *Jurnal Akuntansi*, vol. 11, no.3, pp. 235-246
54. Tagesson, T., Öhman, P. (2015), To be or not to be – auditors' ability to signal going concern problems, *Journal of Accounting & Organizational Change*, vol. 11, no. 2, pp.175-192
55. Tahinakis, P. Samarinas, M. (2016), The incremental information content of audit opinion, *Journal of Applied Accounting Research*, vol. 17, no. 2, pp.139-169
56. Tsipouridou, M., Spathis, C. (2014), Audit opinion and earnings management: Evidence from Greece, *Accounting Forum*, vol. 38, no. 1, pp. 38-54
57. Vanstraelen, A. (2002), Auditor economic incentives and going-concern opinions in a limited litigious Continental European business environment: empirical evidence from Belgium, *Accounting and Business Research*, vol. 32, no. 3. pp. 171-186
58. Viana Jr., D.B.C., Lourenço, I., Black, E. B. (2022), Financial distress, earnings management and Big 4 auditors in emerging markets, *Accounting Research Journal*, vol. 35, no. 5, pp. 660-675
59. Xu, H., Dao, M., Wu, J. (2018), The effect of real activities manipulation on going concern audit opinions for financially distressed companies, *Review of Accounting and Finance*, vol. 17, no. 4, pp. 514-539
60. Zdolšek, D., Jagrič, T., Kolar, I. (2022) Auditor's going-concern opinion prediction: the case of Slovenia, *Economic Research-Ekonomska Istraživanja*, vol. 35, no. 1, pp. 106-121
61. Zuhroh, S., Prasetiyo, Y., Nugraheni, N., Riyani, E. I. (2023), Effect of Leverage, Previous Year's Audit Opinion and Company Growth on Going Concern Audit Opinion, *International Journal of Business and Applied Economics*, Vol. 2, No. 2, 2023: 149-162.

Audit Financiar, XXIII, Nr. 2(178)/**2025**, *345-363*
ISSN on-line: 1844-8801

Determinants of Sustainability Reporting in the Romanian Banking Sector

Univ. Assist. Mihaela CUREA, Ph. D.,
"Alexandru Ioan Cuza" University of Iași, Faculty of Economics and Business Administration, Romania,
e-mail: mihaela.curea@feaa.uaic.ro

Univ. Prof. Maria Carmen HUIAN, Ph. D.,
"Alexandru Ioan Cuza" University of Iași, Faculty of Economics and Business Administration, Romania,
e-mail: maria.huian@uaic.ro

Univ. Prof. Marilena MIRONIUC, Ph. D.,
"Alexandru Ioan Cuza" University of Iași, Faculty of Economics and Business Administration, Romania,
e-mail: marilena@uaic.ro

Abstract

This paper investigates the determinants of Sustainable Development Goals (SDG) reporting in the Romanian banking sector over an extended time horizon (2017-2023), employing a mixed-method approach that combines content analysis, fixed-effects regression, and regression trees. The analysis covers 17 commercial banks. The results indicate that report size and type are the primary determinants of SDG reporting. Additionally, the study highlights a positive effect of gender diversity on the transparency and quality of reported information, although its influence varies depending on bank-specific characteristics. Other governance factors, such as the frequency of board meetings or the independence of board members, exhibit either a negative or insignificant impact, potentially signaling organizational challenges. While macroeconomic factors such as inflation and economic growth do not have a direct effect on SDG scores, they may amplify the impact of governance variables and bank characteristics. The key contribution of this study lies in integrating two complementary methodological approaches, capturing both overarching relationships and conditional effects. Regression trees facilitate the identification and modeling of non-linear and conditional relationships between variables, enabling the detection of complex interactions that traditional fixed-effects regression models cannot capture. The findings provide a nuanced perspective on the role of board activity and composition in fostering transparency and sustainability in the banking sector.

Key words: *Sustainable Development Goals (SDGs); sustainability reporting; corporate governance; gender diversity; banks;*

JEL Classification: *M41, M14, G34*

To cite this article:
Curea, M., Huian, M. C., Mironiuc, M. (2025), Determinants of Sustainability Reporting in the Romanian Banking Sector, *Audit Financiar*, vol. XXIII, no. 2(178)/2025, pp.345-363,
DOI: 10.20869/AUDITF/2025/178/009

To link this article:
http://dx.doi.org/10.20869/AUDITF/2025/178/009
Received: 23.02.2025
Revised: 3.03.2025
Accepted: 10.04.2025

Introduction

The United Nations (UN) drew global attention in September 2015 with the adoption of a 15-year action plan for People, Planet, Prosperity, and Peace - the *2030 Agenda for Sustainable Development*. This plan was designed to balance the dimensions of sustainable development and be implemented through a global partnership. The agenda includes 17 Sustainable Development Goals (SDGs) and 169 universal targets, applicable to both developed and developing countries, depending on their specific realities and aligned with national policies and priorities. These objectives serve as a wake-up call for governments, businesses, and other stakeholders, as they address many of the pressing global challenges affecting nations worldwide, such as poverty, hunger, health, climate change, and other global concerns (Erin and Olojede, 2024).

The success of the SDGs largely depends on the collective efforts of UN member states in progressing toward the 17 goals, as well as on the collaboration between governments and other stakeholders, including non-governmental organizations (NGOs), the private sector, industry associations, consumers, and corporate managers. Although SDG achievement is assessed at the national level, the business sector plays a critical role in their realization, as many of the SDGs directly target corporate strategies and behaviors (Pizzi et al., 2020). Companies are therefore expected to integrate sustainability practices into their business models, align with the SDGs, and demonstrate their corporate commitment to the 2030 Agenda through publicly disclosed sustainability reports (Bose, Khan, and Bakshi, 2024).

The 2030 Agenda has placed increasing social and political pressure on companies across all industries to acknowledge and quantify the positive and/or negative impact of their activities on key sustainability issues and to improve transparency regarding their SDG-related engagement (Datta and Goyal, 2022).

Some experts argue that while corporate awareness of SDG relevance is growing, businesses are still far from fully aligning their corporate ambitions with the SDGs, implementing the necessary organizational changes, and reflecting them in reporting practices. Companies are primarily driven in this process by the need to influence stakeholder perception, regulatory requirements, or the desire to maintain legitimacy (Albu et al., 2024; Zampone et al., 2024). As a result, the promotion of SDGs through enhanced reporting is, in some cases, perceived as "opportunistic," "symbolic," or even "greenwashing," lacking genuine effort and offering low informational value to external stakeholders (Khan et al., 2023).

Sustainability reporting is currently at different levels of maturity across countries and regions, closely correlated with the institutional context of each country. This leaves significant room for improving reporting quality and studying its comparability (Paridhi and Arora, 2023). For example, companies in Central and Eastern Europe have engaged in sustainability reporting later and to a lesser extent compared to their counterparts in more developed countries. Consequently, sustainability reporting in these countries is generally inferior in terms of both the quantity and quality of disclosures (Albu et al., 2024). The Sustainable Development Report 2024 (Sachs, Lafortune, and Fuller, 2024) ranks Romania 40th out of 167 UN member states based on their progress toward achieving the 17 SDGs, with a score of 76.70 out of 100, the latter representing the full achievement of all SDGs. This suggests that, compared to developed countries where sustainability reporting is more established and extensively studied, Romania provides a context in which reporting practices and models are still in the process of maturing.

The UN 2030 Agenda has established itself as a central theme not only in public discourse but also in academic research, particularly in accounting research focused on SDG reporting, which has seen notable growth since 2018 (Datta and Goyal, 2022; Paridhi and Arora, 2023). Research in the field (Zampone et al., 2024) highlights a clustering of studies on this topic into two categories: 1) studies investigating the degree of SDG integration into non-financial reporting systems, which also provide initial knowledge about SDGs (Fonseca and Carvalho, 2019; Cosma et al., 2020; Nicolò et al., 2023; Erin and Olojede, 2024); methodologically, these studies primarily use content analysis in relation to GRI standards and scoring systems that assess the completeness and comprehensibility of reported information; 2) studies examining the determinants of SDG adoption and disclosure by organizations (Pizzi, Rosati, and Venturelli, 2021; Datta and Goyal, 2022; Bose, Khan, and Bakshi, 2024; Hua Sim and Yuan Fung, 2024; Mazumder, 2024). These are fewer in number and explore the motivations and impact behind SDG disclosure, often yielding inconclusive or contradictory results due to the novelty of the subject (Datta and Goyal, 2022).

Most studies in the field have focused on developed countries and large companies (multinationals, publicly listed firms) or on "sensitive industries" (oil and gas, chemicals, transportation, energy, and mining), which are more likely to cause social and environmental harm due to pollution, resource exploitation, waste production, or the manufacturing of ecologically harmful products (Hua Sim and Yuan Fung, 2024). Some researchers (Pizzi et al., 2020; Mazumder, 2024; Datta and Goyal, 2022; Erin, Bamigboye, and Oyewo, 2022) advocate for prioritizing SDG studies in the context of emerging economies, where sustainable development deserves special attention. They suggest focusing on specific regions, sectors, or industries, including "non-sensitive" ones (finance, technology, tourism, real estate). Such research could expand knowledge, offering a more nuanced understanding of the factors influencing sustainability reporting practices in these contexts.

Given this positioning of researchers, we are motivated to study the determinants of Sustainable Development Goals (SDG) reporting in the Romanian banking sector for at least two reasons: 1) both the banking sector and our country represent under-researched contexts in terms of sustainability reporting; 2) many social and environmental programs led by governments in emerging economies are implemented through commercial banks, which, as financial intermediaries, engage in ongoing dialogue with stakeholders (Khan et al., 2023). According to some estimates, the transition to a sustainable and inclusive global economy by 2030 requires $5–7 trillion annually (Avrampou et al., 2019), with a significant share coming from financial institutions. In this regard, 63.3% of European banks have launched SDG-based products, services, or commercial initiatives, such as green and social bonds, sustainable investment funds, and green mortgages (EBEF and KPMG, 2021).

Our research is guided by the following questions:

- *Do report-level determinants (report type and report size) influence the quality of SDG-related information disclosed by banks?*
- *To what extent do bank governance structures (gender diversity, board director independence, and board meeting frequency) impact the quality of SDG reporting?*

Answering these questions - and thereby achieving our research objective - involved conducting a content analysis of reports from 17 commercial banks over a seven-year period and testing five research hypotheses developed based on a review of the relevant literature. This was done by applying fixed-effects regression analysis and regression trees. The results indicate that report size and type are the main determinants of SDG reporting, and gender diversity positively influences the transparency and quality of reported information.

To the best of our knowledge, this paper is the first to address the factors influencing the disclosure of Sustainable Development Goals (SDGs) by banking institutions in Romania, an emerging country that has been less studied in this context. An innovative aspect of the study is the use of regression trees, which allow for the capture of relationships conditioned by specific factors, revealing details that are not identified through conventional fixed-effects regression. These trees provide a more nuanced understanding of variable interactions and can contribute to the development of literature by highlighting the various conditions under which internal and external factors influence SDG reporting in the Romanian banking sector.

The remainder of the paper is structured as follows: a section reviewing the literature on the determinants of SDG reporting is followed by an outline of the research methodology, a discussion of the results obtained from testing the research hypotheses, and, finally, the conclusions, which summarize the key insights, highlight the study's limitations, and discuss its implications.

1. Determinants of SDG sustainability reporting

Previous literature highlights the need to identify the factors explaining the differences and gaps in SDG reporting between countries. Rosati and Faria (2019), analyzing a sample of firms from different countries, empirically demonstrate that institutional factors at the country level ("politics and law, economy and finance, society and culture, technology and innovation, education and workforce, and sustainability") and organizational factors ("firm size, a higher proportion of intangible assets, greater commitment to sustainability frameworks and their external assurance, a higher proportion of female directors on the board, and a younger board of directors") are linked to SDG disclosure. Datta and Goyal (2022) identify three categories of determinants influencing SDG reporting: firm-level determinants (industry sector, regulatory context, risks, size, financial performance, and stakeholder orientation); report-level determinants (reporting processes and choices); and regulatory-level determinants (sustainability committees and compliance with international reporting frameworks). Bose, Khan, and Bakshi (2024) examine SDG disclosure determinants and consequences for the period 2016–2019, analyzing firms from 30 countries (6,941 annual observations). The authors identify the following determinants of SDG reporting: national sustainability regulations, governance models (shareholder-oriented versus stakeholder-oriented), and the economic status of countries. Other studies delve into the influence of governance-related determinants (board structure, gender diversity, and the presence of independent directors) on SDG reporting (Pizzi et al., 2020; Zampone et al., 2024).

In recent years, companies from various countries have paid increased attention to the disclosure of non-financial information through sustainability reports separate from traditional financial reports, as it is believed that the publication of standalone reports demonstrates a stronger commitment to sustainable development (Datta and Goyal, 2022; Bose, Khan and Bakshi, 2024). In other words, when non-financial disclosure is developed independently, it enhances credibility with stakeholders (Bose, Khan and Bakshi, 2024). Pizzi, Rosati and Venturelli (2021) showed that, in Italy, the use of independent reports to disclose sustainability performance is positively correlated with SDG reporting. In the same research direction, Galeazzo, Miandar and Carraro (2024), attempting to demonstrate the superiority of integrated annual reports over separate sustainability reports, do not find a significant influence of the former. Therefore, based on the existing literature, it is anticipated that companies adopting independent sustainability reports will have a higher level of SDG information disclosure.

In this context, the first research hypothesis is developed:

> *H1 The publication of standalone sustainability reports positively influences the quality of SDG disclosures.*

The lack of a standardized format for reporting SDG information also causes their dimensions to vary significantly from one entity to another, even within the same industry. However, some studies argue that the number of pages in reports is an adequate proxy for the quality and coverage capacity of SDG information (Datta and Goyal, 2022). On the other hand, Schena et al. (2022) document that depth, defined as the total volume of SDG-based information reported by a company, remains statistically insignificant in a model analyzing its performance.

To test whether the size of reports indicates a greater orientation towards SDGs, the second research hypothesis is formulated:

> *H2 Banks that publish more extensive sustainability reports are more inclined to report information on the SDGs.*

The inclusion of women in corporate governance structures, such as general managers or members of the board of directors (BOD), brings multiple benefits, both from a social justice perspective and from a strategic viewpoint (Farisyi et al., 2022). Thus, women contribute with unique perspectives and a stronger sense of responsibility towards the sustainability agenda (Mazumder, 2024). They are considered more diligent than their male counterparts, more dedicated to maintaining high ethical standards in organizations, and their important communication and social skills encourage the sharing and exchange of information, including SDG-related information (Huian, Curea and Apostol, 2024). Female members of the board are often perceived as more transparent and ethical, which translates into more honest and accurate disclosures regarding sustainability (Yahaya, 2025). In an empirical study on SDG disclosures in the banking industry in an emerging economy, Mazumder (2024) finds that a critical mass of at least three female directors is necessary to establish a significant positive relationship between gender diversity on the board and SDGs. According to agency theory and stakeholder theory, greater gender diversity in the board contributes to reducing information asymmetry between management and investors, thus improving transparency and corporate accountability, and the company's involvement in SDG reporting, responding to the multiple expectations of stakeholders (Flórez-Parra et al., 2024; Zampone et al., 2024). Additionally, resource dependence theory suggests that the presence of women on the board brings essential human and social capital, influencing the economic, social, and environmental strategies of companies, which adds value and leads to greater involvement in sustainable business networks, with positive effects on sustainability and SDG-related disclosures (Mazumder, 2024; Zampone et al., 2024). These last two studies show a positive relationship between board gender diversity and SDG reporting. However, in the literature, a weak correlation or even the absence of a significant relationship has sometimes been found (Rosati and Faria, 2019; Pizzi, Rosati and Venturelli, 2021).

Despite the mixed results, most studies consider gender diversity an important determinant factor, even in the presence of other organizational and cultural factors that may explain the quality of SDG reporting, which is why we develop the hypothesis:

H3 Gender diversity in banking corporate governance structures significantly influences the quality of SDG disclosures.

Other governance indicators, which appear in well-known studies (Farisyi et al., 2022; Zampone et al., 2024), include board activity, assessed by the number of meetings held by the board in a year, and the proportion of independent directors relative to the total number of directors on the board, which reflects the independence of the board. Extant studies present mixed results regarding the impact of these variables on SDG reporting. Like gender diversity, it is expected that the independence of directors will have a positive impact on SDG reporting due to their superior monitoring skills, impartiality, high concern for their reputation, and unique expertise (Rao and Tilt, 2016). This is due to the lack of material ties to the role, which drives directors to fulfill their duty acting in the long-term interests of shareholders, including improving sustainability performance. Similar results were obtained by Bae, Masud, and Kim (2018). Independent directors bring impartiality to the board, ensuring that sustainability disclosures are not influenced by internal biases or conflicts of interest. Independent boards are more likely to request evidence-based reporting and adherence to global standards, thus reducing the risks of greenwashing. However, Yahaya (2025) argues that excessive reliance on independent directors without adequate expertise in the field may limit the board's capacity to deeply engage in sustainability issues. Thus, findings from authors such as Rao and Tilt (2016) and Zampone et al. (2024) suggest that the number of board meetings does not have a significant impact on SDG reporting, while the percentage of independent directors has a negative influence. Sekarlangit and Wardhani (2021) observe that the effectiveness of the board is limited by the lack of time allocated by directors to fulfill their duties, making an adequate number of board meetings necessary to make effective strategic decisions. According to the same authors, a higher frequency of board meetings can reduce agency problems by increasing transparency.

In the context of these contradictions, we develop hypotheses H4 and H5.

H4 The independence of the directors of the Board of Directors of Romanian banks has a significant impact on the quality of SDG disclosures.

H5 The activity of the Board of Directors of Romanian banks has a significant impact on the quality of SDG disclosures.

2. Research methodology

2.1 The variables analyzed

Table no. 1 shows the calculation of the dependent variables and those of interest in the model used.

Table no. 1. Dependent variables, variables of interest, and control variables

Variable	Calculation method	Data source
Dependent variable		
SDG Reporting Score • Totalvar1 • Total ponderat dimensiuni • TotalWS	The scores are calculated in three variants: -Totalvar1 – The SDGs are weighted according to their relative importance for Romanian banks - Total ponderat dimensiuni – The SDGs are grouped into the three dimensions of sustainability, with each dimension having a different specific weight in the total score -TotalWS – the scores were weighted according to the maximum number of points that can be obtained in a full report	Non-financial statements, Sustainability Reports, CSR Reports, Social impact reports, Directors' reports, Annual Reports, Information Transparency Reports

Main variables of interest		
Type and size of reports • Standalonerep • Report Dimensions (PAG)	- *dummy* variable, taking the value 1 if the ratio is standalone, 0 otherwise - the number of pages of the report	Non-financial statements, Sustainability Reports, CSR Reports, Social Impact Report Directors' reports, Annual Reports, Information Transparency Reports
Banking Corporate Governance • Gender of CEO (CEOF_M) • Independence of the Board of Directors (Indep_dir) • Frequency of BD meetings (BoDmeet) • Presence of women on the Board of Directors (WBoD)	-*dummy* variable, taking the value 1 if the chief executive officer is a woman and 0 if he is a man - the share of independent directors on the Board of Directors in the total members - the number of meetings of the Board of Directors in a year - the share of female directors in the total number of members of the Board of Directors	Non-financial statements, Sustainability Reports, CSR Reports, Social Impact Report Administrators' reports, Annual Reports, Information Transparency Reports
Control variables		
Total Deposit Rate (TDR)	Ratio of total deposits to total assets	BankFocus – Bureau van Dijk and Moody's Analytics
Share of loans in total assets (CapR)	Ratio of total loans to total assets	BankFocus – Bureau van Dijk and Moody's Analytics
Bank size (Size)	Natural log of total assets	BankFocus – Bureau van Dijk and Moody's Analytics
Ownership structure (OwnRFM)	Categorical variable, having 3 categories: 1 – Romanian ownership 2 - Foreign ownership 3 – Mixed ownership	Annual reports of banks
Inflation rate (Inflation)	Annual inflation rate (%)	National Institute of Statistics - INSSE
Economic Growth (GDPg)	Annual GDP growth (%)	Worldbank Data

Source: Authors' processing, 2025

The quality of reporting was captured through the SDG information reporting scores, which were calculated, as in other similar studies (Erin and Olojede, 2024; Zampone et al., 2024), after conducting a content analysis of the banks' reports. The scoring system chosen, widely used in the literature (Tsalis et al., 2020), involves assigning two points for reporting quantitative and qualitative data on SDG targets and one point for reporting qualitative data. The scores were determined in three variants as follows:

- **Totalvar1** involved weighting the SDGs according to their relative importance for Romanian banks. It was taken into account that, depending on the specificities and priorities of the banking activity, some SDGs are better outlined in the reports of the banks in the sample than the rest (Sardianou *et al.*, 2021; Bose, Khan and Bakshi, 2024). This has led to a triple score for some SDGs, such as SDG 8, SDG 9 or SDG12, a double score for others, such as SDG 10, SDG 16 and SDG 17, and a single score for the rest of the SDGs;

- **Total ponderat dimensiuni** consisted of grouping the SDGs on the three dimensions of sustainability, with each dimension having a different weight in the total score (social – 3 points, economic – 2 points, environmental – 1 point), as each dimension unequally affects the overall performance of the bank (Budsaratragoon and Jitmaneeroj, 2019);
- **TotalWS** – scores were weighted according to the maximum number of points that could be obtained in a full report, to ensure comparability between SDGs and between banks, but all SDGs were given equal importance in the total score (Pizzi, Rosati and Venturelli, 2021; Cohen, Manes-Rossi and Brusca, 2023).

The type and size of sustainability reports are considered key organizational factors in the literature that analyzes the determinants of SDG reporting (Bose, Khan and Bakshi, 2024). *The type of report* (Standalonerep) takes different forms at Romanian banks, being found as non-financial statements, sustainability reports, Corporate Social Responsibility (CSR) reports or social impact reports. An indicator of effective orientation towards non-financial themes (Pizzi, Rosati and Venturelli, 2021), the *number of pages* of the Sustainability Report (PAG*)*, has the potential to be an important quantitative indicator of SDG reporting.

Gender diversity is operationalized through two complementary variables: *the gender of the CEO* (CEOF_M) and *the share of female directors* in the total number of Board members (WBoD). These indicators, widely used in recent studies (Rosati and Faria, 2019; Flórez-Parra *et al.*, 2024; Mazumder, 2024; Zampone *et al.*, 2024) are expected to generate mixed results, interesting to interpret in the particular context of Romanian banks. Other governance variables that appear in the analyzed papers are related to the existence of independent directors (Bae, Masud and Kim, 2018; Farisyi *et al.*, 2022; Zampone *et al.*, 2024), expressed as their share in the total number of Board members (Indep_dir), and the number of Board meetings (BoDmeet) in a year (Farisyi *et al.*, 2022).

Based on analyzed literature, *control variables* were also selected to complete the set of determinants of the quality of SDG reporting. These are the *share of deposits attracted* (TDR) and *loans granted* (CapR) in total assets (Nguyen and Vo, 2021; Yitayaw, 2021; Badarin *et al.*, 2024); *the size of banks* (Size), measured by total bank assets (Datta and Goyal, 2022; Farisyi *et al.*, 2022; Bose, Khan and Bakshi, 2024; Mazumder, 2024), with generally positive expected effects; *ownership structure* (OwnRFM), with a focus on the presence of foreign shareholders (Farisyi *et al.*, 2022; Mazumder, 2024) from which a greater concern for the transparency of reports is expected. Two macroeconomic indicators, widely used in the literature (Badarin *et al.*, 2024), *the annual inflation rate* (Inflation) *and economic growth* (GDPg), measured by annual GDP growth, complete the picture of the control variables analyzed.

2.2 Sample and data source

The sample consisted of 17 commercial banks (out of a total of 21, according to the National Bank of Romania Annual Report 2023) that published non-financial reports (BNR, 2023). From the full list of 24 credit institutions, two subsidiaries of groups already included in the sample and one credit cooperative were removed. Four other banks were eliminated due to lack of data. Of the 17 banks for which non-financial information was publicly available, four had majority Romanian capital in 2023 and two were state-owned. Three of the banks in the sample were listed on the Bucharest Stock Exchange. The period under analysis was 2017-2023 (the most recent year for which non-financial reports were available), the starting year being selected because it was the first year for banks to apply the European regulations on non-financial reporting, through NBR Order no. 7/2016. The non-financial data came from 110 annual observations, unevenly distributed by year. The source of the other data is presented in **Table no. 1**.

2.3 Research methods and models

In order to test the determinants of SDG reporting, a panel data analysis with fixed effects was performed, by developing the model in equation (1), which contains the variables of interest and control variables:

$$Y_{it} = \alpha_0 + \alpha_1 \times Standalonerep_{it} + \alpha_2 \times PAG_{it} + \alpha_3 \times CEOF\_M_{it} + \alpha_4 \times Indep\_dir_{it} + \alpha_5 \times BoDmeet_{it} + \alpha_6 \times WBoD_{it} + \alpha_7 \times TDR_{it} + \alpha_8 \times CapR_{it} + \alpha_9 \times Size_{it} + \alpha_{10} \times OwnRFM_{it} + \alpha_{11} \times Inflation_{it} + \alpha_{12} \times GDPg_{it} + \mu_{it} \quad (1)$$

Where, t = time period (year); i = bank at time t; Y = dependent variable (reporting score (calculated in three variants, as described in Table no. 1)); Standalonerep = standalone report; PAG = report size; CEOF_M = CEO gender; Indep_dir = independence of board directors; BoDmeet = frequency of board meetings; WBoD = presence of women on the board; TDR = total deposit ratio; CapR = share of loans in total assets; Size = bank size; OwnRFM = ownership structure; Inflation = inflation rate; GDPg = economic growth; $\alpha0$ = constant; $\alpha1$- $\alpha12$ = coefficients of the independent and control variables; μ = error term.

For the regression models, we used fixed effects estimation, with the selection of this model being validated through the Hausman test. The results of the test indicated that the fixed effects model is more appropriate, as it more effectively controls for heterogeneity between banks. Additionally, to ensure the normality of the distribution, the control variable Size was logarithmically transformed, given the significant skewness of its values.

Another method used to identify the factors that significantly influence SDG reporting in Romanian banks is the regression tree method, a non-parametric approach based on recursive partitioning (Breiman et al., 2017). This method involves dividing the sample into sub-samples based on threshold values of certain variables, until no further splitting is possible (Beyaert, García-Solanes, and Lopez-Gomez, 2023). The partitioning process generates a structure similar to that of a tree. The regression tree method is considered suitable for analyzing SDG reporting by Romanian banks because it allows for the automatic selection of relevant variables and visualization of interactions between them. It has both descriptive and predictive potential (Taskin et al., 2025). Compared to conventional analysis methods, regression trees facilitate better segmentation of the data and highlight conditioned relationships.

The regression tree method is frequently used by authors from various fields to study the factors that influence the behaviors of entities or individuals (Galletta, 2016; Bocci et al., 2024; Jing and Simonoff, 2024; Jarral et al., 2025). In line with existing research, the performance of the regression trees in this study is evaluated using RMSE (Root Mean Squared Error), MAE (Mean Absolute Error), and R^2 (Coefficient of Determination). RMSE is used to measure the overall difference between predicted and observed values, indicating the average prediction error. MAE is used to calculate the mean absolute error and is a useful method for evaluating model performance as it is less sensitive to extreme values. Additionally, R^2 is calculated to determine how well the model explains the variations in the dependent variable, with the aim of validating the regression tree's ability to describe the relationships between the modeled variables.

3. Results and discussions

3.1 Descriptive statistics and correlations

Tables no. 2 and **no. 3** present the descriptive statistics of the variables included in the model, as part of the univariate analysis performed, with relevant indicators selected for continuous and categorical variables. The results show that SDG reporting is inconsistent in the banking sector in Romania, with large variations identified in terms of the extent of the reports and the level of reporting. Romanian banks exhibit a moderate level of engagement in SDG reporting, with an average SDG reporting score of 24.81 (*TOTALvar1*: mean = 24.811, std. dev. = 8.108). Although the majority of banks (74.55%) publish standalone sustainability reports, the extent of reporting varies significantly - some reports are only 2 pages long, while others exceed 200 pages. This lack of standardization in sustainability reporting suggests that, while some banks are committed to transparency in SDG reporting, others provide fragmented information, not extending reporting beyond the legal requirements.

Governance structures are traditional and male-dominated, with low female representation in leadership positions, which may limit the integration of sustainability into the banks' strategy. Only 12.73% of banks have a female CEO, and women represent, on average, 26.1% of board members. This reflects a leadership structure dominated by men, which may influence the decision-making process, including policies related to sustainability. Research suggests that board diversity is associated with stronger commitments to SDGs (Mazumder, 2024), and the underrepresentation of women may have repercussions on SDG reporting. The proportion of independent directors is, on average, 29.7%, although it should be noted that some banks have no independent directors at all. The frequency of board meetings (*BoDmeet*) varies significantly, from 4 to 96 meetings per year, with an average of 23.6. This high variability suggests different levels of board involvement - banks with more frequent meetings might be more engaged in strategic decision-making, including sustainability initiatives, as suggested by a recent study (Umar, 2024), while banks with fewer meetings may prioritize operational efficiency, placing sustainability initiatives as a secondary concern.

Table no. 2. Descriptive statistics for continuous variables

Variables	Obs	Mean	Std. Dev.	Min	Max
Totalvar1	110	24.81	8.10	11.48	41.56
Total ponderat dimensiuni	110	29.33	8.40	15.34	47.14
TotalWS	110	0.40	0.16	0.16	0.76
PAG	110	41.36	48.59	2.00	217
Indep dir	110	0.29	0.17	0.00	0.85
BoDmeet	110	23.60	19.93	4.00	96.00
W BoD	110	0.26	0.15	0.00	0.71
TDR	110	0.71	0.18	0.015	0.87
CapR	110	0.58	0.13	0.14	0.86
Size	110	16.60	1.27	14.08	18.94
Inflation	110	6.05	4.15	1.30	13.80
GDPg	110	3.64	3.49	-3.68	8.20

Source: authors' processing, 2025

Table no. 3. Descriptive statistics for categorical variables

Categories	0	1	2	3
Standalonerep				
-frequency	28	82		
-percentage	25.45	74.55		
CEOF_M				
-frequency	96	14		
-percentage	87.27	12.73		
OwnRFM				
-frequency		16	53	41
-percentage		14.55	48.18	37.27

Source: Authors' processing, 2025

In terms of funding sources, Romanian banks are focused on attracting deposits, which finance 71.7% of total assets (*TDR*: average = 0.717). Lending activity varies significantly, with loans representing only 14% of assets in some banks, while in others, they account for up to 86.6% (*CapR*). The results also show a significant influence of foreign capital in the Romanian banking sector (*OwnRFM*: 48.18% foreign capital and 37.27% mixed capital), which could affect both governance and sustainability practices of the banks (Amidjaya and Widagdo, 2020; Sumarta et al., 2023).

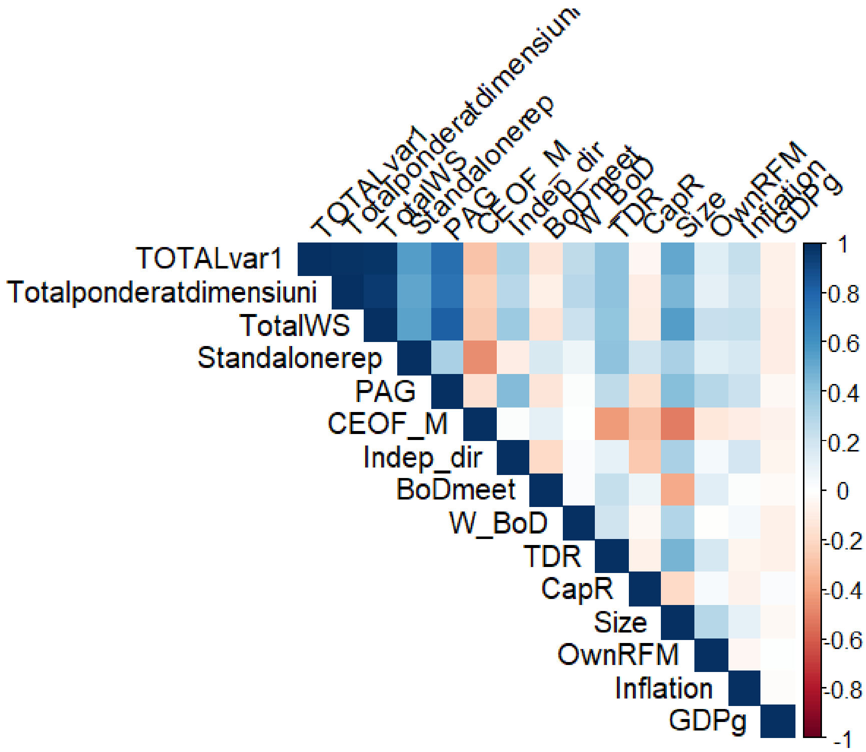
Macroeconomic conditions fluctuated during the analyzed period, with an average inflation rate of 6.05% and volatile economic growth (*GDPg*), ranging from -3.68% to 8.2%. This economic instability is likely to explain the moderate level of SDG reporting by Romanian banks.

To assess the risk of multicollinearity, we calculated Pearson correlation coefficients (**Figure no. 1**) and variance inflation factors (VIF) (**Table no. 4**).

The results of the correlation analysis show that the modeled variables exhibit weak or moderate correlations. The VIF analysis confirms these observations, with the average VIF value being 1.76, suggesting that there are no multicollinearity issues. The highest VIF values are for *Size* (VIF = 3.59) and *CEOF_M* (VIF = 2.22), but these are below the critical threshold of 5 (Studenmund, 2016), confirming that there are no signs of multicollinearity affecting the stability of the regression estimates.

Table no. 5 shows a positive and statistically significant relationship between the type of sustainability report (*StandaloneRep*) and the quality of SDG reporting in all three calculation variants ($p<0.01$ in columns 1 and 2, and $p<0.05$ in column 3). Thus, providing non-financial information in a standalone report is a determinant of SDG reporting in Romanian banks, which, according to **Table no. 3**, use separate reports from financial ones 74.55% of the time to demonstrate their commitment to sustainability through transparency and accountability in communicating progress toward achieving the SDGs. The positive association with the quality of SDG reporting is similar to the results obtained by Bose, Khan, and Bakshi (2024) on firms (including banks) from 30 countries, or by Pizzi, Rosati, and Venturelli (2021) on a sample of 153 Italian public interest companies (including financial institutions). These findings validate hypothesis H_1.

Figure no. 1. Correlation matrix



Source: Authors' processing, 2025

Table no. 4. Variance inflation factors

	VIF	1/VIF
Size	3.594	0.278
CEOF M	2.220	0.450
TDR	2.000	0.500
BoDmeet	1.922	0.520
Standalonerep	1.828	0.547
PAG	1.752	0.571
Indep dir	1.514	0.660
CapR	1.471	0.680
OwnRFM	1.347	0.742
W BoD	1.281	0.780
Inflation	1.179	0.848
GDPg	1.039	0.963
Mean VIF	1.762	

Source: Authors' processing, 2025

3.2 Regression analysis with fixed effects

Table no. 5 illustrates the results of the regression analysis, each column having as a dependent variable one of the three variants for calculating the SDG reporting score, described in Table 1.

Table no. 5. Results of the regression analysis

	(1) TOTALvar1	(2) Totalponderatdimensiuni	(3) TotalWS
Standalonerep	4.7311*** (1.1988)	3.4204*** (1.1955)	0.0642** (0.0283)
PAG	0.0370*** (0.0102)	0.0440*** (0.0101)	-0.0001 (0.0002)
CEOF_M	1.7177 (1.3905)	2.6471* (1.3866)	0.0299 (0.0329)
Indep_dir	2.7311 (4.5747)	0.6664 (4.5618)	-0.0283 (0.1081)
BoDmeet	-0.0937** (0.0445)	-0.1304*** (0.0444)	-0.0024** (0.0011)
W_BoD	4.0084 (2.7488)	3.1291 (2.7411)	0.2810*** (0.0650)
TDR	4.0476 (2.9941)	5.4557* (2.9857)	0.0426 (0.0708)
CapR	-18.3975** (7.1387)	-25.6141*** (7.1188)	-0.2468 (0.1687)
Size	5.6377*** (1.661)	6.0831*** (1.6564)	0.1298*** (.0393)
OwnRFM	-0.2232 (2.4224)	-0.8629 (2.4156)	-0.0117 (.05730)
Inflation	0.0403 (.0857)	-0.0132 (.0855)	0.0033 (0.0020)
GDPg	0.0558 (0.0783)	0.0444 (0.0781)	-0.0003 (0.0019)
_cons	-65.8204** (26.6494)	-61.4098** (26.5748)	-1.6814*** (0.6298)
Observations	110	110	110
R-squared	0.7059	0.7057	0.5855

Standard errors are in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' processing, 2025

In the same vein, the larger size of the report (*PAG*) proves to be a determinant factor for the quality of SDG reporting by Romanian banks, when calculating scores by weighting according to the relative importance of each SDG and the specific weight of each sustainability dimension. Thus, for each additional page in the report, the reporting score increases by 0.0370 units (for *Totalvar1*) and by 0.0440 units (for *Total ponderat dimensiuni*). These results, which confirm other existing studies (Pizzi, Rosati, and Venturelli, 2021; Datta and Goyal, 2022), demonstrate that larger reports better illustrate, through detailed narratives and numerical data, the focus on achieving the SDGs, which validates hypothesis H_2.

Corporate governance structures in banking have mixed effects on the level of SDG reporting. Thus, the gender diversity of CEOs (*CEOF_M*) and board members (WBoD) exerts positive influences, statistically significant to varying degrees (2.6471 with $p<0.1$, column 2, Table 5 for *CEOF_M*, and 0.2810 with $p<0.01$, column 3, Table 5 for *WBoD*), suggesting that the higher presence of women in leadership structures can be considered a guarantee for providing quality information about SDG achievements (Flórez-Parra et al., 2024; Mazumder, 2024; Zampone et al., 2024). The lack of higher statistical significance can also be attributed to the underrepresentation of women in the management bodies of Romanian banks, as shown by the descriptive statistics in **Table no. 3**, as well as other studies documenting a positive relationship of weaker intensity (Rosati and Faria, 2019). In this context, we consider hypothesis H_3 to be validated.

Regression analysis shows that the proportion of independent directors on the board (*Indep_dir*) appears to have little impact on decision-making regarding sustainability reporting and, therefore, is unlikely to influence SDG disclosure by Romanian banks. Similar results are found in Rao and Tilt's (2016) study of 150 Australian listed companies or Mazumder's (2024) study on a sample of 30 commercial banks in Bangladesh. A common feature with the latter study is the low proportion of independent directors in the total number of board members (around 20% compared to 29% in Romania), which may explain the lack of significance of the variable. Therefore, hypothesis H_4 is invalidated.

The last governance variable, corresponding to hypothesis H_5, reveals the negative influence of board activity on SDG reporting in all three reporting score calculation variants. A possible explanation may be attributed to the very high dispersion of the variable (the standard deviation, according to **Table no. 3**, is 19.93, with the number of board meetings varying from 4 to 96 per year). In other words, board activity is less efficient in SDG reporting because, in Romanian banks, no optimal frequency of meetings has been found that allows adequate time allocation by directors to fulfill strategic sustainability duties (Sekarlangit and Wardhani, 2021). Other studies also report similar results, with Pizzi, Rosati, and Venturelli (2021) documenting a negative association, though statistically insignificant, for the entire sample and some of the sub-samples analyzed in their study. In our paper, although the influence of this variable is negative, it is statistically significant, which validates hypothesis H5.

Regarding the control variables, it is worth noting the positive influence of the size of the reporting bank on the SDG scores, which is widely confirmed by other studies in the literature (Datta and Goyal, 2022; Farisyi et al., 2022; Bose, Khan, and Bakshi, 2024; Mazumder, 2024; Zampone et al., 2024), as well as the negative impact of the proportion of loans granted in the total assets. A possible explanation for this situation can be found in the fluctuations in lending activity during the analyzed period (Ozili, 2024), which includes the pandemic years and regional geopolitical crises, during which more consistent financial information was provided by Romanian banks, to the detriment of non-financial information.

3.3 Regression Tree Analysis

Figure no. 2 presents three regression trees corresponding to the three variants of the SDG reporting score calculation. The graphical representations display the variables and decisions in the nodes, the average prediction, and the number of observations in each node. The color scheme is informative, with nodes colored from red (low values) to green (high values). Unlike fixed-effects regression, where all variables are included in the model regardless of their actual impact, regression trees identify and retain only those variables that have a significant influence on the outcomes.

In the case of the regression tree (a) for *Totalvar1*, the first split is made based on the report size (*PAG* variable). This indicates that report size is the variable that most influences the SDG reporting score across the entire dataset. If the report is smaller than 15 pages, it follows the left branch; if the report is at least 15 pages, it follows the right branch. If the report size is reduced (less than 15 pages), it checks whether the bank publishes a standalone report. If this is the case, it further checks if the proportion of independent directors on the board (*Indep_dir*) exceeds 35%. If this condition is also met, the tree reaches a leaf (terminal node). The reporting score is approximately 27 in this case. It is also noted that 6% of the total observations fall into this category. If the report is not standalone, the path leads to the left branch, indicating a higher probability of lower reporting scores.

As can be seen, if the report is at least 49 pages long, the tree continues with splits concerning the board of directors' activity (*BoDmeet*). The regression tree predicts the highest reporting score (40) for those banks that publish extensive SDG-related information (at least 49 pages) but do not hold more than 8 board meetings. Contrary to expectations and previous studies (Umar, 2024), a higher frequency of board meetings does not lead to the highest reporting score. However, this result aligns with the findings from the regression analysis. If the board meets more than 8 times per year, the predicted score is more modest (around 30-35), varying depending on the number of pages in the report. Depending on the specifics of the bank, a higher number of meetings may be associated with a need to compensate for organizational issues, which may actually indicate internal difficulties rather than better management, as demonstrated by a recent study (Haque et al., 2025). The result could also be explained by the concept of "diminishing returns," where there are significant initial benefits, but each additional meeting brings progressively smaller benefits (Bettinelli et al., 2023).

The variables that most influence SDG reporting, according to the first tree, are report size (the variable used in the first split and other key splits) and report type. Other notable variables include inflation, the proportion of independent directors on the board, and the frequency of board meetings. It is worth noting that the model selected only 5 variables as being relevant for predicting the dependent variable (*TOTALvar1*). This indicates that the other variables included in the model did not have a significant impact on the construction of the tree.

At the root level, the decision tree (b) for the *Totalponderatdimensiuni* starts the division based on the report size (the *PAG* variable), with the threshold set at 23 pages. Thus, it separates banks into two categories. Conditions in the subsequent nodes of the tree (such as report type, bank size, total deposit rate, board meeting frequency) will differentiate the prediction score. Banks with shorter reports (less than 23 pages) may have more concise or less complex reports. It is suggested that, if they are also associated with other conditions (e.g., absence of a standalone report or modest performance in attracting deposits), the SDG reporting score could be negatively affected. Banks with reports of at least 23 pages tend to have more detailed reports, reflecting a stronger commitment to SDG reporting. As in the previous tree, it is observed that reporting scores tend to be higher if the report size is larger, if the report is standalone, and if board meetings are not very frequent. The tree predicts the highest reporting score for those banks with large reports (at least 49 pages) and fewer than 8 board meetings per year.

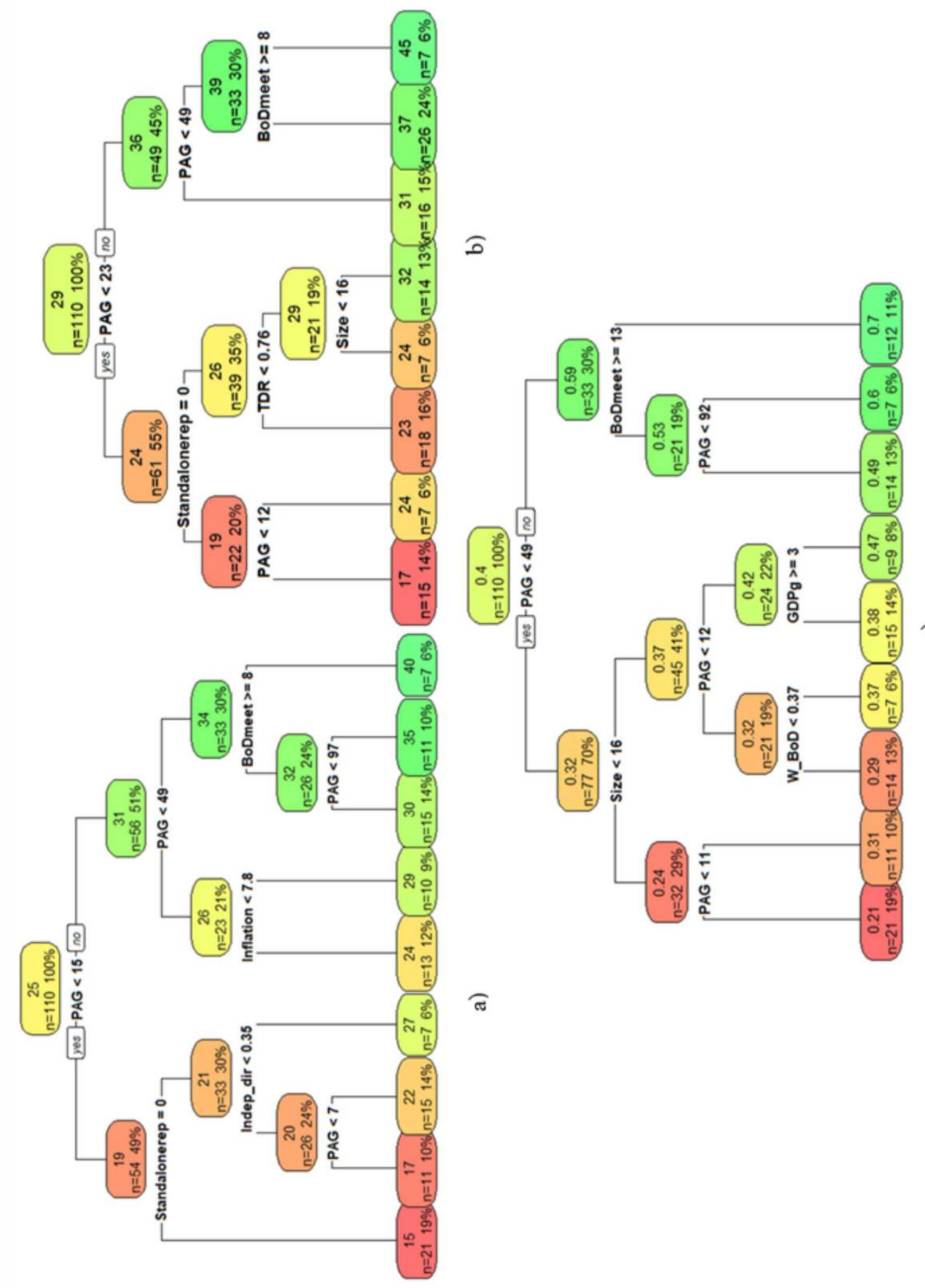
The decision tree (c) for *TotalWS* highlights those variables related to report size (*PAG*), bank size (*Size*), board meeting frequency (*BoDmeet*), gender diversity (*W_BoD*), and the economic context (*GDPg*) are important determinants of the SDG reporting score. Each path in the tree provides a specific combination of conditions that determine the predicted score. The presence of women on the board is used to subdivide larger banks, highlighting that gender diversity on the board can positively influence the reporting score. If the proportion of female directors in the total number of board members exceeds 37%, the predicted score is higher (0.37 compared to 0.29). This structure of the regression tree suggests that for smaller banks (both in size and report), a determining factor is the complexity of the report itself, while for larger banks, aspects related to institutional governance (e.g., the number of board meetings) and the economic context play a major role.

The previous predictions for higher scores in banks that publish detailed reports and do not frequently hold board meetings are supported. In fact, report size (*PAG*) appears as the first splitting variable in all the regression trees, suggesting that it is the main determinant of the SDG reporting score. This means that differentiating banks based on this variable has the largest effect on the variability of scores. The type of report is also a key factor in SDG reporting. The intermediate nodes clarify the role of other important factors. Governance-related variables and bank-specific variables (size, total deposit rate) are integrated into subsequent decisions, amplifying their effects on SDG scores. Inflation and economic growth (*GDPg*) can influence, in a second phase, how a bank's internal conditions translate into reporting scores. All models suggest that the number of pages is a key factor that, following the details provided by governance variables and financial indicators, consistently influences the SDG reporting score.

The "Actual vs. Predicted" graph is a visual tool used to evaluate the performance of regression trees. **Figure no. 3** reveals that the regression trees perform well, meaning that a large portion of the data variation is explained by the tested models. These aspects are also confirmed by the metrics in **Table no. 6** (RMSE, MAE, R^2). For *Totalvar1* and *Totalponderatdimensiuni*, the model achieves very good performance, with low errors (RMSE and MAE) and a high R^2, indicating a large explanation of the variation in reporting scores. For *TotalWS,* although the errors (RMSE and MAE) are higher and the R^2 coefficient is significantly lower, the results suggest that the model has an average performance.

Figure no. 2. Results of the regression tree analysis, according to the variant of calculation of the reporting scores

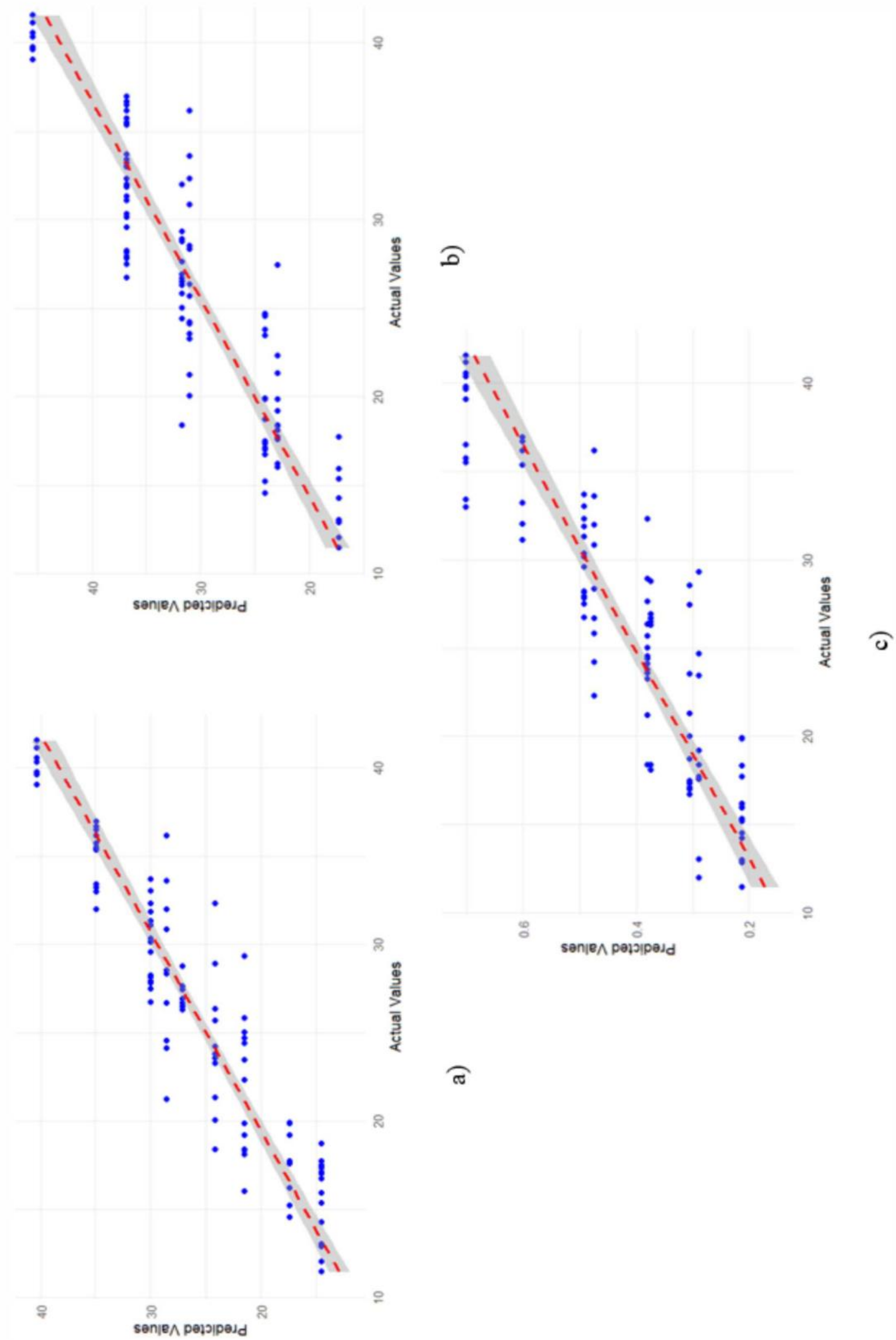
a) Totalvar1 b) Totalponderatdimensiuni c) TotalWS



Source: Authors' processing, 2025

Figure no. 3. Actual vs. predicted values, by the variant of calculation of the reporting scores

a) Totalvar1 b) Totalponderatdimensiuni c) TotalWS)



Source: Authors' processing, 2025

Table no. 6. Performance indicators of regression trees

Performance indicators	(1) TOTALvar1	(2) Totalponderatdimensiuni	(3) TotalWS
RMSE	2.694550	2.694551	5.478280
MAE	2.105364	2.105364	4.806247
R^2	0.888554	0.888554	0.539341

Source: Authors' processing, 2025

4. Conclusions

This study explores the determinants of SDG reporting in the banking sector in Romania, using a complex methodology that combines content analysis, fixed-effects regression, and regression trees, applied to an extensive and up-to-date dataset. Beyond the predictable influence of the report's size and type on SDG reporting scores, certain results deserve special attention and will be discussed further.

The frequency of Board of Directors (*BoD*) meetings does not have a direct positive impact on SDG reporting scores, contrary to some expectations. Both the regression trees analysis and the fixed-effects regression suggest that too many meetings may be associated with organizational difficulties or inefficient decision-making processes, rather than improved governance. Additionally, the idea of diminishing returns emerges, where the benefits of frequent BoD meetings decrease after a certain threshold. In this context, an optimal balance regarding meeting frequency could contribute more effectively to better SDG reporting, rather than simply increasing the number of BoD meetings.

Regression trees can identify complex interactions and non-linear relationships between variables, whereas fixed-effects regression assumes linear relationships between predictors and the dependent variable. This explains why the proportion of independent directors on the BoD (*Indep_dir*) seems to have no impact on sustainability reporting decisions, but regression trees show that this variable may influence SDG reporting under specific conditions (e.g., a standalone report not exceeding 15 pages), which a linear model does not capture. Furthermore, regression trees segment the data and generate rules based on certain thresholds (e.g., the 35% threshold for the proportion of independent directors on the board), while fixed-effects regression estimates an average effect of the variables on SDG reporting. We find that the influence of independent directors is present only in specific subsets of the data but is not strong enough to be significant at the global level in the fixed-effects regression.

The results obtained from both the regression analysis and decision trees underline the importance of gender diversity in the leadership structures of banks for SDG reporting. Although the identified effects vary in intensity and statistical significance, the general trend indicates that a higher representation of women on the Board of Directors contributes to a higher SDG reporting score. This suggests that the presence of women in leadership positions can enhance transparency and the quality of the information provided, aligning with the conclusions of other studies in the literature. However, the moderate statistical significance of this relationship may be attributed to the underrepresentation of women in the leadership bodies of Romanian banks, which limits their impact on the decision-making process. In the case of larger banks, gender diversity becomes a more relevant factor, confirming the hypothesis that corporate governance significantly influences the level of transparency in sustainability reporting. Therefore, promoting greater gender equity in leadership structures could be an important step toward improving SDG reporting in the Romanian banking sector.

Macroeconomic factors, such as inflation and economic growth, do not directly influence SDG reporting scores, but they may amplify the effects of other factors. The size and type of the report remain the main determinants, while governance variables and bank characteristics also play an important role.

This study contributes to the literature by combining fixed-effects regression and decision trees, highlighting both global relationships and effects conditioned by specific factors. However, the results must be interpreted in the particular context of the Romanian banking sector, and future research could extend this analysis through international comparisons or by integrating other corporate governance variables. Promoting effective and balanced governance in terms of diversity could represent a significant step in improving transparency in the Romanian banking sector.

Funding: This research was funded by the Executive Unit for Financing Higher Education, Research, Development and Innovation (UEFISCDI) through grants no. PN-IV-P2-2.2-MC-2024-0179 and PN-IV-P2-2.2-MC-2024-0183

Bibliography

1. Albu, C.-N. *et al.* (2024) Sustainability reporting in Central and Eastern European countries, in G. Rimmel et al. (eds) *Research Handbook on Sustainability Reporting*. Edward Elgar Publishing, pp. 400-417. Available at: https://doi.org/10.4337/9781035316267.00034.
2. Amidjaya, P.G. and Widagdo, A.K. (2020) Sustainability reporting in Indonesian listed banks: Do corporate governance, ownership structure and digital banking matter?, *Journal of Applied Accounting Research*, 21(2), pp. 231–247. Available at: https://doi.org/10.1108/JAAR-09-2018-0149.
3. Avrampou, A. *et al.* (2019) Advancing the Sustainable Development Goals: Evidence from leading European banks, *Sustainable Development*, 27(4), pp. 743-757. Available at: https://doi.org/10.1002/sd.1938.
4. Badarin, A.M.K.A. *et al.* (2024) Systematic and unsystematic determinants of liquidity risk in the Islamic banks in the middle east, *Uncertain Supply Chain Management*, 12(3), pp. 1399-1408. Available at: https://doi.org/10.5267/j.uscm.2024.4.011.
5. Bae, S.M., Masud, Md.A.K. and Kim, J.D. (2018) A Cross-Country Investigation of Corporate Governance and Corporate Sustainability Disclosure: A Signaling Theory Perspective, *Sustainability*, 10(8), p. 2611. Available at: https://doi.org/10.3390/su10082611.
6. Bettinelli, C. *et al.* (2023) The influence of board social activity on firm performance, *Journal of Family Business Strategy*, 14(2), p. 100552. Available at: https://doi.org/10.1016/j.jfbs.2023.100552.
7. Beyaert, A., García-Solanes, J. and Lopez-Gomez, L. (2023) Corruption, quality of institutions and growth, *Applied Economic Analysis*, 31(91), pp. 55–72. Available at: https://doi.org/10.1108/AEA-11-2021-0297.
8. BNR, B.N. a R. (2023) Raport anual 2023. *Banca Națională a României*.
9. Bocci, L. *et al.* (2024) A Regression Tree-Based Analysis of the European Regional Competitiveness, *Social Indicators Research*, 173(1), pp. 137–167. Available at: https://doi.org/10.1007/s11205-021-02869-3.
10. Bose, S., Khan, H.Z. and Bakshi, S. (2024) Determinants and consequences of sustainable development goals disclosure: International evidence, *Journal of Cleaner Production*, 434, p. 140021. Available at: https://doi.org/10.1016/j.jclepro.2023.140021.
11. Breiman, L. *et al.* (2017) *Classification and Regression Trees*. 1st edn. Routledge. Available at: https://doi.org/10.1201/9781315139470.
12. Budsaratragoon, P. and Jitmaneeroj, B. (2019) Measuring causal relations and identifying critical drivers for corporate sustainability: the quadruple bottom line approach, *Measuring Business Excellence*, 23(3), pp. 292-316. Available at: https://doi.org/10.1108/MBE-10-2017-0080.
13. Cohen, S., Manes-Rossi, F. and Brusca, I. (2023) Are SDGs being translated into accounting terms? Evidence from European cities, *Public Money & Management*, 43(7), pp. 669-678. Available at: https://doi.org/10.1080/09540962.2023.2243543.
14. Cosma, S. *et al.* (2020) Sustainable Development and European Banks: A Non-Financial Disclosure Analysis, *Sustainability*, 12(15), p. 6146. Available at: https://doi.org/10.3390/su12156146.
15. Datta, S. and Goyal, S. (2022) Determinants of SDG Reporting by Businesses: A Literature Analysis and Conceptual Model, *Vision: The Journal of Business Perspective*, p. 09722629221096047. Available at: https://doi.org/10.1177/09722629221096047.
16. EBEF, E.B.F. and KPMG (2021) *European Bank Practices in Supporting and Implementing the UN Sustainable Development Goals*. Available at: https://www.ebf.eu/wp-

content/uploads/2021/06/European-bank-practices-in-supporting-and-implementing-the-UN-Sustainable-Development-Goals.pdf.

17. Erin, O.A., Bamigboye, O.A. and Oyewo, B. (2022) Sustainable development goals (SDG) reporting: an analysis of disclosure, *Journal of Accounting in Emerging Economies*, 12(5), pp. 761–789. Available at: https://doi.org/10.1108/JAEE-02-2020-0037.
18. Erin, O.A. and Olojede, P. (2024) Do nonfinancial reporting practices matter in SDG disclosure? An exploratory study, *Meditari Accountancy Research*, 32(4), pp. 1398–1422. Available at: https://doi.org/10.1108/MEDAR-06-2023-2054.
19. Farisyi, S. *et al.* (2022) A Systematic Literature Review: Determinants of Sustainability Reporting in Developing Countries, *Sustainability*, 14(16), p. 10222. Available at: https://doi.org/10.3390/su141610222.
20. Flórez-Parra, J.M. *et al.* (2024) Determinants of the dissemination of economic, social and environmental information at the university level in the context of commitment to the SUSTAINABLE DEVELOPMENT GOALS, *Sustainable Development*, 32(3), pp. 1925–1939. Available at: https://doi.org/10.1002/sd.2760.
21. Fonseca, L. and Carvalho, F. (2019) The Reporting of SDGs by Quality, Environmental, and Occupational Health and Safety-Certified Organizations, *Sustainability*, 11(20), p. 5797. Available at: https://doi.org/10.3390/su11205797.
22. Galeazzo, A., Miandar, T. and Carraro, M. (2024) SDGs in corporate responsibility reporting: a longitudinal investigation of institutional determinants and financial performance, *Journal of Management and Governance*, 28(1), pp. 113-136. Available at: https://doi.org/10.1007/s10997-023-09671-y.
23. Galletta, S. (2016) On the determinants of happiness: a classification and regression tree (CART) approach, *Applied Economics Letters*, 23(2), pp. 121-125. Available at: https://doi.org/10.1080/13504851.2015.1054066.
24. Haque, M.R. *et al.* (2025) Changes in the board of directors' number of meetings: why and so what?, *Corporate Governance: The International Journal of Business in Society* [Preprint]. Available at: https://doi.org/10.1108/CG-05-2024-0293.
25. Hua Sim, C. and Yuan Fung, C. (2024) Exploring the Determinants and Effects of SDG Reporting on Corporate Performance in an Emerging Market, *International Journal of Advanced Research in Economics and Finance* [Preprint]. Available at: https://doi.org/10.55057/ijaref.2024.6.2.12.
26. Huian, M.C., Curea, M. and Apostol, C. (2024) The association between governance mechanisms and engagement in commercialisation and entrepreneurship of Romanian public research institutes, *Heliyon*, 10(15), p. e34909. Available at: https://doi.org/10.1016/j.heliyon.2024.e34909.
27. Jarral, M.S. *et al.* (2025) Using machine learning techniques to identify major determinants of electricity usage in residential buildings of Pakistan, *Journal of Building Engineering*, 100, p. 111800. Available at: https://doi.org/10.1016/j.jobe.2025.111800.
28. Jing, W. and Simonoff, J.S. (2024) A regression tree method for longitudinal and clustered data with multivariate responses, *Journal of Statistical Computation and Simulation*, 94(4), pp. 820–842. Available at: https://doi.org/10.1080/00949655.2023.2273966.
29. Khan, S. *et al.* (2023) Unveiling the Dynamics of Bank Liquidity: Exploring the Impact of BankSpecific and Macroeconomic Factors in Pakistani Commercial Banks, *Pakistan Economic Review*, 6(2), pp. 101–125.
30. Mazumder, M.M.M. (2024) An empirical analysis of SDG disclosure (SDGD) and board gender diversity: insights from the banking sector in an emerging economy, *International Journal of Disclosure and Governance* [Preprint]. Available at: https://doi.org/10.1057/s41310-023-00223-2.
31. Nguyen, H.T.V. and Vo, D.V. (2021) Determinants of Liquidity of Commercial Banks: Empirical Evidence from the Vietnamese Stock Exchange, *The Journal of Asian Finance, Economics and Business*, 8(4), pp. 699–707. Available at: https://doi.org/10.13106/JAFEB.2021.VOL8.NO4.0699.
32. Nicolò, G. *et al.* (2023) Revealing the corporate contribution to sustainable development goals through integrated reporting: a worldwide perspective, *Social Responsibility Journal*, 19(5), pp. 829–857. Available at: https://doi.org/10.1108/SRJ-09-2021-0373.
33. Ozili, P.K. (2024) Bank Loan Loss Provision Determinants in Non-Crisis Years: Evidence from African, European, and Asian Countries, *Journal of*

Risk and Financial Management, 17(3), p. 115. Available at: https://doi.org/10.3390/jrfm17030115.
34. Paridhi and Arora, A. (2023) Sustainability reporting: Current state and challenges, *Business Strategy & Development*, 6(3), pp. 362–381. Available at: https://doi.org/10.1002/bsd2.244.
35. Pizzi, S. *et al.* (2020) Management research and the UN sustainable development goals (SDGs): A bibliometric investigation and systematic review, *Journal of Cleaner Production*, 276, p. 124033. Available at: https://doi.org/10.1016/j.jclepro.2020.124033.
36. Pizzi, S., Rosati, F. and Venturelli, A. (2021) The determinants of business contribution to the 2030 Agenda: Introducing the SDG Reporting Score, *Business Strategy and the Environment*, 30(1), pp. 404–421. Available at: https://doi.org/10.1002/bse.2628.
37. Rao, K. and Tilt, C. (2016) Board diversity and CSR reporting: an Australian study, *Meditari Accountancy Research*, 24(2), pp. 182–210. Available at: https://doi.org/10.1108/MEDAR-08-2015-0052.
38. Rosati, F. and Faria, L.G.D. (2019) Business contribution to the Sustainable Development Agenda: Organizational factors related to early adoption of SDG reporting, *Corporate Social Responsibility and Environmental Management*, 26(3), pp. 588–597. Available at: https://doi.org/10.1002/csr.1705.
39. Sachs, J.D., Lafortune, G. and Fuller, G. (2024) The SDGs and the UN Summit of the Future. Sustainable Development Report 2024. *Dublin University Press*. Available at: https://doi.org/10.25546/108572.
40. Sardianou, E. *et al.* (2021) A materiality analysis framework to assess sustainable development goals of banking sector through sustainability reports, *Sustainable Production and Consumption*, 27, pp. 1775–1793. Available at: https://doi.org/10.1016/j.spc.2021.04.020.
41. Schena, R. *et al.* (2022) Digital reputation and firm performance: The moderating role of firm orientation towards sustainable development goals (SDGs), *Journal of Business Research*, 152, pp. 315–325. Available at: https://doi.org/10.1016/j.jbusres.2022.07.025.
42. Sekarlangit, L.D. and Wardhani, R. (2021) The Effect of the Characteristics and Activities of the Board of Directors on Sustainable Development Goal (SDG) Disclosures: Empirical Evidence from Southeast Asia, *Sustainability*, 13(14), p. 8007. Available at: https://doi.org/10.3390/su13148007.
43. Studenmund, A.H. (2016) *Using ECONOMETRICS. A practical guide*. 7th edition. Pearson.
44. Sumarta, N.H. *et al.* (2023) Bank ownership structure and reputation through sustainability reporting in Indonesia, *Social Responsibility Journal*, 19(6), pp. 989-1002. Available at: https://doi.org/10.1108/SRJ-01-2021-0024.
45. Taskin, D. *et al.* (2025) Do past ESG scores efficiently predict future ESG performance?, *Research in International Business and Finance*, 74, p. 102706. Available at: https://doi.org/10.1016/j.ribaf.2024.102706.
46. Tsalis, T.A. *et al.* (2020) New challenges for corporate sustainability reporting: United Nations' 2030 Agenda for sustainable development and the sustainable development goals, *Corporate Social Responsibility and Environmental Management*, 27(4), pp. 1617-1629. Available at: https://doi.org/10.1002/csr.1910.
47. Umar, U.H. (2024) Gender diversity, foreign directors and sector-wise corporate philanthropic giving of Islamic banks in Bangladesh, *Gender in Management: An International Journal*, 39(2), pp. 206–221. Available at: https://doi.org/10.1108/GM-08-2021-0259.
48. Yahaya, O.A. (2025) Sustainability reporting quality in the face of the board of directors, *SSRN Electronic Journal* [Preprint]. Available at: https://doi.org/10.2139/ssrn.5094168.
49. Yitayaw, M.K. (2021) Firm-specific and macroeconomic determinants of commercial banks liquidity in Ethiopia: Panel data approach, *Cogent Business & Management*. Edited by D. McMillan, 8(1), p. 1956065. Available at: https://doi.org/10.1080/23311975.2021.1956065.
50. Zampone, G. *et al.* (2024) Gender diversity and SDG disclosure: the mediating role of the sustainability committee, *Journal of Applied Accounting Research*, 25(1), pp. 171–193. Available at: https://doi.org/10.1108/JAAR-06-2022-0151

Audit Financiar, XXIII, Nr. 2(178)/**2025**, *364-377*
ISSN on-line: 1844-8801

Compliance Assessments in Corporate Sustainability Reporting

Andra-Oana BURTESCU,
Master student, Bucharest University of Economic Studies, Romania,
e-mail: burtescuandra20@stud.ase.ro

Abstract

Corporate sustainability reporting is a hot topic and practiced both regulated and voluntary. This reporting provides a comprehensive framework for disclosing information in companies' annual sustainability reports. In the context of corporate transparency, reporting on environmental, governance and social (ESG) issues is becoming increasingly important within corporate governance. The objective of the research is to identify and analyze the degree of disclosure of information on environmental aspects for companies listed on the Bucharest Stock Exchange (BVB) that are part of the BET-NG index, during the period 2011-2023. The research results reveal a significant increase in the level of reporting, which demonstrates a gradual alignment with the requirements of transparency and corporate responsibility.

Key words: *companies; sustainability reporting; environment; BET-NG index; Bucharest Stock Exchange; information disclosure index;*

JEL Classification: *M42, M48*

To cite this article:
Burtescu, A.-O. (2025), Compliance Assessments in Corporate Sustainability Reporting, *Audit Financiar*, vol. XXIII, no. 2(178)/2025, pp.364-377, DOI: 10.20869/AUDITF/2025/178/010

To link this article:
http://dx.doi.org/10.20869/AUDITF/2025/178/010
Received: 5.03.2025
Revised: 11.03.2025
Accepted: 25.04.2025

Introduction

In the current period, the disclosure of non-financial information by companies has become increasingly important to meet the increasingly diverse information needs of stakeholders. The limitations of traditional financial reports have led to the development of new standards and guidelines to facilitate the reporting of non-financial information.

Thus, corporate sustainability reporting has become increasingly necessary both globally and in Europe, and especially in Romania. In this context, in recent years, transparency and accountability towards the management and communication of environmental, social and governance (ESG) impacts have intensified, and organizations have been increasingly pressured to implement sustainability practices.

At the same time, this dynamic has favored the emergence of integrated reporting, which marked the progress of accounting initiatives on sustainability, offering a broad vision of the information disclosed in companies' annual reports. The integrated reporting (IR) system is supported by professional accounting organizations, advisory bodies, and business leaders (World Business Council for Sustainable Development, Global Reporting Initiative – GRI, International Federation of Accountants – IFAC, Association of Chartered Certified Accountants – ACCA, Accountancy Europe - ACE).

Being a very current field, which interconnects elements regarding risk management, managerial control and financial accounting, the European Union issued, in 2014, Directive 2014/95/EU (EU Directive), with subsequent additions and amendments, to regulate the information in the reports submitted by European public interest entities, all with the aim of providing investors or other interested parties with relevant non-financial information regarding the performance, position and impact of companies on their activities.

The trend observed on the capital markets in recent years has been the development of sustainable assets, against the backdrop of global warming and environmental protection. This concern is important at the present time, and global efforts to significantly reduce climate change, such as keeping the global average temperature below 2°C, have led the European Commission to adopt Regulation no. 2088/2019, to regulate aspects related to sustainable investments. The environmental criteria presented in the regulation, refer to the way in which companies operate, so as not to affect the environment, and the social criteria, put their mark on the way in which companies manage relations with the parties involved in carrying out their activities: customers, suppliers, employees, etc.

Directive 2014/95/EU (NFRD) is the most important legislative act targeting sustainability for large companies in the European Union. This directive was adopted in 2014 and entered into force in 2018. The NFRD or Non-Financial Reporting Directive is transposed in Romania by Order of the Minister of Finance no. 85/2024, dated January 26, 2024, and companies that meet the following criteria are subject to compliance with this directive: they have more than 500 employees, a net turnover of over 40 million Euros.

In the context of these legislative norms, the stock exchange has a key role in opening the transfer of information between investors and entities, becoming the main promoter in supporting and implementing sustainability standards (ESG) at the local level.

In this sense, the objective of the research is to identify the degree of compliance of companies whose main field of activity is energy and related utilities, listed on the Bucharest Stock Exchange (BVB), with environmental requirements, from the perspective of corporate sustainability reporting.

We believe that the results of this research will contribute to enriching the literature on corporate sustainability reporting but will also be relevant for stakeholders in the energy, oil and gas industry. We believe that this perspective helps to strengthen stakeholder relations and also improves company performance, highlighting the importance of aligning with corporate sustainability requirements.

In terms of structure, the paper is organized as follows: the first section reflects the review of the specialized literature in the researched field, the second section presents the research methodology, followed by the processing and analysis of the data in the third section. Subsequently, the paper concludes with the final conclusions, research limitations and future research directions, intended to support the consolidation of ESG principles.

Review of the specialized literature

In the context of corporate sustainability reporting, the specialized literature offers us a wide range of approaches to this topic, including the study of Mousa & Hassan (2015) which presents the theory through which companies align reporting practices to maintain social acceptance and demonstrate compliance with stakeholder expectations.

In this sense, sustainability reporting becomes a strategic tool for building a responsible corporate image, especially in industries with significant environmental impact (Perera, 2019).

Solomon and Maroun (2012) state that "entities are expected to achieve the integration of sustainability and governance information in the annual report. Such integration is considered essential if companies want to incorporate stakeholder responsibility at the heart of their operations in a meaningful way."

The stakeholder theory also argues that transparency in reporting is influenced by pressure from investors, NGOs and consumers, which leads companies to adopt international standards such as GRI (Global Reporting Initiative) or TCFD (Task Force on Climate-related Financial Disclosures) (Comyns, 2018).

Even though the adoption of reporting standards has progressed, there are still significant variations between companies in terms of the extent and quality of the information communicated.

A study of Polish companies in the field of corporate social responsibility (CSR) indicates an average climate information disclosure index of only 0.51, which shows a relatively low level of awareness of the impact of climate change on activities (Jastrzębska, 2023).

Studies in the field state that firms in regulated sectors, such as energy and oil, are more transparent in reporting than those in other areas (Bauckloh, 2022; Chen, 2022).

At the same time, investor pressure and ESG rating agency assessments play an important role in stimulating companies to adopt more detailed reporting practices (Liesen, 2015).

Previous research that studied the direct effect of sustainability reporting on investor actions has validated that great importance is given to non-financial reporting before the completion of the decision-making process by investors (Khemir, 2019).

Also, other authors have found based on previous studies that sustainability reports can positively impact investor relations, which can also influence company performance (Chrzan, 2021).

In addition to this information, an experimental study found that investors are attracted to additional information in reports (taxonomy etc.) and perceive it in a positive way, and thus trust can increase (Chrzan, 2021).

At the end of 2020, China published a strategy to achieve a "carbon peak" by 2030 and "carbon neutrality" by 2060, a prospect that has increased interest in corporate sustainability reporting. In December 2020, the Chinese government published the White Paper on ESG Development, with the aim of promoting investments in sustainability, in conjunction with compared to the situation in Europe and the United States, China is only at an early stage that needs a reporting standard and better ESG reporting quality (Lai and Zhang, 2022).

Hartzmark and Sussman (2019) state that "Socially responsible investors base their investment decisions on their ESG preferences and attribute firm value to the CSR profile of firms with higher ESG ratings, which could be reflected in strong capital flows towards more sustainable investment objectives."

Interest in sustainability reporting (ESG) is growing, and there is a lot of debate at the academic level regarding ESG performance and investment efficiency, which is very important for sustainable and quality corporate development. From the perspective of an ideal capital market, all investment projects with a positive net worth should receive financing until the marginal return reaches equality with the marginal cost. But in reality, information asymmetry and problems often influence firms to deviate from optimal investment levels. Previous studies on sustainability reporting have shown that transparent ESG reporting reduces information asymmetry between the entity and investors, thus decreasing corporate financing costs. ESG transparency can contribute to reducing underinvestment caused by capital constraints, by attracting a much larger number of investors and facilitating access to financing, thus improving investment efficiency (Lai and Zhang, 2022).

At the same time, from the point of view of the policies in force, the disclosure of information in sustainability reports is highly encouraged, but is not yet mandatory worldwide (Bofinger, 2022).

Research methodology

In order to assess the degree of compliance of companies whose main activity is energy and related utilities, listed on the Bucharest Stock Exchange (BVB), with environmental requirements, from the perspective of corporate sustainability reporting, we used an information disclosure index. As part of the research, in order to analyze the degree of compliance with environmental requirements of companies listed on the BVB, we examined both the information published on the official websites of the companies analyzed, as well as the sustainability reports from the period 2011-2023. The elements considered in the research were strictly limited to environmental aspects, in accordance with the criteria set out in the BVB ESG Reporting Guide, which were subsequently analyzed and interpreted.

The companies analyzed in the research are part of the BET-NG index (Bucharest exchange trading energy & related utilities index), with the field of activity being energy and related utilities, as well as the oil and gas industry. The selected companies are part of a sector of activity with significant environmental impact, subject to strict regulations and multiple political changes, but also facing pressure from stakeholders to reduce greenhouse gas (GES) emissions, but also to implement sustainable practices.

The companies selected based on the BET-NG index in January 2025 are shown in **Table no. 1**.

Table no. 1. Composition of the BET-NG index

No.	Company	Percentage (%) in BET-NG	Activity
1	OMV PETROM S.A.	29.3	Crude oil producer.
2	S.P.E.E.H. HIDROELECTRICA S.A.	27.6	Water-based electricity producer.
3	S.N.G.N. ROMGAZ S.A.	17.0	Natural gas producer.
4	S.N.T.G.N. TRANSGAZ S.A.	6.7	Natural gas distributor.
5	SOCIETATEA ENERGETICA ELECTRICA S.A.	6.4	Electricity distributor.
6	S.N. NUCLEARELECTRICA S.A.	6.3	Nuclear power producer.
7	C.N.T.E.E. TRANSELECTRICA	3.5	Electricity distributor.
8	PREMIER ENERGY PLC	1.8	Natural gas distributor.
9	CONPET SA	0.7	Crude oil carrier.
10	ROMPETROL RAFINARE S.A.	0.5	Manufacturer of products petrochemical.
11	OIL TERMINAL S.A.	0.2	Import/export of crude oil.
12	ROMPETROL WELL SERVICES S.A.	0.1	Oil and gas well services.

Source: own processing

The research period analyzed was established based on the first appearance of the sustainability reports, namely 2011-2023. According to the BVB ESG Reporting Guide, the criteria that track environmental aspects published in sustainability reports are the following: environmental policy, GES emissions, energy consumption, climate change, water consumption, waste management and negative environmental effects.

The environmental policy requires that each of the companies listed on the BVB have such a policy. It must reflect environmental aspects, compliance with laws and other legislative norms regarding the environment, how the negative impact on the environment is controlled, how the environment is protected, and how the environmental impact is monitored and improved.

GES emissions represent direct and indirect releases of substances into the air that have a greenhouse effect. These are classified into 3 main categories, namely, direct emissions caused by own sources such as: industrial processes, vehicles and fuel use. The second category is represented by indirect emissions that are generated by electrical or thermal energy, and the third category contains indirect emissions that occur involuntarily from the simple performance of the basic activity. And for this criterion, companies must specify in their sustainability reports the methods and assumptions regarding the method of calculating emissions, a comparison over the last 3 years for emissions released into the atmosphere and explanations for their significant impact on performance.

Energy consumption involves mentioning the amount of energy consumed, whether from internal or external sources of the company, and for this criterion, companies must also provide the method of calculating consumption, the amount of energy consumed in MWh (megawatt-hour), but also the share of each type of energy used.

Climate change for this criterion, companies must implement the TCFD (Task Force on Climate – Related Financial Disclosures) recommendations regarding the presentation of information on the organization's governance related to climate-related risks and opportunities, the processes used to manage risks and how these processes are integrated into the overall risk management, or present future deadlines for their implementation.

Water consumption: Under this criterion, companies must present the amount of water consumed in, as well as the method of reducing consumption.

Waste management entities must present the total quantity of waste generated in tons, the types of treatment applied to waste (recycling, incineration, etc.), and the methods used to reduce waste.

Negative effects on the environment: for this criterion, companies must argue about the impact on biodiversity, and the strategies implemented to mitigate negative effects on the environment.

To correlate the criteria imposed by the BVB and the sustainability reports, we conducted an analysis of the disclosure of information in the sustainability reports using a binary approach, which assigned a score of 1 if information on environmental aspects was mentioned in the Annual Sustainability Reports, and a score of 0 in the opposite cases.

The information disclosure index proposed by Zoysa and Takaoka (2020) presents the following formula:

$$\text{Disclosures index (DI)} = \sum_{i=1}^{m}(d_i/m)$$

Where:

DI – represents the value of the information disclosure index.

d_i – can only take the value 1 or 0 under the following conditions: d_i=1 when the relevant information is presented and d_i=0 when the specified information does not exist.

m – represents the maximum number of information that could be disclosed.

Results and discussion

Taking into account the principles of the research methodology outlined above, an analysis was created for each reporting year presenting the environmental disclosure index (ID) on report-level issues. The period considered for this analysis is between 2011 and 2023. The results are presented in Table no. 2.

Table no. 2. Dividend index providing information on environmental aspects for companies in the energy and related utilities sector

Company name / Period	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Average DI
OMV PETROM S.A.	0.7	0.7	0.7	0.7	0.7	0.7		0.9	0.7	1.0	1.0	1.0	1.0	0.8
S.P.E.E.H. HIDROELECTRICA S.A.												0.7	0.7	0.1
S.N.G.N. ROMGAZ S.A.							0.9	1.0	0.9	1.0	0.7	0.9	1.0	0.5
S.N.T.G.N. TRANSGAZ S.A.										0.3	0.3	0.9	0.9	0.2
SOCIETATEA ENERGETICA ELECTRICA S.A.						0.1	0.1	0.3	0.4	0.4	0.7	0.7	0.7	0.3
S.N. NUCLEARELECTRICA S.A.										0.6	1.0	1.0	1.0	0.3
C.N.T.E.E. TRANSELECTRICA							0.3	0.3	0.4	0.9	0.9	1.0	0.9	0.4
PREMIER ENERGY PLC														-
CONPET SA												0.3		0.0
ROMPETROL RAFINARE S.A.			0.9	0.9	0.6	0.6	0.9	0.9	0.9	0.9	1.0	1.0	1.0	0.7
OIL TERMINAL S.A.												0.1	0.7	0.1
ROMPETROL WELL SERVICES S.A.			0.9	0.9	0.6	0.6	0.9	0.9	0.9	0.9	1.0	1.0	1.0	0.7

Source: own processing

The results obtained from this analysis highlight the fact that approximately 50% of the companies listed on the BVB, which fall within the BET-NG index, started to prepare sustainability reports only after 2017. And in the period 2022-2023, 92% of the companies included in the BET-NG index published sustainability reports. Also, through the lens of this analysis, we can note an upward trend in the disclosure of information on environmental aspects in sustainability reports.

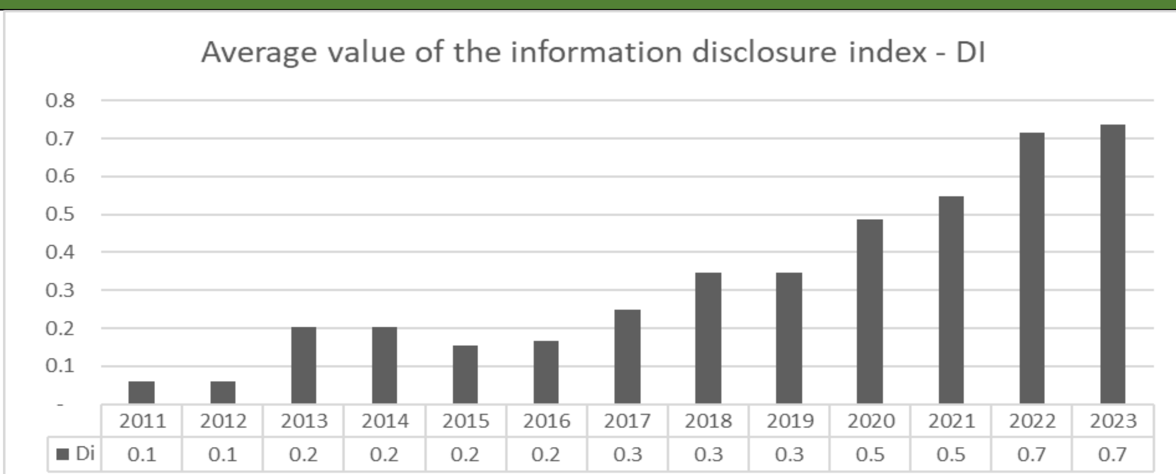
Table no. 3. Average value of the disclosure index of information on environmental aspects related to companies in the energy and related utilities sector, listed on the BVB

Period	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Average value of the DI index	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.7	0.7

Source: own processing

In **Table no. 3**, regarding the evolution of the average value of the DI index, during the period 2011-2016, a slow increase between 0.1 and 0.2 can be noted, which suggests that during this period the disclosure of information regarding environmental aspects (environmental policy, GES emissions, energy consumption, climate change, water consumption, waste management and negative effects on the environment), did not have a major priority for the companies analyzed.

Figure no. 1. Average variation of the environmental disclosure index during the period 2011-2023



Source: own processing

Figure no. 1 shows the trend of the average value of the DI index, which reveals a constant increase in the indicator based on stricter regulations regarding the elements transposed into sustainability reports, increased investor interest in these reports and public pressure that led to a significant improvement in the transparency of companies in the energy sector regarding environmental aspects.

Tables no. 4 and no. 5 present the average value of the environmental disclosure index reported by the companies included in the BET-NG index, during the period 2011-2023. The data is structured according to the BVB ESG Guide, and each company is evaluated according to its transparency on several criteria, such as environmental policy, greenhouse gas emissions (GES), energy consumption, climate change, water consumption, waste management and negative effects on the environment.

Table no. 4. Average variation of the disclosure index of information on environmental aspects presented by companies and their disclosure during the period 2011-2023

Detailed environmental aspects according to the BVB ESG Reporting Guidelines	Environmental policy	GES emissions	Energy consumption	Climate change	Water consumption	Waste management	Negative effects on the environment
OMV PETROM S.A.	0.92	0.92	0.92	0.31	0.92	0.92	0.38
S.P.E.E.H. HIDROELECTRICA S.A.	0.15	-	0.15	0.15	-	0.15	0.15
S.N.G.N. ROMGAZ S.A.	0.54	0.54	0.54	0.23	0.54	0.54	0.46
S.N.T.G.N. TRANSGAZ S.A.	0.31	0.08	0.15	0.15	0.08	0.15	0.31
SOCIETATEA ENERGETICA ELECTRICA S.A.	0.62	0.23	0.23	-	-	0.46	0.38
S.N. NUCLEARELECTRICA S.A.	0.31	0.31	0.23	0.23	0.23	0.31	0.31
C.N.T.E.E. TRANSELECTRICA	0.54	0.31	0.23	0.15	0.31	0.54	0.38
PREMIER ENERGY PLC	-	-	-	-	-	-	-
CONPET SA	0.08	-	-	-	-	-	0.08
ROMPETROL RAFINARE S.A.	0.85	0.69	0.77	0.23	0.85	0.85	0.77
OIL TERMINAL S.A.	0.15	0.08	0.08	-	-	0.08	0.08
ROMPETROL WELL SERVICES S.A.	0.85	0.69	0.77	0.23	0.85	0.85	0.77

Source: own processing

Table no. 5. Information disclosure index at the environmental criterion level for each year from 2011-2023

Environmental aspects according to BVB	Environmental policy	GES emissions	Energy consumption	Climate change	Water consumption	Waste management	Negative effects on the environment
2011	0.08	0.08	0.08	-	0.08	0.08	-
2012	0.08	0.08	0.08	-	0.08	0.08	-
2013	0.25	0.25	0.25	-	0.25	0.25	0.17
2014	0.25	0.25	0.25	-	0.25	0.25	0.17
2015	0.25	0.08	0.08	-	0.25	0.25	0.17
2016	0.33	0.08	0.25	-	0.25	0.25	-
2017	0.42	0.25	0.25	-	0.25	0.33	0.25
2018	0.50	0.33	0.33	0.08	0.33	0.50	0.33
2019	0.50	0.33	0.33	-	0.33	0.50	0.42
2020	0.67	0.50	0.42	0.17	0.42	0.58	0.67
2021	0.67	0.58	0.58	0.33	0.50	0.58	0.58
2022	0.92	0.58	0.75	0.58	0.58	0.75	0.83
2023	0.83	0.75	0.75	0.67	0.50	0.83	0.83

Source: own processing

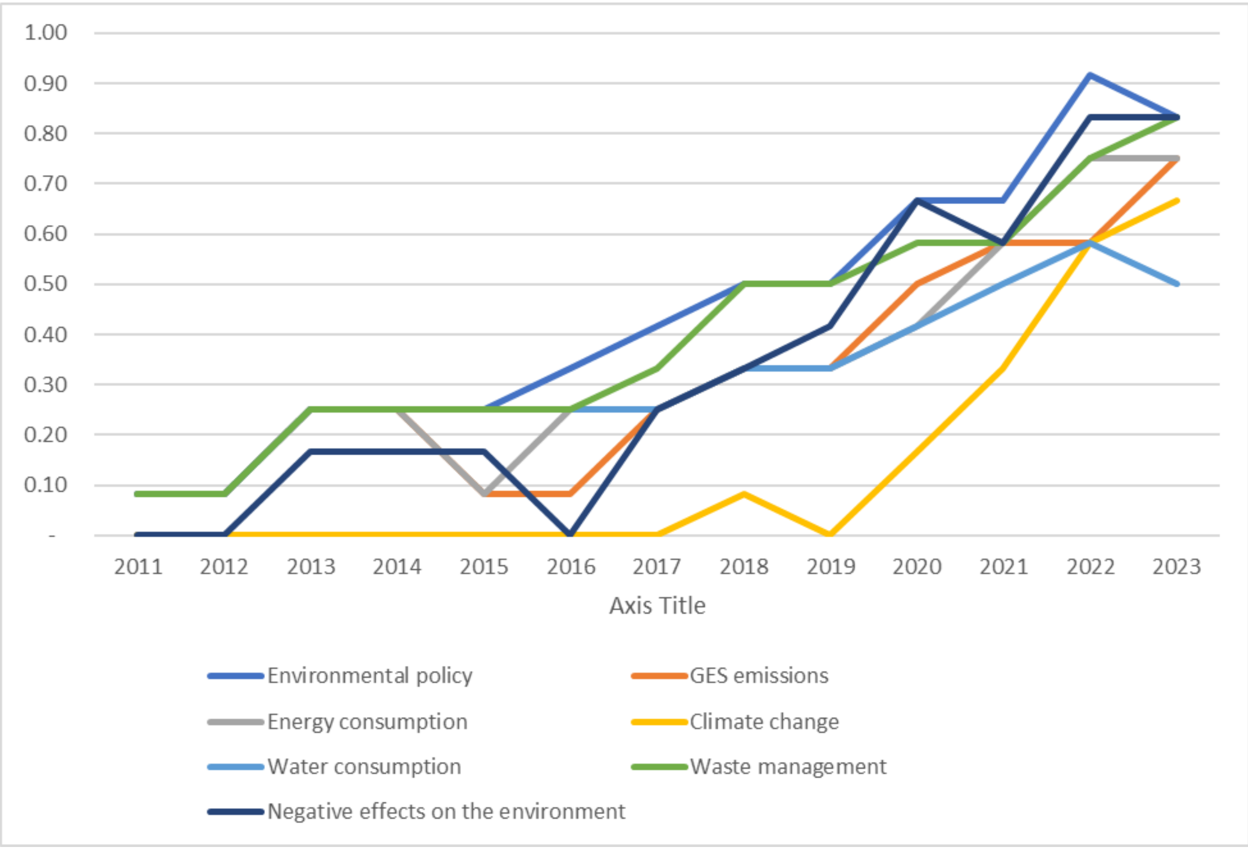
According to the analysis, OMV PETROM SA, ROMPETROL RAFINARE SA and ROMPETROL WELL SERVICES SA have the highest DI index values (over 0.85 across multiple categories), indicating detailed reporting of environmental aspects.

On the other hand, CONPET SA, OIL TERMINAL SA and PREMIER ENERGY PLC either have very low value or do not report at all, which suggests low transparency.

Large energy and oil companies have more extensive reporting, and OMV PETROM SA and ROMPETROL RAFINARE SA stand out with high values (0.85-0.92), covering most environmental aspects. SNGN ROMGAZ SA and SNTGN TRANSGAZ SA report partially, but with moderate values (0.31-0.54), indicating increasing involvement.

Waste management and water consumption are less detailed in the sustainability reports of the companies analyzed. While environmental policy, GES emissions and energy consumption are more frequently reported, highlighting their importance within sustainability reports.

Figure no. 2. Trend of the average variation of the environmental disclosure index during the period 2011-2023



Source: own processing

Figure no. 2 shows that the level of environmental disclosure has increased significantly in recent years among companies in BET-NG. Environmental policy, energy consumption and waste management are the best reported, while water consumption and climate change have had a slower evolution. The general increase in transparency is influenced by stricter regulations, investor pressure, and the adoption of more sustainable practices in the energy and industrial sectors.

Corporate sustainability reporting in Romania marks the disclosure of non-financial information by companies regarding the economic, environmental and social impact of their activities, in accordance with the requirements of European and national regulations, helping to ensure transparency and corporate responsibility towards stakeholders, including investors, authorities and society. According to the analysis carried out on the companies that are part of the BVB BET-NG index, several major differences can be distinguished in reporting on the level of detail of information, even if some companies provide extensive and structured reports, others have summary or incomplete disclosures.

Discrepancies in reporting highlight the need for harmonization of ESG standards at national and sectoral levels so that all companies align with the same transparency requirements.

Summarizing, the analysis of corporate sustainability reporting in BET-NG companies highlights progress in transparency and compliance with ESG standards but also challenges in terms of reporting uniformity. The steady increase in the DI disclosure index suggests a maturation of sustainability practices, but significant differences remain between companies. To ensure uniform and relevant reporting, it is essential to strengthen the internal audit framework and regulations, so that all companies achieve a high level of transparency and accountability in reporting on sustainability issues.

Conclusions

The analysis of the degree of disclosure of information on environmental aspects by companies included in the BET-NG index reflects a significant increase in their transparency between 2011 and 2023. This trend highlights an increased concern for sustainability reporting and alignment with ESG requirements, essential in the current context of the sustainable economy.

Based on the analyzed graphs, a constant evolution of the information disclosure index (DI) was observed, indicating an increase in the level of compliance of companies with environmental reporting standards. If in the first years (2011-2016) the average level of disclosure was low, starting with 2017, an accelerated growth is recorded, reaching the value of 0.7 in 2023. This positive trend suggests a progressive adaptation to the increasingly strict requirements regarding sustainability and corporate responsibility.

The detailed analysis of the companies in BET-NG indicates significant differences in the levels of information disclosure. OMV PETROM, ROMPETROL RAFINARE and ROMPETROL WELL SERVICES stand out with a high level of reporting, covering multiple aspects such as environmental policy, GES emissions, energy consumption and waste management. In contrast, companies such as PREMIER ENERGY PLC or CONPET SA present major gaps in terms of environmental information transparency.

Another important aspect reflected by the analysis is the uneven distribution of reporting across specific categories. The best documented aspects are environmental policy, GES emissions and waste management, while climate change and negative environmental impacts are reported in less detail, indicating the need for improvements in these areas.

This research highlights the importance of a standardized reporting framework that facilitates comparability and efficiency in monitoring the environmental impact of energy and utility companies. It recommends harmonizing compliance practices and creating an internal audit framework that allows for continuous and objective assessment of ESG performance.

Although the study provides a clear picture of the evolution of environmental disclosure, one of the limitations of the research is that the analysis is focused only on companies in the BET-NG index, which restricts the applicability of the conclusions to the entire capital market. However, the results suggest a positive trend and can serve as a basis for future studies, which could extend the analysis to other economic sectors listed on the BVB.

Looking ahead, it is essential that organizations in this field continue to improve transparency and integrate sustainable strategies to remain competitive and aligned with increasingly stringent market requirements. Adopting uniform reporting practices and intensifying efforts to reduce environmental impact will contribute to strengthening investor confidence and the sustainable development of the energy sector.

Bibliography

Specialized literature

1. Bauckloh, T., Klein, C., Pioch, T., & Schiemann, F. (2022). Under Pressure? The Link Between Mandatory Climate Reporting and Firms' Carbon Performance. *Organization & Environment*, Vol. 36, Issue 1, available online at: https://doi.org/10.1177/10860266221083340
2. Bofinger, Y., Heyden, Kim J., Rock, B. (2022) Corporate social responsibility and market efficiency: evidence from ESG and misvaluation measures. *Journal of Banking & Finance*, Vol. 134, available online at: https://0410ayqd6-y-https-www-sciencedirect-com.z.e-nformation.ro/science/article/pii/S0378426621002739?via%3Dihub

3. Bucharest Stock Exchange (2022), ESG Reporting Guide 2022 [Online] available at: https://bvb.ro/info/Rapoarte/Ghiduri/Ghid_privind_raportarea_ESG.pdf
4. Chen, H.-M., Kuo, T.-Ch., & Chen, J.-L. (2022). Impacts on the ESG and financial performances of companies in the manufacturing industry based on the climate change related risks. Journal of Cleaner Production, vol. 380, part 1, December, available online at: https://doi.org/10.1016/j.jclepro.2022.134951
5. Chrzan, S. Taxonomia UE pentru investițiile verzi afectează judecata investitorilor? Un studiu experimental al investitorilor germani privați și profesioniști. *SSRN J.* 2021, 1-34.
6. European Commission, Directive of the European Parliament and of the Council on corporate sustainability due diligence and amending Directive (EU) 2019/1937, Brussels, 23.02.2022.
7. Comyns, B. (2018). Climate change reporting and multinational companies: Insights from institutional theory and international business. *Accounting Forum*, Vol. 42, No.1, 65-77. Disponibil online la: https://doi.org/10.1016/j.accfor.2017.07.003
8. Global Sustainability Standards Board (GSSB), GRI Standards, Universal Standards, revised 2021.
9. Hartzmark, S.M., Sussman, A.B. (2019) Do Investors Value Sustainability? A Natural Experiment Examining Ranking and Fund Flows, *European Corporate Governance Institute*, Finance Working Paper N° 565/2018
10. International Sustainability Standards Board (ISSB) (2023), The international applicability of the SASB Standards, December 2023.
11. Jastrzębska, E. (2023). The reporting of climate-related information by CSR leaders in Poland: a climate-related disclosures index, *Economics and Environment*, 1(84), 96-115.
12. Khemir, S., Baccouche, C., Ayadi, S.D. (2019) The influence of ESG information on investment allocation decisions: An experimental study in an emerging country. *Journal of Applied Accounting Research*, August, 458-480.
13. Lai, X., Zhang, F. (2022) Can ESG certification help company get out of over-indebtedness? Evidence from China. *Pacific-Basin Finance Journal*, Elsevier, vol. 76(C).
14. Liesen, A., Hoepner, A. G., Patten, D. M., & Figge, F. (2015). Does stakeholder pressure influence corporate GHG emissions reporting? Empirical evidence from Europe. *Accounting, Auditing & Accountability Journal*, 28(7), 1047-1074, available at: https://doi.org/10.1108/AAAJ-12-2013-1547
15. Mousa, G. A., & Hassan, N. T. (2015). Legitimacy Theory and Environmental Practices: Short Notes. *International Journal of Business and Statistical Analysis*, 2(1), 41-53. Disponibil online la: http://dx.doi.org/10.12785/IJBSA/020104
16. Order of the Minister of Finance (2024), Order for the regulation of aspects related to sustainability reporting, [Online] available at: https://static.anaf.ro/static/10/Anaf/legislatie/OMF_85_2024.pdf
17. Perera, L., Jubb, Ch., & Gopalan, S. (2019). A comparison of voluntary and mandated climate change-related disclosure. *Journal of Contemporary Accounting & Economics*, 15(2), 243-266. https://doi.org/10.1016/j.jcae.2019.100157
18. Solomon, J.; Maroun, W. (2012) Integrated reporting: the influence of King III on social, ethical and environmental reporting, *ACCA*: Londra, august
19. Task Force on Climate-related Financial Disclosures (TCFD) (2017), Recommendations of the Task Force on Climate- Related Financial Disclosures, Iunie, [Online] disponibil la: https://assets.bbhub.io/company/sites/60/2021/10/FINAL-2017-TCFD-Report.pdf
20. TCFD- Task Force on Climate – Related Financial Disclosures (2021), Manual 2021 [Online] available at: https://www.cdsb.net/sites/default/files/tcfd_good_practice_handbook_v5_pages.pdf
21. Uniunea Europeană (2017), Ghid privind raportarea informațiilor nefinanciare [Online] disponibil la: https://eur-lex.europa.eu/legal-content/RO/TXT/?uri=CELEX:52017XC0705(01)
22. Zoysa, A. D., & Takaoka, N. (2019). Corporate Social Responsibility performance of small and medium enterprises in regional Japan: an empirical examination. *Social Responsibility Journal*, 16(4), 449-466. https://doi.org/10.1108/SRJ-05-2018-0116

Companies' sites

1. C.N.T.E.E. TRANSELECTRICA (2017), Annual Report 2017 [Online] available at: https://www.transelectrica.ro/documents/10179/6806714/Raport+de+sustenabilitate+Transelectrica+2017.pdf/5d60635b-eb80-47a8-922e-57fb0df44e1f
2. C.N.T.E.E. TRANSELECTRICA (2018), Annual Report 2018 [Online] available at: https://www.transelectrica.ro/documents/10179/8439491/Raport+de+Sustenabilitate+2018+TEL.pdf/e1efab6d-6747-45b2-aaf3-f48f2c356e36
3. C.N.T.E.E. TRANSELECTRICA (2019), Annual Report 2019 [Online] available at: https://www.transelectrica.ro/documents/10179/9902999/13_Prezentarea+Raportului+de+Sustenabilitate+pentru+anul+2019.pdf/a89f57c9-ace1-4493-a262-2737ed91dcb5
4. C.N.T.E.E. TRANSELECTRICA (2020), Annual Report 2020 [Online] available at: https://www.transelectrica.ro/documents/10179/11684857/Raport+de+sustenabilitate+TRANSELECTRICA+2020+%28rom%C3%A2n%C4%83%29_compressed.pdf/31292167-55e6-437f-bd1f-db2ca2c76689
5. C.N.T.E.E. TRANSELECTRICA (2021), Annual Report 2021 [Online] available at: https://www.transelectrica.ro/documents/10179/13378426/11+Raport+sustenabilitate+2021.pdf/6edd7e45-6f15-45cd-a0f8-ac9bc46c5baa
6. C.N.T.E.E. TRANSELECTRICA (2022), Annual Report 2022 [Online] available at: https://www.transelectrica.ro/documents/10179/16096912/Raport+sustenabilitate+al+Transelectrica+2022+var+2+octombrie_final.pdf/9c285c1f-ee79-4b0c-811d-09815b149aec
7. C.N.T.E.E. TRANSELECTRICA (2023), Annual Report 2023 [Online] available at: https://www.transelectrica.ro/documents/10179/16919692/01_Raport+sustenabilitate+al+Transelectrica+2023+final.pdf/f4696cbe-8396-4da6-bcaf-dd86837ee3a8
8. OIL TERMINAL S.A. (2022), Annual Report 2022 [Online] available at: https://relatia.oil-terminal.com/wp-content/uploads/2023/07/Raport-de-Sustenabilitate-AN-2022.pdf
9. OIL TERMINAL S.A. (2023), Annual Report 2023 [Online] available at:: https://relatia.oil-terminal.com/wp-content/uploads/2024/06/Raport-de-Sustenabilitate-AN-2023.pdf
10. OMV PETROM S.A. (2011), Annual Report 2011 [Online] available at:https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522189108701/raport-de-sustenabilitate-2011-ro.pdf
11. OMV PETROM S.A. (2012), Annual Report 2012 [Online] available at: https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522189108783/raport-de-sustenabilitate-2012-ro-.pdf
12. OMV PETROM S.A. (2013), Annual Report 2013 [Online] available at: https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522189115906/raport-de-sustenabilitate-2013-ro-.pdf
13. OMV PETROM S.A. (2014), Annual Report 2014 [Online] available at: https://www.omv.com/downloads/2018/07/ae98adea-85db-471e-ad16-a0478ae70bc2/sustainability-report-2014.pdf
14. OMV PETROM S.A. (2015), Annual Report 2015 [Online] available at: https://www.omv.com/downloads/2018/07/14e8387b-6712-47de-9f9e-5f4e915c0a45/Susta inability%20Report%202015_EN.pdf
15. OMV PETROM S.A. (2016), Annual Report 2016 [Online] available at: https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522189116279/raport-de-sustenabilitate-2016-ro-.pdf
16. OMV PETROM S.A. (2018), Annual Report 2018 [Online] available at: https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522170967456/omv-petrom-raport-sustenabilitate-2018.pdf
17. OMV PETROM S.A. (2019), Annual Report 2019 [Online] available at: https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522188090115/raport-de-sustenabilitate-2019.pdf
18. OMV PETROM S.A. (2020), Annual Report 2020 [Online] available at: https://www.omvpetrom.com/services/downloads/00/o

mvpetrom.com/1522203131095/raport-de-sustenabilitate-2020.pdf

19. OMV PETROM S.A. (2021), Annual Report 2021 [Online] available at: https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522222223056/raport-de-sustenabilitate-2021.pdf
20. OMV PETROM S.A. (2022), Annual Report 2022 [Online] available at: https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522238650256/raportul-de-sustenabilitate-2022omv-petrom.pdf
21. OMV PETROM S.A. (2023), Annual Report 2023 [Online] available at: https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522253251887/raport-de-sustenabilitate-omv-petrom-2023.pdf
22. ROMPETROL RAFINARE S.A. și ROMPETROL WELL SERVICES S.A. (2013-2014), Sustainability Report 2013-2014 [Online] available at: https://rompetrol-rafinare.kmginternational.com/upload/files/2013_2014_kmgi_raport_sustenabilitate_2289.pdf
23. ROMPETROL RAFINARE S.A. și ROMPETROL WELL SERVICES S.A. (2015), Sustainability Report 2015 [Online] available at: https://rompetrol-rafinare.kmginternational.com/upload/files/2015_kmgi_raport_sustenabilitate_2288.pdf
24. ROMPETROL RAFINARE S.A. și ROMPETROL WELL SERVICES S.A. (2016), Sustainability Report 2016 [Online] available at: https://rompetrol-rafinare.kmginternational.com/upload/files/2016_kmgi_raport_sustenabilitate_2287.pdf
25. ROMPETROL RAFINARE S.A. și ROMPETROL WELL SERVICES S.A. (2017), Sustainability Report 2017 [Online] available at: https://rompetrol-rafinare.kmginternational.com/upload/files/2017_kmgi_raport_sustenabilitate_2291.pdf
26. ROMPETROL RAFINARE S.A. și ROMPETROL WELL SERVICES S.A. (2018), Sustainability Report 2018 [Online] available at: https://rompetrol-rafinare.kmginternational.com/upload/files/kmg_international_2018_raport_sustenabilitate_2625.pdf
27. ROMPETROL RAFINARE S.A. și ROMPETROL WELL SERVICES S.A. (2019), Sustainability Report 2019 [Online] available at: https://rompetrol-rafinare.kmginternational.com/upload/files/kmg_international_2019_raport_sustenabilitate_2620.pdf
28. ROMPETROL RAFINARE S.A. și ROMPETROL WELL SERVICES S.A. (2020), Sustainability Report 2020 [Online] available at: https://rompetrol-rafinare.kmginternational.com/upload/files/kmg_international_2020_raport_sustenabilitate_2621.pdf
29. ROMPETROL RAFINARE S.A. și ROMPETROL WELL SERVICES S.A. (2021), Sustainability Report 2021 [Online] available at: https://rompetrol-rafinare.kmginternational.com/upload/files/2021-rompetrol-raport-sustenabilitate-ro-web-3593.pdf
30. ROMPETROL RAFINARE S.A. și ROMPETROL WELL SERVICES S.A. (2022), Sustainability Report 2022 [Online] available at: https://rompetrol-rafinare.kmginternational.com/upload/files/2022-rompetrol-raport-sustenabilitate-ro-web-3592.pdf
31. ROMPETROL RAFINARE S.A. și ROMPETROL WELL SERVICES S.A. (2023), Sustainability Report 2023 [Online] available at: https://rompetrol-rafinare.kmginternational.com/upload/files/2024-09-19-kmgi-sr-2023-ro-spread-14mb-3602.pdf
32. S.N.G.N. ROMGAZ S.A. (2017), Annual Report 2017 [Online] available at:https://www.romgaz.ro/sites/default/files/2021-06/Raport%20de%20Sustenabilitate%20pentru%202017_3.pdf
33. S.N.G.N. ROMGAZ S.A. (2018), Annual Report 2018 [Online] available at:https://www.romgaz.ro/sites/default/files/2021-06/Raport%20de%20Sustenabilitate%20an%202018_3.pdf
34. S.N.G.N. ROMGAZ S.A. (2019), Annual Report 2019 [Online] available at:https://www.romgaz.ro/sites/default/files/2021-03/Raport%20de%20Sustenabilitate%20an%202019.pdf
35. S.N.G.N. ROMGAZ S.A. (2020), Annual Report 2020 [Online] available at:https://www.romgaz.ro/sites/default/files/2021-06/Raport%20de%20Sustenabilitate%20an%202020_0.pdf
36. S.N.G.N. ROMGAZ S.A. (2021), Annual Report 2021 [Online] available

at:https://www.romgaz.ro/sites/default/files/2022-06/Raport%20Sustenabilitate%20Romgaz%202021_0.pdf

37. S.N.G.N. ROMGAZ S.A. (2022), Annual Report 2022 [Online] available at: https://www.romgaz.ro/sites/default/files/2023-06/Raport%20de%20Sustenabilitate%202022.pdf
38. S.N.G.N. ROMGAZ S.A. (2023), Annual Report 2023 [Online] available at:https://www.romgaz.ro/sites/default/files/2024-06/Raport%20sustenabilitate%20Romgaz%202023.pdf
39. S.N. NUCLEARELECTRICA S.A. (2020), Annual Report 2020 [Online] available at:https://nuclearelectrica.ro/ir/wp-content/uploads/sites/9/2021/03/Declaratia-non-fin-machetata.pdf
40. S.N. NUCLEARELECTRICA S.A. (2021), Annual Report 2021 [Online] available at:https://nuclearelectrica.ro/ir/wp-content/uploads/sites/9/2022/04/00_RaportSustenabilitate2021_SNN_297x210mm_Book_RO_220329_lowres.pdf
41. S.N. NUCLEARELECTRICA S.A. (2022), Annual Report 2022 [Online] available at:https://nuclearelectrica.ro/ir/wp-content/uploads/sites/9/2023/04/ESG-Raport_RO_mic.pdf
42. S.N. NUCLEARELECTRICA S.A. (2023), Annual Report 2023 [Online] available at:https://nuclearelectrica.ro/ir/wp-content/uploads/sites/9/2024/04/SNN-Raport-sustenabilitate_RO_150mic_20240426.pdfS.N.T.G.N. TRANSGAZ S.A. (2020) , Raport Anual 2020 [Online] disponibil la: https://www.transgaz.ro/sites/default/files/users/user360/Raport%20de%20sustenabilitate%20pentru%20anul%202020.pdf
43. S.N.T.G.N. TRANSGAZ S.A. (2020), Annual Report 2020 [Online] available at:https://www.transgaz.ro/sites/default/files/users/user360/Raport%20de%20sustenabilitate%20pentru%20anul%202020.pdf
44. S.N.T.G.N. TRANSGAZ S.A. (2021), Annual Report 2021 [Online] available at:https://www.transgaz.ro/sites/default/files/uploads/users/admin/Raport%20de%20sustenabilitate%20pe%20anul%202021.pdf
45. S.N.T.G.N. TRANSGAZ S.A. (2022), Annual Report 2022 [Online] available at:https://www.transgaz.ro/sites/default/files/users/user360/Transgaz%20-%20Raport%20de%20Sustenabilitate%202022%20final.pdf
46. S.N.T.G.N. TRANSGAZ S.A. (2023), Annual Report 2023 [Online] available at:https://www.transgaz.ro/sites/default/files/Downloads/Raport%20sustenabilitate%202023_SNTGN%20Transgaz%20SA.pdf
47. SOCIETATEA ENERGETICA ELECTRICA S.A. (2016), Annual Report 2016 [Online] available at: https://www.electrica.ro/wp-content/uploads/2017/12/RS-Electrica-Interactiv-RO_final.pdf
48. SOCIETATEA ENERGETICA ELECTRICA S.A. (2017), Annual Report 2017 [Online] available at: https://www.electrica.ro/wp-content/uploads/2018/07/RS-Electrica-Interactiv-RO_final_2017.pdf
49. SOCIETATEA ENERGETICA ELECTRICA S.A. (2018), Annual Report 2018 [Online] available at: https://www.electrica.ro/wp-content/uploads/2019/06/Electrica_RS2018_ro.pdf
50. SOCIETATEA ENERGETICA ELECTRICA S.A. (2019), Annual Report 2019 [Online] available at: https://www.electrica.ro/wp-content/uploads/2020/06/Electrica-Raport-sustenabilitate-RO_30.06-web.pdf
51. SOCIETATEA ENERGETICA ELECTRICA S.A. (2020), Annual Report 2020 [Online] available at: https://www.electrica.ro/wp-content/uploads/2021/06/Raport_Sustenabilitate_Electrica_2020_RO.pdf
52. SOCIETATEA ENERGETICA ELECTRICA S.A. (2021), Annual Report 2021 [Online] available at: https://www.electrica.ro/wp-content/uploads/2022/07/2021_Raport-Sustenabilitate-Grup-Electrica-RO.pdf
53. SOCIETATEA ENERGETICA ELECTRICA S.A. (2022), Annual Report 2022 [Online] available at: https://www.electrica.ro/wp-

content/uploads/2023/06/2022_Raport-Sustenabilitate-Grup-Electrica-RO.pdf

54. SOCIETATEA ENERGETICA ELECTRICA S.A. (2023), Annual Report 2023 [Online] available at: https://www.electrica.ro/wp-content/uploads/2024/06/ELSA_RO_Raport_de_Sustenabilitate_Electrica_2023.pdf
55. S.P.E.E.H. HIDROELECTRICA S.A. (2022), Annual Report 2022 [Online] available at: https://cdn.hidroelectrica.ro/cdn/raport_sustenabilitate/Raport_de_sustenabilitate_2022.pdf
56. S.P.E.E.H. HIDROELECTRICA S.A. (2023), Annual Report 2023 [Online] available at: https://cdn.hidroelectrica.ro/cdn/raport_sustenabilitate/Raport_de_sustenabilitate_2023.pdf

Audit Financiar, XXIII, Nr. 2(178)/**2025**, *378-387*
ISSN on-line: 1844-8801

Particularities and Requirements of the Evolution of Sustainability Reporting in the Romanian Pharmaceutical Sector

Lect. Luminița-Mihaela DUMITRAȘCU, Ph. D.,
The Bucharest University of Economic Studies, Romania,
e-mail: mihaela.dumitrascu@cig.ase.ro

To cite this article:
Dumitrașcu, L.-M. (2025), Particularities and Requirements of the Evolution of Sustainability Reporting in the Romanian Pharmaceutical Sector, *Audit Financiar*, vol. XXIII, no. 2(178)/2025, pp.378-387, DOI: 10.20869/AUDITF/2025/178/011

To link this article:
http://dx.doi.org/10.20869/AUDITF/2025/178/011
Received: 10.03.2025
Revised: 14.03.2025
Accepted: 29.04.2025

Abstract

Nowadays, many companies have adopted non-financial reporting in addition to financial reporting, presenting sustainable development practices. They have prepared and published sustainability reports or non-financial statements to highlight their commitment to sustainability. ESRS - the European Sustainability Reporting Standards, and GRI - the Global Reporting Initiative emphasize social, environmental, or governance impacts.

The objective of the research is to present the particularities and requirements regarding the evolution of sustainability reporting of companies in the Romanian pharmaceutical sector. The gaps in non-financial reporting regarding the Comply or Explain Statement and the United Nations Sustainable Development Goals (UN SDG) were also presented.

The current research addresses these aspects from an empirical perspective based on the analysis of the reports of companies listed on the Bucharest Stock Exchange. The exploratory analysis is carried out for the period 2011-2023. The information was taken from the financial and non-financial reports, available on the official websites of the companies analyzed.

The results of the research, although limited to one sector of activity and only to companies listed in the Premium category, on the Bucharest Stock Exchange, these being considered a reporting model for other unlisted companies, demonstrate that in Romania companies do not offer a specific structure of non-financial reporting, the implementation of these reports being still in its early stages.

Future research directions may consider a larger sample of companies, both listed and unlisted, from various sectors of activity, in order to be able to perform a comparative analysis by activity areas and to have an exhaustive picture of sustainability practices and existing challenges at the national level.

Key words: *sustainability; sustainable development; sustainability reporting; ESRS; GRI; SDG;*

JEL Classification: *M21, M40, M41, M42*

Introduction

As companies grapple with digitalization, technological and legislative developments, Simpson et al (2021) highlights the importance of sustainability reporting. This comes with many challenges for the accounting profession in terms of understanding sustainability reporting requirements, identifying areas of significance for the company, clearly establishing sustainability objectives, identifying sources from which data will be collected, involving stakeholders, choosing the reporting framework, developing reports, and continuous improvement.

A significant change in the Romanian business environment is represented by the implementation of mandatory non-financial reporting, through the Non-Financial Reporting Directive NFRD through OMPF 1938/2016 and OMFP 3456/2018.

Sustainability reporting is currently becoming an essential requirement, which provides a competitive advantage for companies, increasing innovation and contributing to adequate risk management. The development of sustainability practices involves assessing the benefits of addressing social and environmental issues and assessing the contribution to value creation, cost reduction, revenue generation, reputation enhancement, efficiency promotion, transparency and credibility enhancement. A challenge for the accounting professional is represented by continuous professional training.

This study synthesizes the level of sustainability reporting of companies, through a qualitative research, conducted on the basis of sustainability reports and Annual Reports of Administrators, Non-Financial Statements, Applied or Explicit Declaration, which includes criteria related to social and environmental aspects, as well as on the basis of other documents and information available on the official websites of the companies. Thus, the particularities and requirements of the evolution of sustainability reporting in the Romanian pharmaceutical sector are highlighted.

The article is structured as follows: introduction to sustainability reporting, with a presentation of the evolution of reporting, research methodology, results and conclusions.

1. Literature Review

Sustainability or sustainable development aims to improve environmental, social and governance (ESG) operations so as not to compromise the ability of future generations to meet their own needs, according to the 1987 Brundtland Commission, the United Nations World Commission on Environment and Development.

Sustainability reporting does not have a specific name, in practice, it is called *integrated reporting, sustainability reporting* (European Directive 2014/95/EU), *corporate social responsibility reporting* (CSR Reporting), *sustainability reporting* (European Directive 2022/2464/EU), *ESG reporting* (environment, social, governance).

At the European level, regulations on sustainability reporting have evolved from European Directive 2013/34/EU of the European Parliament and of the Council on the annual financial statements, consolidated financial statements and related reports of certain types of companies[1] to European Directive 2014/95/EU NFRD, which amends the previous directive[2], namely European Directive 2022/2464 CSRD[3], Commission Delegated Regulation 2023/2772/EU ESRS of 31.07.2023 supplementing Directive 2013/34/EU of the European Parliament and of the Council and Directive 2024/1760/EU of the European Parliament and of the Council[4] of 13.06. 2024 on sustainability due diligence, amends Directive 2019/1937 and Regulation 2023/2859[5].

The issuance of the European Directive CSRD 2022/2464/EU on sustainability was transposed into national legislation by Order of the Minister of Public Finance number 85/2024, which produces amendments to OMFP 1802/2014.

The European Sustainability Reporting Standards - ESRS, issued by EFRAG, the European Financial Reporting Advisory Group, specify the information regarding companies that are required to report on sustainability

[1] https://eur-lex.europa.eu/eli/dir/2013/34/oj
[2] https://eur-lex.europa.eu/eli/dir/2014/95/oj

[3] https://eur-lex.europa.eu/eli/dir/2022/2464/oj
[4] https://eur-lex.europa.eu/legal-content/RO/TXT/HTML/?uri=OJ:L_202302772
[5] https://eur-lex.europa.eu/legal-content/RO,,0,00,/TXT/?uri=OJ%3AL_202401760

issues. Given the recent changes in the legislation in the field of sustainability, even small companies will have to report, even if in a voluntary manner, in order to maintain their relationships with stakeholders.

The sustainability reporting frameworks used by companies to date are:

- national and European legislative framework (CSRD - Romanian Sustainability Code)
- non-financial reporting standards (SASB - Sustainability Accounting Standards Board, TFCD - Task Force on Climate-Related Disclosures)
- non-financial indicators (GRI - Global Reporting Initiative)
- European sustainability standards, ESRS.

European regulations on sustainability reporting have led to the emergence of the current reporting framework in Romania. Large EU and non-EU companies operating in the EU will have to mitigate the negative environmental impact caused by their activities. Directive 2014/95/EU NFRD has been applied by 11,700 companies, while Directive 2022/2464/EU CSRD has been applied by 49,000 European companies[1].

Sustainability reporting has been addressed in various sectors of activity (Rodriguez et al, 2019; Siew et al, 2013; Paolone et al, 2021; Lopez et al, 2021; Tarquinio et al, 2020; Wirth et al, 2016) and studies have been conducted in various countries (Bunget et al, 2024; Velte, 2017; Chen et al, 2020; Doni et al, 2019; Duran et al, 2018; Yoon et al, 2018; Mannes et al, 2018; Raucco and Tarquinio, 2020; Romolini et al, 2017; Reverte, 2009; Ruan and Liu, 2021; Venturelli et al, 2018).

The pharmaceutical industry is increasingly concerned about the impact that its activity has on the environment and society in general. The ingredients used affect the environment through the production of emissions, soil or water pollution, noise pollution or the amount of waste resulting from production. Negative effects on the environment can also be observed through the emission of greenhouse gases. Numerous researchers have approached this sector of activity, which is oxymoronic with social responsibility and sustainability, and have analyzed the relationship between financial indicators, such as return on assets, return on capital and non-financial, environmental, social and corporate governance indicators (Dalal et al, 2019; Paolone et al, 2021; Lopez et al, 2021; Min et al, 2017).

The environmental pillar of sustainability refers to the industry's contribution to climate change, the depletion of natural resources, climate change. Social aspects refer to access to medicines and promote responsible labor practices, human rights, diversity, inclusion, equal opportunities, health and safety at work. Companies implement solutions to address these aspects, which remain difficult to measure due to cultural differences and different legal contexts. The governance pillar considers the way in which companies in the pharmaceutical sector comply with legal provisions (Mihaiu et al, 2021).

Sustainability practices in the pharmaceutical sector include strategies to reduce production costs or optimize supply chains (Kim et al, 2021). Research, development, innovation contribute to social impact, Dicuonzo et al 2022 demonstrating that organizations that invest more in innovation also pay increased attention to sustainability aspects. The practices of pharmaceutical companies in developed countries differ from those in developing countries, with researchers demonstrating significant differences in sustainability practices. Companies in developed countries have a higher level of regulatory compliance compared to organizations in developing countries (Nascimento et al, 2024).

2. Research Methodology

This research uses a qualitative approach based on the analysis of reports of companies listed on the Bucharest Stock Exchange, in order to observe the particularities and requirements of the evolution of sustainability reporting implemented by the companies in the selected sample (**Table no. 1**). The content analysis of annual reports, sustainability reports and various statements was carried out with the aim of observing the situation in the pharmaceutical industry.

The sample includes the companies Antibiotice SA, Biofarm SA, Farmaceutica Remedia SA, Ropharma SA.

Antibiotice S.A. is a pharmaceutical company, founded in 1955, with majority state capital, as well as international recognition in a Romanian sustainability ranking, obtaining 90/100 points.

[1] https://kpmg.com/nl/en/home/topics/environmental-social-governance/corporate-sustainability-reporting-directive.html

Table no. 1. Selected sample

Name of the company	The incorporation year	First listed on BSE	BSE Symbol	Majority shareholder	Percentage of majority shareholder
ANTIBIOTICE SA	1955	1997	ATB	Ministry of Health	53,02%
BIOFARM SA	1921	2005	BIO	SIF Muntenia	51,58%
FARMACEUTICA REMEDIA SA	1999	2009	RMAH	Individual	81,45%
ROPHARMA SA	1952	2010	RPH	Ropharma SA	90%

Source: own projection

Biofarm S.A. is a company founded in 1921, which produces and sells medicines, supplements and cosmetics and which was first listed on the BVB on the RASDAQ market.

Farmaceutica Remedia S.A. is a pharmaceutical distribution company, founded in 1991, with majority private capital.

Ropharma S.A. was founded in 1952, as a manufacturer and distributor of medicines and supplements.

The research methodology is based on collecting data from various reports and performing a content analysis of the reports published by the companies in the sample. The objective of the research is to present the particularities and requirements regarding the evolution of sustainability reporting of companies in the Romanian pharmaceutical sector, through the lens of sustainability reports or non-financial statements to highlight the companies' commitment to sustainability. These aspects can provide an integrated picture of a company, observing the impact it has on the environment, governance or society. The gaps in non-financial reporting regarding the Comply or Explain Statement and the United Nations Sustainable Development Goals (UN SDGs) were also presented.

The SDGs are a set of 17 interconnected goals, developed by the United Nations in 2015. The pharmaceutical industry is a major player in this regard, being dedicated to the creation of new medicines and being vital for global efforts to ensure health and improve the quality of life. From this perspective, there are many areas in which the pharmaceutical industry could contribute to the progress of the SDGs. Thus, we can classify the SDGs according to the pillars of sustainability, environmental, social, and governance, as follows:

- **Environment:** SDG 6 *Clean water and sanitation*, SDG 7 *Affordable and clean energy*, SDG 9 *Industry, innovation and infrastructure*, SDG 11 *Sustainable cities and communities*, SDG 12 *Responsible consumption and production*, SDG 13 *Climate action*, SDG 14 *Partnerships for the goals*, SDG 15 *Life on land*;
- **Social:** SDG 1 *No poverty*, SDG 2 *Zero hunger*, SDG 3 *Good health and well-being*, SDG 4 *Quality education*, SDG 5 Gender equality, SDG 6 *Clean water and sanitation*, SDG 8 *Decent work and economic growth*, SDG 9 *Industry, innovation and infrastructure*, SDG 10 *Reduced inequalities*, SDG 12 *Responsible consumption and production,* SDG 16 *Peace, justice and strong institutions*;
- **Governance:** SDG 5 *Gender equality*, SDG 8 *Decent work and economic growth*, SDG 9 *Industry, innovation and infrastructure*, SDG 11 Sustainable cities and communities, SDG 12 *Responsible consumption and production*, SDG 13 *Climate action*, SDG 16 *Peace, Justice and strong institutions*, SDG 17 *Partnerships for the goals*.

Pharmaceutical companies take such initiatives, such as SDGs and ESG, given that they are part of a sector of activity that consumes limited natural resources, such as water, gas, and that they are a polluting sector. Pollution includes greenhouse gas emissions, wastewater generation, and other waste (Barei et al, 2013).

A sample of companies listed on the Bucharest Stock Exchange in the pharmaceutical sector was used to collect data, as it offers a broader perspective of business models, ensuring a complex approach.

A comparative approach to sustainability reports was used, for a period between 2011-2023. This time interval captures the evolution of sustainability reporting, through the lens of all legislative changes related to sustainability, including even the pandemic period, as well as the post-pandemic period.

This study adheres to ethical research principles, using data publicly available on the companies' official websites, ensuring that the study does not cause any harm to any company.

3. Research Results

The analysis carried out within the sample of companies in the pharmaceutical sector demonstrates the particularities and requirements regarding the evolution of sustainability reporting of companies in this sector of activity, through the perspective of the evolution of sustainability reporting within the environmental, social and governance dimensions and a continuous evolution towards sustainability and adaptation to transparency requirements. The COVID pandemic has highlighted the importance of companies' social practices. Increasing transparency in sustainability reporting plays an important role in ensuring trusting and efficient relationships with stakeholders. The comparative analysis by companies and reporting years reveals that the companies analyzed adopt sustainable practices, but also have aspects that require improvement. All this information is available and presented within the *Sustainability* or *ESG Reporting* sections, on the official pages of the companies (**Table no. 2**).

Table no. 2 Presence of sustainability aspects on the company's official website

Company	Aspects
ANTIBIOTICE SA	Environment, social
BIOFARM SA	Environment, corporate governance
FARMACEUTICA REMEDIA SA	Environment, social, corporate governance
ROPHARMA SA	There is no dedicated section on the official website, information is presented in reports

Source: own projection

Regarding sustainability reporting in annual reports, all companies analyzed present information on corporate governance, environmental protection and social aspects: Antibiotice SA for the period 2017-2023, Biofarm SA for the period 2011-2023, Farmaceutica Remedia SA and Ropharma SA for the period 2012-2023 (except for the reports from 2013 and 2015, which are not available on the official website of Farmaceutica Remedia SA, respectively the annual reports from 2014-2016 of Ropharma SA) (**Table no. 3**).

Figure no. 1 The Sustainable Development Goals, case study of Biofarm

Source: ESG Biofarm 2022

More and more companies are choosing to communicate information on their contribution to achieving the SDGs in the reports published on their official websites. Thus, organizations allow stakeholders to understand how, through their actions and decisions, they contribute to the sustainable development goals. Only the companies Antibiotice SA, Biofarm SA and Farmaceutica Remedia SA presented information about the Sustainable Development Goals (SDGs). Thus, the company Antibiotice SA, in 2020, integrated into its activity 76% of these objectives for environmental aspects (SDG 3, SDG 5, SDG 6, SDG 7, SDG 8, SDG 9, SDG 10, SDG 12, SDG 13, SDG 14, SDG 15), social (SDG 3, SDG 4, SDG 5, SDG 8, SDG 9, SDG 10, SDG 12, SDG 16, SDG 17) and governance (SDG 5, SDG 8, SDG 9, SDG 12, SDG 13, SDG 17), and in 2021 environmental aspects (SDG 3, SDG 5, SDG 6, SDG 7, SDG 8, SDG 9, SDG 12, SDG 13, SDG 14, SDG 15), social (SDG 3, SDG 4, SDG 5, SDG 8, SDG 9, SDG 10), governance (SDG 5, SDG 8, 12, SDG 16, SDG 17). Biofarm SA company, in 2021 and 2022 (**Figure no. 1**), respectively, integrated 65% of these objectives in its activity for environmental aspects (SDG 6, SDG 7, SDG 9, SDG 12, SDG 13), social (SDG 1, SDG 3, SDG 5, SDG 6, SDG 8, SDG 9, SDG 10, SDG 12) and governance (SDG 5, SDG 8, SDG 9, SDG 12, SDG 13, SDG 17), compared to 2021, when the Farmaceutica Remedia SA company integrated only 29% of the objectives regarding environmental protection (SDG 14, SDG 15) or social aspects (SDG 3, SDG 4, SDG 9) (**Table no. 3**).

Table no. 3. Sustainability reporting

Company	Year	Report type	Report name	Number of pages	SDG	GRI
ANTIBIOTICE SA	2023	Integrated annual report	We invest responsible for the health of future generations	164	No	Yes
	2022	Integrated annual report	We invest responsible for the health of future generations	150	No	Yes
	2021	Integrated annual report	We work for a better life	144	Yes	Yes
	2020	Sustainability report	We work for a better life	116	Yes	Yes
	2019	Non-financial report	Sustainability for a better life	76	No	Yes
	2018	Non-financial report	Responsibility for a better life	64	No	Yes
	2017	Non-financial report	Together for a better life	34	No	Yes
BIOFARM SA	2022	ESG Report	Sustainability report	66	Yes	No
	2021	ESG Report	MSG Sustainable report	70	Yes	No
	2020	ESG Report	Nonfinancial sustainability report The good of living better	30	No	No
FARMACEUTICA REMEDIA SA	2023	Nonfinancial sustainability report	Nonfinancial sustainability report	31	No	Yes
	2022	Nonfinancial sustainability report	Nonfinancial sustainability report	30	No	Yes
	2021	Nonfinancial Statement	Sustainability report	22	Yes	No
	2020	Nonfinancial Statement	Nonfinancial Statement	15	No	No
	2019	Nonfinancial Statement	Nonfinancial Statement	15	No	No

Source: own projection, based on information disclosed on official websited of analysed companies

The GRI, Global Reporting Initiative, standards are recognized globally. These standards, which report on sustainable development practices through indicators, were first developed in 1997 and have been reviewed and updated periodically. They represent a universal language in sustainability, and currently there are universal GRI standards and specific GRI standards, which ensure transparency and comparability of information between companies. GRI sustainability reporting is presented by the company Antibiotice SA for the period 2017-2023, in the integrated annual report, respectively in the sustainability report. The company Biofarm SA presents this information only for the period 2020-2022, and Farmaceutica Remedia SA only for the years 2022 and 2023 (**Table no. 3**).

The GRI standards, which are voluntary, were the most well-known sustainability measurement tools, before the emergence of the Corporate Sustainability Reporting Initiative - CSRD, which brings into question the European ESRS standards, at the European Union level being ESG standards (environmental, social, governance). A new element is the double materiality threshold, with companies reporting the social and environmental impact as well as the financial component, presenting the associated risks and opportunities. Multinational companies, companies listed on the Bucharest Stock Exchange, banks, insurance and reinsurance companies, if they have over 500 employees starting with 2024, the first sustainability report being published on the company's official website in 2025, other companies listed on other stock exchanges outside the EU, if they have over 500 employees, starting with the financial year 2025, the first sustainability report being published on the company's official website in 2026, listed SMEs, even those outside the EU, from the financial year 2026, the first sustainability reports being available on the official website starting with 2027 and no later than 2029. Even if the Directive is not mandatory for all companies, stakeholders in the business will request such information.

The name of sustainability reports differs from one company to another, respectively from one period to another (**Table no. 3**). There is also an evolution over time in the size of these reports, which varies from 15 to 165 pages (**Table no. 3**).

Environmental aspects refer to the way in which a company addresses and manages the reduction of greenhouse gas (GHG) emissions, uses natural resources responsibly, protects biodiversity, adopts waste management policies.

Environmental hazards are common in industrial sectors. Companies that address these aspects, along with those related to renewable energy or waste reduction technologies, tend to have better financial results, primarily because they share such information with stakeholders.

Within the analyzed sample, there are companies that have been included in an ESG risk ranking, developed by Sustainalytics, namely Antibiotice SA and Farmaceutica Remedia SA (**Table no. 4**).

Table no. 4. ESG Ranking Scores Sustainalytics

Company	ESG risk Score	ESG Risk Ranking Score	Exposure	Management	Momentum
Antibiotice (2023)	22,2	28/443 top 7%	49	58,8	-2,2
Remedia (2021)	16,7	15/46 top 32%	23	28,9	-1,6
Remedia (2023)	14,7	N/A	N/A	N/A	N/A

Source: own projection, adapted from https://www.bvbresearch.ro/ReportDashboard/ESGScores

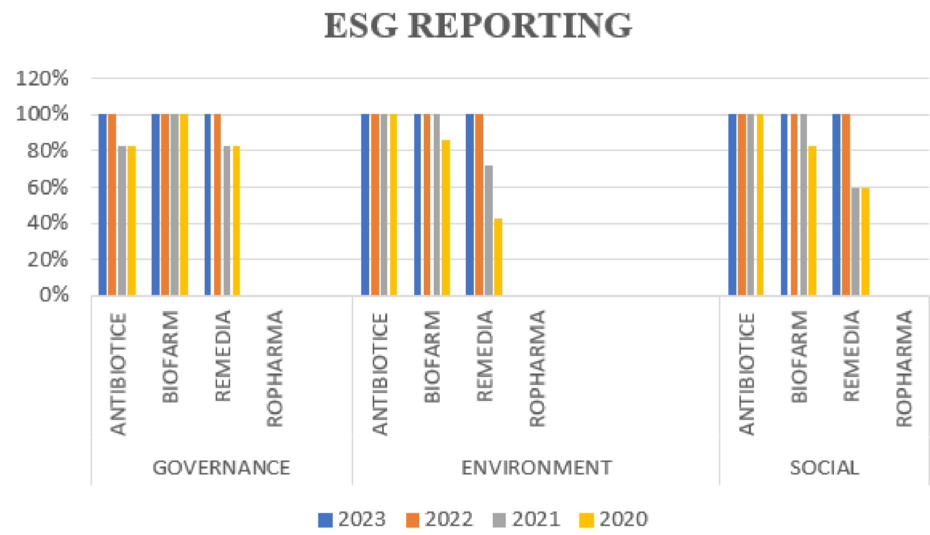
Social aspects address the company's relationship with employees and the community as a whole and include diversity within the organization, aspects related to human rights, gender equality, equity, working conditions, safety and security in the workplace, involvement in social responsibility actions and activities (**Figure no. 2**).

Companies involved in social aspects attract employees with ethical behavior, create deep connections in the communities in which they operate, mitigating labor conflicts and increasing efficiency.

Aspects of governance

Governance issues address the structures and practices of management and control within organizations, refer to transparency, ethics, board independence, risk management, compliance with legal regulations and conflicts of interest.

Figure no. 2. ESG Reporting



Source: own projection, based on reporting

To increase transparency and credibility with stakeholders, companies also complete the Comply or Explain Statement, in accordance with the provisions of the BVB.

Antibiotice SA company stands out for its good practices in complying with the BVB provisions on corporate governance reporting through the completion of the Comply or Explain Statement, reaching 100% for the first time in 2019. This is followed by the Biofarm SA company, which complied with these provisions, reaching the highest degree, with a compliance percentage of 88% in 2010, followed by Farmaceutica Remedia SA company which reached 98% in 2017. Ropharma complied with the BVB provisions, responding affirmatively to the requirements, in a proportion of 93% in 2023, 95% in 2022, compared to 93% in 2016, 91% in 2012 and 88% in 2011. The consistency in reporting corporate governance aspects through the Comply or Explain Statement is notable at Ropharma SA, and the largest oscillations at Farmaceutica Remedia SA, while the companies with the best practices are Antibiotice SA and Biofarm SA.

Conclusions

The results of the research on the particularities and requirements of the evolution of sustainability reporting in the Romanian pharmaceutical sector, although limited to one sector of activity and only to companies listed in the Premium category on the Bucharest Stock Exchange, which are considered a reporting model for other unlisted companies, demonstrate that in Romania companies do not offer a specific structure for non-financial reporting, the implementation of these reports being still in its early stages.

Transparency, comparability and efficient communication of both financial and non-financial information and sustainable development objectives are essential aspects for companies in any field of activity in the current context of awareness related to social impact, the environment and corporate governance, becoming part of the company's strategy, while also contributing to increasing credibility from the perspective of stakeholders.

Technological innovation through the use of artificial intelligence systems can contribute to an analysis of ESG reporting, by highlighting trends or comparative studies, as well as by creating strategies to improve reporting.

The opportunities for companies that integrate ESG into their business strategy are countless, this reporting method being a catalyst for innovation, financial performance and reputation.

In Romania, the challenge is the implementation of ESG by any company, being an opportunity to highlight the commitment to sustainability issues. In our country, this reporting has evolved, becoming mandatory from 2023 for a number of companies, such as listed and public interest companies. Companies from any sector of activity, regardless of their size, will be encouraged to prepare sustainability reports, highlighting social and corporate governance aspects, as well as the impact they have on the environment. This approach comes with both benefits, such as increased transparency, reputation, credibility, attracting new investments, and challenges related to the necessary infrastructure and specialization courses, data collection and analysis. The Bucharest Stock Exchange has published an ESG Reporting Guide in collaboration with the EBRD - European Bank for Reconstruction and Development.

The comparative analysis reveals a growing level of sustainability reporting for the companies analyzed. The research conducted can be useful for various stakeholders and can represent a starting point for future research directions.

By analyzing the leaders in the pharmaceutical industry, there were identified key aspects related to sustainability, noting the progress in reporting from one period to another in areas such as waste reduction or energy efficiency.

The current research presents certain limitations that can be addressed through future research directions, which may consider a larger sample of companies, both listed and unlisted, from various countries and sectors of activity, in order to be able to perform a comparative analysis by areas of activity and to have an exhaustive picture of sustainability practices and challenges existing at the international level.

Bibliography

1. Barei, F., Pen, C. Le, & Simoens, S. (2013). The generic pharmaceutical industry/:movingbeyondincremental innovation towards re-innovation. *Generics and Biosimilars Initiative Journal*, 2(1), 13-19
2. Broniewicz, E., Jastrzębska, E., & Lulewicz-Sas, A. (2024). Environmental disclosures according to ESRS in ESG reporting of selected banks in Poland. *Economics and Environment*, *88*(1), 719. https://doi.org/10.34659/eis.2024.88.1.719.3
3. Bunget, O., Dumitrescu, A., Burcă, V., Bogdan, O., & Şocaţiu, M. (2024). Comparative Analysis: Regarding the Sustainability Reporting Practice in Romania at the Level of Sustainability Reports. *Audit Financiar,* 22(4), 769-782, doi:https://doi.org/10.20869/AUDITF/2024/176/027
4. Chen, J.; Liu, L. (2020) Eco-efficiency and private firms' relationships with heterogeneous public stakeholders in China. *International Journal of Environmental Research and Public Health,* 17, 6983
5. Dalal, K.K.; Thaker, N. (2019) ESG and corporate financial performance: A panel study of Indian companies. *IUP J. Corp. Gov.*,18, 44-59.
6. Doni, F.; Bianchi-Martini, S.; Corvino, A.; Mazzoni, M. (2019) Voluntary Versus Mandatory Non-financial Disclosure: EU Directive 95/2014 and Sustainability Reporting Practices Based on Empirical Evidence from Italy. *Meditari Accountancy Research*,28, 781-802.
7. Duran, I.J.; Rodrigo, P. (2018) Why Do Firms in Emerging Markets Report? A Stakeholder Theory Approach to Study the Determinants of Non-Financial Disclosure in Latin America. *Sustainability*, 10, 3111.
8. López-Toro, A. A., Sánchez-Teba, E. M., Benítez-Márquez, M. D., & Rodríguez-Fernández, M. (2021). Influence of ESGC Indicators on Financial Performance of Listed Pharmaceutical Companies. *International Journal of Environmental Research and Public Health*, *18*(9), 4556. https://doi.org/10.3390/ijerph18094556.
9. Manes-Rossi, F.; Tiron-Tudor, A.; Nicolò, G.; Zanellato, G. (2018) Ensuring More Sustainable Reporting in Europe Using Non-Financial Disclosure - De Facto and De Jure Evidence. *Sustainability*, 10, 1162.
10. Mihaiu, D. M., Șerban, R.-A., Opreana, A., Tichindelean, M., Brătian, V., & Barbu, L. (2021). The impact of mergers and acquisitions and sustainability on company performance in the pharmaceutical sector. *Sustainability*, 13(11), 6252. https://doi.org/10.3390/su13126525
11. Min, M.; Desmoulins-Lebeault, F.; Esposito, M. (2017) Should pharmaceutical companies engage in corporate social responsibility? *Journal of Management Development*, 36, 58-70.

12. Nascimento Jucá, M., Domadenik Muren, P., Valentinčič, A., & Ichev, R. (2024). The impact of ESG controversies on the financial performance of firms: An analysis of industry and country clusters. *Borsa Istanbul Review*, 24 (3). https://www.elsevier.com/journals/borsa-istanbul review/2214-8450
13. Paolone, F.; Cucari, N.; Wu, J.; Tiscini, R. (2021) How do ESG pillars impact firms' marketing performance? A configurational analysis in the pharmaceutical sector. *Journal of Business and Industrial Marketing.* February
14. Raucci, D.; Tarquinio, L. (2020) Sustainability Performance Indicators and Non-Financial Information Reporting. Evidence from the Italian Case. *Administrative Sciences*, 10, 13
15. Reverte, C. (2009) Determinants of Corporate Social Responsibility Disclosure Ratings by Spanish Listed Firms. *Journal of Business Ethics*, 88, 351-366.).
16. Romolini, A.; Fissi, S.; Gori, E. (2017) Exploring Integrated Reporting Research: Results and Perspectives. *International Journal of Accounting & Finance. Review*, 7, 32-59.
17. Rodríguez-Fernández, M.; Sánchez-Teba, E.M.; López-Toro, A.A.; Borrego-Domínguez, S. (2019) Influence of ESGC indicators on financial performance of listed travel and leisure companies. *Sustainability*, 11, 5529.
18. Ruan, L.; Liu, H. (2021) Environmental, Social, Governance Activities and Firm Performance: Evidence from China. *Sustainability*, 13, 767.
19. Siew, R.Y.; Balatbat, M.C.; Carmichael, D.G. (2013) The relationship between sustainability practices and financial performance of construction companies. *Smart and Sustainable Built Environment*, 2, 6-27.
20. Simpson, S.N.Y, Otchere, F.A., Ahadzie, R., (2022). Assurance of environmental, social and governance disclosures in a developing country: perspectives of regulators and quasi-regulators*. Accounting Forum*, vol. 46(2), pp. 109-133, April.
21. Tarquinio, L.; Posadas, S.C.; Pedicone, D. (2020) Scoring Nonfinancial Information Reporting in Italian Listed Companies: A Comparison of before and after the Legislative Decree 254/2016. *Sustainability*, MDPI, 12(10), 1-22
22. Wirth, H.; Kulczycka, J.; Hausner, J.; Koński, M. (2016) Corporate Social Responsibility: Communication About Social and Environmental Disclosure by Large and Small Copper Mining Companies. *Resources Policy*, 49, 53-60.
23. United Nations. *The 17 Goals – Sustainable Development Goals*. Disponibil la: https://sdgs.un.org/goals
24. Velte, P. (2017) Does ESG performance have an impact on financial performance? Evidence from Germany. *Journal of Global Responsibility*, 8, 169-178
25. Venturelli, A.; Caputo, F.; Leopizzi, R.; Pizzi, S. (2018) The State of Art of Corporate Social Disclosure Before the Introduction of Non-financial Reporting Directive: A Cross Country Analysis. *Social. Responsibility Journal*, 15, 409-423.
26. Yoon, B.; Lee, J.H.; Byun, R. (2018) Does ESG performance enhance firm value? Evidence from Korea. *Sustainability*, MDPI, 10(10), 1-18.
27. www.bvb.ro
28. https://eur-lex.europa.eu/eli/dir/2013/34/oj
29. https://eur-lex.europa.eu/eli/dir/2014/95/oj
30. https://eur-lex.europa.eu/legal-content/RO/TXT/?uri=CELEX:32019R0815
31. https://eur-lex.europa.eu/eli/reg/2020/852/oj
32. https://eur-lex.europa.eu/legal-content/RO/TXT/?uri=CELEX%3A32021R2139
33. https://eur-lex.europa.eu/eli/reg_del/2021/2178/oj
34. https://eur-lex.europa.eu/eli/reg_del/2022/1214/oj
35. https://eur-lex.europa.eu/eli/dir/2022/2464/oj
36. https://eur-lex.europa.eu/legal-content/RO/TXT/HTML/?uri=OJ:L_202302772
37. https://eur-lex.europa.eu/legal-content/RO/TXT/?uri=OJ%3AL_202401760
38. https://kpmg.com/nl/en/home/topics/environmental-social-governance/corporate-sustainability-reporting-directive.html
39. https://www.bvbresearch.ro/ReportDashboard/ESGScores
40. www.antibiotice.ro
41. www.biofarm.ro
42. www.corporate.remedia.ro
43. www.ropharma.ro.

Audit Financiar, XXIII, Nr. 2(178)/**2025**, *388-399*
ISSN on-line: 1844-8801

Continuity of the Auditing Profession in the Context of Digitalization and Automation

Research assist. Cristian LUNGU, Ph.D. Student,
Faculty of Economics and Business Administration, West University of Timişoara, Romania,
e-mail: cristian.lungu00@e-uvt.ro

Univ. Prof. Ovidiu Constantin BUNGET, Ph.D.,
Faculty of Economics and Business Administration, West University of Timişoara, Romania,
e-mail: ovidiu.bunget@e-uvt.ro

Abstract

The rapid advancement of digitalization and automation is redefining the financial audit profession, profoundly influencing auditor practices and competencies. This paper aims to analyze the mechanisms by which the financial audit practice sustains its continuity and relevance amidst ongoing changes and transformations. Through a review of the specialized literature, this study identifies the main benefits and challenges generated by automation and digitalization to assess their impact on the relevance of the audit profession in the future. The main results emphasize that the continuity of the financial audit profession will depend on the ability of auditors to integrate emerging technologies strategically and ethically, ensuring a balance between human expertise and automation capabilities. This research contributes to a deeper understanding of the impact of automation and digitalization on financial audits, providing practitioners with relevant insights and guiding future research directions. At the same time, the results obtained support the maintenance and strengthening of high professional standards in the context of technological transformations.

Key words: *financial audit; digitalization; automation; audit profession;*

JEL Classification: *M41, M42*

To cite this article:
Lungu, C., Bunget, O. C. (2025), Continuity of the Auditing Profession in the Context of Digitalization and Automation, *Audit Financiar*, vol. XXIII, no. 2(178)/2025, pp.388-399, DOI: 10.20869/AUDITF/2025/178/012

To link this article:
http://dx.doi.org/10.20869/AUDITF/2025/178/012
Received: 24.01.2025
Revised: 4.02.2025
Accepted: 5.05.2025

Introduction

The financial audit profession is currently experiencing a significant and transformative evolution, driven by rapid advances in digitalization and automation, reshaping the field's landscape. These advances, characterized in particular by the incorporation and application of technologies such as artificial intelligence, sophisticated machine learning algorithms, and solutions that are fundamentally based on extensive data analytics, are fundamentally reconfiguring not only the traditional processes associated with auditing but also redefining the essential role and responsibilities of auditors in an increasingly interconnected and globalized economic environment (Alles, 2015; Cao *et al*., 2015). In this rapidly evolving context, the financial audit operation has surpassed its previous status as a simple static effort focused exclusively on confirming financial data; it is now evolving into a dynamic and multifaceted activity, fundamentally oriented towards the comprehensive analysis of complex data sets and the anticipation and proactive management of potential financial risks.

Advances in digitalization and automation present substantial opportunities that have the potential to significantly enhance both the efficiency and accuracy of audit-related activities, effectively helping to reduce errors, facilitating the early identification of inconsistencies in financial reports, and ultimately increasing the overall transparency of the audit process (Brazel *et al*., 2016; Grepp *et al*., 2018). However, it is imperative to recognize that this transition does not come without its own set of considerable challenges, which include the crucial need for professionals in the field to adapt to a rapidly evolving technological landscape, the need for continuous professional development and retraining of auditors to equip them with the necessary skills, and the critical task of managing the various risks that are inherently associated with the increasing reliance on technological solutions in the audit process (Yoon et al., 2015). In addition, the regulatory standards and ethical frameworks that govern the profession require continuous updating and re-evaluation to effectively keep pace with the rapid technological advances and their implications for the audit landscape (IAASB, 2020).

The main objective of this scientific article is to investigate and elucidate in detail the mechanisms by which the practice of financial auditing sustains its continuity and relevance amidst the ongoing changes and transformations occurring in both the economic and technological environments. Through a comprehensive examination encompassing both theoretical and practical dimensions, the article aims to analyze the impact that digitalization and automation are exerting on the audit profession, simultaneously highlighting the various opportunities that arise and the substantial challenges that need to be navigated in this evolving landscape. In this regard, the research emphasizes the critical importance of adopting a proactive strategy for integrating technology while firmly upholding and preserving the core fundamental values that are intrinsic to the profession, which include independence, objectivity, and integrity, as articulated in various scientific works and guidelines (Alles, 2015; IAASB, 2020).

The proposed research effort has been meticulously structured into five distinct and well-defined sections: starting with the initial section, which serves as an introduction, this segment effectively establishes the contextual framework in which the study operates and is subsequently followed by the second section, which meticulously highlights the theoretical foundations underlying the research, focusing in particular on the contemporary debates that are prevalent in the academic literature regarding the multifaceted impact of digitalization and automation on the professional landscape of financial auditing. The third section of the study is dedicated to presenting a comprehensive overview of the research methodology used, thus elucidating the complicated processes involved in conducting the literature review, while the fourth section is committed to delivering the research results, which graphically delineates and articulates the challenges and opportunities that have been triggered by the rapid technological advances impacting the financial auditing profession. Finally, the fifth section presents the results in a structured format that provides actionable recommendations and insights for both practitioners in the field and researchers interested in this pertinent area of study.

Specialized literature overview

The continuity of the financial audit profession in the context of digitalization and automation is marked by significant transformations driven by technological advances. Continuous audit and monitoring (CA/CM) programs, enabled by digital innovations such as artificial intelligence (AI) and robotic process automation (RPA), are increasingly being adopted in the public sector to provide real-time information and improve internal controls and risk management frameworks (Naoufal, 2024). The rapid pace of digitalization has revolutionized accounting and auditing, requiring adapting business models and creating opportunities and challenges, such as resistance to change and high upfront costs (Stoica & Feleaga, 2024). Digital maturity is essential for auditors, requiring continuous training in modern technologies to effectively manage audit processes and ensure comprehensive data analysis (Lazareva, 2024). The evolving nature of audit practices involves a redefinition of auditor competencies, emphasizing technological agility and continuous professional development to maintain the relevance and integrity of the profession (Leacadio *et al.*, 2024). AI and automation have shifted accounting from manual tasks to automated processes, increasing efficiency and allowing accountants to take on more strategic roles, thereby reshaping financial reporting and audit practices (Georgios & Kampiatios, 2024).

According to Haung (2023), the accounting profession is continuously undergoing a transformative process, requiring increased knowledge and skills among practitioners to address emerging technological challenges adequately. In a similar perspective, Kurt (2023) emphasizes that while the incorporation of artificial intelligence (AI) significantly alters accounting and auditing methodologies, the profession's fundamental essence remains unchanged. However, contemporary technological demands require acquiring skills such as data analysis, cybersecurity, and adaptability. Furthermore, his investigation elucidates the ability of AI to enhance operational efficiency and risk assessment while preserving the indispensable value of human judgment.

Budimir (2023) highlights the benefits of digitalization in the audit landscape, particularly in the areas of improved data management and increased process efficiency. Furthermore, the author states that continuous audit and procedural flexibility are critical components in the evolution of digital audit practices. In contrast, Angeles *et al.* (2023) raise awareness of the challenges inherent in digitalization, including a shortage of necessary skills, resistance to transformation, and concerns about data security.

Guevara (2024) outlines the potential dangers of excessive reliance on technology, such as information saturation, which can negatively affect critical assessment capabilities. In response to these challenges, the author advocates a phased approach to automation, the establishment of appropriate regulatory mechanisms, and ongoing oversight of automated systems. Nazarova *et al.* (2021) further emphasize the importance of digitalization in improving the effectiveness and competitiveness of audit processes, in addition to the imperative to improve the software used to meet modern requirements.

Grylitska (2022) examines the classification of information technologies and the development of audit software, highlighting the importance of digitalization as a key factor for achieving competitive advantage. However, the author identifies barriers that prevent the complete automation of processes. Demura & Kuvaldina (2024), highlight the role of human oversight, emphasizing that digital technologies can produce errors that only qualified professionals can identify and correct.

Furthermore, digitalization has a twofold impact on the audit profession. While automation may lead to the displacement of certain entry-level positions, it simultaneously creates new opportunities for professionals equipped with advanced digital skills. The literature emphasizes the importance of continuous learning and professional development to ensure that auditors remain relevant in a technology-driven landscape (Ruiter, 2017). Educational institutions play a critical role in this, as they need to prepare future auditors with the skills needed to navigate the complexities of modern audit practices (Ruiter, 2017).

In the context of accelerated technological transformations, the continuity of the financial audit profession is closely linked to the ability of auditors to adapt and integrate new technologies into their professional practices (Kwok *et al.* 2024). According to Mihaila *et al.* (2023), the financial audit profession faces significant challenges generated by digitalization and automation, including the high costs of information technologies and the lack of trust in automated systems. Research emphasizes that the success of the profession depends on the willingness of auditors to accept and adapt to change, indicating that professionals who embrace transformations will thrive, while those who resist risk becoming irrelevant. Complementarily, Fotoh & Lorentzon (2022) suggest that the transition to digital auditing can transform auditors' approaches, allowing them to respond more effectively to user expectations using digital tools that improve internal controls and fraud prevention.

The role of blockchain technology is also gaining attention in the literature as a transformative force in auditing. Blockchain provides a secure and transparent method for recording transactions, which can significantly increase the efficiency and reliability of financial audits. By using blockchain, auditors can ensure data integrity and compliance, thereby strengthening their role as trusted advisors in the financial reporting process (Safonova *et al.*, 2022).

Other scientific efforts, such as Schreuder & Smuts (2023) and Bejjar & Siala (2024), have demonstrated that automation, mainly focusing on the integration of emerging technologies such as Big Data analytics, artificial intelligence (AI), and blockchain technology in the audit execution phase, has led to substantial time savings and increased efficiency. Study participants reported that automation allows auditors to devote more time to exception investigation, opinion formation, and client engagement, thereby improving the quality of audit results and client relationships. The shift from sample testing to complete population testing through automated procedures has been highlighted as a key factor in improving the reliability and depth of audit opinions and judgments.

Although automation and digitalization have brought significant benefits to the financial audit profession, the literature also highlights the risks associated with business continuity. Kurnykina's (2023) study highlights that cyberattacks or technological failures can negatively affect the audit process, calling into question the accuracy and reliability of conclusions. In addition, auditors must manage risks associated with manipulating algorithms or lack of transparency in their operations (the so-called "black box effect").

Angeles *et al*. (2023) find that the intensive use of emerging technologies can lead to an overreliance on automated systems. This risks to diminish auditors' technical and professional judgment skills, which are essential for assessing complex situations that cannot be fully modeled by algorithms or artificial intelligence. Over time, this phenomenon can erode the traditional expertise that is the profession's foundation.

The automation of some tasks can lead to the perception that auditors contribute less to the decision-making process and that their professional value is diminished. This problem is exacerbated by the lack of a clear understanding of the auditor's role in interpreting and validating data generated by automated systems (Daidj, 2022).

Koske *et al*. (2022) argue that while the advent of digitalization raises concerns about the potential demise of the financial audit profession, technology is unlikely to eradicate the profession; instead, it will fundamentally change its characteristics. The research implies that the functions of professional accountants are set to shift towards activities focused on consulting and data analysis, thereby diminishing the emphasis on conventional accounting practices, which will consequently maintain their relevance in an increasingly dynamic economic environment.

The same researchers, Koske *et al.* (2021), in another scientific approach, analyzes perceptions regarding the impact of technological advances on the accounting profession, emphasizing that although digital transformation reconfigures the structure of activities and responsibilities of accounting professionals, there is no current evidence to suggest the disappearance of this profession or a significant reduction in demand on the labor market. Thus, the specialized literature indicates an adaptation of the profession rather than its replacement.

Research methodology

The research adopts a qualitative methodology, with a systematic review of the specialized literature as the primary data collection and analysis method. This approach was chosen because it provides a deep understanding of complex phenomena and allows the development of a solid theoretical framework grounded in the existing literature (Levy & Ellis, 2006).

The research methodology adopted in this study consists of a detailed analysis of the benefits and challenges generated by automation and digitalization, to assess their impact on the relevance of the auditing profession in the future.

The study was developed following several distinct stages. As shown in **Figure no. 1**, the first stage consisted of identifying relevant specialized literature. Given the analyzed topic, focused on emerging technologies, bibliographic references were collected using SciSpace, a modern platform based on artificial intelligence.

This platform facilitates collaboration between researchers, publishers, and institutions, automates repetitive tasks, and accelerates the process of information discovery. As a vast repository of scientific papers from all fields, SciSpace includes metadata for 200 million papers and is used by renowned institutions such as the Massachusetts Institute of Technology (MIT), Stanford University, the European Organization for Nuclear Research (CERN), as well as over 150 leading publishing companies (Turnitin, 2025).

The process of identifying relevant studies for the development of the first two stages of the research was structured according to a rigorous search strategy based on the following selection criteria:

1. **Keywords:** The search was conducted using specific terms such as "financial audit," "audit profession," "continuity," "artificial intelligence," "emerging technologies," "automation," and "digitalization" to accurately reflect the central theme of the study.
2. **Temporal criterion:** To ensure the timeliness and relevance of the conclusions, only works published in the last 10 years were included in the analysis.
3. **Relevance criterion:** The studies were selected based on the degree to which they address topics related to the impact of automation and digitalization on the audit profession, contributing to the research objectives.
4. **Type of publication:** Articles published in scientific journals, books, and book chapters were considered, as these are recognized as high-quality academic sources.

Figure no. 1. Research methodology

Source: own processing

Stages 2 and 3 of the research were developed as a table that identified and summarized the challenges and benefits associated with automation and digitalization. In addition, our approach allowed concluding the impact of these factors on the relevance of the audit profession in the near future. Based on the data summarized in the summary table, in the last stage of this scientific approach, conclusions were drawn regarding the technological implications for the future of the audit profession.

Research results

This study provides a synthesis of the challenges and benefits associated with automation and digitalization in the financial audit profession based on a review of the specialized literature. At the same time, as presented in Table no. 1, each author's perspectives on the relevance of the financial audit profession in the near future are identified based on these advantages and disadvantages.

Table no. 1. Summary of the challenges and benefits of automation and digitalization on the continuity of the financial auditing profession

Authors	Benefits	Challenges	Relevance of the profession in the future
(Naoufal, 2024)	• Optimize repetitive tasks.; • Improves workflows.	Complex process regarding the implementation of continuous audit programs (CA).	Findings suggest that the audit profession will adapt and remain relevant in the future.
(Stoica & Feleaga, 2024)	It will improve the overall effectiveness of accounting and auditing practices.	• Employee resistance to change; • High costs.	The profession will remain relevant as companies adapt to technological advances.

Authors	Benefits	Challenges	Relevance of the profession in the future
(Lazareva, 2024)	• Helps process large volumes of reporting data; • Improves the completeness of audits.	• New requirements for professional skills; • The need for continuous training.	The auditing profession is expected to remain relevant due to the increasing demands for professional skills closely linked to technological mastery.
(Leacadio, *et al.*, 2024)	Reduces the potential for human error.	• New requirements for professional skills; • The need for continuous training.	The future of the audit profession will be shaped by the need for auditors to strengthen their professional competencies in response to innovative audit practices.
(Georgios & Kampiatios, 2024)	• Significantly reduce the time required for audit tasks; • Minimizing human errors.	• The need for extensive training and skills development for auditors; • High costs.	Continuing professional education and training in emerging technologies will enable auditors to adapt and thrive in a technology-driven environment.
(Budimir, 2023)	• Increases audit quality and efficiency; • Improved communication between auditors and clients.	• New requirements for professional skills.	The profession may see a shift in services, with a decrease in traditional accounting and auditing tasks and an increase in consulting services.
(Angeles *et al.*, 2023)	• Provides a competitive advantage over other companies; • Improves auditor competence, allowing for better planning and execution of audits.	• Resistance to change; • Lack of skills and resources.	Findings suggest that the audit profession will continue to be valuable and necessary as it embraces digital advances.
(Guevara, 2024)	Improves accuracy in error detection.	Excessive dependence on technology can impair critical judgment.	Auditors must acquire new technological skills, indicating that their role will evolve rather than diminish.
(Kurnykina, 2023)	• Streamlining processes and reducing manual tasks; • Automation can lead to cost savings by reducing time.	Resistance to change.	The profession will continue to be relevant as it adapts to the demands of a digitalized economy.
(Pargmann *et al.*, 2023)	• Cost savings by streamlining workflows; • Minimizing human errors.	Lack of digital skills	Overall, while the audit profession will continue to be helpful, it will require adaptation to new technologies and processes to maintain its relevance in the future.
(Kwok *et al.*, 2024)	• Ensures quality in professional judgments.	Balancing digital audit methods is a challenge.	The auditing profession is expected to remain helpful in the future, especially in the e-commerce industry.
(Nazarova *et al.*, 2024)	• Processing large volumes of data; • Improves communication with customers.	• Resistance to change; • Lack of skills and resources.	The demand for higher-quality audits will drive the need for qualified auditors who can adapt to new technologies and methodologies.

Authors	Benefits	Challenges	Relevance of the profession in the future
(Grylitska, 2022)	• Increases the efficiency of audit processes; • Provides a competitive advantage for audit firms in the market.	Lack of digital skills.	Auditors must adapt to using advanced software that meets modern requirements to remain competitive in the audit services market.
(Demura & Kuvaldina, 2024)	Reducing the number of errors in documentation.	Job losses.	Experts believe that while artificial intelligence can assist with audit tasks, it cannot fully replace the need for human auditors who can interpret and analyze data.
(Haung, 2023)	• Reduction of manual tasks; • Enable real-time data analysis, allowing auditors to provide timely insights and recommendations.	New requirements for professional skills.	The future of the audit profession will be influenced by continuous technological changes and the digitalization of business practices.
(Koske *et al.*, 2022)	• Optimization of routine tasks; • Allows for real-time data processing, leading to faster decision-making and audits.	Lack of digital skills.	The profession can adapt by expanding into new areas, such as data analysis and consulting services, which are increasingly in demand.
(Fotoh & Lorentzon, 2022)	• Automation and digitalization in the audit profession can lead to lower costs for audit firms; • Can prevent and detect fraud, thus reducing the expectation gap.	Data security threats.	The audit profession is expected to remain relevant in the future due to the transition from traditional to digital audits.
(Ruiter, 2017)	Increases audit quality and efficiency.	• The need for extensive training and skills development for auditors; • High costs.	The audit profession is expected to remain relevant in the future due to digitalization's significant positive impact on audit quality.
(Mihaila *et al.*, 2023)	• Can increase the overall productivity of professionals; • Significantly reduce the time required for routine tasks.	There is a need for extensive training and skills development for auditors.	Auditors must adapt to new technologies to remain relevant and effective in their roles.
(Koske, *et al.*, 2021)	It can improve the accuracy and reliability of financial data, which is crucial for an efficient audit.	New requirements for professional skills.	• The demand for auditors in the labor market is not expected to decrease significantly; • The profession will evolve, requiring adaptation to new technologies and changes in business management practices.

Source: Own processing

Based on the cited sources, a clear trend towards fundamental transformation of audit processes is highlighted, with significant implications for the relevance and continuity of the profession in the future.

One of the predominant aspects identified in the specialized literature is the **streamlining of audit processes**, which contributes to reducing repetitive tasks and optimizing workflows (Naoufal, 2024; Budimir, 2023). This operational efficiency not only allows for a more strategic allocation of resources but also facilitates greater accuracy and reliability of financial data (Lazareva, 2024; Kwok et al., 2024).

Another significant benefit highlighted is the **increase in audit quality** through the use of advanced technologies for error and fraud detection (Fotoh & Lorentzon, 2022; Guevara, 2024). Digital technologies allow for more exhaustive analysis of large volumes of data and more efficient communication between auditors and clients (Nazarova et al., 2024), thus improving the decision-making process and contributing to greater transparency.

Automation also provides a **competitive advantage** to audit firms, allowing for better planning and execution of audit activities (Angeles et al., 2023). The ability to provide faster and more accurate services is a key factor in maintaining competitiveness in the market.

However, the table also highlights several significant challenges that may affect the adoption of digital technologies in auditing. Among these, employee **resistance to change** is a significant obstacle (Stoica & Feleaga, 2024; Kurnykina, 2023). Adapting to new technologies requires a change in mindset and an openness to continuous learning, which can generate reluctance among professionals.

Another critical challenge is **digital skills and continuous training** (Leacadio et al., 2024; Mihaila et al., 2023). The emergence of new professional requirements requires constant retraining of auditors to understand and effectively use new technological tools. The lack of these skills can lead to a significant gap between audit firms that adopt technology and those that remain with traditional methods.

High implementation costs are also a constraint (Georgios & Kampiatios, 2024; Demura & Kuvaldina, 2024). The necessary investments in technological infrastructure and training programs can represent a barrier for smaller firms, thus limiting access to the benefits of digitalization.

In addition, excessive reliance on technology may threaten **the critical professional judgment** of auditors, who must balance the use of digital tools with human expertise and experience (Guevara, 2024).

Thus, it is found that the academic environment reflects a diversity of opinions regarding the future of the auditing profession, significantly influenced by emerging technological advances. In this context, **Table no. 2** provides a detailed classification of the determinants of the continuity of the auditing profession, structured into distinct categories, highlighting both the challenges and the associated benefits. This synthesis contributes to a deeper understanding of how digital technologies influence auditing practice, facilitating the identification of adaptation strategies necessary to ensure the relevance and sustainability of the profession in the context of current transformations.

Table no. 2. Summary of the challenges and benefits of automation and digitalization on the continuity of financial auditor profession, classified into distinct categories

Category	Challenges	Benefits	Perspective on the continuity of the profession
Technology	The rapid adoption of new technologies, high implementation costs, cybersecurity risks.	Increased operational efficiency, rapid access to data, improved audit quality through advanced data analytics.	Technology supports the evolution of the profession but requires constant adaptability.
Professional	The need to develop digital skills; fear of replacing auditors with technology.	Automate repetitive tasks; allow you to focus on strategic and value-added activities.	Auditors need to improve their skills to remain relevant.
Regulation	Adapting to ever-changing regulations; integrating compliance requirements into digital solutions.	Increasing transparency and traceability of audit activities.	Regulations can positively influence the adoption of technologies while maintaining the profession's integrity.

Category	Challenges	Benefits	Perspective on the continuity of the profession
Ethics	Privacy and data protection; ethical dilemmas regarding the use of artificial intelligence.	Reducing human error and increasing objectivity and confidence in the audit process.	Adopting sound ethical frameworks is essential for maintaining the credibility of the profession.
Economic	Transition and training costs; limited access to technological resources for small and medium-sized businesses.	Reducing long-term operational costs, increasing productivity, and optimizing resources.	Professionals must find adaptive solutions to remain competitive.
Social	Resistance to change; impact on jobs and redistribution of auditor roles.	Creating new career opportunities, emphasizing the strategic role of auditors.	The profession requires reconfiguration of skills and roles to adapt.
Innovative	The rapid pace of innovation and risks associated with the insufficiently tested implementation of new solutions.	Providing more complex and personalized audit services, improving fraud detection capacity.	Innovation is essential for the sustainability of the profession, requiring continuous investment.

Source: own processing

The analysis presented in **Table no. 2** highlights the significant impact of automation and digitalization on the financial audit profession, delineating the main challenges and benefits associated with this transformational process. Overall, automation and digitalization contribute to improving the efficiency and transparency of audit activities, but they also involve a series of obstacles that require a strategic approach to ensure the continuity of the profession.

1. **Technological and professional challenges**. The rapid adoption of emerging technologies, such as artificial intelligence and advanced data analytics, poses challenges in terms of high implementation costs and the need for continuous training for auditors (Aksoy & Gurol, 2021). This requires transitioning from traditional competencies to an expanded set of digital skills, allowing auditors to manage complex tools and large volumes of data. Also, the perception of auditors being replaced by technology remains a psychological and professional challenge, requiring professional retraining strategies.
2. **Regulation and ethics**. Another critical aspect highlighted in the analysis is the constantly changing regulatory requirements and the ethical implications of using digital technologies. Adapting to new compliance standards and ensuring data protection and confidentiality are essential factors for maintaining trust in the audit profession (Brender & Gauthier, 2021). Ethical dilemmas arise primarily in the use of artificial intelligence, where transparency and decision-making responsibility become imperative to avoid possible harm.
3. **Economic and social impact**. From an economic perspective, automation and digitalization can lead to significant reductions in operational costs and resource optimization, but the transition process can be complicated for small and medium-sized entities with limited resources (Ogunshile, 2018). At a social level, resistance to change and fears about the impact of technology on jobs represent major challenges, requiring initiatives to integrate new professional roles and redefine the duties of auditors.
4. **Innovation dimension**. Continuous innovation in the audit field opens up significant opportunities for personalizing services and improving risk and fraud detection (Marques, 2021). However, the accelerated pace of technological progress requires constant investment in research and development to maintain professional relevance and adapt to new market demands.

Therefore, the automation and digitalization of the financial audit profession generate a balance between the identified challenges and benefits. On the one hand, technology offers substantial opportunities to increase audit efficiency and accuracy, but on the other hand, it implies profound changes at the professional, organizational, and social levels. The continuity of the audit profession depends crucially on the ability to adapt to new technological realities, the development of digital skills, and the assurance of compliance with ethical standards and regulations in force (Kazakova & Brovkina, 2020).

Conclusions

Digitalization and automation have become defining factors in the evolution of the financial audit profession, reshaping traditional processes and significantly contributing to increasing the efficiency and accuracy of audit activities. Based on the analysis performed, it can be concluded that although the transition to a digitalized environment brings multiple benefits, such as optimizing workflows, reducing human errors, and improving data analysis capacity, it comes with a series of challenges that cannot be ignored.

Resistance to change, high costs associated with the implementation of advanced technologies, and the need for continuous development of professional skills are essential factors influencing the ability of auditors to adapt to new requirements. In this context, it becomes imperative to adopt a proactive approach on the part of professionals in the field, through which they improve their digital skills and capitalize on the opportunities offered by new technologies, thus maintaining the high standards of quality and trust specific to the financial audit profession (Erkuş & Taşar, 2022).

In the future, the continuity of the financial audit profession will depend on auditors' ability to integrate emerging technologies strategically and ethically, ensuring a balance between human expertise and automation capabilities (Carpenter & McGregor, 2020). As audit processes become increasingly digitalized, auditors must redefine their role, focusing on interpreting complex data and providing value-added advisory services.

Thus, despite the challenges, the financial audit profession will not only maintain its relevance in the digital economy but has the potential to strengthen and evolve through a harmonious combination of technological innovation and advanced human skills (Sever Mališ et al., 2021).

References

1. Aksoy, T., & Gurol, B. (2021). Auditing Ecosystem and Strategic Accounting in the Digital Era. In T. Aksoy, & U. Hacioglu, *Artificial Intelligence in Computer-Aided Auditing Techniques and Technologies (CAATTs) and an Application Proposal for Auditors* (pp. 361-384). Chicago: Springer.
2. Alles, M. (2015). Drivers of the use and facilitators and obstacles of the evolution of Big Data by the audit profession. *Accounting Horizons, 29*(2), 439-449.
3. Angeles, E., Mabazza, G., Pascua, A., Salta, K., Zedric, J., Marquez, J., & Catacun, K. (2023). Shift to Digital Audit: A Study Investigating the Benefits and Challenges of Digitalization on the Audit Profession. *Asian Journal of Management Analytics, 2*(4), 415-440.
4. Bejjar, M., & Siala, Y. (2024). The Impact of Blockchain Technology on the Financial Audit. *In book: Impact of Digitalization on Reporting, Tax Avoidance, Accounting, and Green Finance*, 272-300.
5. Brazel, J., Jackson, S., Schaefer, T., & Stewart, B. (2016). The outcome effect and professional skepticism. *The Accounting Review, 89*(2), 602-623.
6. Brender, N., & Gauthier, M. (2021). How do the current auditing standards fit the emergent use of blockchain? *Managerial Auditing Journal, 36*(3), 365-385.
7. Budimir, N. (2023). Revision and digitalization. *Revizor, 26*(102), 95-111.
8. Cao, M., Chychyla, R., & Stewart, T. (2015). Big data analytics in financial statement audits. *Accounting Horizons, 35*(1), 147-168.
9. Carpenter, R., & McGregor, D. (2020). The implications, applications, and benefits of emerging technologies in audit. *The Business and Management Review, 11*(2), 36-44.
10. Daidj, N. (2022). The Digital Transformation of Auditing and the Evolution of the Internal Audit. *Routledge*.
11. Demura, E., & Kuvaldina, T. (2024). Accounting profession and digital technologies: threats and reality. *Sibirskaâ finansovaâ škola, 1*(1), 92-97.
12. Erkuş, H., & Taşar, A. (2022). THE ADAPTATION OF INDEPENDENT AUDIT PROFESSION TO THE

DIGITAL ERA. *İnönü Üniversitesi Uluslararası Sosyal Bilimler Dergisi, 11*(2), 479-565.

13. Fotoh, L., & Lorentzon, J. (2022). Audit digitalization and its consequences on the audit expectation gap: A critical perspective. *Accounting Horizons, 37*(1), 43-69.
14. Georgios, L., & Kampiatios, G. (2024). Transformation in Accounting Practices. *Technium Business and Management, 10*, 1-16.
15. Grepp, A., Linnenluecke, M., O'Neill, T., & Smith, T. (2018). Big Data and management research: Framework, challenges, and opportunities. *Journal of Accounting Literature, 40*, 102-115.
16. Grylitska, A. (2022). The digital audit as a key element of ukraine`s way out from covid-19. *Journal of International Legal Communication, 7*(4), 5-12.
17. uevara, R. (2024). Impacto de la Automatización en la Auditoría: Ventajas y Desafíos. *Zambos, 3*(1), 30-43.
18. Haung, Z. (2023). Impact of Digitalization on the Accounting Profession. *Contributions to Finance and Accounting*, 19-34.
19. IAASB. (2020). Technology: A focus on audit quality. International Auditing and Assurance Standards Board (IAASB). Retrieved from https://www.iaasb.org
20. Kazakova, N., & Brovkina, N. (2020). ASSESSMENT OF THE COMPETENCIES AND PROFESSIONAL SKILLS OF AN AUDITOR IN THE DIGITAL ENVIRONMENT: THE MOST SIGNIFI CANT ASPECTS OF THE USE OF INFORMATION TECHNOLOGY IN AUDIT. *Theory and Practice of audit, 6*(8), 20-24.
21. Koske, M., Mishuchkova, Y., & Voyutskaya, I. (2021). Prospects of Professional Activity of Accountants in the Conditions of Digital Transformation of Accounting. *Auditor, 7*(7), 49-56.
22. Koske, M., Voyutskaya, I., & Mishuchkova, Y. (2022). Transformation of the accounting profession: a review of current trends and prospects. *Intellect. Innovations. Investments, 1*(5), 37-46.
23. Kurnykina, O. (2023). Audit in the Context of Digitalization: Problems and Prospects. *Auditor (Infra-M Academic Publishing House), 9*(5), 8-14.
24. Kurt, Y. (2023). Digital Transformation in Accounting and Auditing: Insights from The ChatGPT. *Iğdır University Journal of Economics and Administrative Sciences, 1*(10), 11-12.
25. Kwok, S., Omran, M., & Yu, P. (2024). Audit Digitalization, Do-Calculus, and Professional Judgment. *Advances in finance, accounting, and economics*, 1-25.
26. Lazareva, N. (2024). Innovative technologies for growing digital maturity in auditors. *Vestnik Univ, 8*, 34-40.
27. Leacadio, D., Malheiro, L., & Reis, J. (2024). Auditors in the digital age: a systematic literature review . *Digital Transformation and Society*.
28. Levy, Y., & Ellis, T. (2006). A Systems Approach to Conduct an Effective Literature Review in Support of Information Systems Research. *International Journal of an Emerging Transdiscipline, 9*, 181-212.
29. Margarita, F., Safonova, T., & Kisilevich, I. (2022). Transformation of information and analytical audit support during the digitalization of economic and accounting systems. *International accounting, 25*(7), 780-805.
30. Marques, R. (2021). Continuous Assurance as Digital Transformation Enabler of Audit, Risk Management, and Business Compliance. In M. Khosrow-Pour, *Encyclopedia of Organizational Knowledge, Administration, and Technology* (pp. 392-405). New York: IGI-Global.
31. Mihaila, S., Badicu, G., & Codrean, V. (2023). Evolving Aspects Regarding the Accounting Profession in the Context of Digitalization: An Imperative of the 21st Century. *Economica, 4*(122), 44-61.
32. Naoufal, G. (2024). *Continuous auditing/continuous monitoring* (Vol. 1). Boca Raton: Taylorfrancis.
33. Nazarova, K., Nezhyva, M., Hotsuliak, V., Novika, N., & Fedorenko, O. (2021). Digital Audit as an Imperative for Ukraine's Way out From the COVID-crisis and a Tool to Increase the Competitveness of the State. *EDP Sciences, 100*.
34. Ogunshile, E. (2018). Developing a power efficient private cloud ready infrastructure for small-medium sized enterprises. *International Conference on Cloud Computing and Services Science* (pp. 299-309). Funchal: ScitePress.
35. Pargmann, J., Riebenbauer, E., & Berding, F. (2023). Digitalisation in accounting: a systematic literature review of activities and implications for competences. *Empirical Research in Vocational Education and Training, 15*(1), 1-37.

36. Ruiter, B. (2017). Towards a continuous auditing philosophy. *PWC*, 1-64.
37. Schreuder, A., & Smuts, H. (2023). Audit Digitalization - Key Impacts on the Audit Profession. *IntechOpen*, 1-24.
38. Sever Mališ, S., Žager, L., & Brozović, M. (2021). The Future of Audit in Light of Technological Changes: Opportunities and Threats. In I. Boitan, & K. Marchewka-Bartkowiak, *Fostering Innovation and Competitiveness With FinTech, RegTech, and SupTech* (pp. 1-22). IGI Global.
39. Stoica, O., & Feleaga, L. (2024). A Qualitative Approach Regarding the Impact of Digitalization and Automation on the Accounting and Auditing Profession. *Audit Financiar, 22*(176), 742-757.
40. Turnitin. (2025, 01 07). *SciSpace*. Retrieved from www.turnitin.co.uk: https://www.turnitin.co.uk/partners/directory/scispace
41. Yoon, K., Hoogduin, L., & Zhang, L. (2015). Big Data as complementary audit evidence. *Accounting Horizons, 29*(2), 431-438

Audit Financiar, XXIII, Nr. 2(178)/**2025**, *400-411*
ISSN on-line: 1844-8801

Research Trends on Related Party Transactions and their Reporting

Lioara-Veronica PASC, Ph. D.,
West University of Timisoara, Romania,
e-mail: lioara.pasc73@e-uvt.ro

Univ. Prof. Camelia-Daniela HAȚEGAN, Ph. D.,
East European Center for Research in Economics and Business, West University of Timisoara, Romania
e-mail: camelia.hategan@e-uvt.ro

Abstract

Related party transactions have implications for financial and tax reporting, as well as for financial auditing. The objective of the paper is to identify trends and approaches in the field of related party transactions, as well as authors who have had an impact in the analyzed field. The research methodology is based on bibliometric analysis of data downloaded from Web of Science – Clarivate Analytics, for the period 2000–2022. The selected keywords were "related-party-transactions", "audit", "risk", which led to a sample of 325 papers published in English. The data were processed using the Rstudio Biblioshiny software. The results show that since 2017 the number of papers has increased considerably, and most of the papers were written in journals mainly in the field of finance, with most of the authors being affiliated with institutions in China. It was found that there was an almost constant research interest between related party transactions, performance and firm value, highlighting a new direction of interest, that of the risks associated with these types of transactions. Thus, the topic studied has been in the attention of regulatory bodies, professionals, but also of business researchers, each approaching the subject from different perspectives.

Key words: *related parties; transactions; audit; risk; transfer pricing;*

JEL Classification*: M40, M41*

To cite this article:
Pasc, L.-V., Hațegan, C.-D. (2025), Research Trends on Related Party Transactions and their Reporting, *Audit Financiar*, vol. XXIII, no. 2(178)/2025, pp.400-411,
DOI: 10.20869/AUDITF/2025/178/013

To link this article:
http://dx.doi.org/10.20869/AUDITF/2025/178/013
Received: 22.02.2025
Revised: 14.03.2025
Accepted: 8.05.2025

Introduction

Related party transactions (RPT) are separately reported from both an accounting and tax perspective. Thus, the flow and balance of these transactions are presented in the annual or periodic financial statements as well as in the tax returns prepared by companies, based on the reporting requirements of each country. At the international level, the OECD is the organization that strictly regulates these types of transactions and their effects (OECD, 2022). Failure to comply with the provisions regarding the reporting and reporting of related party transactions leads to some risks that can be seen as an effect of uncertainty on business objectives and which have been analyzed in the works published by various authors as external risks, operational risks, financial risks, transactional risks, accidental risks, audit risk, tax risk. In this context, the topic addressed regarding the risks in identifying, highlighting and reporting related party transactions is of particular importance both for shareholders, persons responsible for governance, and for other categories of reporting users, namely state institutions, financial institutions, employees, business partners and other interested persons. The topic is also of interest both in the academic field and in the financial-accounting profession.

The objective of the paper is to identify existing research trends over a 20-year time horizon regarding related party transactions and their reporting. To achieve the objective, papers published in journals indexed in Web of Science – Clarivate Analytics were selected, the selection criterion being according to the keywords expressed in English "related-party-transactions", "audit", "risk". Thus, the sample highlighted a number of 325 works from various document genres, with works published between 2000 and 2022 being selected. Rstudio software was used for data processing in order to identify relationships between keywords used in the literature, as well as between authors and citations of their works.

The work can be useful from both a theoretical and practical point of view. From a theoretical point of view, it aims to identify the main research topics related to transactions that arise between affiliated parties, transactions that can directly or indirectly influence the financial result of the companies in the group. From a practical point of view, the correct reporting of these transactions in the content of individual or consolidated financial statements is necessary to inform users, having significant implications also on the activity of financial auditors. Thus, the topic studied is in the attention of regulatory and professional bodies, as well as business researchers, each of whom can approach the subject from different perspectives.

The paper is structured in sections, as follows: in section 1 the literature in the field is presented, after which section 2 describes the methodology used. In section 3 the results obtained are presented, in graphical, tabular and descriptive form, as well as discussions regarding their interpretation based on the existing literature. The paper ends with the section of conclusions drawn, research limits and future directions for further study.

1. Literature Review

Related parties have, within their relationships, the ability to carry out transactions that they would not otherwise be able to complete independently. This is where the importance of financial reporting regulations comes in, which have, among other things, the objective of ensuring that the financial statements of related parties are not distorted by the erroneous presentation of transactions between them. This is where the role of independent auditors comes in, who carry out their work in an objective and impartial manner, to ensure that transactions with related parties are properly treated from an accounting point of view and that the financial information presented is credible and relevant to their users.

Alm & Liu (2018) believe that a person pays taxes because they are afraid of being caught and penalized if they don't report all their income. Therefore, the approach gives the plausible and productive result that compliance depends on the audit and the level of the fine. Indeed, the central point of this approach is that a person pays taxes because of – and only because of – this fear of being detected and punished. This situation can be extrapolated to companies.

Regarding the manipulation of financial results by using transactions with related parties to overstate income, understate expenses or transfer profits to entities that benefit from lower taxes, Stefan & Mutulescu (2016) identified the tax risk of these types of transactions, given that the transfer prices practiced do not respect the “fairness” principle since, in the event of a tax audit by the authorities, adjustments for tax purposes may be imposed, both on income and on the expenses included in its calculation. According to Lohse and Riedel (2012), advance pricing agreements (APAs) reduce the risk of double taxation and lead to greater certainty in international trade. If transaction prices are not established according to the arm's length principle, there are risks of readjustment of taxable bases, tax sanctions for non-compliance with regulations.

Difficulties may also arise in identifying related parties. Ignat & Feleagă (2019) identified that from the point of view of the relationship between related party transactions and corporate governance risk in Romania, transactions between related parties are prone to misuse by management. On the other hand, the governance mechanism of the group has an effect on the value of companies (Abdul Rasheed et al., 2023).

Masking of debts or obligations by omitting the recording and reporting of transactions in the financial statements for various reasons or masking of obligations to affiliated parties to improve financial indicators are not easily identified by auditors, requiring closer examination. Furthermore, the only source of information for auditors about RPTs is the audited entity's management, and internal controls cannot easily track RPTs, which can create major difficulties in auditing related party transactions. Beasley et al. (2000) found that RPTs are among the top ten audit deficiencies and concluded that auditors are often unaware of RPTs or appear to be cooperative with the client's decision to conceal a related party transaction. They also showed that impaired auditor independence was a factor in 50% of cases where RPTs were cited as a major audit deficiency. Perhaps not surprisingly, and yes, to minimize the likelihood of detection, the synthesis of research on RPTs by Gordon et al. (2007) suggested that companies that use RPTs for fraudulent purposes are more likely to hire the services of auditors with whom they already have a relationship.

Lupu et al. (2024) consider that transfer pricing is also a benchmark in the audit activity carried out at the company level since compliance or not with the market value principle directly influences the reflection of the elements of income, expenses, result, assets, equity or liabilities in accordance with the principle of a true and fair view, as well as, ultimately, the audit opinion. Also, Ştefan & Mutulescu (2016) consider that the transfer pricing file does not implicitly determine that the transactions analyzed within it are correctly valued and as a result it must be established whether it is relevant and adequate as audit evidence.

The legislation requires the reporting and disclosure of transactions with affiliated parties, and failure to comply with these requirements may attract sanctions and reputational damage. Abdul Rasheed et al. (2021) tested an econometric model through which they measured the impact of the new RPT regulations adopted in India, (aligned with international regulations) on the relationship between RPT and audit fee and its result shows a positive interaction effect demonstrating that the new RPT regulations increase the complexity of auditing RPTs.

The findings of the aforementioned studies indicate that, in some cases, auditors may be unaware of the risks associated with related party transactions or may underestimate the challenges and associated risks. However, from a regulatory and supervisory perspective, the link between related party transactions and audit risk has become clearer in recent years.

Based on the literature, the research question is:

Which were the most cited articles, most cited authors and journals regarding related party transactions and which were the research trends on this topic?

2. Methodology

To achieve the proposed objective, namely to identify trends and approaches in the field of related party transactions, as well as authors who have had an impact in the analyzed field, the research methodology is based on bibliometric analysis. This is a research method that involves the evaluation and quantitative analysis of scientific production, publications, with the aim of identifying trends, relationships, main directions of research and collaboration as well as the desire to evaluate the impact of works already published in the field of study.

The method allows the development of studies that recognize the current state of research and identify opportunities for future studies, through different approaches, such as the analysis of the influence of journals, authors, articles, keywords and contribution per country (Fulop, 2022).

The bibliometric analysis was based on data downloaded from Web of Science (WoS) – Clarivate Analytics on July 27, 2023, for the period 2000-2022. To identify papers that addressed the topic of related-party transactions, groups containing the keywords "related-party-transactions"-

"audit"-"risk" were taken into account. The sample highlighted a number of 325 papers from various document genres for the period 1997-2022. Papers published in the period 2000-2022 were selected. It was decided that the sample of papers would be limited to those published in English. The final sample is represented by 325 papers, 640 authors and 189 sources. R Studio software was used to process the data to identify relationships between keywords used in the literature, as well as between authors and citations of their works.

The Bibliometrix package in the software allowed the import of the library of data collected from the Web of Science (WoS), their selection and analysis.

The main steps followed in the bibliometric analysis with RStudio consisted of:

Step 1 - installation and loading of the packages. The data sample was saved as a text file and was corrected through a library file to reduce similar terms or to eliminate unnecessary ones.

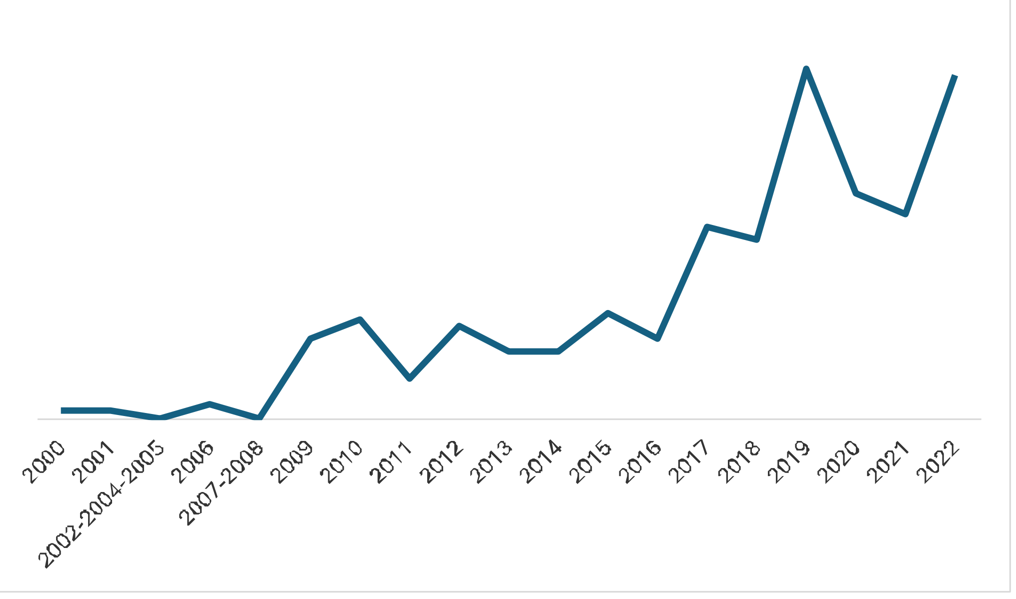
Step 2 - data import; their processing and summarization. The final file thus modified was subsequently processed using the Rstudio software, providing various results from the geographical area, affiliation to an educational institution, the most frequently used words, the most cited authors, the most productive and the list goes on.

Step 3 - viewing bibliometric data in tables as presented in this article, namely: Evolution of published articles by year, Distribution of authors by country, Distribution of published articles by country, citations and average citations per article, Top authors with at least 100 citations, Distribution of works by publications, Performance indicators of articles by sources, Top research directions, Content of word clusters, Articles with over 100 citations.

3. Results

Between the years 2000-2022 included in the sample, 325 papers were detected that met the selection criteria. The evolution of published articles can be divided as follows: the period between 2000-2008, when a maximum of two papers were published per year, the period starting with 2009, when between 10 and 16 papers were published each year, on an upward trend; and starting with 2017, the interest in this topic becomes evident, as the number of papers increases considerably, from 29 papers published in 2017 to 53 papers published in 2019, respectively 52 papers in 2022 (**Figure no. 1**).

Figure no. 1. Evolution of published articles over the years



Source: own processing with Rstudio_Biblioshiny

Figure no. 1 shows an upward trend in published articles during the analyzed period, with an explosive growth in 2019 when published articles reached a maximum number of 53.

The small number of papers published in the early years may be due to the lack of interest of the business environment in related party transactions, due to the lack of legislative regulations and the increase in this interest through the emergence of stricter legislative regulations at a global level, regarding the mandatory publication and transparency of these transactions by the business environment.

The research areas of the papers published by the authors are presented in **Table no. 1**.

Table no. 1. Top research areas

Areas	Papers	Weight
Public Administration	6	1.85%
Agriculture	2	0.62%
Justice	48	14.77%
Economy	50	15.38%
Ethics	3	0.92%
Finances	111	34.15%
Geography	1	0.31%
Management	50	15.38%
Applied Mathematics; Statistics and Probability	5	1.54%
Regional and Urban planning	5	1.54%
Psichology	2	0.62%
Development Studies; Economics; Social Sciences, Interdisciplinary	12	3.69%
Green/Sustainable Science and Technology	11	3.38%
Multidisciplinary Sciences	6	1.85%
Computer Engineering, Information Science, Theories and Methods	13	4.00%

Source: own processing

Thus, from **Table no. 1** results that the financial field occupies the first place with 111 papers, followed by the economic and management fields with 50 papers each and 48 papers for the legal field. Since some journals were indexed on several fields, it was impossible to totalize the exact number of papers according to this criterion.

After processing the data, 36 countries were identified according to the affiliation of the authors. The assignment to a country was made according to the country of origin of the first author. In **Table no. 2**, the countries of origin of the authors who published a minimum number of 10 papers are selected, in descending order. This ranking includes 8 countries, of which only one is European, the United Kingdom, which covers 3.38% of the volume of published papers.

Table no. 2. Distribution of authors by country

Country	Published articles	%
China	105	32.31
USA	35	10.77
Korea	20	6.15
Australia	19	5.85
Indonesia	13	4,00
Malaysia	12	3.69
India	11	3.38
Great Britain	11	3.38

Source: Own processing

We find that the most productive countries in terms of published articles are China with a percentage of 32.31%, i.e. 105 published papers, followed by the USA with 10.77%, i.e. 35 published papers, South Korea with

6.15%, i.e. 20 published papers and at a small interval with a difference of one paper compared to South Korea is Australia with 19 papers and a share of 5.85%. In eighth place, tied with India, are authors from the United Kingdom with 11 published papers each.

Research shows that the number of papers published in a country depends on the degree of research funding (Rahman & Fukui, 2003). Thus, according to OECD data on research funding, China, Korea and Japan have the highest percentage of GDP allocated to research and development, the USA ranks sixth, and the UK is only in 11th place, being surpassed by Germany, Belgium, Austria, France, the Netherlands, Slovenia and the Czech Republic (OECD, 2022).

Next, the number of citations by country and the average citations per article are analyzed (**Table no. 3**).

Table no. 3. Distribution by country of published articles, citations and average citations per article

Country	No. of articles	No. of citations	Average citations per article
China	105	1584	15.1
USA	35	875	25.0
Singapore	7	433	61.9
New Zealand	8	299	37.4
Australia	19	239	12.6
Israel	5	206	41.2
Korea	20	170	8.5
Great Britain	11	117	10.6
India	11	60	5.5
Italy	8	60	7.5

Source: own processing

Table no. 3 shows that the top three places are occupied by China with 105 published articles, the USA with 35 published articles and Singapore with 7 published articles, with 1584, 875 and 433 citations of the mentioned articles, respectively. It is found that Singapore, Israel and New Zealand, although they published fewer articles than the countries that lead the ranking in the number of published articles, attracted the interest of readers through consistency, content and clarity that they considered them worthy of being cited, ending up having a higher average of citations per article. The first places are occupied by authors from Singapore with an average of citations of 61.90% for 7 published articles, followed by authors from Israel with 5 articles and an average of citations of 41.20% per article as well as authors from New Zealand with 8 articles and an average of citations per article of 37.40%.

The analysis continues with the identification of the most cited authors at the local level, who published articles on related party transactions that were indexed in the WoS database. Out of the total of 640 identified authors, the selection criterion was that an author had accumulated a minimum of 100 citations. Thus, with the help of the Rstudio software, we highlighted 5 authors who met these conditions. **Table no. 4** presents the top authors with over 100 citations identified by processing the data with Rstudio and Biblioshiny.

Table no. 4. Top authors with minimum 100 citations

Author	Document	Citations
Ming Jian	1	109
T. J. Wong	1	109
Yan-Leung Cheung	3	103
P. Raghavendra Rau	3	103
Aris Stouraitis	3	103

Source: own processing

Table no. 4 shows that there were two authors with 109 citations and 3 authors with 103 citations. Continuing the ranking, the next most cited authors collected less than half of the citations of the mentioned authors, not being nominated.

Table no. 5 presents the most productive journals in publishing articles, in descending order by the number of articles published. The articles appeared in renowned journals dedicated to research, and the journals had at least 5 published works on the studied topic.

Table no. 5. Distribution of works by publications		
Name of publication	**Article count**	**Weight %**
Law and Finance of Related Party Transactions	17	32.13
Pacific-Basin Finance Journal	10	18.90
Journal of Corporate Finance	9	17.01
Sustainability	8	15.12
Journal of Accounting and Public Policy	6	11.34
European Company and Financial Law Review	5	2.90
Finance Research Letters	5	2.90
International Journal of Accounting and Information Management	5	2.90
Journal of Banking and Finance	5	2.90

Source: own processing

Table no. 6. Article performance indicators by sources						
Publication	**H_index**	**G_index**	**M_index**	**Total citations**	**Nr. articles**	**Year _start**
Law and Finance of Related Party Transactions	6	6	1.200	59	17	2019
Pacific-Basin Finance Journal	8	10	0.533	331	10	2009
Journal of Corporate Finance	5	9	0.357	482	9	2010
Sustainability	4	6	0.571	39	8	2017
Journal of Accounting and Public Policy	6	6	0.429	347	6	2010
Journal of Banking & Finance	5	5	0.333	260	5	2009
International Journal of Accounting and Information Management	4	5	0.571	57	5	2017
Finance Research Letters	3	4	1.000	16	5	2021
Review of Accounting Studies	4	4	0.286	454	4	2010
Contemporary Accounting Research	3	3	0.429	107	3	2017

Source: own processing

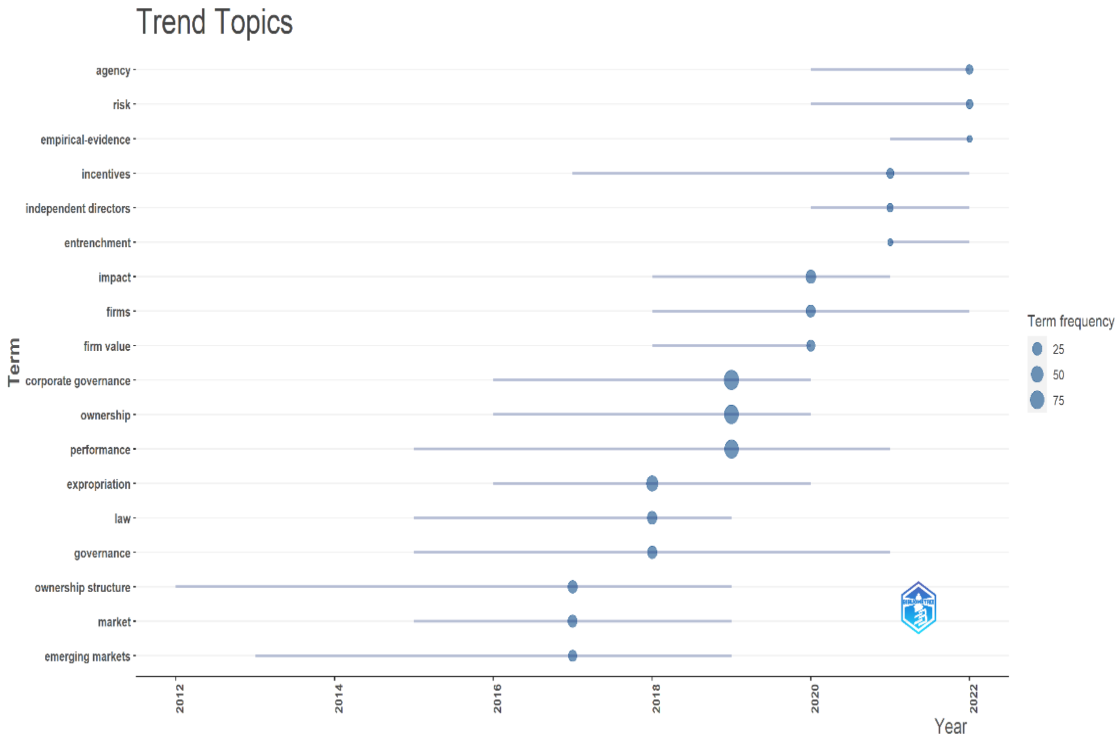
The most productive journal in terms of published articles, namely 17 articles, is *Law and Finance of Related Party Transactions*, followed by *Pacific-Basin Finance Journal* with 10 published papers, and the papers in the other journals are both in the economic and interdisciplinary fields indexed in several categories (**Table no. 5**).

Table no. 6 presents the most used performance indicators by sources for published articles. One of the indicators is the H Index proposed by J.E. Hirsch for the evaluation of researchers in the field of physics, but which is applicable in all fields of research. Another indicator that is more precise than the H indicator and which manages to resolve certain limitations is M, which also takes into account the duration of the academic career, and the G indicator is another improved variation of H.

Table no. 6 shows that the ranking includes eight of the publications that were also included in **Table no. 5**, by the number of published articles.

The analysis by frequently used words represents the way in which the most common words appeared together in the published works. The RStudio software highlighted 815 frequently used words. Only keywords that had at least 15 occurrences were included in the analysis. From the total number of words identified, 24 irrelevant words were eliminated and some were replaced with similar expressions (for example China, Korea, IFRS, reports or the union of terms expressed in the singular or plural), thus resulting in a close connection between 20 keywords. Finally, the 20 words remaining for analysis were grouped into 4 groups, with a minimum of 3 words per group, a setting existing in the bibliometric software used. Because research interest has increased in the last 10 years, **Figure no. 2** includes the most frequently used words during the analyzed period, as well as the research directions.

Figure no. 2. Trend of researched topics



Source: own processing with Rstudio_Biblioshiny

Thus, it is observed that, starting from the research direction that targets the shareholder structure, for which there is an almost constant interest, as well as directions such as performance, firm value, in the last year a new area of interest opens up, namely that of risks that represents a major point of interest and a necessity of analysis for the academic and business environment.

The link between the main keywords and the distribution by groups is presented in **Table no. 7**.

Group U brings together the words that appeared most often, the central frequent word is “related party transactions” with 149 occurrences, followed by other words such as “corporate governance” with 56 occurrences, “company performance” with 21 occurrences, “ownership” - 20 words, “revenue” - 15 words, “reporting”/“Director”/“Political connections” - 8 words, “support/removal from possession” - 5 words.

Group X - the second group in order of relevance, resulting from the analysis, was the one related to auditing. This group contains elements derived from the audit field, namely “audit fees” - 4 occurrences, “audit quality” - through 4 occurrences, “revenue quality” - through 4 occurrences, “management team independence”.

Group Y includes the keywords “Transfer prices” with 14 occurrences, “Business-group” - 7 occurrences, “Performance” - 6 occurrences, “Company” - 4 occurrences. It is found that there is a direct link between related party transactions and transfer pricing that emerged as a need to regulate related party transactions. Regardless of which of the two terms is analyzed, the link with the other term will be highlighted. Both keywords are equally relevant, transfer pricing is perhaps slightly more frequent because it also has tax implications.

Table no. 7. The content of word groups

Group U	No.	Group X	No.	Group Y	No.	Group Z	No.
related party transactions	149	audit fees	4	transfer prices	14	agency problems	4
company management	56	Audit quality	4	business-group	7	Tax avoidance	4
company performance/tunneling effect	21	Independence of management committee	4	performance	6	corporations	4
property	20	Revenue quality	4	company	4		
revenue	15						
controlling shareholders	13						
reporting/director/political connections	8						
support/removal of possession	5						

Source: own processing

Table no. 8. Articles with more than 100 citations

Average citation no.	Year	No. of citations	%	Authors	Document title
10,80	2009	162	3.66	Cheung Y.L. Jing L. Lu T. Rau P. R. Stouraitis A.	Tunneling and propping up: an analysis of related party transactions by chinese listed companies
29,14	2010	408	9.23	Jian M. Wong T. J.	Propping through related party transactions
12,14	2010	170	3.85	Aharony J. Wang J. Yuan H.	Tunneling as an incentive for earnings management during the ipo process in China
12,00	2012	144	3.26	Liu Q. Tian G.	Controlling shareholder, expropriations and firm's leverage decision: evidence from Chinese non-tradable share reform.
11,44	2015	103	2.33	Wang L.	Protection or expropriation: politically connected independent directors in China.
13,00	2010	182	4.12	Berkman H. Cole R.A. Fu L.J.	Political connections and minority-shareholder protection: evidence from securities-market regulation in China
11,29	2010	158	3.57	Lo A. W.Y. Wong R. M.K. Firth M.	Can corporate governance deter management from manipulating earnings? evidence from related-party sales transactions in China
18,75	2016	150	3.39	Nianhang Xu N. Qinyuan Chen Q. Yan Xu Y. Chan K. C.	Political uncertainty and cash holdings: evidence from China

Source: own processing

The word group Z has a lower significance, it includes terms that refer to “agency issues”, on par with “tax avoidance” and “corporations”.

Table no. 8 presents the articles with more than 100 citations and their share in the total articles published in the analyzed period.

Of the 325 articles totaling 4,421 citations, 33.41% are held by the 8 papers presented in **Table no. 8**. It is worth noting that articles written between 2009-2010 and 2012 accumulated 84.87% of the total citations for the analyzed period, that is, 1,224 citations out of a total of 1,477 citations. Citations of articles published between 2015-2016 occupy a share of 17.13% with 253 citations. The authors of the 8 articles with over 100 citations, included in **Table no. 8**, analyzed the transactions with affiliated parties of companies in China, on different samples and study periods. The main theme of these works was to address the phenomenon of “tunneling” which in fact represents an expropriation of minority shareholders through transactions with affiliated parties (Cheung et al., 2009; Aharony, Wang, & Yuan, 2010; Jian & Wong, 2010; Liu & Ţian, 2012). These operations show a weakened governance and a high influence of politics in the management of companies (Wang, 2015; Berkman, Cole, & Fu, 2010; Lo, Wong, & Firth, 2010; Xu et al., 2016).

The results of the bibliometric analysis, namely the evolution of research in this field, the connection between the keywords, are similar to other analyses carried out over a longer period of time, a situation that has also been highlighted by other significant research on this subject (Kumar et al., 2021; Căpăține-Verdeș, 2022). These results are also confirmed by a more recent study conducted by Mijoč, Briš Alić & Drvenkar (2024) aiming to study the evolution of research in the field of transfer pricing.

Conclusions

The aim of the article was to identify the main research topics related to transactions that arise between affiliated parties, transactions that can directly or indirectly influence the profit or loss of the companies in the group and implicitly influencing the financial statements or consolidated financial statements.

The review of the specialized literature highlighted the fact that the topic of transactions with affiliated parties has been intensively approached both from an accounting and financial reporting point of view, but also from a fiscal and legal point of view.

The bibliometric analysis carried out with the help of Rstudio Biblioshiny confirmed that the topic of transactions with affiliated parties and the audit of these transactions has not been sufficiently explored and remains relevant regarding the deepening of research directions related to financial performance, company value and corporate governance mechanisms.

The analysis of keywords, as well as their division into groups, highlighted the new research directions. The research addresses related party transactions from the following perspectives: transfer pricing taxation theories within which transfer pricing theories are located, the fraudulent use of transfer pricing, as well as topics where transfer pricing is related to sustainability, innovation and ethics. In relation to related party transactions, studies focusing on RPT disclosure, RPT performance, RPT revenue management and RPT fraudulent use have been revealed, also confirmed by the bibliometric analysis published by Fulop (2022). The results obtained are limited to a set of articles that meet the selection criteria and the databases used. Authors who did not publish articles present in the WoS database, but who made an important academic contribution to the research, were not taken into account in the analysis, although perhaps the results they reached were important and impactful for this type of analysis. We cannot say that the bibliometric analysis outlined a complete overview of the issues analyzed. From another perspective, journals with low impact factors have more published articles than a journal with high impact, but with fewer published articles, or countries that have a significant contribution in publishing articles do not have the authors cited. We can consider that countries that publish a lot do not necessarily have the most qualitative articles or journals with many appearances promote the most relevant research.

In response to the research question, the literature review and bibliometric analysis conducted revealed that the topic is of interest to professional regulatory bodies, as well as to business researchers, each approaching the topic from different perspectives. Thus, the analysis conducted is original and contributes to the existing literature through the results obtained based on the selection criteria presented.

A limitation with a strong impact in the bibliometric analysis is that only one or two authors have contributed to this type of bibliometric analysis, through the works they have published on topics very close to related party transactions, namely transfer pricing, but no author has approached this analysis from the perspective of audit, the risks and responsibilities that these transactions imply. The bibliography is very limited and research of this type is very early in this area of related party transactions.

The limitations of the research consist in the fact that the sample of works was selected from a single database, so it is possible that there are some significant, valuable works that could have further consolidated the results obtained. Also, an additional systematic analysis of the literature would have completed the research carried out.

Therefore, future research directions can be focused on identifying new publications that deal with the topic of related party relations, as well as the use of other databases to make an additional contribution to the previous results. Also, the topic of affiliated parties could be studied in correlation with other micro and macroeconomic topics.

Bibliography

1. Abdul Rasheed, P. C., Iqbal, T. H., & Mallikarjunappa, T. (2021), Related party transactions and audit risk. *Cogent Business & Management*, 8(1) 1888669.
2. Abdul Rasheed, P. C., Thonse Hawaldar, I., & Mallikarjunappa, T. (2023). Related Party Transactions and firm value: the role of governance mechanism. *Economic Research-Ekonomska Istraživanja*, 36(2), 2109053.
3. Aharony, J., Wang, J., & Yuan, H. (2010). Tunneling as an incentive for earnings management during the IPO process in China. *Journal of Accounting and Public Policy*, 29(1), 1-26.
4. Alm, J., & Liu, Y. (2018). Corruption, taxation, and tax evasion, *Working Paper 1802*. Tulane University, Department of Economics. http://repec.tulane.edu/RePEc/pdf/tul1802.pdf
5. Beasley, M. S., Carcello, J. V., Hermanson, D. R., & Lapides, P. D. (2000). Fraudulent financial reporting: Consideration of industry traits and corporate governance mechanisms. *Accounting horizons*, 14, 441-454. doi:10.2308/acch.2000.14.4.441
6. Berkman, H., Cole, R. A., & Fu, L. J. (2010). Political connections and minority-shareholder protection: Evidence from securities-market regulation in China. *Journal of financial and quantitative analysis*, 45(6), 1391-1417.
7. Căpățînă-Verdeș, N. (2022). Transfer Pricing and Related Party Transactions: A Bibliometric Analysis. *Central European Economic Journal*, 9(56), 237-253
8. Cheung, Y. L., Jing, L., Lu, T., Rau, P. R., & Stouraitis, A. (2009). Tunneling and propping up: An analysis of related party transactions by Chinese listed companies. *Pacific-Basin Finance Journal*, 17(3), 372-393.
9. Fulop, R., (2022). The influence of fiscal regulations on transfer pricing: a bibliometric review. *Review of Economic Studies and Research Virgil Madgearu*, 15(1), pp.35-57. DOI: 10.24193/RVM.2022.15.84
10. Gordon, E., Henry, B. V., Louwers, E., T., & Reed, B. (2007). Auditing related party transactions: a literature overview and research synthesis. *Accounting Horizons*, 21, 81-102. doi:10.2308/acch.2007.21.1.81
11. Ignat, I., & Feleagă, L. (2019), Research regarding the issues of the arm's length principle mentioned by IAS 24. *Economic research-Ekonomska istraživanja*, 32(1), 3034-3051.
12. Jian, M., & Wong, T. J. (2010). Propping through related party transactions. *Review of Accounting Studies*, 15, 70-105.
13. Kumar, S., Pandey, N., Lim, WM., Chatterjee, A. N. & Pandey, N. (2021). What do we know about transfer pricing? Insights from bibliometric analysis. *Journal of Business Research*, 134, 275-287. DOI: 10.1016/j.jbusres.2021.05.041
14. Liu, Q., & Tian, G. (2012). Controlling shareholder, expropriations and firm's leverage decision: Evidence from Chinese Non-tradable share reform. *Journal of Corporate finance*, 18(4), 782-803.
15. Lo, A. W. Y., Wong, R. M. K., & Firth, M. (2010). Can corporate governance deter management from manipulating earnings? Evidence from related-party

sales transactions in China. *Journal of Corporate Finance*, 16(2), 225-235.

16. Lohse, T. & Riedel, N. (2012). The impact of transfer pricing regulations on profit shifting within European multinationals, *FZID Discussion paper*, 61, available online at: https://www.econstor.eu/bitstream/10419/67717/1/732536626.pdf
17. Lupu, M., Ghica, M., Năstase, C. (2024), The Impact of Transfer Pricing on the Company's Image. Implications in Audit Work, *Audit Financiar*, vol. XXII, no. 2(174)/2024, pp. 343-359, DOI: 10.20869/AUDITF/2024/174/012
18. Mijoč, I., Briš Alić, M., & Drvenkar, N. (2024). What We Know So Far about Transfer Pricing: a Bibliometric Analysis. *Zagreb international review of economics & business*, 27(1), 253-282.
19. OCDE (2022). Liniile directoare privind prețurile de transfer pentru întreprinderile multinaționale și administrațiile fiscale. Available at: https://static.anaf.ro/static/10/Anaf/Prezentare_R/T-2022_GhidulOCDE2022_ROMANA.pdf (accessed on February 1st., 2025).
20. Rahman, M., & Fukui, T. (2003). Biomedical research productivity: factors across the countries. *International Journal of Technology Assessment in Health Care*, 19(1), 249-252.
21. Stefan M., & Mutulescu A. (2016). Tranzacţiile cu părţi afiliate şi implicaţii în procedurile de audit, *Practici de Audit*, 17(1), 41-48, available at: https://www.cafr.ro/uploads/PdA%201%202016-6b52.pdf
22. Wang, L. (2015). Protection or expropriation: Politically connected independent directors in China. *Journal of Banking & Finance*, *55*, 92-106.
23. Xu, N., Chen, Q., Xu, Y., & Chan, K. C. (2016). Political uncertainty and cash holdings: Evidence from China. *Journal of Corporate Finance*, 40, 276-295.

Audit Financiar, XXIII, Nr. 2(178)/**2025**, *412-424*
ISSN on-line: 1844-8801

The Analysis of the Relationship between Gender Diversity and Corporate Governance Performance

Diana-Adelina-Maria BUCURAȘ,
Student, Master's Program in Accounting and Taxation of Economic Entities,
Bucharest University of Economic Studies, Romania,
e-mail: bucurasdiana20@stud.ase.ro

Abstract

ESG (Environmental, Social, Governance) performance has become a key criterion for assessing corporate sustainability and responsibility, being increasingly adopted by investors, regulators, and stakeholders. Recent trends highlight a growing interest in companies that demonstrate a clear commitment to sustainable practices, diversity, and inclusion, elements that contribute to building trust and long-term performance. In this context, gender diversity on boards of directors has attracted particular attention, being recognized as a factor that can positively influence not only financial performance but also the social and governance dimensions of organizations. Based on this premise, the objective of the research is to identify and analyze the impact of gender diversity on corporate governance, with a focus on how the composition of boards of directors influences organizational performance and sustainability. The sample includes companies listed on the Bucharest Stock Exchange with the highest market capitalization. The research approach involves reviewing the relevant literature and constructing a regression model to test the relationship between gender diversity and corporate governance performance. The findings of the research emphasize the multidimensional importance of gender diversity in corporate governance and the gender diversity imbalance in the corporate governance of the analyzed companies.

Key words: *corporate governance; gender diversity; transparency; market capitalization; ESG score; Bucharest Stock Exchange;*

JEL Classification: *M42, M48*

To cite this article:
Bucuraș, D.-A.-M. (2025), The Analysis of the Relationship between Gender Diversity and Corporate Governance Performance, *Audit Financiar*, vol. XXIII, no. 2(178)/2025, pp.412-424, DOI: 10.20869/AUDITF/2025/178/014

To link this article:
http://dx.doi.org/10.20869/AUDITF/2025/178/014
Received: 3.03.2025
Revised: 11.03.2025
Accepted: 11.05.2025

Introduction

Corporate governance represents a fundamental pillar of any modern organization, playing a crucial role in ensuring transparent, efficient, and accountable leadership. Through a solid corporate governance framework, economic entities can build a healthy organizational culture, fostering responsibility, ethics, and the protection of the interests of all stakeholders, from shareholders and investors to employees and communities.

Leadership plays an essential role as it sets the tone for organizational culture and allocates the necessary resources to develop and maintain this system. Leadership is responsible for creating a culture of accountability and transparency, emphasizing the importance of adhering to procedures and ethical practices in all operations. The growing interest of investors and other stakeholders in information regarding sustainable corporate governance practices influences companies' credibility, financial performance, innovation, and long-term sustainability. Gender diversity plays a fundamental role in corporate governance through it is significant impact on equity and social inclusion, financial performance, decision-making processes, transparency, reputation, and corporate social responsibility.

In the context of the increasing interest of stakeholders in ESG (Environmental, Social, Governance) information, the research objective is to investigate and analyze the impact of gender diversity on the corporate governance of companies listed on the Bucharest Stock Exchange, based on market capitalization.

The article is structured as follows: the first section presents a review of the specialized literature on corporate governance and the impact of gender diversity within companies; the second section includes the research methodology, while the third section discusses the results and findings. The final section is dedicated to conclusions, research limitations, and future research directions.

Literature review

In the specialized literature, the role of corporate governance is to address issues related to the coordination of actions among investors and to align the interests of various stakeholders with corporate claims there, by preventing conflicts between them. Mohamed, Yongqiang, and Ahmed (2024) analyze the relationship between gender diversity in boards of directors and ESG performance. Their findings reveal a negative relationship between the two, supported by the observation that women tend to make short-term decisions to demonstrate their competence and efficiency, which can negatively impact ESG performance.

Samsul, Muhammad, Douglas, and Shahidul (2022) demonstrate that gender diversity in boards brings tangible benefits to firms. Their research highlights that companies and creditors should consider gender diversity as a risk-reduction factor in loan contracts when it comes to covenant violations. Based on the analyzed data, the study suggests that gender diversity in boards has a beneficial effect on compliance with loan covenants, particularly through the influence of independent women and by improving monitoring and financial performance.

Also, the article by Atif, Hossain, Alam, and Georgen (2021) examine the impact of gender diversity on boards of directors on the use of renewable energy. Using a sample of 11,677 firm-year observations from US companies for the period 2008-2016, the study analyzes whether the presence of women on boards of directors influences the use of renewable energy sources. So, the conclusion reached by the authors is that gender diversity on boards of directors not only favors the transition to the use of renewable energy sources, but also contributes to improving the financial performance of firms.

Tribbitt Mark A and Richard Walton (2024) analyze the impact of women's influence on the risk of bankruptcy of firms. The study uses a sample of 6,652 observations of public US firms between 2010 and 2020 and measures credit risk using the Altman Z score. The results of the study reveal a convex relationship between women's influence on the management team and the risk of bankruptcy. Management teams with a balance of men and women accept a higher level of risk than those dominated by only one gender. However, when women's influence is very high, the risk of bankruptcy decreases significantly, suggesting that their tendency towards risk aversion may reduce the probability of bankruptcy. This supports the hypothesis that gender diversity improves decision-making and can contribute to optimizing the financial risk of firms.

Jie, Woon, Marc (2017) analyze the influence of women on boards on firms' dividend policy. Based on a sample of 1,691 firms from 1997-2011, the study explores whether firms with a higher proportion of women on the board pay higher dividends. The research results show that firms with a higher proportion of women on the board tend to pay higher dividends. This relationship is robust to various econometric methods and alternative measures of dividend payments and women's representation on boards. The study also argues that women on boards use dividends as a corporate governance mechanism to reduce cash waste and agency problems, especially in firms with weak governance.

Irma, Siri and Silvia (2024) highlight the institutional factors influencing the adoption of gender quotas and corporate governance codes on gender diversity on boards in Europe. The study is based on a pan-European dataset with 510 observations from 30 countries, collected between 2002 and 2018. Based on the results obtained, the authors argue that the strongest determinant of the adoption of gender quotas and codes is the presence of women in state decision-making bodies (parliament, government). Countries with better quality of governance and longer maternity leave are less likely to adopt mandatory gender quotas. Cultural factors such as high-power distance, masculinity, uncertainty avoidance and short-term orientation also increase the likelihood of introducing quotas. In contrast, left-wing political ideology does not have a significant influence on the regulation of gender diversity on boards. These findings show that the adoption of gender diversity regulations is influenced by each country's institutional and cultural structures rather than by short-term political factors.

Martin, Donald, and Siri (2024) explore gender diversity in the management teams and boards of entrepreneurial firms that conducted initial public offerings (IPOs) in the US between 1990 and 2020. The authors analyze changes in gender composition, investigating whether and how firms add women to leadership positions immediately before the IPO to meet institutional investors' demands for corporate governance. The research shows that firms appear to add women to management teams immediately before the IPO to send a positive signal to public investors, with gender diversity becoming an important signal for good corporate governance and influencing how entrepreneurial firms prepare for the IPO. Differences were also observed at the industry level, with the biotechnology industry having a higher level of female representation compared to digital technologies, where the "tech bro mentality" has long dominated.

Renee Adams and Patricia Funk (2010) conducted research examining how gender influences performance and decisions in leadership positions. The study examines behavioral differences between women and men in leadership positions, and the results suggest that these differences are not just a consequence of women's underrepresentation in these positions, but may be fundamental.

To explore the impact of corporate governance factors on the performance of financial institutions in Bangladesh, the authors Shaikh, Tawfiq, Mahedi and Anwarul (2024) used annual data from 20 financial institutions from 2011 to 2022. The study shows that board size has a significant positive impact on performance as measured by Return on Assets (ROA) and Net Asset Value (NAV). Another key aspect determined by the authors is related to firm-specific factors, such as firm age, firm size and financial leverage that have a significant impact on performance. For example, firm size has a negative impact on ROA and ROE, while financial leverage has a positive effect on ROE but a negative one on NAV. Although other aspects of corporate governance, such as board independence and director ownership, do not show a significant influence, board size could contribute to more effective governance and increased performance.

Another approach to the relationship between corporate governance characteristics and financial risks in US financial institutions is carried out by Noora, Rasol, Arman, Hassan (2021). Based on a sample of 3,116 observations of financial institutions between 2011 and 2018, they apply principal component analysis (PCA) and structural equation modeling (SEM) to assess the impact of governance variables on risks. The authors conclude that certain characteristics, such as stock-based compensation or unequal voting rights, increase risk, while board independence and gender diversity have the opposite effect.

Research methodology

The main objective of the study is to highlight the impact of gender diversity on the performance of governance of companies listed on the Bucharest Stock Exchange. In this regard, we resorted to content analysis of the annual reports published by the companies included in the sample and to regression modeling.

The sample chosen for the research is made up of the top 10 companies listed on the Bucharest Stock Exchange. The selection of companies took into account the descending order of the existing stock market capitalization at the end of October 2024. The companies operate in the following industries: energy, chemical, finance - banking, telecommunications.

The option for the top 10 companies listed on the Bucharest Stock Exchange, based on stock market capitalization, is argued by the fact that it provides an objective, updated and representative measure of the size and market position of the company. Stock market capitalization is a dynamic indicator, constantly updated, which reflects in real time the perceived value of the company.

The data used come from public information available in the annual reports for the period 2019-2023, financial statements, independent auditors' reports and other relevant documents, as appropriate, for the entities included in the sample, available on the official website of the Bucharest Stock Exchange.

As for the regression model, it aims to analyze the factors that influence the ESG (Environmental, Social, Governance) score of the companies in the presented sample. The ESG score, used as a dependent variable, represents a key indicator of the sustainability and social responsibility of companies. In the analysis, two independent variables were selected: the proportion of women on the board of directors and the stock market capitalization. The first variable, the proportion of women on the board of directors, is considered an important social factor, suggesting diversity and gender equality in the decision-making process. The second variable, the stock market capitalization, is used as a proxy for the size and economic influence of the company.

The purpose of this model is to assess the extent to which these two variables explain variations in the ESG score, so identifying the factors that significantly contribute to the sustainable performance of companies. This analysis aims to both confirm the impact of diversity and economic size on ESG performance and provide useful insights for strategic decision-making in the field of sustainability.

The information collected to achieve the research objective is as follows:

- ESG score: the dependent variable of the model, used to assess the performance of companies in terms of environmental, social and governance aspects.
- Proportion of women on boards of directors: this is a key independent variable, used to measure the level of gender diversity at the level of company management. The data were collected from annual reports.
- Market capitalization: this independent variable was used to reflect the economic size of the companies and their position on the market. The values were taken from the data available on the official website of the Bucharest Stock Exchange.
- Board structure: information on the total number of members on the boards of directors, as well as the gender distribution, in order to analyze their balanced or unbalanced composition.
- Analysis period: data were collected for a period of five consecutive years, to allow for a longitudinal analysis and to observe the variations over time of the analyzed indicators.
- Industry information: some characteristics specific to the industry to which companies belong could influence the relationship between diversity and performance, for example, through the level of regulation or market specifics.

The analyzed sample consists of the following companies: Hidroelectrica S.A., OMV Petrom S.A., Banca Transilvania S.A., Romgaz S.A., BRD – Groupe Société Générale S.A, S.N. Nuclearelectrica S.A., Digi Communications S.A., Societatea Energetica Electrica S.A., S.N.T.G.N Transgaz S.A., Chimcomplex S.A.

OMV Petrom S.A is the largest integrated energy producer in South-Eastern Europe. The company is active along the entire energy value chain: from exploration and production of crude oil and natural gas, to refining and distribution of fuels and, further, to power generation, as well as the trading of natural gas and electricity. The company is organized into three operationally integrated business segments – Exploration and Production, Refining and Marketing, Gas and Power. OMV Petrom's integrated business model gives it financial resilience due to synergies and natural protection against oil and gas price volatility.

Banca Transilvania S.A is the third most powerful banking brand in the world according to the Brand Finance Banking 500, 2024 assessment. Banca Transilvania entered the Brand Finance Banking 500 in 2018, at 486th place, with a brand value of 174 million dollars.

Romgaz S.A is the largest producer and main supplier of natural gas in Romania. The company is admitted to trading on the Bucharest Stock Exchange and the London

Stock Exchange (LSE). The activities carried out within the Romgaz Group are the following: exploration and production of natural gas, underground storage of natural gas, supply of natural gas, special operations and well services, maintenance and transport services; production and supply of electricity.

BRD – Groupe Société Générale S.A is the second largest bank in Romania by total assets and has the fourth largest market capitalization on the Bucharest Stock Exchange. It has over 2.2 million customers and operates a network of 870 units. The bank mainly operates in 3 markets: retail banking, corporate banking and investment banking.

Chimcomplex S.A is the main producer and supplier of vital chemicals in the region, specializing in polyols, sodium chlorides and oxo alcohols. It is also a strategic company for the Romanian economy, continuously investing in new technologies to increase efficiency, while maintaining environmental protection and sustainability at the heart of its strategy.

Electrica S.A. is a key player in the electricity distribution and supply market in Romania, as well as one of the most important players in the energy services sector. The Electrica Group provides services to approximately 3.8 million users and has a national coverage area – organized in three areas for electricity distribution: Northern Transylvania, Southern Transylvania, Northern Muntenia, and throughout the country for electricity supply, maintenance and energy services. Since July 2014, Electrica has been a company with majority private capital, listed on the Bucharest and London stock exchanges. Electrica is the only Romanian company listed in the field of electricity distribution and supply in Romania.

Hidroelectrica S.A. is a leader in electricity production and the main provider of technological services necessary for the National Energy System in Romania. In November 2019, Hidroelectrica was ranked 3rd in the top of the most valuable companies in Romania, being the most valuable company with state capital, valued at 24.4 billion lei.

Societatea Natională Nuclearelectrica S.A. ("SNN" or "the Company") is a national joint-stock company, managed in a unitary system. Currently, SNN is the only producer of electricity based on nuclear technology in Romania. At the same time, SNN produces the CANDU nuclear fuel bundles that are used to operate its own nuclear reactors.

Transgaz holds the monopoly status in the transportation of natural gas in Romania and transports approximately 90% of the total natural gas consumed. Transgaz intends to become an internationally recognized operator in the field of natural gas transportation, a leader in the energy market in the region, with a modern national natural gas transportation system, integrated at European level and with a competitive management system, in accordance with the best corporate governance practices.

Digi Communications N.V. is one of the leading telecommunications service providers in Romania and Hungary, based on the number of revenues generating units (RGUs), with significant operations in Spain and Italy. The company's offerings in its main markets include pay-TV (cable and DTH), fixed internet, fixed data, mobile telephony and mobile data, as well as fixed telephony. Fixed telecommunications and entertainment services are provided through a technologically advanced fiber optic network, which serves 84.3% and 46.3% of households in Romania and Hungary, respectively.

Results and discussion

The results of the research from the point of view of gender diversity, at the level of corporate governance of the companies included in the sample, highlighted, globally, the preponderance of male members.

For the year 2019 (**Figure no. 1**) the companies Chimcomplex Borzești, Transgaz and Digi Communications stand out, having only male members of the board of directors.

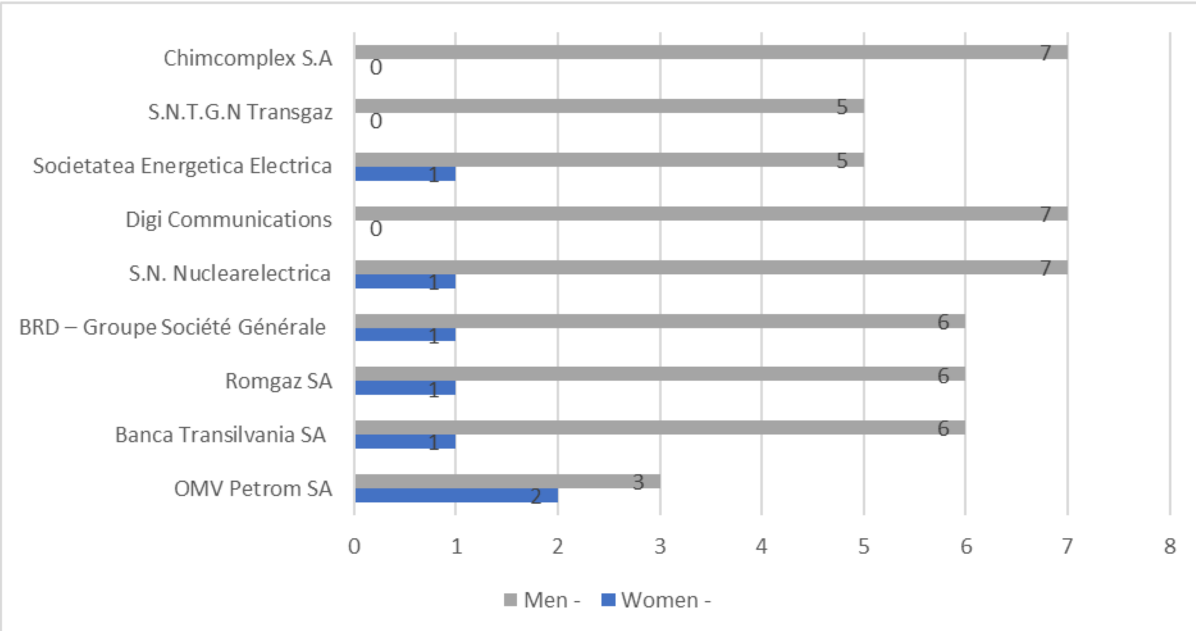
Regarding the analysis for 2020 (**Figure no. 2**), a constant can be observed in terms of the composition of the boards of directors. At the level of BRD – Groupe Société Générale, an improvement is noted in terms of increasing the number of female persons on the board of directors.

In 2021 (**Figure no. 3**), an increasing trend of female members is observed. Transgaz and BRD – Groupe Societe Generale companies are starting to pay increased attention to gender diversity.

For 2022 (**Figure no. 4**), the Electrica Power Company stands out, with its board of directors composed only of male members. This represents a significant change from the previous period, when there was gender diversity in management, highlighting a possible involution in terms of gender balance.

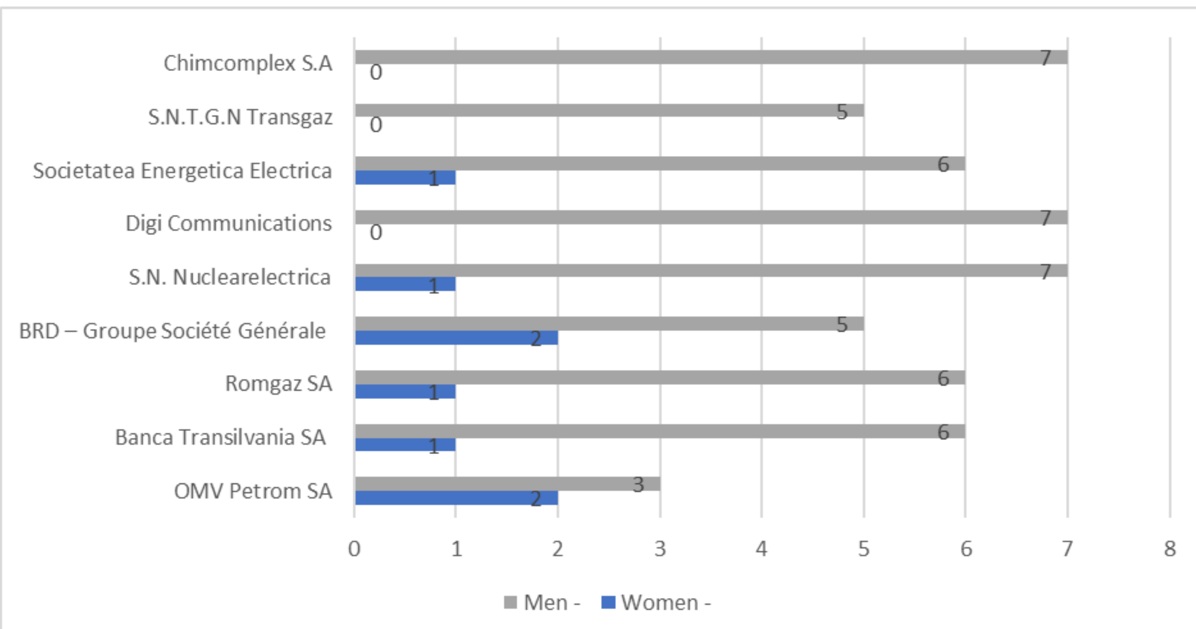
In 2023 (**Figure no. 5**), a significant increase in gender diversity in boards of directors is observed. A notable example is the company Chimcomplex Borzești which, although throughout the entire period analyzed, had exclusively male members on its board, in 2023 demonstrated an increased interest in promoting gender diversity, marking a positive change in this direction.

Figure no. 1. Presentation of the board of directors in 2019



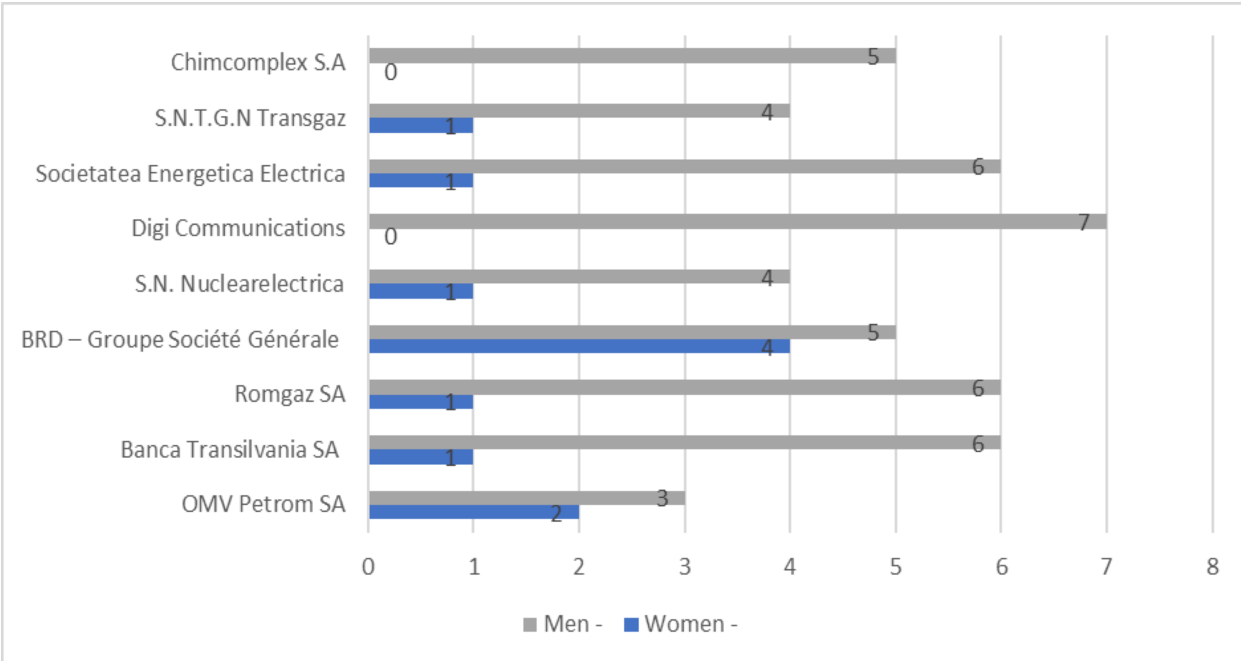
Source: own analysis

Figure no. 2. Presentation of the board of directors in 2020



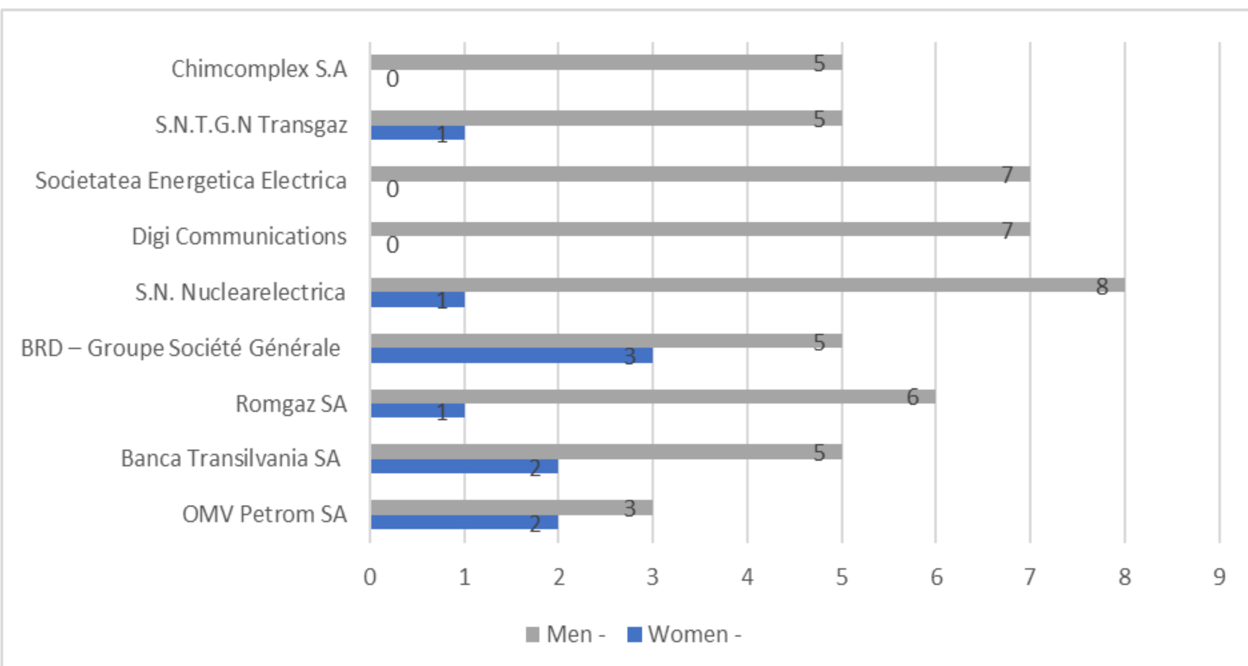
Source: own analysis

Figure no. 3. Presentation of the board of directors in 2021



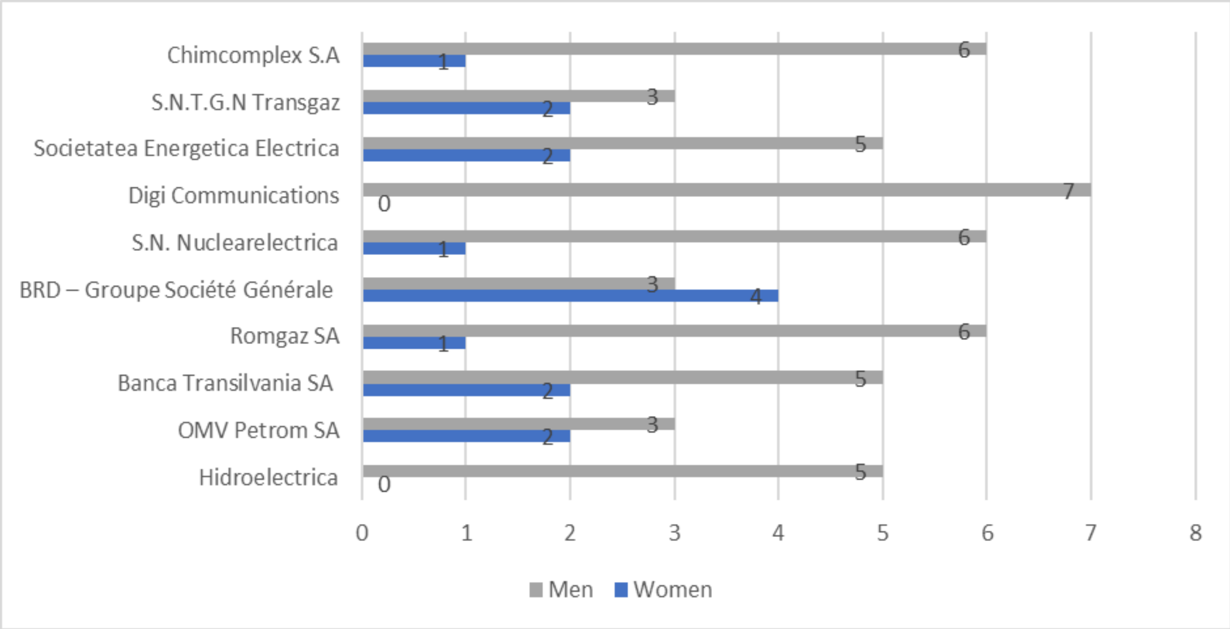
Source: own analysis

Figure no. 4. Presentation of the board of directors in 2022



Source: own analysis

Figure no. 5. Presentation of the board of directors in 2023



Source: own analysis

Analyzing the graphs regarding the structure of the boards of directors of the 10 companies evaluated, it can be seen that, during the period 2019-2022, men were predominantly represented in these management positions. However, in 2023, the data indicate a slight increase in the number of women on boards of directors, suggesting a positive trend towards greater gender diversity. Although this evolution is still modest, it may reflect a growing concern for balancing gender representation in the management structures of companies.

A notable aspect of the analysis is that one of the companies evaluated (Digi Communications S.A) maintained an exclusively male management throughout the period 2019-2023, without any change in terms of female representation on the board of directors. This aspect highlights either a lack of initiative towards gender diversity or a possible structural barrier to women's access to leadership positions within that company. In contrast to the general trend of a slight increase in the number of women on boards of directors, this situation could suggest the need for more concrete measures to promote equal opportunities at the leadership level.

It is also important to note that Hidroelectrica S.A was only listed on the Bucharest Stock Exchange in 2023, which may influence the structure and dynamics of its board of directors compared to the other companies evaluated.

To investigate the impact of gender diversity on corporate governance (**Table no. 1**), a multiple regression model inspired by the one proposed by Mark A. Tribbitt and Richard Walton was built, with the aim of demonstrating the objectives established at the beginning of this research. Thus, information was collected about the ESG (Environmental, Social, Governance) scores of the 10 companies from the official website of the Bucharest Stock Exchange Research Hub. For the independent variable y1, data collected from the companies' annual reports were processed, while the independent variable y2 was taken directly from the website of the Bucharest Stock Exchange.

The multiple regression analysis (**Figure no. 6**) highlights the relationship between the ESG score, the proportion of women on the board of directors and the stock market capitalization. The results obtained show that the model is statistically significant, with an adjusted R^2 value of 0.7844, indicating that approximately 78.44% of the variation in the ESG score can be explained by the two independent variables included in the model. This value suggests that the model is robust, with considerable explanatory power. In addition, the adjusted R^2 value (0.7228) confirms that the model remains robust even when the number of variables included is taken into account.

Table no. 1. Centralization of data used for the regression model

Company	Dependent variable x - ESG score	Independent variable y - proportion of women in CA	Market capitalization	Estimated ESG score
Hidroelectrica	70	0,00	55.055.834.200,00	44
OMV Petrom SA	75	0,40	47.979.983.634,00	56
Banca Transilvania SA	66	0,29	26.497.827.549,00	53
Romgaz SA	60	0,14	22.894.090.560,00	48
BRD – Groupe Société Générale	67	0,57	12.892.678.083,00	61
S.N. Nuclearelectrica	45	0,14	13.212.002.557,00	48
Digi Communications	20	0,00	6.720.000.000,00	44
Societatea Energetica Electrica	37	0,29	5.195.160.961,00	53
S.N.T.G.N Transgaz	30	0,40	5.312.358.412,00	56
Chimcomplex S.A	41	0,14	3.232.023.220,00	48

Source: own analysis

Figure no. 6. Anova model

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0,885675091
R Square	0,784420366
Adjusted R Square	0,722826185
Standard Error	9,978171875
Observations	10

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	2535,952602	1267,976301	12,73529988	0,004651864
Residual	7	696,9473977	99,56391396		
Total	9	3232,9			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95,0%*	*Ipper 95,0%*
Intercept	24,11405324	6,737328203	3,579171522	0,008986101	8,182803579	40,0453	8,182804	40,0453
X Variable 1	41,16846959	18,10194787	2,274256334	0,057117901	-1,63583534	83,97277	-1,63584	83,97277
X Variable 2	8,65519E-10	1,82061E-10	4,754002641	0,00207385	4,35013E-10	1,3E-09	4,35E-10	1,3E-09

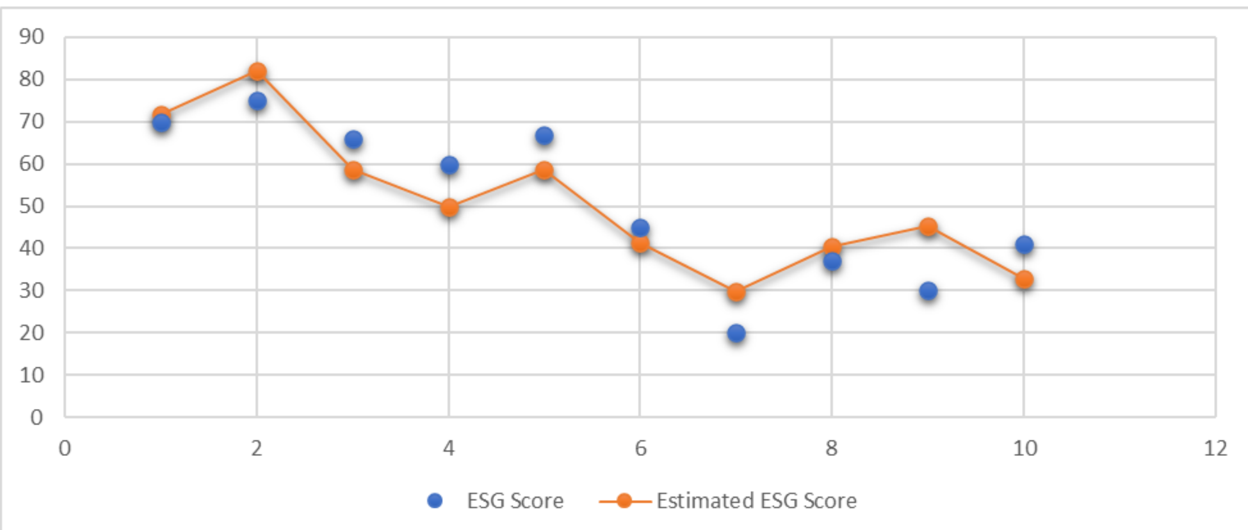
Source: own analysis

From the perspective of overall significance, the ANOVA test shows that the model as a whole is statistically significant, with a significance level of 0.0046. This indicates that at least one of the independent variables has a significant impact on the ESG score. The analysis of the coefficients provides more detailed information about each predictor. The proportion of women on the board of directors has a positive effect on the ESG score, with its coefficient being 41.164. This suggests that an increase in the proportion of women would theoretically lead to an increase in the ESG score. However, the p-value associated with this variable is 0.057, which places it slightly above the conventional threshold of 0.05. For this reason, the influence of the proportion of women cannot be considered significant at the 95% confidence level.

On the other hand, market capitalization is found to have a significant impact on the ESG score, with a positive coefficient of 8.655. Although the value of the coefficient is small, given the magnitude of market capitalization, its cumulative effect becomes substantial. Furthermore, the p-value of 0.002 associated with this variable indicates high statistical significance, highlighting that the variable, market capitalization, has a clear influence on the ESG score.

Based on the values obtained using the ANOVA Test, the estimated ESG score for each company can be determined. In **Figure no. 7** you can see the deviation from the scores held by the companies at the time of the analysis.

Figure no. 7. ESG Score VS Estimated ESG Score



Source: own analysis

The model results showed that approximately 78.44% of the variation in the ESG score can be explained by these two variables. Market capitalization was found to have a statistically significant effect on the ESG score, suggesting that the size and economic influence of a company play an important role in its corporate governance performance.

Although the proportion of women on the board had a positive effect on the ESG score, this effect was not significant at the 95% confidence level, indicating that, in the context of the companies analyzed, gender diversity is not yet well enough represented to have a clear impact on the ESG score. This result reflects the need for further efforts to promote diversity on boards and to continuously assess its influence on corporate governance.

The model provides valuable insight into the factors that contribute to ESG performance, but also indicates the need to explore additional variables to better understand the dynamics of this phenomenon.

So, gender diversity is an essential aspect of modern corporate governance, with the potential to enhance organizational performance, improve decision-making processes, and bring broader perspectives on sustainability and social responsibility. For the companies analyzed, increasing the proportion of women on boards could start with a series of specific measures such as:

- **Setting clear gender diversity targets.** Companies could adopt internal policies that set quantifiable goals for increasing female representation. For example, they could aim to reach a certain percentage (e.g. 30-40%) of women on the board of directors within a defined timeframe.
- **Implement mentoring and development programs.** To support the advancement of women into leadership positions, companies can introduce dedicated mentoring and professional development programs for women in management positions, preparing them for board roles.
- **Increase transparency in the recruitment process.** The selection of board members should be a transparent process, based on competence and diversity. Recruitment processes that eliminate bias can be used, such as including an equal number of male and female candidates on shortlists.
- **Adopt inclusion policies.** Companies should integrate gender diversity into their overall sustainability strategy, encouraging a corporate culture that promotes equal opportunities and respect for diversity.
- **Collaborate with investors and stakeholders.** Investors are increasingly concerned about sustainability and diversity, and companies can work with them to integrate diversity goals into their long-term strategy.

In this context, adopting measures to increase corporate governance could generate a series of significant benefits for both the companies analyzed and their stakeholders. Among these, we could mention:

- *Improve decision-making:* Gender diversity contributes to a better representation of different perspectives and experiences. Studies show that diverse teams make better-informed and more creative decisions, reducing the risks associated with unilateral decisions.
- *Increased financial performance:* Research shows that greater diversity on boards is associated with improved financial performance. This is due to more innovative approaches and a better understanding of market and consumer needs.
- *Improved corporate image:* Companies that promote diversity are perceived more positively by investors, customers and employees. An improved public image can attract new talent and help build customer loyalty.
- *Increased sustainability:* Gender diversity is a pillar of the ESG agenda, and companies that embrace this goal can more easily attract investors interested in sustainability. This can lead to greater access to capital and a stronger market position.
- *Reduced reputational risks:* A lack of diversity can lead to criticism from investors, activists or the general public. By promoting gender diversity, companies can prevent these risks and build a better relationship with stakeholders.

Conclusions

The literature review highlights that gender diversity on boards brings significant benefits, not only in terms of financial performance, but also in terms of other essential dimensions of corporate governance. Studies show that a balanced gender representation can contribute to increased transparency and accountability, having a positive impact on dividend distribution and on the more efficient use of renewable resources. At the same time, gender diversity has been associated with a significant reduction in financial risks, especially in terms of loan contracts, due to a more balanced perspective and a more rigorous risk analysis.

Our research results highlight that the structure of the boards of directors of the ten companies included in the sample is relatively constant over a five-year period. This analysis highlighted the fact that although the proportion of women on boards varies between companies, in general, their representation remains relatively low, suggesting that gender diversity among decision-makers still represents a challenge within the companies analyzed.

The research results also highlight that gender diversity can have a positive impact on ESG score, even if this effect was not statistically significant in the current context. This aspect highlights the need to encourage a greater representation of women in order to observe clearer benefits. Moreover, the economic size of the company (measured by market capitalization) was shown to have a significant influence on ESG performance, suggesting that organizations with greater financial capacity can invest more efficiently in sustainability initiatives.

In terms of research limitations, we consider that one of them is the reduced research sample that includes only companies listed on the Bucharest Stock Exchange which have the largest market capitalization. As future research directions, we will extend the analysis on gender diversity in corporate governance to companies listed on the BVB from other industries, but over a longer time horizon.

Bibliography

1. Abdelkader, M. G., Gao, Y., Elamer, A. A., (2024), Board gender diversity and ESG performance: The mediating role of temporal orientation in South Africa context, *Journal of Cleaner Production*, vol. 440, February
2. Adams, R., Funk, P. (2012), Beyond the Glass Ceiling: Does Gender Matter?, *Management Science*, 58(2)
3. Alam, Md. S., Atif, M., Cumming, D., Islam, Md. (2023), The impact of board gender composition on loan convenant violations, *Corporate Governance: An International Review*, 32:703-731
4. Alzayed, N., Eskandari, R., Eshraghi, A., Yazdifar, H. (2021), Revisiting corporate governance and financial risk-taking, *International Journal of Finance & Economics*, 29(4)
5. Atif, M., Hossain, M., Alam, Md S., Goergen, M. (2021), Does board gender diversity affect renewable energy consumption? *Journal of Corporate Finance*, vol.66, February
6. Banca Transilvania S.A. (2019-2023), Annual reports 2019-2023 [Online] available at: https://bvb.ro/FinancialInstruments/Details/FinancialInstrumentsDetails.aspx?s=TLV&ref=bvbradar.ro
7. Bătae, O-M., Feleagă, L., (2020), Corporate Governance in Listed and State-Controlled Companies in the Romanian Energy System, *Audit Financiar*, vol. XVIII, no. 2(158)/2020
8. BRD-Groupe Société Générale S.A. (2019-2023), Annual Reports 2019-2023 [Online] available at: https://bvb.ro/FinancialInstruments/Details/FinancialInstrumentsDetails. aspx?s=BRD&ref=bvbradar.ro
9. BVB Research Hub: https://bvbresearch.ro/ReportDashboard/ESGScores
10. Chen, J., Leung, W. S., Goergen, M. (2017), The impact of board gender composition on dividend payouts, *Journal of Corporate Finance*, vol. 43, April, pp. 86-105
11. Chimcomplex S.A. Borzești (2019-2023), Annual Reports 2019-2023 [Online] available at: https://www.bvb.ro/FinancialInstruments/Details/FinancialInstrumentsDetails.aspx?s=CRC&ref=bvbradar.ro
12. Digi Communications N.V. (2019-2023), Annual Reports 2019-2023 [Online] available at: https://bvb.ro/FinancialInstruments/Details/FinancialInstrumentsDetails.aspx?s=DIGI& ref=bvbradar.ro
13. Hasan, S. M., Tawfiq, T. T., Hasan, Md. M., Islam, K. M. A. (2024), Corporate governance dynamics in financial institution performance: A panel data analysis, *Investment Management and Financial Innovations*, 21(3): 292-303
14. Hidroelectrica S.A. (2023), Annual Report 2023 [Online] available at: https://bvb.ro/infocont/infocont24/H2O_20240430120503_H2O-RO-Raport-anual-2023.pdf
15. Kenney, M., Patton, D., Terjesen, S. (2024), Gender diversity at entrepreneurial firm IPOs: responding to changing societal norms, *Small Business Economics*, Springer, vol. 63(3), pp. 897-915
16. Martinez-Garcia, I., Terjesen, S., Gomez-Anson, S. (2024), Regulating board gender diversity in Europe: The influence of cultural, governmental, and women`s institutions, *Journal of Business Research*, Elsevier Vol. 182(C)
17. OMV PETROM S.A. (2019-2023), Annual Reports 2019-2023 [Online] available at: https://www.bvb.ro/FinancialInstruments/Details/FinancialInstrumentsDetails.aspx?s=SNP&ref=bvbradar.ro
18. S.N. NuclearElectrica S.A. (2019-2023), Annual Reports 2019-2023 [Online] available at:

https://bvb.ro/FinancialInstruments/Details/FinancialInstrumentsDetails.aspx?s=SNN& ref=bvbradar.ro

19. S.N.G.N. Romgaz S.A. (2019-2023), Annual Reports 2019-2023 [Online] available at: https://bvb.ro/FinancialInstruments/Details/FinancialInstrumentsDetails.aspx?s=SNG&ref=bvbradar.ro
20. S.N.T.G.N. Transgaz S.A. (2019-2023), Annual Reports 2019-2023 [Online] available at: https://www.bvb.ro/FinancialInstruments/Details/FinancialInstrumentsDetails.aspx?s= TGN&ref=bvbradar.ro
21. Societatea Energetica Electrica S.A. (2019-2023), Annual Reports 2019-2023 [Online] available at: https://www.bvb.ro/FinancialInstruments/Details/FinancialInstruments Details.aspx?s=EL&ref=bvbradar.ro
22. Tribbitt, M. A., Walton, R. (2024), Gender Power, the Top Management Team, and Firm Credit Default Risk, *Journal of Risk and Financial Management*, August, 17(8): 368