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Determinants of ESG Reporting Difficulty in the Absence of Global Standardization

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Abstract: In recent years, the increasing demand for transparent and comparable ESG (Environmental, Social and Governance) disclosures has placed considerable pressure on organizations worldwide to align with emerging sustainability standards. However, the absence of a globally standardized ESG reporting framework continues to generate significant challenges, especially in emerging economies such as Romania. This paper investigates the perceived difficulty of ESG reporting in the Romanian context by empirically testing the influence of key organizational factors using data collected through a structured questionnaire. Based on a sample of 291 respondents, the study employs an OLS econometric model to examine the effects of five core dimensions: the cost of data collection, information complexity, data reliability, report comparability, and the perceived influence of global regulations and ethical principles. The findings confirm that the perceived difficulty of ESG reporting is positively and significantly associated with high data collection costs, the complexity of ESG information, unreliable internal data systems, and the lack of inter-organizational comparability. In contrast, the influence of global regulations and ethics does not appear to be a significant determinant in the Romanian case. The results highlight the need for national policy frameworks to harmonize with European directives and to provide institutional support for developing digitalized, integrated ESG reporting systems. Furthermore, the paper suggests that increasing data reliability, reducing informational complexity, and strengthening organizational capacity are critical for facilitating effective ESG disclosure and avoiding structural underreporting in emerging markets.

Keywords: ESG reporting, sustainability; standardization; Romania; econometric model; corporate disclosure; public policy

JEL Classification: M41; Q56; H83; M14

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1. Introduction

In a global context marked by intensifying pressures for the transition to a sustainable economy, reporting on environmental, social and governance (ESG) performance has become an indispensable tool in enhancing corporate transparency, aligning with new investor demands and responding to increasingly sophisticated stakeholder expectations. Despite the conceptual and institutional advances made at international level - reflected in the proliferation of ESG reporting frameworks – Global Reporting Initiative – GRI (Global Reporting Initiative, 2025), Sustainability Accounting Standards Board – SASB (IFRS Foundation, 2024), Task Force on Climate-related Financial Disclosures – TCFD (TCFD, 2025), European Financial Reporting Advisory Group – EFRAG (EFRAG, 2025), International Sustainability Standards Board – ISSB (IFRS, 2025), the standardization process remains fragmented and incomplete. This lack of harmonization leads to significant uncertainties in the quality, comparability and credibility of reported information, creating, especially for organizations in emerging economies, significant challenges in terms of compliance, auditability and effective use of ESG data.

Within this framework, Romania faces specific difficulties due to the low degree of institutionalization of ESG principles, the limited capacity to collect and process relevant data and the lack of uniform practices among economic entities. These elements create fertile ground for empirical analysis of how economic actors perceive the difficulty of ESG reporting, especially in the absence of clear and uniform standards.

The novelty of the research lies in the integrated approach of several determinants that affect the difficulty of ESG reporting from the perspective of Romanian organizations, at a time when the implementation of European directives and pressures on sustainable taxonomy are becoming more and more significant. The study proposes an original conceptual framework, in which the costs of data collection, the complexity and reliability of information, the difficulty of inter-organizational comparability, and the perceived role of the global regulatory framework are simultaneously analyzed. In addition, the use of a quantitative tool applied at the organizational level allows the empirical testing of the relationships between these dimensions in a way that may contribute to closing a relevant gap in the national and regional literature on sustainability reporting.

The main aim of the research is to analyze, from an organizational perspective, the determinants that contribute to the difficulty of ESG reporting in the absence of global standardization, in an institutional context in transition, such as the Romanian economy.

To achieve this aim, the research pursues the following specific objectives:

O1: Assess respondents' perceptions of the difficulty of ESG reporting and the variables that influence it.

O2: To identify the extent to which the cost of collecting and verifying ESG data is a significant barrier.

O3: To analyze the impact of the complexity and reliability of ESG information on the difficulty of reporting.

O4: Investigate the perceived role of inter-organizational comparability in the absence of international standardization.

O5: To empirically substantiate an explanatory econometric model that captures the relationships between the difficulty of ESG reporting and the determinants analyzed.

Through this approach, the study contributes both to extending the theoretical framework on the obstacles to ESG reporting in emerging economies and to formulating relevant recommendations for policy makers, regulators and practitioners involved in strengthening the corporate sustainability infrastructure in Romania.

2. Literature Review

In recent times, the literature on sustainability reporting has grown significantly, reflecting a transition from voluntary and fragmented approaches to attempts at global standardization, spurred by increasing pressure from investors, regulators and civil society (Afolabi et al., 2022; Rowbottom, 2023; Villiers, 2022) has been enshrined as an essential component of corporate transparency, representing a tool for assessing the non-financial impact of economic entities and supporting sustainable governance. However, despite institutional and conceptual progress, a number of systemic challenges persist, particularly in emerging economies, related to the lack of a unified regulatory framework, terminological ambiguity, methodological complexity and data inconsistency (Damayanti et al., 2021; Usman Khizar et al., 2022).

A first relevant theoretical stream in literature is represented by institutionalist approaches, which emphasize the role of coercive, mimetic and normative pressures in promoting the adoption of ESG practices (Galleli & Amaral, 2025; Kim et al., 2024; Solimene et al., 2025). In the absence of a binding global regulatory framework, organizations tend to adopt forms of reporting that reflect either the expectations of global investors or voluntary compliance with mainstream standards such as GRI (Global Reporting Initiative, 2025), SASB (IFRS Foundation, 2024), TCFD (TCFD, 2025), but without sufficient methodological consistency to ensure comparability. This dynamic has been frequently documented in the literature

analyzing the fragmentation of sustainability standards and their impact on the quality and usefulness of reporting (Goerzen et al., 2025; Gopal & Pitts, 2024; Ilori et al., 2023).
Second, the literature focusing on resource and capability theory emphasizes that the adoption and effective implementation of ESG reporting involves significant financial, human and technological resources that are not evenly distributed across organizations (Asif et al., 2023; Moreira et al., 2025; Wang et al., 2024). Empirical studies conducted in a European or global context indicate that small and medium-sized firms face major difficulties in collecting, validating and reporting ESG data due to structural constraints, while large corporations benefit from economies of scale and developed internal infrastructure (Bezerra et al., 2024; Momtaz & Parra, 2025).

Another important analytical strand in the literature concerns the challenges related to the complexity and reliability of ESG information. Sustainability reporting involves the aggregation of data from heterogeneous sources, with varying degrees of verifiability, reflecting quantitative and qualitative dimensions that are difficult to standardize (Boiral & Heras-Saizarbitoria, 2020; Maghsoudi et al., 2025). The complexity of these data is accentuated by the trans-disciplinary nature of ESG indicators, which requires collaboration between different departments (environment, accounting, legal, human resources), leading to institutional synchronicity and the risk of inconsistent reporting (Aguilera & Ruiz Castillo, 2025; Amaranydia & Putri, 2023).

As regards the reliability of ESG information, numerous studies report that in the absence of integrated IT systems and robust audit procedures, reported data may be incomplete, erroneous or susceptible to manipulation (Chopra et al., 2024; Wan & Li, 2025; Zhang & Guo, 2024). This increases the risk of greenwashing and undermines investor confidence. In the Romanian context, these risks are aggravated by structural deficiencies in the digital infrastructure and the lack of specialized skills in non-financial reporting (Aureli et al., 2020; Mehedintu & Soava, 2023; Raluca & Mangiuc, 2022).

Another relevant issue addressed in the literature is the inter-organizational comparability of ESG reporting. Comparability is considered an essential attribute of the usefulness of accounting information (Dinh et al., 2023; Püchel et al., 2024), but in the case of ESG reporting, the plurality of reference frameworks, the lack of convergence between standards and sectoral and regional differences compromise this feature (Mio et al., 2024; Sulkowski & Jebe, 2022). Furthermore, in the absence of a unified taxonomy and clear rules on materiality delineation, external users (investors, authorities, NGOs) have difficulties in assessing ESG performance consistently across entities.

The literature on the influence of global regulations on ESG reporting is also relevant for understanding the context analyzed in this study. Although institutions such as the International Sustainability Standards Board (ISSB), the European Financial Reporting Advisory Group (EFRAG), the Task Force on Climate-related Financial Disclosures (TCFD) or the Global Reporting Initiative (GRI) promote convergence of standards, the effectiveness of these efforts is limited by the lack of a binding legal framework and local resistance to change (Bednárová, 2025; Dathe et al., 2024; Giner & Luque-Vílchez, 2022). In the case of emerging economies such as Romania, the adoption of these regulations depends to a large extent on the institutional capacity to transpose European directives and on the existing culture of compliance in the corporate environment (Bejan et al., 2025; Albu et al., 2021).

In particular, the literature from Central and Eastern Europe points to a significant gap between the rhetoric of sustainability and the concrete implementation of ESG reporting. Recent studies highlight that, in the absence of clear requirements and standardized digital tools, organizations in the region show superficial compliance that is reputation rather than impact oriented (Al-Kubaisi & Abu Khalaf, 2025; Metelytsia et al., 2025; Yu, 2025). This is also confirmed by readiness assessments for new EU regulations such as the CSR Directive (Corporate Sustainability Reporting Directive) (European Union, 2022), requiring the extension of the reporting obligation to a significant number of entities, including SMEs.

In terms of the literature on perceived difficulties in ESG reporting, there are relatively few studies that analyze these perceptions systematically and with rigorous quantitative tools. Most research focuses on content analysis of ESG reports or case studies of good reporting practices (Mukhtar et al., 2025; Paolone & Bitbol-Saba, 2025). However, some recent studies propose econometric models to assess the factors influencing the quality or difficulty of non-financial reporting, identifying as determinants: firm size, sector of activity, international group membership, value chain complexity or the level of national regulation (Christensen et al., 2021; Ortiz-Martínez et al., 2023; Paula Monteiro et al., 2022; Turzo et al., 2022).

At the same time, a recent direction in the literature concerns the impact of digitization on ESG reporting. Digital platforms, Enterprise Resource Planning (ERP) systems and blockchain solutions can help improve the reliability, traceability and comparability of ESG data. Studies report that organizations that invest in advanced digital technologies are better prepared to meet sustainable reporting requirements, significantly reducing the costs of data collection and verification (Bakarich et al., 2020; Cardinali & De Giovanni, 2022; Costa et al., 2023; Dwivedi et al., 2022). However, the benefits of digitization are unevenly distributed and depend on the institutional context, the level of digital literacy and the availability of financial resources - critical issues in emerging economies.

The literature confirms that the difficulty of ESG reporting is a systemic issue, generated by the complex interplay between economic, institutional, regulatory and technological factors. However, there is a research void in terms of an integrated, organizational-level analysis of perceptions of reporting difficulties in the absence of global standardization, particularly in emerging economies in Eastern Europe. This study responds to this gap by proposing a theoretical and empirical model that brings together the most relevant dimensions identified in literature: the cost of information collection, its complexity and reliability, inter-organizational comparability and the perceived influence of global regulations. Therefore, this research not only validates and extends the existing results, but also provides an analytical framework adapted to the Romanian realities, contributing to the strengthening of the theoretical basis on ESG reporting in institutional contexts in transition.

3. Methodology

To investigate the determinants influencing the difficulty of ESG (Environmental, Social and Governance) reporting in the context of the Romanian economy, this study used a quantitative approach, based on the analysis of data collected through a structured questionnaire. The research instrument was applied to a sample of professionals (auditors) in Romania, aiming to assess respondents' perceptions of the main obstacles encountered in the ESG reporting process. The questions in the questionnaire were constructed to capture five distinct dimensions: costs of information collection (ADRcci), lack of standardization (ADRnstdi), complexity of information (ADRcxi), reliability of information (ADRfbi) and comparability of reports (ADRcmpr), along with an additional dimension on regulations and ethical principles (RRspe) as shown in Table 1.

Table 1. Presentation of indicators

Indicator	Symbol	Domain	Likert scale
To what extent do you see the high costs and resources involved in collecting and verifying ESG information as an obstacle to reporting it?	ADRcci	Audit and reporting difficulty (cost of collecting information))	1 (Low difficulty) ... 5 (High difficulty)
To what extent do you consider that the lack of global standardization of ESG reporting frameworks, which creates difficulties in comparing and aligning reported data, contributes to the difficulty of ESG reporting?	ADRnstdi	Auditing and the difficulty of reporting (non-standardization of information)	1 (Low difficulty) ... 5 (High difficulty)

To what extent do you consider that the complexity of ESG data, which requires interdepartmental collaboration and expertise from multiple domains, contributes to the difficulty of ESG reporting?	ADRcxi	Auditing and reporting difficulty (complexity of information)	1 (Low difficulty) ... 5 (High difficulty)
To what extent do you consider that the inability to obtain relevant and reliable data from within the organization, due to sub-optimal internal processes or lack of adequate monitoring systems, contributes to the difficulty of ESG reporting?	ADRfbi	Auditing and the difficulty of reporting (reliability of information)	1 (Low difficulty) ... 5 (High difficulty)
To what extent do you consider that the multitude of regulations and standards, which makes it difficult for auditors to assess and compare companies in a consistent way, contributes to the difficulty of ESG reporting?	ADRcmpr	Auditing and the difficulty of reporting (comparability of reporting)	1 (Low difficulty) ... 5 (High difficulty)
To what extent do you consider that global regulations affect the uniformity of auditing standards, ensuring both compliance with ethical principles and increasing users' confidence in financial reporting in the context of economic and cultural diversity?	RRspe	Regulations and reporting (standardization and ethical principles)	1 (Low difficulty) ... 5 (High difficulty)

Source: Prepared by the author

To test the relationships between the variables analyzed, an OLS (Ordinary Least Squares) econometric model was estimated for panel data, with the dependent variable being the perception of the difficulty of ESG reporting caused by the lack of global standardization (ADRnstdi). The model was calibrated using cross-sectional data obtained from 291 respondents, and the estimates were made using Stata 18 software.

The selection of indicators used in this study was based both on the literature on ESG reporting and on the need to reflect the key dimensions that contribute to the difficulty of operationalizing and auditing sustainability information. Specifically, the five indicators included in the analysis model reflect recurring obstacles identified in empirical research and reports by international organizations (e.g., GRI, EFRAG, SASB, TCFD) on the implementation of ESG standards at the organizational level.

- **ADRcci** (Cost of information collection): This indicator captures the perception of the economic burden associated with obtaining and verifying ESG data, justified by the fact that organizations, especially small and medium-sized ones, experience budgetary and resource constraints when implementing robust reporting mechanisms. The literature consistently highlights costs as a significant barrier to the transition to sustainable reporting.

- **ADRnstdi** (Lack of global standardization): The choice of this indicator is justified by the absence of international convergence on the regulatory framework for ESG reporting, which leads to inconsistencies in the definition of indicators, difficulties in inter-firm comparability, and methodological uncertainties. Thus, this variable reflects the lack of a common language in ESG reporting, generating ambiguity and information volatility.

- **ADRcxi** (Information complexity): This indicator captures the transdisciplinary nature of ESG data, which requires simultaneous expertise in areas such as the environment, corporate governance, social responsibility, and accounting. The complexity of the processes of collecting, integrating, and validating these data creates major difficulties in interdepartmental coordination and is recognized as a systemic barrier in literature.

- **ADRfbi** (Information reliability): Reliability is an essential condition for auditability and transparency. This indicator reflects the perceived difficulties in generating relevant and accurate ESG data, especially in the absence of robust IT systems or standardized internal control and validation processes. In addition, the lack of clear traceability reduces stakeholder confidence in the veracity of ESG reports.

- **ADRcmpr** (Comparability of reports): This variable captures the difficulty of assessing and comparing ESG performance between economic entities due to the plurality of regulations and methodological options available. Comparability is a fundamental principle of financial and sustainable reporting, and its absence limits the usefulness of ESG information for investors, regulators, and other stakeholders.

- **RRspe** (Regulations and ethical principles): This variable was introduced to capture the institutional-normative dimension, i.e., the impact that global regulations and alignment with ethical principles have on the uniformity of audit standards and the credibility of ESG information. The importance of this dimension is reflected in the literature on sustainable governance, which emphasizes the need for consistency and ethics in reporting to combat the phenomenon of “greenwashing.”

Therefore, the choice of these indicators allows for an approach capable of capturing the multiple facets of the difficulties associated with ESG reporting in a transitional institutional context such as Romania’s.

We have formulated the following research hypotheses:

H1: There is a positive and significant relationship between the costs of collecting ESG information (ADRcci) and the difficulty of reporting caused by the lack of global standardization (ADRnstdi).

H2: The complexity of ESG information (ADRcxi) is positively and significantly associated with the difficulty of reporting caused by the lack of a global standardized framework.

H3: The low reliability of ESG information (ADRfbi) leads to a significant increase in the difficulty of reporting in the absence of global standardization.

H4: The perception of a lack of comparability of ESG reports (ADRcmpr) has a positive and significant effect on reporting difficulty in the absence of a standardized framework.

The econometric equation estimated in the study expresses the relationship between the perceived difficulty of ESG reporting caused by the lack of global standardization (ADRnstdi) and a set of five explanatory factors, namely information collection costs (ADRcci), the influence of global regulations and ethical principles (RRspe), the complexity of ESG information (ADRcxi), its reliability (ADRfbi), and the difficulty of comparing reports (ADRcmpr) according to the following multiple linear regression model:

$$ADRnstdi_{it} = \beta_0 + \beta_1 \cdot ADRcci_{it} + \beta_2 \cdot RRspe_{it} + \beta_3 \cdot ADRcxi_{it} + \beta_4 \cdot ADRfbi_{it} + \beta_5 \cdot ADRcmprit_{it} + \varepsilon_{it} \quad (1)$$

Where:

- $ADRnstdi_{it}$, perception of the difficulty of ESG reporting caused by the lack of global standardization, for observation i at time t
- $ADRcci_{it}$, the cost of collecting and verifying ESG information
- RRspeit, perception of the impact of global regulations and ethical principles
- $ADRcxi_{it}$, complexity of ESG information
- $ADRfbi_{it}$, ESG information reliability
- $ADRcmpr_{it}$, comparability of ESG reports between organizations
- β0, intercept (constant) of the model
- β1…β5, estimated regression coefficients
- ε_{it} random error, which captures unobserved influences

Therefore, the methodology adopted allows for a rigorous assessment of the perceived impact of the main institutional, informational, and regulatory barriers on the difficulty of ESG reporting, while providing a relevant empirical framework for understanding the challenges faced by Romanian organizations in the process of complying with sustainable reporting requirements.

4. Results and Discussions

The results of the econometric analysis highlight significant relationships between the difficulty of ESG reporting, determined by the lack of global standardization, and a set of relevant explanatory factors, providing a solid empirical basis for interpreting the challenges faced by Romanian organizations in the sustainable reporting process.

The descriptive statistics presented in Table 2 provide an overview of the distribution of responses for each of the variables analyzed in the econometric model, reflecting respondents' perceptions of the difficulties of ESG reporting in the Romanian organizational context. The average values of all variables fall within a relatively narrow range, between 3.50 and 3.67, indicating a moderately high perception of the existence of the barriers investigated.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ADRnstdi	291	3.608	0.825	1	5
ADRcci	291	3.529	0.892	1	5
RRspe	291	3.502	0.848	1	5
ADRcxi	291	3.522	0.888	1	5
ADRfbi	291	3.667	0.868	1	5
ADRcmpr	291	3.591	0.910	1	5

Source: Prepared by the authors using Stata 18 software.

According to Table 2, the dependent variable, ESG reporting difficulty due to lack of global standardization (ADRnstdi), has an average of 3. 608 and a standard deviation of 0.825, suggesting a widespread perception among respondents that the absence of a unified global framework is a significant obstacle to sustainable reporting. Among the explanatory variables, the highest average level is associated with the reliability of ESG information (ADRfbi), with a value of 3.667, thus reflecting the importance attributed to the availability of relevant and verifiable data in facilitating reporting. Similarly, the comparability of ESG reports (ADRcmpr), with an average of 3.591, and the costs associated with collecting ESG information (ADRcci), with an average of 3.529, are perceived as relevant factors contributing to the difficulty of the reporting process.

All variables show moderate variation, with standard deviations close to 0.85–0.91, suggesting reasonable dispersion of responses within the sample and supporting the robustness of subsequent estimates. The minimum and maximum ranges for each variable vary between 1 and 5, confirming the use of a five-point ordinal Likert scale, consistent with standard approaches in the empirical literature focused on perception analysis.

Overall, these preliminary statistics validate the suitability of the data for estimating a linear regression model, indicating sufficient variation in responses to capture significant relationships between the difficulty of reporting ESG and the factors considered to be determinants.

The correlation matrix presented in Table 3 provides a preliminary overview of the intensity and direction of linear relationships between the dependent variable and the explanatory variables included in the econometric model. All correlation coefficients are positive and significant, indicating that as the perception of the difficulties associated with each factor increases, so does the perception of the negative impact of the lack of standardization in the ESG reporting process.

Table 3. Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) ADRnstdi	1.000					
(2) ADRcci	0.545	1.000				
(3) RRspe	0.435	0.332	1.000			
(4) ADRcxi	0.633	0.508	0.447	1.000		
(5) ADRfbi	0.587	0.451	0.448	0.634	1.000	
(6) ADRcmpr	0.612	0.471	0.454	0.619	0.603	1.000

Source: Prepared by the authors using Stata 18 software.

The results of the correlation matrix validate the theoretical consistency of the proposed model and provide preliminary empirical support for testing the formulated hypotheses, highlighting significant links between respondents' perceptions of different types of constraints and the overall difficulty of ESG reporting in the absence of international standardization.

Table 4 presents the values of the variance inflation factor (VIF), providing a quantitative assessment of the degree of collinearity between the explanatory variables included in the estimated linear regression model. VIF values are a standard tool for detecting potential multicollinearity issues, which can distort coefficient estimates and the statistical significance of relationships between variables.

Table 4. Variance inflation factor

	VIF	1/VIF
ADRcxi	2.120	0.472
ADRfbi	1.979	0.505
ADRcmpr	1.965	0.509
ADRcci	1.452	0.689

RRspe	1.378	0.726
Mean VIF	1.779	.

Source: Prepared by the authors using Stata 18 software

All VIF values recorded are below the conventional threshold of 5, which clearly indicates the absence of problematic collinearity between the predictors included in the model. Moreover, none of the values exceeds 2.2, which reinforces the validity of the estimates and suggests that the independent variables are not redundant with each other. The highest VIF value is associated with the ADRcxi variable (ESG information complexity), with a coefficient of 2.120, indicating a slight but insignificant explanatory overlap with the other predictors. The values corresponding to the other variables – ADRfbi (1.979), ADRcmpr (1.965), ADRcci (1.452) and RRspe (1.378) – also remain at low levels, reflecting a relative independence in the structure of the explanatory relationships of the model. The results of the multiple linear regression presented in Table 5 provide a solid empirical basis for evaluating the hypotheses formulated regarding the difficulty of ESG reporting caused by the lack of global standardization.

Table 5. Linear regression

ADRnstdi	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
ADRcci	0.199	0.045	4.44	0	0.110	0.287	***
RRspe	0.076	0.046	1.65	0.100	-0.015	0.166	
ADRcxi	0.230	0.054	4.23	0	0.123	0.337	***
ADRfbi	0.156	0.054	2.90	0.004	0.050	0.261	***
ADRcmpr	0.203	0.051	3.98	0	0.103	0.303	***
Constant	0.534	0.180	2.98	0.003	0.181	0.888	***
Mean dependent var	3.608		SD dependent var		0.825		
R-squared	0.541		Number of obs		291		
F-test	67.137		Prob > F		0.000		
Akaike crit. (AIC)	498.305		Bayesian crit. (BIC)		520.345		

**** p<.01, ** p<.05, * p<.1*

Source: Prepared by the authors using Stata 18 software

The estimated model is statistically significant as a whole, as indicated by the F-test value ($F = 67.137$, $p < 0.001$), confirming that the explanatory variables included contribute significantly to explaining the variation in the dependent variable (ADRnstdi). The coefficient of determination (R-squared = 0.541) reveals that approximately 54.1% of the variation in the perception of the difficulty of ESG reporting can be attributed to the four factors analyzed, reflecting adequate explanatory power for a model applied in the social sciences.

Regarding the validation of individual hypotheses, the results fully confirm the theoretical expectations. Hypothesis H1 is validated, as the coefficient associated with the costs of collecting ESG information (ADRcci) is positive (0.199) and statistically significant at a 99% confidence level ($p = 0.000$). This indicates that the perception of the financial and logistical burden involved in the process of collecting and verifying ESG data contributes significantly to the difficulty of reporting, especially in the absence of a standardized framework to simplify or streamline these processes. Hypothesis H2 is also validated, given that the variable relating to the complexity of ESG information (ADRcxi) has a coefficient of 0.230 and high statistical significance ($p = 0.000$). This result reflects the fact that difficulties related to the integration, interpretation, and coordination of ESG data, which involve multiple functional areas and disciplines, intensify the perception of the difficulty of ESG reporting in the absence of a common standard. Hypothesis H3 is confirmed, as the coefficient for ESG information reliability (ADRfbi) is positive (0.156) and significant at the 1% level ($p = 0.004$). Thus, deficiencies in obtaining relevant, verifiable, and consistent data within organizations contribute to the perception that ESG reporting is difficult when there are no uniform standards to guide the quality of reported data.

Hypothesis H4 is validated, with the coefficient of the ESG report comparability variable (ADRcmpr) being positive (0.203) and significant at $p = 0.000$. This result highlights that the inability to effectively compare ESG data across organizations, due to the plurality of reporting frameworks and formats, is a major obstacle perceived in the absence of global standardization. At the same time, the model constant (0.534) is statistically significant ($p = 0.003$), suggesting that, even in the absence of a direct influence of the explanatory variables analyzed, there is a baseline level of perceived difficulty in ESG reporting attributed to other factors not selected in the model. Furthermore, the confidence intervals of the coefficients are at a reasonable distance from zero, reinforcing the robustness of the estimates. The results confirm the validity of the proposed theoretical model and support the hypotheses formulated, empirically demonstrating that the perception of the difficulty of ESG reporting in the absence of a global standardized framework is strongly influenced by the costs of collection, complexity, reliability, and comparability of ESG information. These findings underscore the importance of implementing a coherent system of international standards in the field of sustainable reporting.

Figure 1 provides an overview of how respondents' perceptions vary according to the level of costs. These relationships are plotted against the ordinal scale applied to the dependent variable, where values from 1 to 5 signify very low, low, medium, high, and very high difficulty, respectively.

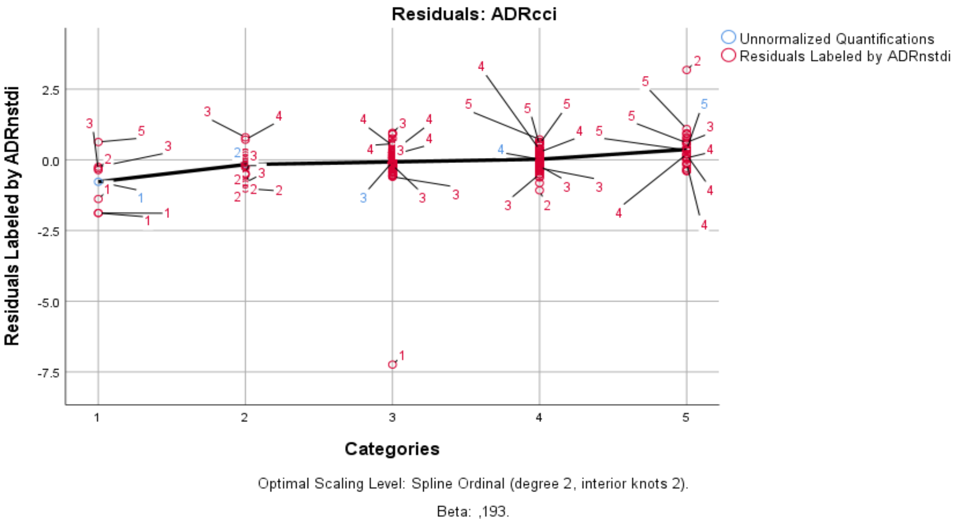

Figure 1. Distribution of residues according to ADRcci variable categories and its effect on ESG reporting difficulty (ADRnstdi)

Source: Prepared by the author

For the lower categories of the ADRcci variable, corresponding to the perception of a low financial and logistical effort in terms of ESG data collection (levels 1 and 2), there is a significant dispersion of residuals, with pronounced negative values. This reflects the model's tendency to underestimate the actual perceived difficulty of ESG reporting for some respondents who, despite perceiving low costs, report medium or even high levels of difficulty (labels 3, 4, and 5). This discrepancy can be interpreted as an expression of the influence of other structural or institutional factors which, in the absence of clear reporting standards, amplify the perceived difficulty even under conditions of low costs.

In the middle of the scale (category 3), the model provides a more stable fit, with residuals relatively close to zero and most scores clustered around the average value of ESG reporting difficulty. This suggests that, for respondents who perceive a moderate level of costs involved, there is a direct and proportional correlation between the perceived effort and the difficulty of reporting, indicating a robust predictive relationship in this area of the distribution.

For the higher categories of the ADRcci variable (levels 4 and 5), corresponding to the perception of high and very high costs, there is a pronounced concentration of residuals in the vicinity of the zero axis, and most of the scores corresponding to the dependent variable are associated with high and very high reporting difficulties (values of 4 and 5). This confirms that the model effectively estimates the true values of ESG difficulty for those respondents who strongly feel the financial and logistical burden of data collection. This finding reinforces the conclusions of the multiple linear regression, according to which the costs of collecting ESG information are a positive and significant determinant of reporting difficulty in the absence of global standardization.

Figure 2 illustrates the relationship between the variable RRspe, which measures respondents' perception of the influence of international regulations and ethical principles on ESG reporting, and ADRnstdi, which reflects the difficulty of ESG reporting caused by the lack of a global standardized framework. The interpretation scale of the dependent variable is ordered from 1 (very low difficulty) to 5 (very high difficulty), and the vertical axis shows the model residuals, i.e., the differences between the observed values and those estimated by the model, labeled with the actual scores for ADRnstdi.

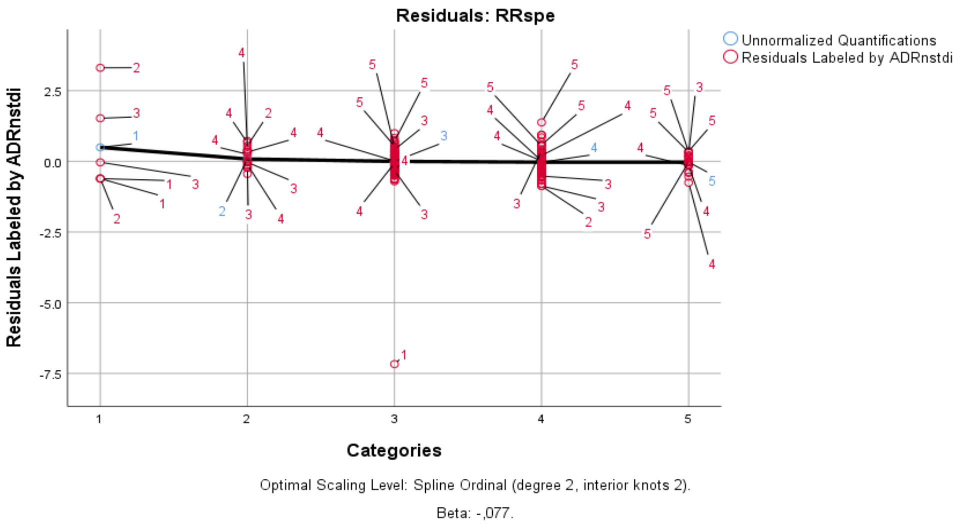

Figure 2. Distribution of residuals by perceived categories of global regulations and ethical principles (RRspe) and their effect on ESG reporting difficulties (ADRnstdi)

Source: Prepared by the author

For the lower categories of the RRspe (scores 1 and 2), which reflect the perception that international regulations do not significantly influence the ESG reporting process, a visible dispersion of residuals is observed, with both negative and positive values. For example, in category 2 there are numerous values of high perceived difficulty (scores 4), which suggests that even in the absence of perceived regulatory pressure, some respondents experience major difficulties in reporting — an aspect that cannot be satisfactorily explained by this variable.

In the central area (category 3), the model seems to perform best, with most residuals being close to zero and the values of perceived difficulty being relatively homogeneous, around a score of 4 (high difficulty). However, this result is not sufficient to support a consistent relationship between the two variables.

In the higher categories (4 and 5), which reflect agreement that international regulations and ethical principles affect the uniformity and credibility of ESG reporting, the residuals remain relatively close to zero, but no clear direction or significant upward trend in ADRnstdi scores is observed. In addition, the responses are dispersed between values 3, 4 and 5, indicating a lack of homogeneity in perceptions, even among those who accept the importance of the global regulatory framework.

Figure 3 analyzes the relationship between ADRcxi, the variable expressing the perception of the complexity of ESG information, and the difficulty of ESG reporting in the absence of a standardized framework (ADRnstdi), considering the ordered scale of interpretation from 1 (very low difficulty) to 5 (very high difficulty). The vertical axis represents the model residuals (the difference between the observed and estimated values for ADRnstdi), labeled with the actual values of perceived difficulty, and the horizontal axis shows the five levels of perceived complexity.

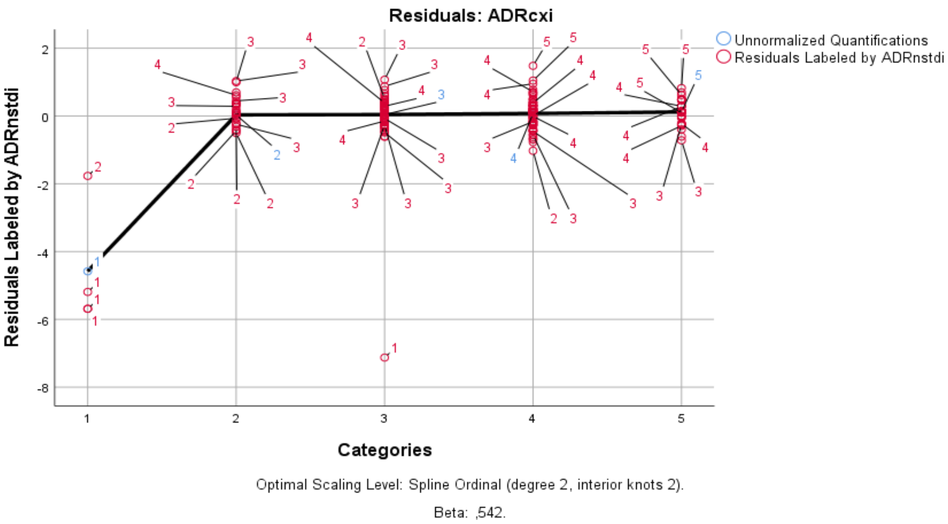

Figure 3 Distribution of residuals according to the complexity of ESG information (ADRcxi) and its influence on the difficulty of reporting in the absence of global standardization (ADRnstdi)

Source: Prepared by the author

Figure 3 uses an ordinal spline scaling (degree 2, with two inner nodes), which allows capturing any nonlinearities in the relationship. The thick black line, which follows the average trend of the data, describes a clearly upward trajectory from category 1 to 5, suggesting a strong positive relationship between the perception of the complexity of ESG information and the difficulty of reporting. This conclusion is numerically supported by the Beta coefficient = 0.542, which indicates a substantial influence of this variable on the difficulty of ESG reporting. For category 1 (very low complexity), a concentration of real values is noted around the score 1 (very low difficulty), and the residuals are negative and significant, indicating that the model tends to overestimate the perceived difficulty when respondents consider that ESG information is easy to understand and manage. For categories 2 and 3 (low/medium complexity), the distribution of residuals is relatively symmetrical and balanced around the zero axis, indicating good predictive accuracy in this area. The scores associated with perceived difficulty are predominantly 3 and 4 (medium and high difficulty), indicating moderate consensus among respondents on the association between complexity and difficulty. For categories 4 and 5 (high and very high complexity), there is a visible concentration of residuals around zero and a prevalence of scores of 4 and 5 on the dependent variable, suggesting that the model accurately captures the high levels of difficulty among respondents who perceive ESG information as complex. The lack of large variation in residuals in these categories validates the robustness of the relationship.

Figure 4 shows the relationship between the variable ADRfbi reflecting respondents' perception of the reliability of internally generated ESG information and the difficulty of ESG reporting in the absence of an international standardized framework (ADRnstdi). The scores on the horizontal axis correspond to the five levels of perceived reliability (from 1 = very low, to 5 = very high), and the vertical axis represents the residuals of the model, labeled with the actual values of perceived difficulty (1–5).

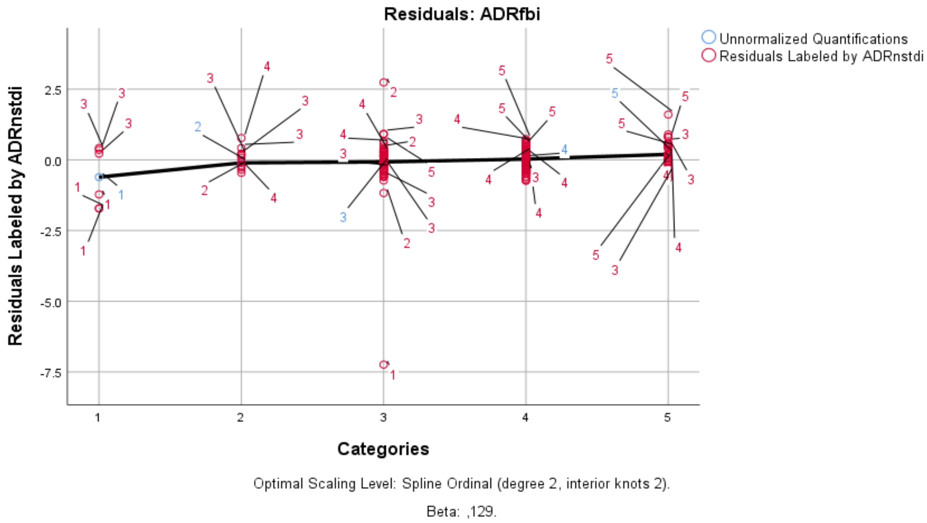

Figure 4 The distribution of residuals according to the reliability of ESG information (ADRfbi) and its impact on the difficulty of reporting in the absence of global standardization (ADRnstdi)

Source: Prepared by the author

The spline trend lines and the distribution of the residuals provide essential information about the empirical validity of the relationship between the two variables. The Beta coefficient value = 0.129, although modest compared to other predictors, is positive, which confirms the existence of a direct relationship between lack of reliability and difficulty of ESG reporting, a relationship that was previously confirmed by multiple linear regression, where ADRfbi recorded a statistically significant coefficient ($p = 0.004$).

For the lower categories of ADRfbi (1–2), which signify perceptions of low reliability, a slightly accentuated dispersion of the residuals is observed, including both negative and positive values. This high variability suggests that for respondents who consider ESG information to be unreliable or incomplete, the perception of difficulty of reporting may be affected by additional factors (e.g. lack of internal skills or technological resources), which causes the model to slightly underestimate the true values. For the intermediate categories (3–4), there is increased stability of the estimates, with most of the residuals placed in the vicinity of the zero axis. This indicates a good fit between the predicted and observed values, with the model managing to correctly estimate the difficulty of reporting under conditions of medium or moderate reliability of ESG data.

In the upper category (5), corresponding to the perception of high reliability of information, a significant concentration of difficulty scores is observed in the area

3–5 (medium to very high difficulty), which may seem paradoxical. This finding suggests that although some organizations have reliable data, the lack of a global standardized framework continues to generate systemic difficulties in reporting, for example, in the interpretation, auditing or comparability of ESG information. The model captures this reality, with good prediction accuracy (residuals close to zero).

Figure 5 shows the relationship between the variable ADRcmpr — which captures respondents' perceptions of the difficulty of comparing ESG reports across organizations — and ADRnstdi, the dependent variable that measures the difficulty of ESG reporting due to the lack of global standardization. The horizontal axis shows the five levels of perceived comparability (from 1 = very easy comparability, to 5 = very difficult comparability), and the vertical axis shows the residuals of the model, labeled with the actual scores of difficulty of ESG reporting (1 = very low, 5 = very high).

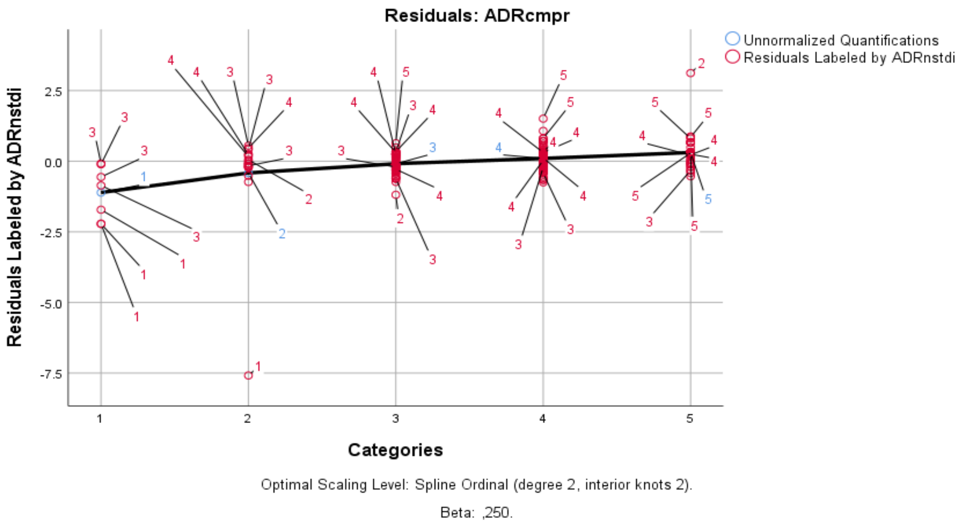

Figure 5. Distribution of residuals according to the comparability of ESG reports (ADRcmpr) and its influence on the difficulty of reporting in the absence of a standardized framework (ADRnstdi)

Source: Prepared by the author

The general relationship is illustrated by a slightly ascending spline, indicating that as the perception of comparability difficulty increases, the perception of ESG reporting difficulty also increases. This conclusion is supported by the Beta coefficient = 0.250, which indicates a positive relationship of moderate intensity between the variables, consistent with the results of the multiple linear regression, where ADRcmpr recorded a significant and statistically relevant coefficient ($p = 0.000$).

For the lower categories (1–2), associated with a favorable perception of comparability of ESG reports, a greater dispersion of the residuals is observed, including cases in which the perceived difficulty of reporting is high (scores 3–4), although respondents do not report comparability problems. These negative deviations indicate underestimations of the real values by the model in these situations, suggesting that other factors (e.g. lack of internal expertise, institutional pressures, etc.) may influence the difficulty of reporting even in conditions of relatively good comparability. For the intermediate categories (3–4), the model shows increased stability: the residuals are close to zero and the perceived difficulty scores are predominantly between 3 and 4. This indicates a good fit of the model in this area, which strengthens the validity of the theoretical relationship. For the upper category (5), which signifies the perception of very difficult comparability, the scores are concentrated in the range 4–5 (high or very high difficulty), and the residuals are distributed symmetrically around the zero axis. This configuration indicates that the model accurately reproduces the degree of perceived difficulty when the comparability of ESG reports is considered poor, suggesting a robust relationship between the two variables.

5. Conclusions

The results obtained in this study highlight, in an empirically rigorous manner, that the difficulty of ESG reporting, in the absence of a global standardized framework, is deeply influenced by a series of factors perceived as significant obstacles at the organizational level. The multiple linear regression analysis, supported by the graphical interpretations of the residuals, confirms the existence of significant and positive relationships between the difficulty of reporting and four key dimensions: the perception of the high costs of collecting and verifying ESG data, the complexity of ESG information involving multidisciplinary expertise, the lack of reliability of information obtained internally and the difficulty of inter-organizational comparability. In contrast, the perception of the influence of global regulations and ethical principles did not have a statistically significant contribution to the explanatory model, which can be interpreted as a reflection of the misalignment between international regulatory requirements and the operational realities of Romanian economic entities.

These findings highlight a pressing need for systemic intervention, as the perceived difficulties do not stem exclusively from a lack of voluntary compliance but reflect the absence of an adequate institutional and information infrastructure. In this regard, it is necessary to strengthen the national public policy framework, both by harmonizing national legislation with European directives on sustainable reporting, and by implementing active support mechanisms, designed to facilitate the transition of organizations to reporting practices aligned with international standards. A priority direction is the development of an integrated national system for collecting, verifying and reporting ESG data, supported by interoperable digital platforms and unitary methodologies, which ensure coherence and comparability across entities. In addition, continuous training of staff responsible for ESG reporting, accompanied by financial incentives for investments in IT systems and auditing tools, can contribute to reducing the informational and operational barriers reported by respondents.

In the medium and long term, promoting an organizational culture focused on transparency, responsibility and sustainable ethics becomes essential, not only for increasing the quality of ESG reporting, but also for integrating sustainability into the strategic corporate governance model. Thus, the study's conclusions firmly support the idea that streamlining ESG reporting in Romania cannot be achieved exclusively through compliance with international regulations, but requires an integrated approach to public policies, combining regulatory intervention with technical, educational and financial support, within an institutional framework capable of stimulating the active and sustainable participation of economic actors.

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