From Transparency to Maturity. An Exploratory Exercise to Assess Supply Value Chain ESG Reporting in the Light of ESRS Requirements

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Abstract

The study is an exploratory exercise to assess the transparency and quality of supply chain reporting through ESG factors. A qualitative thematic content analysis of sustainability and integrated reports was employed on a sample constituted by Romanian listed companies, following the topic of supply and value chain reporting and transparency. The textual analysis was carried out with NVivo 15 after manual data gathering of reports publicly available for 2024. Afterward, a qualitative assessment was employed on the quality of supply and value chain reporting. For both qualitative assessments, the scoring method was used. The qualitative analysis revealed that the sustainability themes regarding “Value chain policies and codes of business conduct” and “ESRS value chain reporting” are the most transparently presented, obtaining the highest scores, followed by “Supply chain impact” and “Due diligence and ESG risk management in the value chain”. The least transparent topics are “ESG criteria integrated into supply chain management and suppliers selection” and “Communication and grievance mechanisms for value chain workers”. The supply chain reporting quality was assessed through the lens of robust points and weaknesses. The results showed that three companies have a good to outstanding quality of reporting, with a clear understanding of ESRS requirements and concrete steps integrated to improve supply chain transparency through ESG reporting. The paper enriches the knowledge in the field of assessing the supply chain ESG reporting transparency by adding value through the thematic qualitative analysis and evaluation of supply chain reporting quality, following the ESRS reporting framework. The results of the study can be helpful in the process of improving supply chain reporting, integrating ESG, and increasing the transparency of information by offering managers possible options for developing appropriate reporting tools.

Keywords

supply chain, sustainability reports, ESG, transparency, ESRS, content analysis

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Introduction

As global sustainability concerns become increasingly pressing, the demand for rigorous environmental, social, and governance (ESG) reporting in supply chains has intensified. The ESRS represents a legislative framework that obligates companies to disclose non-financial information, enhancing accountability in their sustainability practices. Research suggests that the adoption of structured ESG reporting can significantly improve transparency and stakeholder trust while facilitating better decision-making within supply chains (Vegter, Hillegersberg and Olthaar, 2021; Betts, Gutierrez-Franco and Ponce-Cueto, 2022; Zeng, Li and Zeng, 2022). Effective ESG reporting supports the establishment of performance measurement systems that monitor sustainability across various dimensions, including economic, social, and environmental parameters. Thus, performance metrics must align with ESG requirements to ensure supply chains can adequately assess and articulate their sustainability efforts (Ahi, 2021; Cao, Shen and Chan, 2024). Moreover, developing supply chain sustainability metrics, framed within the ESRS context, promotes identifying critical success factors, thus fostering sustainable practices within supply chain operations (Dai and Tang, 2022; Paul et al., 2022). Companies are often pressured to substantiate their ESG claims with quantitative evidence, which highlights the importance of integrating quantitative techniques and data-driven assessments into supply chain sustainability reporting frameworks (Xing, 2023; Leogrande, 2024). In this regard, the ESRS is a guiding instrument pushes organizations towards embracing comprehensive ESG metrics that cater to regulatory demands while promoting holistic sustainability throughout their supply chains.

According to the GEM 2022 Report, *Measuring ESG transparency worldwide*, prepared for Romania, the supply value chain is not sufficiently described, and generally presents a low degree of transparency (Hofstetter and Diegelmann, 2023). As Hofstetter and Diegelmann (2023) pointed out, in the sustainability reports of the Romanian listed companies included in the top 20, according to the BET index, the topic of supply value chain is not very present, approx. 30% of the companies report a description of the supply value chain, only 5% provide information about their suppliers and contractors, and also about the estimated number of suppliers along the value chain, and a percentage of 15% of the companies report on the geographical distribution of suppliers. The issue of insufficient ESG transparency in supply chains has been observed not only in Romania but also in various other countries. According to Chang (2023), integrating ESG principles in China's supply chains has gained momentum but remains hampered by incomplete disclosures and a lack of clarity regarding supplier engagement and environmental impacts. The study indicates that while many firms recognize the importance of ESG, less than 35% effectively report detailed information on their supply chains, with substantial gaps in disclosing supplier evaluations and geographical distribution, akin to findings observed in Romania (Das, 2023). In the United States, Villena and Dhanorkar (2020) addressed the need for enhanced transparency in global supply chains, underscoring how institutional pressures compel companies to provide substantial disclosures regarding environmental practices. Like the Romanian context, many firms lacked comprehensive information on supplier assessments and the environmental criteria used in decision-making processes (Villena and Dhanorkar, 2020; Tian, Tian and Guo, 2025; Xing, 2023). Moreover, a comparative study analyzing multiple countries, including those within the European Union, found that companies often provided minimal information about their ESG partnerships. While 55% of surveyed companies reported ESG-related practices in their sustainability reports, only 25% provided adequate information on the environmental regulations adhered to by their suppliers. Such findings reflect a trend where the focus on ESG as a marketing tool often overshadows the necessity for genuine transparency and accountability in supply chains, echoing concerns raised in related reports about Romania (Baid and Jayaraman, 2022). On the other hand, the recent amendments to the CSRD following the European Commission's proposal as part of the "Omnibus I" package to simplify EU sustainability legislation, postpone by two years the entry into force of the CSRD requirements for large companies that have not yet started reporting, as well as for listed SMEs, and by one year the deadline for transposition and the first phase of application (covering the most prominent companies) of the Corporate Sustainability Due Diligence Directive (CSDDD) (The European Parliament and of the Council, 2025). This delay is beneficial, providing companies with extra time to enhance their reporting practices. However, it also raises concerns about ongoing commitment to sustainability and accountability during the transition period. This postponement reflects a growing recognition of the complexities involved in implementing ESG frameworks within corporate structures. Similar trends have been observed in other jurisdictions, including the United States, where the Securities and Exchange Commission (SEC) has indicated the need for more flexible timelines for ESG disclosures due to varied levels of preparation among companies (Marie et al., 2024). Such regulatory approaches emphasize the balance that authorities must maintain between fostering transparency and ensuring companies are adequately prepared to meet these standards. Organizations grappling with similar reporting challenges can benefit from more straightforward guidelines and enhanced institutional support, as studies show this fosters more effective ESG practices (Luo and Tang, 2023; Korzeb et al., 2025).

In this context, our study aims primarily to assess the reporting and transparency of the value and supply chain by integrating ESG aspects and a proposal to assess the quality of information reporting on this topic. To achieve this objective, a qualitative thematic content analysis of sustainability and integrated reports was carried out, where applicable, for listed Romanian companies selected and included in the top 20, according to the BET index and rigorous selection criteria. Only companies with sustainability or integrated reports published for 2024 by the end of April 2025 were included in the final sample. Through our scientific approach, we aimed to find answers to the following questions: *RQ1. What is the degree of transparency and maturity of companies in the process of reporting information on the value and supply chain?; RQ2. What are the most transparently reported supply value chain topics?; RQ3. How can the* *quality of supply chain reporting be assessed by integrating ESG aspects into sustainability or integrated reports?*

1. Review of the scientific literature

Recent research underscores the importance of supply chain transparency as a critical aspect of effective ESG reporting. Morgan, Richey Jr. and Ellinger (2018) emphasize that supplier transparency, as a strategic advantage, is pivotal for facilitating comprehensive information sharing between stakeholders. Their findings show that although numerous firms recognize the competitive advantage linked to transparency, many still encounter challenges in executing and managing transparent practices throughout their supply chains. Furthermore, the ongoing evolution of sustainability reporting reflects a broader trend towards greater accountability and trust among stakeholders, further reinforcing the significance of establishing operational transparency within the value chain. Oriekhoe et al. (2024) present a compelling argument regarding blockchain's capacity to revolutionize traditional supply chain management paradigms by providing real-time, immutable information to stakeholders. The integration of blockchain technology streamlines operations and bolsters the reliability and accessibility of ESG-related data within supply chains. The potential for blockchain to enhance transparency is echoed by Maslekar and Mandave (2024), who highlight its multifaceted benefits, including improved traceability and operational efficiency across the supply chain. On the social responsibility front, Baid and Jayaraman (2022) advocate for amplifying the "S" aspect of ESG within supply chain finance. Their approach resonates with findings that underscore the interconnection between social responsibility initiatives and enhanced transparency within the supply chain, suggesting that companies fulfilling social governance responsibilities through clear reporting practices will likely see improved stakeholder trust and investment potential. Moreover, Zhu et al. (2018) describe how operational supply chain transparency (OSCT) enables firms to engage proactively with their stakeholders, ensuring completeness and accuracy in the information shared across the supply chain. This reiterates the importance of structured and coherent information reporting in enhancing visibility within the supply chain framework. The dynamic nature of supply chains requires continuous improvement in information quality, aligning with the emerging ESG reporting standards.

The literature also highlights distinct patterns of ESG performance across various supply chain layers, as Xu et al. (2024) identified, suggesting that the depth and quality of ESG disclosures can significantly influence financial outcomes and stakeholder engagement. Thus, a strategic alignment between ESG objectives and supply chain management practices is crucial for fostering sustainable business operations. Furthermore, Chevrollier et al. (2020) discuss the predictive value of strategic orientation concerning ESG performance, suggesting that organizations adopting a more stakeholder-oriented approach yield significantly better ESG outcomes. This finding implies that corporate cultures promoting transparency and stakeholder engagement will likely be more effective in fulfilling ESG commitments. In addressing the challenges of adequate supply chain transparency, Zheng et al. (2024) illustrate potential solutions, highlighting how enhanced digitalization efforts can mitigate risks associated with insufficient transparency. These insights support the notion that leveraging technological advancements is vital for improving compliance with stakeholder expectations and regulatory frameworks. Lastly, Chatterjee and Chatterjee (2022) assert that a transparent supply chain is fundamental to sustainable supply chain management (SSCM), revealing that operational resilience, efficiency, and sustainability are interconnected through comprehensive reporting practices. Additional research by Das (2023) substantiates this perspective, showing that sustainability initiatives correlate positively with improved ESG performance across global supply chains.

2. Research methodology

2.1. Sample constitution and data collection

To constitute the sample of RO companies listed on Bucharest Stock Exchange (BSE), the top 20 companies that recorded the highest ESG reporting transparency score according to the GEM ASSAY™ 2022 methodology were selected. The Global ESG monitor investigates the transparency of non-financial reporting of companies listed in Europe, the United States, Australia, and Asia (Hofstetter and Diegelmann, 2023). The content analysis of the reports within the GEM ASSAY™ methodology was based on six criteria (balance, comparability, accuracy, timeliness, reliability, relevance), and fifteen evaluation components were included in this methodology. The weight of the value and supply chain component is 8% (Hofstetter and Diegelmann, 2023). The following selection criteria were further applied to establish the final sample of companies in the non-financial sector: online availability of the sustainability report/statement for 2024;

online publication of the sustainability report/statement for 2024, in English, and the ESRS reporting framework. Also, the premise of this study is the higher probability of the companies in the sample, considered to be the most transparent in ESG reporting according to the GEM AssayScore 2022 methodology, to publish more comprehensive and detailed information on the supply value chain, in their sustainability or integrated reports for 2024. Thus, in order to carry out the qualitative content analysis aimed at assessing the supply chain transparency, the companies' sustainability reports/statements for 2024 were downloaded. Six companies published individual sustainability reports or statements (OMV, Alro, Aquila, Conpet, Transgaz, and MedLife), and two included the sustainability information according to the ESRS framework within the integrated annual report (Romgaz and Teraplast).

2.2. Methodology design

To build a methodology for assessing the transparency, extent, and maturity of ESG reporting in the supply value chain, data was collected and extracted manually and processed using NVivo 15 software, from companies' descriptions and reports on items and processes related to the supply chain that could serve as components in building the assessment model. Also, the KPMG report (2023), *The Future of Supply Chain*, was studied to establish the evaluation criteria for the reported components regarding the supply value chain. This report emphasizes that to build a sustainable value chain, companies must be prepared to make substantial progress in the following aspects: responsible sourcing, due diligence, decarbonization, circular economy, human rights working in manufacturing and production, and technology-based ESG reporting (KPMG, 2023). Thus, considering the ESRS reporting requirements, the KPMG report on the sustainable value chain, and the studies conducted by Chiffoleau and Dourian (2020), Cavicchi and Vagnoni (2022), Zidar, Turk and Prišenk (2023), six main themes were identified and subjected to analysis based on criteria and a rating scale. The scoring scale from 0 to 3 was used, and points were assigned based on the existence and level of detail of the reported information, as can be seen in Table no. 1.

Table no. 1. The supply value chain transparency reporting assessment process descriptors

Supply and value chain (S&VC) themes	Assessment criterion	The scoring basis	The scoring scale
Supply chain impact	The company identifies the value chain (suppliers, contractors, value chain workers) as a key stakeholder and recognizes the relevant impacts, risks, and opportunities (IROs) at this level. Briefly, IROs' identification in the value chain	Awarding scores for explicitly recognizing the value chain as an area of impact, risk, or opportunity (IRO).	0 points (not explicitly recognized), 1 point (generally recognized), 2 points (general IRO identification), 3 points (key IROs identified in the S&VC and detailed).
ESG criteria integrated into supply chain management and supplier selection	The company uses ESG criteria in the supplier selection, evaluation, or monitoring processes.	Points are awarded for ESG integration processes in the relationship with suppliers (for instance, questionnaires, audits, various platforms, acquisition criteria, other issues).	0 points (not mentioned), 1 point (generally mentioned), 2 points (existence of processes , for instance, measurement), 3 points (formal processes are mentioned clearly, for instance questionnaires, audits, external platforms).
Value chain policies and codes of business conduct	The company establishes and communicates to suppliers ESG policies and codes of conduct that they must comply with.	Points are awarded for the existence of policies and codes of conduct relevant to the value chain and mechanisms to ensure adherence (for instance contractual provisions, responsibility statements).	0 points (not mentioned), 1 point (existence of a general code), 2 points (particular code applicable to suppliers and contractors), 3 points (existence of a code with a clear compliance mechanism).

Due diligence and ESG risk management in the value chain	The company employs due diligence and risk management processes that cover ESG issues specific to the value chain (for instance, human rights, environment, corruption, bribery, working terms).	Points are awarded for due diligence and ESG risk management processes description in the value chain. Additional points are awarded for a formalized system or clear implementation plans.	0 points (not mentioned), 1 point (existence of a general due diligence), 2 points (due diligence that includes ESG value chain aspects), 3 points (a coherent and clear formalized ESG value chain due diligence system).
Communication and grievance mechanisms for value chain workers	The company provides channels through which workers in the value chain (not just its employees) can express their concerns or complaints about ESG issues.	Points are awarded for mechanisms accessible to workers in the value chain and plans to improve accessibility and also, credibility in them.	0 points (not mentioned), 1 point (channels available to other parties generically), 2 points (channels specified as accessible to the value chain), 3 points (channels accessible to the value chain with monitoring or improvement plans).
ESRS value chain reporting	The company reports on aspects related to managing relationships with suppliers (ESRS G1-2) and workers in the value chain (ESRS S2) or other ESG topics significant for the value chain (ESRS E1-1 Climate transition plan, ESRS E5-7 Resource use optimization, ESRS E5-9 Financial effects from resource use and circular economy-related IROs.), ESRS compliant.	Awarding points for reporting according to ESRS on topics directly relevant to suppy and value chain (S2, G1-2) and for other ESG topics (E, S1, S3, G1) that significantly influence the company value chain.	0 points (no value chain reference), 1 point (existence of general reference), 2 points (reporting on ESRS topics relevant to the value chain, for instance, G1-2, S2), 3 points (detailed reporting on several ESRS topics significant to the supply value chain).

3. Results and discussion

The analysis began with examining the state of the overall degree of transparency of ESG reporting compared to the degree of transparency of the value and supply chain, according to the GEM ASSAY™ 2022 methodology. As can be seen in Figure no. 1, the supply chain transparency score follows the same trend as the ESG reporting transparency scores according to the GEM ASSAY™ 2022 methodology.

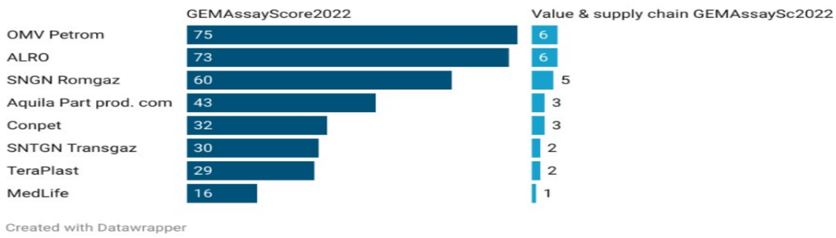

Figure no. 1. Distribution of ESG and supply value chain transparency score
*Source: authors' projection based on (*Hofstetter and Diegelmann, 2023)

In the first stage of content analysis, a text examination was performed, and key terms were extracted based on their frequency. As can be seen in Figure no. 2, the highest frequency of the term value chain is recorded in the case of the companies OMV, ALRO, MedLife, and Romgaz, and the item supply chain presents a high frequency in the case of OMV, ALRO, Conpet, and MedLife. Therefore, it is assumed that in the case of these companies, more quantitative and qualitative information on the sustainable supply value chain will be identified and extracted.

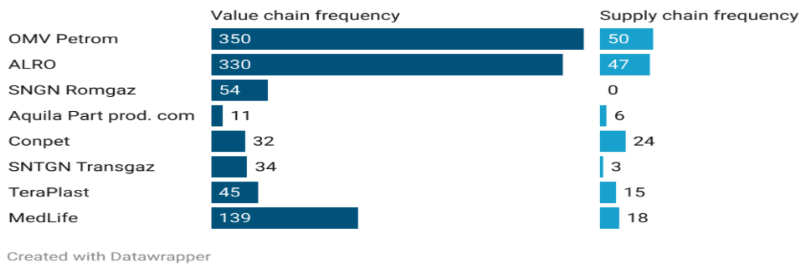

Figure no. 2. Supply and value chain frequency in the analyzed reports

In the second stage, thematic content analysis of sustainability and integrated reports was used, focusing on the qualitative examination of the information reported on the six aspects pre-established in the methodology. Thus, the thematic analysis was carried out using NVivo 15.0 software, and the scoring was done manually. In Figure no. 3 it can be seen that the sustainability themes regarding "Value chain policies and codes of business conduct" and "ESRS value chain reporting" obtained the highest scores, followed by the aspects reported regarding "Supply chain impact" and "Due diligence and ESG risk management in the value chain". The least well-represented topics from the perspective of reported information are "ESG criteria integrated into supply chain management and suppliers selection" and "Communication and grievance mechanisms for value chain workers". This ranking is not surprising if we consider that this is the first year of ESRS reporting, excluding pilot year reporting. From the perspective of ESG factors and the integrated value chain, the degree of transparency is average, good, or, in other words, developing.

Figure no. 3. The average transparency scores on supply and value chain selected topics

The thematic analysis revealed that supply and value chain impact obtained the highest score in the case of Teraplast, the theme ESG criteria integrated into supply chain management and suppliers selection obtained the highest transparency score in the case of OMV, and the degree of transparency of value chain policies and codes of business conduct obtained the highest score in the case of OMV, ALRO, and Conpet. OMV and MedLife obtained the best transparency score for the topic of due diligence and ESG risk management in the value chain. These companies also recorded the highest transparency score for communication and grievance mechanisms for value chain workers, along with ALRO. Regarding the degree of transparency of ESRS value chain reporting, it is observed that the other companies register high scores, except for Aquila, which does not report according to ESRS. Thus, Transgaz and Teraplast have a reasonable degree of transparency, and OMV, ALRO, Romgaz, Conpet, and MedLife register very good scores in terms of the ESRS reporting framework and the ESRS references related to the value and supply chain. Also, as can be seen in Figure no. 4, based on the average transparency score of sustainability themes on value and supply chain, the best ranked companies are OMV (2.83), MedLife (2.50), Conpet (2.33), and ALRO (2.00). In summary, the thematic content analysis highlights that the leader in reporting and transparency of the supply value chain is OMV, with an advanced degree of maturity in reporting information, detailed processes, using external tools (EcoVadis, Tfs), and specific indicators in supplier management. ALRO, Conpet, and MedLife companies, on the other hand, have good reporting and transparency, in development and demonstrating a good understanding of the requirements (ESRS), including the value chain in the materiality assessment, have started integrating ESG criteria in the relationship with suppliers (ALRO) or monitor operational indicators (MedLife), and explicitly recognize areas for improvement. These companies have robust reporting foundations but still need to mature in detailing information on the value chain. The other category includes companies that report well on other ESG areas but have limited details on the supply value chain (Romgaz, TeraPlast, Transgaz).

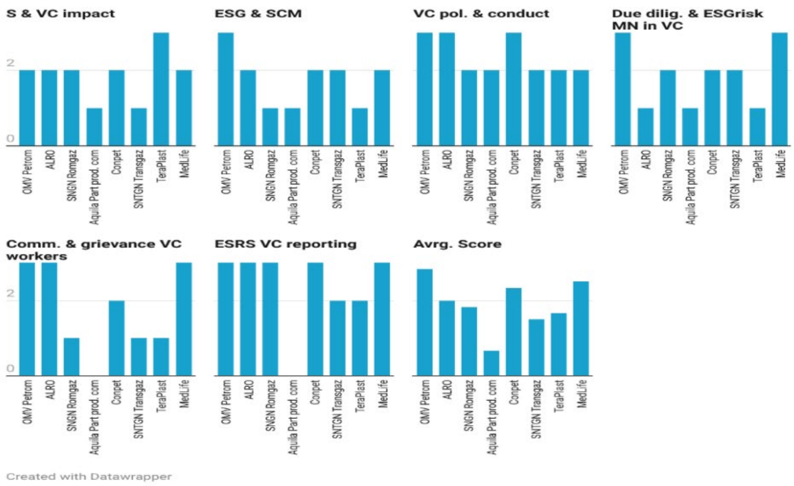

Figure no. 4. Distribution of supply and value chain transparency scores by companies

Further on, we proceeded to an assessment of the quality of value and supply chain reporting by integrating ESG aspects and to perform this, we focused on the following criteria: reporting of information according to the requirements of the ESRS framework; compliance and detail of the due diligence and supplier management processes, including their monitoring; availability of data and quantitative indicators, and mentioning of challenges and concrete action plans. The quality of supply chain reporting was assessed through the lens of identifying strong and robust points and weaknesses, using an assessment scale (1 to 4), where the score 1 was assigned for weak quality, and 4 for very good quality. Visualization of companies' rankings can be seen in Figure no. 5.

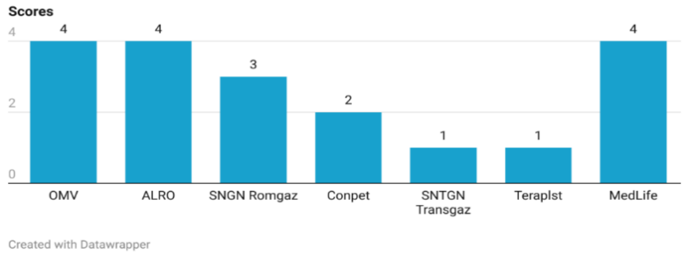

Figure no. 5. Distribution of supply value chain reporting quality scores by companies

Therefore, based on the qualitative thematic content analysis targeting the transparency, extent and maturity of companies' value and supply chain management practices, and the qualitative assessment of their reporting, OMV offers the most complete, complex and interrelated picture of information communication and transparency and can be included in the category of companies with good practices and to follow in the area of supply chain reporting by integrating ESG aspects.

Conclusions

This study is an exercise to assess the transparency and quality of supply and value chain reporting through integrated ESG factors, for a small sample of companies listed on the BSE and considered to be the most transparent, from the perspective of ESG reporting using the GEM ASSAY™ methodology for the year 2022. To conduct the qualitative thematic analysis, companies that have prepared and published sustainability or integrated reports for 2024, according to ESRS requirements, were selected. The results of the thematic analysis showed that the most transparent topics according to the degree of detail of the reported information are "Value chain policies and codes of business conduct" and "ESRS value chain reporting", and the least transparent are "ESG criteria integrated into supply chain management and suppliers selection" and "Communication and grievance mechanisms for value chain workers". Depending on the scores obtained by companies for the six themes analyzed according to the degree of transparency, it can be assessed that the degree of maturity of reporting and communication of supply and value chain information is developing. The content analysis revealed that the examined reports describe how these sampled companies address, manage, and report ESG aspects in their relationship with their suppliers and contractors, emphasizing the importance of the value chain. The results showed that in terms of recognizing the importance of the value chain, companies identify suppliers and workers in the value chain as key stakeholders and recognize the impact, both positive and negative, risks and opportunities (IROs) that may arise at this level, and ESG criteria are taken into account in the processes of identifying and assessing IROs. The key finding is that transparency and quality of supply chain reporting, according to ESRS requirements, are improving; listed companies are making efforts to increase the quality of sustainability reporting. However, there is a need to increase the degree of connectivity of information and a more structured and layered presentation with clear reference to specific indicators and their degree of fulfillment. The study has practical implications and can provide managers with several insights into what needs to be improved regarding reporting and transparency in the supply value chain. The limitations are found in the small sample of companies. Future studies aim to expand the study to a larger number of companies.

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