Quality of Knowledge in Sustainability Reports: A Comparative Analysis Using ESG Disclosure Scores

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Abstract: The growing importance of sustainability reporting has led organisations to disclose increasing amounts of environmental, social, and governance (ESG) information. However, limited attention has been paid to the quality of knowledge embedded in such disclosures. This study examines whether ESG Disclosure Scores can serve as a proxy for the quality of organisational knowledge presented in sustainability reports. The analysis is based on companies included in the WIG20 index and combines ESG scores with a newly developed Quality of Knowledge Index (QKI), capturing dimensions such as relevance, completeness, comparability, and clarity. The results reveal a positive but weak correlation between ESG scores and knowledge quality, indicating that ESG metrics primarily reflect the extent of disclosure rather than its clarity and usability. The findings contribute to the literature by introducing a novel approach to measuring knowledge quality in sustainability reporting and highlighting the distinction between the quantity of disclosed information and the effectiveness of knowledge communication. From a knowledge management perspective, the study demonstrates that high levels of ESG disclosure do not necessarily translate into high-quality, decision-useful knowledge.

Keywords: Knowledge management, Sustainability reporting, ESG (environmental, social, governance), ESG disclosure score, Quality of Knowledge Index (QKI)

1. Introduction

Today, knowledge is an elementary component of a company's assets. It is difficult to identify and even more difficult to value. The ability to manage knowledge (KM) becomes critical in today's knowledge economy. The creation and diffusion of knowledge have become increasingly important factors in competitiveness. Global economic development based on sustainability is only possible through broadly understood knowledge (Krawczyk, 2022).

As Environmental, Social, and Governance (ESG) disclosure shifts from voluntary to mandatory practice worldwide, its economic implications are becoming increasingly significant (Krawczyk, 2019; Mohammed Abubakr et al., 2025; Piersiala, 2024; Wu et al., 2026). However, a growing body of literature questions its effectiveness, pointing to inconsistencies in ESG ratings (Berg et al., 2022), risks of greenwashing (Delmas & Burbano, 2011; Hummel & Schlick, 2016), and the limited decision-usefulness of disclosures due to information overload (Dumay et al., 2016). These concerns suggest that the expansion of ESG reporting does not necessarily translate into higher-quality or more useful information for stakeholders. The solution to this problem is ESG Disclosure Scores, a metric that shows the extent and level of detail with which a company discloses ESG information, namely:

- E (Environmental) – the environment (e.g. CO_2 emissions, energy consumption),
- S (Social) – social issues (e.g. employee rights, diversity),
- G (Governance) – corporate governance (e.g. board structure, business ethics).

The literature on the subject emphasises that these indicators primarily reflect a company's level of transparency rather than its actual sustainability performance (Eccles et al., 2014).

ESG Disclosure Scores are most commonly compiled by specialist rating agencies that analyse companies' disclosures against standardised indicators. These include both quantitative data (e.g. greenhouse gas emissions, energy consumption) and qualitative data (e.g. anti-corruption policies, board structure). On this basis, a score is assigned, usually on a scale (e.g. 0–100), reflecting the degree of completeness and detail of the reported information (Dhaliwal et al., 2011). **Major ESG Rating Agencies:**

- MSCI ESG Ratings – focused on industry-specific ESG risk exposure,
- S&P Global ESG Scores – providing comprehensive ESG performance metrics,
- Sustainalytics (Morningstar) – focusing on ESG risk assessment and management,
- Refinitiv ESG Scores (LSEG) – offering detailed, data-driven ESG disclosure metrics.

ESG Disclosure Scores play a significant role in academic research, particularly when analysing the relationship between non-financial disclosures and companies' financial performance. Research suggests that greater ESG transparency may help to reduce the cost of capital and lessen information asymmetry between companies and investors (Clarkson et al., 2008; Dhaliwal et al., 2011). At the same time, however, methodological differences between ESG data providers limit the comparability of results and pose a challenge for researchers (Berg et al., 2022).

ESG Disclosure Scores are an important analytical tool in research on non-financial reporting and capital markets, whilst also falling within the scope of knowledge management. Their main function is to measure the level of ESG disclosures, which can be interpreted as an assessment of an organisation's ability to collect, process and share knowledge regarding environmental, social and corporate governance aspects. In this context, ESG Disclosure Scores reflect not only corporate transparency but also the maturity of their knowledge management systems regarding non-financial information. At the same time, however, these indicators do not allow for a direct assessment of an organisation's actual impact on its environment, pointing instead to the effectiveness of information management processes rather than the actual outcomes of ESG activities.

Beyond regulatory compliance, ESG reporting has become an important mechanism for communicating organisational knowledge to external stakeholders. In the context of the ECKM Mini Track "Reclaiming Organisational Knowledge in an Age of Post-Truth Disruption", the challenge is no longer limited to increasing the volume of disclosed information, but rather to ensuring that such information constitutes trustworthy, relevant and decision-useful knowledge. The growing risks of information overload, selective disclosure and greenwashing illustrate that extensive reporting does not automatically guarantee knowledge quality. From this perspective, assessing sustainability reports through the Quality of Knowledge Index (QKI) contributes to the broader discussion on how organisations can communicate reliable knowledge in an environment increasingly affected by information distortion and declining trust.

2. Literature Review

It is not possible to specify a single, definitive date for the creation of the first ESG Disclosure Score, as the concept developed gradually alongside the evolution of non-financial reporting. However, it is generally accepted in the literature and in market practice that its origins date back to the 1990s, coinciding with the development of environmental and social reporting (Krawczyk, 2022). One of the first and most widely recognised is the ESG Disclosure Score developed by Refinitiv (formerly Thomson Reuters ASSET4), which has been in development since around 2002. Academic discussions on this topic date to around 2012. The date of the first article on this subject in the Web of Science database.

The study, already mentioned (Berg et al., 2022), published in Review of Finance, is one of the most influential and widely cited recent contributions to the ESG literature. The authors investigate the extent to which ESG ratings from different providers diverge and identify the key sources of this divergence, using data from major rating agencies. Their findings reveal a substantial lack of agreement across ESG ratings, driven primarily by differences in measurement, scope, and weighting of ESG indicators. Importantly, the study demonstrates that this divergence is significantly greater than that observed in traditional credit ratings, raising concerns about the reliability and comparability of ESG metrics. As such, the paper highlights fundamental challenges for investors, researchers, and policymakers, emphasising the need for greater standardisation and transparency in ESG assessment methodologies.

From an investor's perspective, ESG practices reflect a company's ability to identify, process, and utilise knowledge to reduce uncertainty and increase resilience to market fluctuations. The study's findings support the argument that well-developed ESG knowledge management systems can lead to more stable corporate risk profiles, thereby strengthening their long-term value and operational security (Bifulco et al., 2023; Galeone et al., 2025; Vyletelka, 2024).

From a knowledge management perspective (Krawczyk, 2024), ESG reporting can be understood as a structured process of knowledge creation, codification, and sharing with external stakeholders. Effective disclosure practices reflect an organisation's ability to manage and disseminate knowledge about its environmental, social, and governance activities, thereby reducing information asymmetry and increasing investor trust. Consequently, the study suggests that firms that not only generate ESG-related knowledge but also actively share it through high-quality reporting are better positioned to translate sustainability efforts into tangible financial value (Bigelli et al., 2023).

The literature documents the prevalence of greenwashing practices, whereby companies selectively disclose or strategically frame sustainability information to enhance their image rather than reflect actual performance (Zhong et al., 2025). Further concerns relate to information overload, as expanding regulatory requirements may lead to excessive volumes of disclosures that are difficult to interpret and of limited practical relevance for stakeholders (Markarian & Salerno, 2025)

This tension suggests that the key challenge is no longer whether firms disclose ESG information, but whether such disclosures contribute to the creation and transfer of meaningful knowledge. Consequently, assessing ESG reporting through the lens of knowledge quality provides a more nuanced understanding of its actual value for stakeholders and decision-making processes. The analysis of the literature and the initially prepared research material allows the formulation of the main task:

Is there a relationship between ESG Disclosure Scores and the quality of knowledge in sustainability reports?

Problems can be solved by asking a question:

> *H1: Is there a positive correlation between ESG Disclosure Scores and the Quality of Knowledge Index (QKI).*

3. Research Methodology

From a knowledge management perspective, ESG reporting can be interpreted as a process of knowledge creation, codification, and dissemination. The proposed Quality of Knowledge Index contributes to the literature by operationalising the concept of knowledge quality in sustainability reporting and enabling its empirical measurement in relation to ESG disclosure practices. This study aims to examine whether there is a statistically significant relationship between ESG Disclosure Scores and the quality of knowledge presented in sustainability reports. The research adopts a quantitative approach supported by qualitative content analysis. The empirical analysis is based on a sample of companies included in the WIG20 index, representing the largest publicly listed firms in Poland. The study covers sustainability and integrated reports published in 2024. This sample was selected due to the availability of ESG disclosures and the feasibility of conducting in-depth manual content analysis. The Quality of Knowledge Index (QKI) proposed in this study should be regarded as an exploratory research instrument designed to operationalise the concept of knowledge quality in sustainability reporting. At this stage, the index has not yet undergone formal psychometric validation; therefore, the present study should be considered an initial proof of concept intended to assess the feasibility and potential usefulness of the proposed framework. Further validation using larger and more diverse samples constitutes an important direction for future research.

The dependent variable is the Quality of Knowledge Index (QKI), developed to assess the quality of knowledge disclosed in sustainability reports. The index is based on four dimensions:

- Relevance – the extent to which disclosed information is material and decision-useful,
- Completeness – the coverage of environmental, social, and governance aspects,
- Comparability – the use of standardised frameworks and consistency over time,
- Clarity – the readability and transparency of the report.

Each dimension is evaluated using a standardised scoring scale (e.g. 0–1). The overall index is calculated as the average of the four components.

$$\textbf{Quality of Knowledge Index (QKI)} = \frac{\boldsymbol{Relevance+Completeness+Comparability+Clarity}}{\mathbf{4}}$$

Sustainability and integrated reports are collected from official company websites. A structured content analysis is conducted to assess the Quality of Knowledge Index. The evaluation is based on predefined criteria to ensure consistency and replicability of the scoring process.

To test the research hypothesis, correlation analysis is applied to examine the relationship between ESG Disclosure Scores and the Quality of Knowledge Index. Depending on the distribution of the data correlation. The statistical significance of the relationship is assessed using p-values, with standard significance levels applied (e.g. 0.05). This approach allows for identifying whether higher ESG disclosure is associated with higher-quality knowledge, without assuming a causal relationship.

4. Research Results

The research sample consists of companies included in the WIG20 index in 2024, representing the largest and most liquid firms listed on the Warsaw Stock Exchange. The sample includes 20 companies from various sectors, including banking, energy, retail, and telecommunications, ensuring sectoral diversity and high relevance for ESG analysis.

Table 2: Quality of Knowledge Index (QKI) selected WIG 20 companies

Company	QKI	Relevance	Completeness	Comparability	Clarity	Comments
PKO Bank Polski	1	1	1	1	1	High knowledge quality with comprehensive ESG coverage, measurable indicators, multi-year comparability, and clear structure, resulting in the maximum QKI.
Orlen	0.875	1	1	1	0.5	Orlen provides extensive ESG disclosures supported by quantitative and multi-year data; however, complexity and volume reduce clarity, leading to a slightly lower QKI.
PZU	1	1	1	1	1	PZU demonstrates high knowledge quality with comprehensive ESG coverage, measurable indicators, and clear structure, resulting in the maximum QKI.
Bank Pekao	1	1	1	1	1	Bank Pekao shows high knowledge quality with comprehensive disclosures, strong comparability, and clear reporting, achieving the maximum QKI.
Santander Bank Polska	1	1	1	1	1	Santander Bank Polska demonstrates high knowledge quality supported by standardised reporting and clear structure, resulting in the maximum QKI.
mBank	1	1	1	1	1	mBank presents high knowledge quality with comprehensive ESG coverage and a clear, user-friendly structure, achieving the maximum QKI.
KGHM	0.875	1	1	1	0.5	KGHM provides extensive ESG disclosures; however, technical complexity reduces clarity and accessibility, resulting in a lower QKI.
PGE	0.875	1	1	1	0.5	PGE shows comprehensive ESG reporting, but complexity and technical detail limit clarity, leading to a lower QKI.
Orange Polska	0.9375	1	1	1	0.75	Orange Polska demonstrates high ESG disclosure, but some narrative complexity reduces clarity, resulting in a slightly lower QKI.
Cyfrowy Polsat	0.8125	0.75	1	0.75	0.75	Cyfrowy Polsat shows moderate knowledge quality, with more narrative and fewer consistent indicators, leading to lower comparability and QKI.
LPP	0.9375	1	1	1	0.75	LPP demonstrates high ESG disclosure and knowledge quality, though narrative elements slightly reduce clarity.
Dino Polska	0.75	0.75	0.75	0.75	0.75	Dino Polska shows moderate ESG disclosure with limited indicators and comparability, resulting in a lower QKI.
CD Projekt	0.8125	0.75	0.75	0.75	1	CD Projekt demonstrates moderate ESG disclosure with strong clarity but limited scope and standardisation, resulting in a moderate QKI.
JSW	0.8125	1	1	1	0.25	JSW provides extensive ESG disclosures; however, high complexity and low clarity reduce usability, resulting in a lower QKI.
The research sample consists of 14 companies selected from the WIG20 index. While the index includes the largest and most liquid firms listed on the Warsaw Stock Exchange, not all companies were included in the final analysis due to data availability						

constraints. Specifically, the study required ESG scores from publicly accessible sources, and for some companies such data were not consistently available. Therefore, only firms with complete and comparable ESG data were retained in the sample. This approach ensures the reliability and consistency of the analysis, although it reduces the sample size and may limit the generalizability of the findings.

Source: own compilation based on the sustainability reports of selected companies

To examine the relationship between ESG performance and the quality of knowledge in sustainability reports, a correlation analysis was conducted between the transformed ESG scores and the Quality of Knowledge Index (QKI). The results indicate a positive but weak correlation (r = 0.29) between ESG scores and QKI. This suggests that companies with higher ESG scores tend to present slightly higher-quality knowledge in their sustainability reports; however, the relationship is not strong.

Table 2: Descriptive Statistics - ESG Risk Scores and Quality of Knowledge Index (QKI)

Company	ESG Risk Score	Transformed ESG Score (100-Risk)	QKI
PKO Bank Polski	24	76	1
Orlen	33	67	0.875
PZU	20	80	1
Bank Pekao	22	78	1
Santander Bank Polska	20	80	1
mBank	23	77	1
KGHM	38	62	0.875
PGE	39	61	0.875
Orange Polska	18	82	0.9375
Cyfrowy Polsat	23	77	0.8125
LPP	18	82	0.9375
Dino Polska	21	79	0.75
CD Projekt	15	85	0.8125
JSW	42	58	0.8125
ESG data were collected from publicly available Sustainalytics ESG Risk Scores. It should be noted that the metric reflects ESG risk exposure, with higher values indicating greater risk and weaker ESG performance.			

Source: own compilation.

The findings indicate that ESG Disclosure Scores capture only a limited aspect of knowledge quality. While firms with higher ESG performance generally provide more structured and comprehensive disclosures, this does not necessarily translate into higher clarity or usability of information. In particular, sectoral differences are evident. Financial institutions consistently achieve high QKI values due to structured and standardised reporting, whereas industrial companies, despite extensive ESG disclosures, often present lower clarity due to technical complexity. As a result, ESG scores appear to reflect the extent of disclosure rather than the quality of knowledge.

5. Limitation and Future Research

The study is subject to several limitations that should be acknowledged. First, the research sample consists exclusively of companies included in the WIG20 index, representing the largest and most liquid firms listed on the Warsaw Stock Exchange. While this ensures data availability and comparability, it also limits the generalizability of the findings. Large, well-established companies are typically more advanced in ESG reporting and knowledge management practices, which may lead to systematically higher QKI scores and reduce variability within the sample. As a result, the WIG20 may not constitute a fully representative sample of the broader population of firms, particularly smaller or less mature organisations.

Second, the sample was further constrained by the availability of ESG data. Due to the limited accessibility of publicly available ESG scores, some companies were excluded from the analysis. This introduces potential selection bias, as firms with available ESG ratings are more likely to be transparent and actively engaged in sustainability reporting. Consequently, the final sample may overrepresent companies with more developed ESG practices.

These limitations suggest that the results should be interpreted with caution and highlight the need for future research to include a broader and more diverse set of firms, as well as more comprehensive ESG data sources.

An additional limitation relates to the construction of the Quality of Knowledge Index (QKI). Although the index is based on predefined and structured criteria, its assessment involves a degree of subjective judgment in evaluating dimensions such as clarity, relevance, and comparability. Despite efforts to ensure consistency in the scoring process, the evaluation may be influenced by the researcher's interpretation of the reports. This limitation is inherent in content analysis and suggests that future studies could benefit from automated or multi-rater approaches to enhance objectivity and reliability.

An important contribution of this study is the development of the Quality of Knowledge Index (QKI), which provides a structured approach to assessing the qualitative dimensions of sustainability reporting. Unlike traditional ESG metrics that primarily capture the extent of disclosure, the QKI focuses on clarity, comparability, relevance, and completeness, thereby addressing a gap in existing research. The proposed index offers a foundation for future studies to refine and validate the measurement of knowledge quality, including the use of automated methods or multi-rater approaches, and opens new research directions at the intersection of ESG disclosure and knowledge management.

Future research could extend the analysis by including a broader and more diverse sample of firms, particularly small and medium-sized enterprises, which may exhibit different ESG reporting practices and knowledge management capabilities. Additionally, further studies could explore alternative measures of ESG disclosure and compare different ESG rating providers to assess consistency in results.

From a knowledge management perspective, future research could also focus on developing more objective and automated measures of knowledge quality, as well as examining the relationship between ESG disclosure and internal knowledge management processes. This would provide a deeper understanding of how organisations create, structure, and communicate sustainability-related knowledge.

6. Conclusion

Given the relatively small research sample (14 companies) and the preliminary nature of the proposed Quality of Knowledge Index, the findings should be interpreted as exploratory rather than conclusive. Consequently, the results should be regarded as experimental evidence providing an initial verification of the proposed research framework rather than a validated measurement model. The findings of this exploratory study suggest that ESG Disclosure Scores alone may not constitute sufficient proxies for knowledge quality. While ESG reporting enhances transparency and supports stakeholder engagement, it primarily reflects the extent of disclosed information rather than its clarity and usability. From a knowledge management perspective, sustainability reports serve as mechanisms for the creation, codification, and dissemination of organisational knowledge; however, high levels of disclosure do not necessarily translate into high-quality, decision-useful knowledge.

An important contribution of this study lies in the development of the Quality of Knowledge Index (QKI), which offers a simple yet effective tool for assessing the qualitative dimensions of sustainability reporting. By integrating relevance, completeness, comparability, and clarity, the QKI provides a structured framework for evaluating how ESG information is communicated to stakeholders.

The findings highlight a fundamental distinction between ESG disclosure and knowledge quality: while ESG scores capture the breadth of reporting, the QKI reflects the effectiveness of knowledge communication. This distinction is particularly evident in sectors characterised by complex and technical reporting, where extensive disclosures may coexist with lower clarity and usability.

The weak positive correlation observed between ESG Disclosure Scores and QKI indicates that organisations reporting larger volumes of ESG information do not necessarily communicate higher-quality knowledge. This finding is consistent with previous studies highlighting the distinction between disclosure quantity and information usefulness (Dumay et al., 2016) and concerns regarding information overload and greenwashing (Hummel & Schlick, 2016; Markarian & Salerno, 2025). From a knowledge management perspective, this suggests that effective sustainability reporting should be evaluated not only by the completeness of disclosures but also by the extent to which the reported information supports stakeholder understanding and informed decision-making.

These results suggest that future ESG research should move beyond the quantity of disclosure towards the quality of knowledge, emphasising the role of knowledge management in enhancing the usefulness of sustainability reporting. Therefore, the proposed QKI should be considered as a complementary rather than alternative measure to existing ESG disclosure metrics, providing additional insight into the effectiveness of organisational knowledge communication.

Ethics Declaration: The author adhered to the principles of scientific integrity and ethics in the research and publication preparation process, ensuring the full originality of the article, in accordance with the journal's guidelines.

7. AI Declaration: The authors declare that artificial intelligence (AI) tools were used in the preparation of this manuscript solely for language editing purposes. In particular, the Grammarly tool was employed to improve the correctness, clarity, and readability of the English language.

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