

Disclosures on the Sustainable Development Goals in the non-financial reports of companies listed on the Warsaw Stock Exchange

Ujawnienia dotyczące Celów Zrównoważonego Rozwoju w raportach niefinansowych spółek notowanych na Giełdzie Papierów Wartościowych w Warszawie

ARLETA SZADZIEWSKA*, ANNA SZYCHTA**,
HALINA WANIAK-MICHALAK***


Received: 27.08.2024 – Revised: 02.11.2024 – Accepted: 02.11.2024


Abstract


Purpose: The article aims to determine whether and how companies listed on the Warsaw Stock Exchange (WSE) presented their commitment to the Sustainable Development Goals (SDGs) in integrated or non-financial reports prepared from 2019 to 2022.

Methodology/approach: Content analysis of 235 reports of listed companies (from 55 to 62 depending on the year) was used to identify the number and type of disclosed indicators of companies' implementation of the SDGs according to the guidelines of the Intergovernmental Working Group of Experts on International Accounting and Reporting Standards (UNCTAD-ISAR), and the panel regression method was applied to verify four research hypotheses.

Findings: Although about 2/3 of the companies have declared their commitment to the SDGs, the number of companies that disclosed information on the implementation of the SDGs was lower. Of the 34 core SDG indicators intended for enterprises, according to the UNCTAD-ISAR, companies listed on the WSE used, on average, only 32% in 2019 and 37% in 2022. Thus, the average number of indicators increased from 11 to 13 in this period; the highest number of disclosed metrics was 22 in two very large entities. The study indicates that company size, its belonging to a “sinful” industry, and the number of declared SDGs

* Dr hab. Arleta Szadziewska, associate professor, University of Gdansk, Faculty of Management, Department of Accounting,  <https://orcid.org/0000-0001-8151-5820>, arleta.szadziewska@ug.edu.pl

** Prof. dr hab. Anna Szychta, University of Lodz, Faculty of Management, Department of Accounting,  <https://orcid.org/0000-0001-8465-0542>, anna.szychta@uni.lodz.pl

*** Dr hab. Halina Waniak-Michalak, associate professor, University of Lodz, Faculty of Management, Department of Accounting,  <https://orcid.org/0000-0003-1857-4339>, halina.michalak@uni.lodz.pl

influence the number of SDG indicators disclosed. The reporting standards used (GRI or other) did not affect the number of SDG measures presented by the company.

Research limitations/implications: The main limitation of the research is the inclusion of only companies listed on the WSE.

Originality/value: The study contributes to the literature on the sustainable development reporting of business entities and measuring the implementation of SDGs at the micro level.

Keywords: Sustainable Development Goals (SDG), Intergovernmental Working Group of Experts on International Accounting and Reporting Standards, non-financial report, Warsaw Stock Exchange, core SDG indicators.

Streszczenie

Cel: Celem artykułu jest ustalenie, czy i jak spółki notowane na Giełdzie Papierów Wartościowych (GPW) w Warszawie prezentowały swoje zaangażowanie w realizację Celów Zrównoważonego Rozwoju (CZR) w zintegrowanych lub niefinansowych raportach sporządzonych za poszczególne lata od 2019 do 2022 roku.

Metodyka/podejście badawcze: Zastosowano analizę treści 235 raportów spółek giełdowych (od 55 do 62 w zależności od roku) do ustalenia liczby i rodzaju ujawnianych wskaźników realizacji CZR przez przedsiębiorstwa według wytycznych Międzyrządowej Grupy Roboczej Ekspertów ds. Międzynarodowych Standardów Rachunkowości i Sprawozdawczości (UNCTAD-ISAR) oraz metodę regresji panelowej do weryfikacji czterech hipotez badawczych.

Wyniki: Około 2/3 spółek zadeklarowało swoje zaangażowanie w CZR, ale liczba firm, które ujawniły informacje na temat realizacji CZR, była niższa. Spośród 34 podstawowych wskaźników CZR, które są przeznaczone dla przedsiębiorstw według UNCTAD-ISAR, spółki notowane na GPW wykorzystywały średnio tylko 32% w 2019 roku i 37% w 2022 roku. Przeciętna liczba tych wskaźników wzrosła zatem z 11 do 13 w tych latach, a najwyższa liczba ujawnionych mierników wyniosła 22 w dwóch bardzo dużych podmiotach. Badanie wykazało, że wielkość spółki, przynależność przedsiębiorstwa do branży kontrowersyjnej i liczba zadeklarowanych CZR wpływają na liczbę ujawnionych wskaźników CZR. Rodzaj zastosowanych standardów raportowania (GRI lub inne) nie miał wpływu na liczbę mierników przedstawionych przez spółkę.

Ograniczenia/implikacje badawcze: Głównym ograniczeniem badania jest uwzględnienie wyłącznie spółek notowanych na GPW w Warszawie.

Oryginalność/wartość: Artykuł stanowi wkład w literaturę dotyczącą sprawozdawczości w zakresie zrównoważonego rozwoju podmiotów gospodarczych oraz pomiaru realizacji CZR na poziomie mikro.

Słowa kluczowe: Cele Zrównoważonego Rozwoju (CZR), Międzyrządowa Grupa Robocza Ekspertów ds. Międzynarodowych Standardów Rachunkowości i Sprawozdawczości, sprawozdanie niefinansowe, Giełda Papierów Wartościowych w Warszawie, podstawowe wskaźniki CZR.

Introduction

Corporate reporting, especially non-financial reports, is an important source of data for monitoring companies' commitment to the Sustainable Development Goals (SDGs) that were adopted in Agenda 2030 by the United Nations (UN) General Assembly for the years 2016 to 2030 (UN, 2015). The 17 SDGs and their 169

subordinate targets are intended to stimulate the actions of governments, public organisations and private sector entities over 15 years in areas of critical importance for humanity and the planet.

The implementation of the SDGs by business entities is a prerequisite for contributing to sustainable development and fulfilling task 12.6 of Agenda 2030, which requires UN member states to encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle (UN, 2015, p. 22).

The empirical studies conducted so far by professional accounting organisations (e.g., KPMG, 2018, 2022; PwC, 2018, 2019) and academic researchers (e.g., Izzo et al., 2020a, 2020b; Krasodomska et al., 2022, 2023; Lodhia et al., 2023; Nicolò et al., 2023; Pizzi et al., 2022; Santos, Silva Bastos, 2021), confirm that business entities include the SDGs in their annual reports or sustainability reports. According to a KPMG (2022, p. 70) survey of reporting by the world's largest companies, the SDGs have resonated strongly with business, with big jumps in reporting between 2017 and 2020. The rate increased from 39% to 69% among the 100 largest enterprises by revenue (N100) from 58 countries and from 43% to 72% among the 250 largest global enterprises by revenue (G250) based on the 2021 *Fortune 500* rankings. However, this indicator increased by only 2 percentage points by 2022, i.e., to 71% for N100 and 74% for G250, respectively.

According to Awuah et al.'s (2023) structured review of the English language literature on SDG reporting, the dominant research theme is SDG engagement or involvement at the firm level, followed by the extent of SDG reporting. The third most frequently researched topic is drivers of SDGs reporting. In contrast, researchers paid the least attention to business strategy, which considers SDGs and performance measurement. Empirical studies and 65 reviewed articles mainly concerned SDG reporting in Europe (41%) and globally (35%).

Reviews of the English-language literature by Awuah et al. (2023) and Pizzi et al. (2020) showed that Polish companies' SDG reporting has not been presented to a foreign audience. With this in mind and recognising the contribution of listed companies as key economic players in achieving the SDGs, this study focuses on companies listed on the Warsaw Stock Exchange (WSE). The research examines these companies' reporting on sustainability issues, including separate non-financial reports and integrated reports.

The article aims to determine whether and how WSE-listed companies presented their commitment to the SDGs in integrated or non-financial reports prepared for 2019, 2020, 2021 and 2022. To achieve this, the following research questions are addressed:

1. How many and which SDGs were declared and implemented in the listed companies covered by the study as described in their integrated or non-financial reports?
2. How many and which indicators to measure SDGs according to the Intergovernmental Working Group of Experts on International Accounting and Reporting Standards (UNCTAD, 2022) methodology were disclosed in the analysed reports of WSE-listed companies?

3. Which factors affect the number of SDG indicators disclosed by WSE-listed companies? These factors include company size, the company's affiliation with a sinful industry, the type of standards used in preparing the non-financial report (Global Reporting Initiative (GRI) or others), and the number of SDGs declared by the company in the report.

To answer the third question, we formulated four research hypotheses verified on the basis of empirical data obtained during content analysis of non-financial reports of WSE-listed companies for four years (from 2019 to 2022). The random sample comprises 235 reports. To identify the implementation of the SDGs, we used 34 indicators contained in the *Guidance on Core Indicators for Sustainability and SDG Impact Reporting*, which was developed by the United Nations Conference on Trade and Development with the participation of the Intergovernmental Working Group of Experts on International Accounting and Reporting Standards (UNCTAD-ISAR) (see UNCTAD, 2022).

This study contributes to the literature on sustainable development reporting of business entities and the measurement of SDG implementation at the micro level. Although recently, several works aimed at identifying the factors that influence the disclosure of the SDGs, there remains a need to determine the reasons underlying the reporting of information in this area. In particular, deciding on the activities involved in implementing the SDGs disclosed in the non-financial reports published in individual European Union (EU) countries is essential. Our research expands knowledge on this aspect by considering the UNCTAD-ISAR guidelines to assess the implementation of the global SDGs using the example of WSE-listed companies. This is a new approach to establishing the scope of sustainability reporting, which has been the subject of limited research to date (UNCTAD, 2021a, 2021b, 2021c; Szadziewska et al., 2023). Moreover, the results we have obtained have practical implications by providing information on the current commitment to SDG reporting by listed companies in Poland.

The article is structured as follows. After the Introduction, Part 1 contains a literature review. Part 2 describes the conceptual framework for the empirical study and the methods of the study. Part 3 is divided into four sections; three refer to our research hypotheses and findings, and one contains the discussion. The article closes with concluding remarks.

1. Literature review

1.1. Literature review – SDGs in non-financial reports

Since the beginning of the 21st century, there has been an ongoing international debate regarding the need for businesses to meet the SDGs, which “play a strategic role in countries' economic, social, and environmental progress” (Galeazzo et al., 2024). This follows from adopting Agenda 2030 and introducing regulations obliging companies to report their sustainability commitment to stakeholders. The

document underscores the key role to be played by business entities. According to Busco (2018), integrating the SDGs into business strategies yields several benefits, from increased revenue through attracting new investors to increased supply chain resilience. However, the broad scope and complexity of the SDGs result in a gap between the actual implementation of the SDGs and the declarations in the reports containing such information.

This was indicated by a study by Heras-Saizarbitoria et al. (2022), who analysed 1370 sustainability reports published between 2018 and 2020. The results confirmed that companies make superficial commitments to the SDGs without providing specific indicators. These commitments typically come in the form of visually appealing and colourful infographics and icons, which, as Nicolò et al. (2023) stated, “are not followed by an explanation of how SDGs have been operationalised or integrated into corporate strategies and goals.” According to Heras-Saizarbitoria et al., “these practices are suggestive of impression management and SDG-washing.” Such measures aim to strengthen the companies’ social legitimacy and create an image of socially responsible organisations. Similar results were obtained by Nicolò et al. (2023). They used both deductive content analysis and inductive thematic analysis of 46 integrated reports. They found a tendency to disclose information on SDGs “as a camouflage, symbolic tool to enhance company’s reputation and obtain a license to operate” (sic!).

These findings align with an earlier study by Van der Waal and Thijssens (2020). Their analysis of sustainability report quality “suggests that companies treat the SDGs as a scheme with non-committal implications, facilitating impression management and learning.” Silva (2021) examined SDG disclosures contained in the reports of companies listed on the FTSE 100 (Financial Times Stock Exchange) in conjunction with legitimacy theory. She concluded that the way multinational companies present their SDG disclosures indicates symbolic rather than substantive changes in their strategies, often in response to external stakeholder pressure. Companies’ commitment to sustainability, however, requires them to align their corporate strategies, business models and value-creation processes with their chosen SDGs (Nicolò et al., 2023).

In analysing sustainability reports published by 523 companies between 2015 and 2016, García-Meca and Martínez-Ferrero (2021) also found “that SDG disclosure may still be largely driven by concerns about corporate legitimacy” and that it represents a response to stakeholder pressure. Nonetheless, their results “confirm that in controversial and environmentally sensitive sectors, addressing SDGs is not merely symbolic but a value-enhancement tool for firms.”

Based on interviews with the five largest Portuguese companies on the Forbes Global 2000 list, Santos and Silva Bastos (2021) likewise determined that the adoption of SDGs by companies with significant social and environmental impacts was primarily driven by the need for regulatory compliance and pressure from external stakeholders. Commitment to sustainability has become an integral part of these companies’ visions and strategies, forming the foundation for efforts aimed at creating value.

Table 1. Selected empirical studies on SDGs reporting

Authors	Research sample	Purpose of research	Results
Izzo et al. (2020a)	40 companies listed on the Italian Stock Exchange in the FTSE MIB Index (as of 31 December 2018)	The research answered the following questions: 1. Do Italian companies disclose SDGs? 2. Do these companies relate their SDGs to their business models or goals? 3. Do companies define KPIs (key performance indicators) based on the SDGs?	The majority of Italian companies have introduced SDGs in their non-financial reports. However, only 5% linked the SDGs to their business models and KPIs
García et al. (2022)	131 ESG-rated companies listed on the Madrid Stock Exchange	The research identified the relationship between the SDGs and the quality of non-financial information (NFI) analysed, according to the assurance of this information	The results indicate that the association between the adoption of assurance and the provision of SDG reporting is significant. Moreover, selecting an audit firm such as KPMG, PwC, or another (non-accounting) firm is more likely to lead to SDGs being addressed in the companies' sustainability reports
Krasodomska et al. (2023)	341 non-financial (sustainability or integrated) reports from 23 countries located in the EU, including 148 from 2017 and 178 from 2019.	The research identified changes in the share of PIEs (large public interest entities) located in EU Member States, providing SDG reporting prior to (2017) and after (2019) the implementation of Directive 2014/95/EU, including the factors that influenced their decision to provide SDG reporting in 2019	The findings identified a significant positive change in the share of companies that referred to SDGs in 2019 compared to 2017. The research confirms that the companies' United Nations Global Compact engagement and their previous experience in sustainability reporting positively influenced the decision to report on SDGs in 2019
Hamad et al. (2023)	The top 100 companies' reports from 2016–2020	This study assessed Malaysian public listed companies' (PLCs) contributions to supporting SDGs. The authors also investigated the impact of IR quality on SDG disclosure	The results show an increase in the information reported regarding Malaysian companies' commitment to sustainability. Moreover, companies with high levels of IR quality are considered pioneers in SDG

cont. tab. 1

Authors	Research sample	Purpose of research	Results
Ferrero-Ferrero et al. (2023)	20 Valencian companies which are members of business clubs or foundations promoting corporate responsibility and sustainability	The study empirically analysed the sound commitment and consistent integration of SDGs in the corporate reporting and management systems of companies with a leading position in sustainability	disclosure in terms of presentation quality and quantity. Their integrated reports present a clear picture of where and how they can contribute to the SDGs
Erin, Olojede (2024)	120 companies from 12 African nations for the years 2016 to 2020	The research examined the contribution of non-financial reporting practices to SDG disclosure in Africa	The findings show a lack of formality regarding SDG commitment at the highest decision-making level and a low level of SDG integration in the reporting and management systems. Nevertheless, the leading companies declared a commitment to certain SDGs, which is not reflected in associated materiality analyses, targets or KPIs. This result is consistent with the symbolic approach to SDG integration
			The findings indicate that African firms have not given much thought to SDG disclosure, as evidenced by company reporting metrics. Moreover, disclosure contents lack uniformity, making the comparability of companies difficult

Source: authors' own elaboration based on Erin, Olojede (2024), Ferrero-Ferrero et al. (2023), García et al. (2022), Izzo et al. (2020a) and Krasodomska et al. (2023).

By contrast, different results emerged from a study by Lodhia et al. (2023), which revealed no variation in the disclosure of SDGs across industries. Instead, a symbolic approach to legitimacy was confirmed in the sustainability reports of fifty companies with the highest market capitalisation on the Australian Stock Exchange. This symbolic approach stemmed from the lack of top management support for SDGs, insufficient business cases for taking action, the absence of specific SDG targets, and inadequate measurement of progress towards achieving the SDGs. According to Lodhia et al., substantive legitimacy cannot be achieved without introducing changes to existing business strategies, management systems, and approaches to measuring their sustainability commitment.

While several studies carried out in the last decade also indicate increased reporting of SDG information, many companies fail to indicate how they integrate the SDGs into their development strategies or how they select priority targets. Moreover, connections between declared SDGs and companies' efforts to achieve them are still nonexistent (see Table 1).

A recent study by KPMG (2022) confirms the increase in companies' reporting of information on the SDGs: 74% of companies in the N250 large companies' sample did make such disclosures. However, 68% of these companies only reported positive efforts, while a mere 6% disclosed both positive and negative impacts.

1.2. Literature review – factors affecting SDG disclosure in non-financial reporting and research hypotheses

In recent years, research on the factors that influence SDG disclosure in non-financial reports and the analysis of the extent of information on SDG achievement has increased in popularity. Researchers have focused, in particular, on the relationship between the reporting of SDG achievement efforts and the following factors: company size, profitability, the industry of operation, company ownership, the type of report, the reporting standards used, and inclusion in a social responsibility index. Apart from the factors mentioned above, the literature also highlights the existence of connections between the SDG measures disclosed in reports and external factors, including intersectoral pressure, institutional pressures arising from the country of origin, the level of compliance with national sustainability goals, and national development (Bose, Khan, 2022; García-Sánchez et al., 2022; Rosati, Faira, 2019). Examples of such studies are provided in Table 2.

Table 2. Examples of studies on the links between SDG disclosures and internal/external factors

Authors	Research sample	Studied variables	Results
Dissanayake et al. (2019)	84 companies which had included some sustainability information in their annual report for at least one of the four years 2012–2015	Company ownership, GRI usage, Company size, Industry sector affiliation	<p>Dependency Company size and usage of the GRI guidelines are the most relevant company characteristics associated with sustainability reporting by listed companies in Sri Lanka</p> <p>Lack of dependency Ownership and industry sector do not show a strong influence on the extent of sustainability reporting</p>
Elalfy et al. (2021)	14308 reports provided by 9397 organisations in 2016 and 2017	Company size, Type of organisation, Industrial sectors, Public listing effect, Region, GRI usage	<p>Dependency Larger organisations are more likely to integrate SDGs into their reporting than smaller organisations. Publicly listed firms are more likely to address the SDGs. Industries with higher sustainability impacts are more likely to address the SDGs in their reporting. The results confirm a regional effect with respect to SDG reporting</p> <p>Lack of dependency The results did not confirm a relationship between organisation type and SDG reporting</p>
Pizzi et al. (2021)	153 Italian Public Interest Entities	Presence of independent directors on the board, Expertise with non-financial reporting, Length of the report, Environmentally sensitive sectors, GRI usage, Company size, Financial performance, Board size, women on the board, number of board meetings	<p>Dependency The results show a positive relationship between the SDG Reporting Score (SRS) and determinants such as the presence of independent directors on the board, expertise in non-financial reporting, and report length. Additionally, the highest levels of SRS are achieved by firms operating in environmentally sensitive sectors</p>

cont. tab. 2

Authors	Research sample	Studied variables	Results
Pizzi et al. (2022)	873 European Public Interest Entities which published a mandatory non-financial declaration in 2019	Six variables are included that represent one of the main theoretical approaches used by accounting scholars to evaluate the relationship between cultural dimensions and accounting practices: Power Distance (PDI), Individualism (IDV), Masculinity (MAS), Uncertainty Avoidance (UAI), Long-Term Orientation (LTO), and Indulgence versus Restraint (IVR). In addition, variables such as were included: Return on Equity (ROE), leverage (LEV), and the natural logarithm of the overall number of employees (SIZE)	<p>Lack of dependency The results did not confirm a relationship between the other variables studied (GRI usage, company size, financial performance, board size, women on board, number of board meetings) and SRS</p> <p>Dependency The results indicate that SDG reporting is positively influenced by the variables LTO and IVR. In turn, the variables IDV and MAS exert a negative influence The research also confirms a lack of transparency in terms of contribution to the SDGs.</p> <p>Lack of dependency A negative impact of the variables PDI and UAI on sustainability reporting has not been confirmed</p>
Krasodomska et al. (2022)	8499 companies from the Refinitiv ESG Global database	Commitment to social and environmental issues, GRI standards, Stakeholders (employees, customers, investors, environment)	<p>Dependency Companies' SDG reporting hinges on their commitment to social and environmental issues, the use of GRI standards, and pressure from employees and customers.</p> <p>Lack of dependency The results of the study indicate that investor pressure exerts no influence on SDG reporting.</p>

cont. tab. 2

Authors	Research sample	Studied variables	Results
Bose, Khan (2022)	The study sample consisted of all companies covered by the Refinitiv ESG database from 2016 to 2019 (6942 company-year observations in thirty countries)	Country-level institutional factors, such as Sustainability regulation stringency, Sustainable Development Goal performance, Stakeholder orientation vs. shareholder orientation, Economic status of a country	<p>Dependency The results indicate that SDG reporting differs for companies operating in countries with sustainability regulations and higher SDG performance ratings. The authors found that companies operating in developing countries reported higher levels of SDG reporting than those in developed countries.</p> <p>Lack of dependency The results indicate that SDG reporting is higher for companies operating in shareholder-oriented countries than for those in stakeholder-oriented countries.</p>
Szadzińska et al. (2023)	62 companies listed on the Warsaw Stock Exchange	Company size, Industry of operation, Inclusion in the WIG-ESG index, Type of report	<p>Dependency The results indicate that the number of SDG achievement metrics disclosed varies depending on company size, the type of report produced and the company's operation in controversial (sinful) industries.</p> <p>Lack of dependency Inclusion in the WIG-ESG index did not affect the number of SDG achievement metrics presented by a given company.</p>
Krasodomska et al. (2023)	341 non-financial reports (sustainability or integrated) from 23 countries located in the EU	Government's future orientation, Company membership in UNGC (United Nations system and United Nations Global Compact), Company experience in non-financial reporting, Industry sensitiveness, Firm size,	<p>Dependency The results indicate that companies' engagement in UNGC constitutes a relevant factor that explained their decisions to report on SDGs in 2019. A positive impact of</p>

cont. tab. 2

Authors	Research sample	Studied variables	Results
		SDG implementation score, Corporate governance score	<p>experience in disclosing the SDGs in non-financial reporting was also confirmed.</p> <p>Lack of dependency</p> <p>Contrary to expectations, industry, size, SDG implementation score, government's future orientation, and corporate governance score do not constitute relevant factors that influence the disclosure of PIEs. Nor was any correlation found between industry sensitivity and SDG reporting.</p>

Source: authors' own elaboration based on Bose, Khan (2022), Dissanayake et al. (2019), Elalfy et al. (2021), Krasodomska et al. (2022; 2023), Pizzi et al. (2021; 2022), Sekarlangit, Wardhani (2021), and Szadziewska et al. (2023).

Numerous studies have confirmed the significant positive impact of company size on the disclosure of SDGs (see Table 2). As concluded by Dissanayake et al. (2019), this stems from the fact that larger companies exert more influence on their environment and are, therefore, under greater scrutiny and pressure from stakeholders. This is precisely the reason why, according to Reverte (2009), these companies “are more likely to be subject to public resentment, consumer hostility, militant employees, and the attention of government regulatory bodies.” Furthermore, larger entities, more than smaller ones, utilise capital markets for external financing, compete for access to international resources, and, importantly, hold more financial resources necessary for preparing sustainability reports (Dissanayake et al., 2019; García-Sánchez et al., 2021; Van der Waal, Thijssens, 2020). With this in mind, the following research hypothesis was formulated:

H1. The larger the size of a WSE-listed company, the greater the number of SDG indicators disclosed in its non-financial report.

Companies operating in environmentally and socially harmful industries face greater stakeholder pressure (Byrd et al., 2017; Sierra-Garcia et al., 2018; Szadziewska et al., 2023). As Galeazzo et al. (2024) noted, “companies in these industries are probably more prone to demonstrating their efforts to minimise their unsustainable behaviors.” Accordingly, to earn social legitimacy for their business activities, they provide a wider range of disclosures on the achievement of the SDGs in their non-financial reports. Moreover, companies operating in controversial (or “sinful”) industries¹ often present only positive information, advertising their commitment to sustainability. Such practices aim to conceal the negative effects of their business activities (Szadziewska et al., 2023). Taking these aspects into account, we formulated the following research hypothesis:

H2. WSE-listed companies operating in sinful (controversial) industries disclose more SDG indicators in their non-financial reports than those that do not operate in such industries.

Numerous research results indicate that one prominent factor that influences the disclosure of SDGs is the application of the GRI standards (see Table 2). According to Dissanayake et al. (2019), implementing the GRI standards “enable[s] business entities operating in various industries to pursue sustainability reporting in an orderly and consistent manner.” A 2022 study by KPMG shows that these standards are among the most widely used in sustainability reporting. They were applied by 68% of the N100 companies and 78% of the G250 companies. Non-financial reports prepared under the GRI standards increase the transparency and credibility of the information provided to stakeholders regarding corporate commitment to sustainability. Moreover, as asserted by Rahdari and Braendle (2016), information reporting under these standards indicates “that a company considers those environmental and social aspects that are significant to its key stakeholders and have an impact on its business.” With this in mind, we formulated the following research hypothesis:

¹ Sinful industries include tobacco, gambling and alcohol industries (e.g., Lindorff et al., 2012; Oh et al., 2017), as well as energy, mining, chemicals, transport, automotive and metal products companies (e.g., Du, Vieira, 2012; Günther, Hüske, 2015).

H3. WSE-listed companies that prepare non-financial reports under the GRI standards disclose more SDG indicators than those that apply other reporting standards.

The imperative for companies to achieve the SDGs adopted in Agenda 2030 has increased the disclosure of such information in non-financial reports. However, several studies have shown that this type of information is poor and of low value to stakeholders as it does not reflect actual SDG implementation activities (Khan et al., 2021; Silva, 2021; Van der Waal, Thijssens, 2020). Such practices indicate companies' symbolic rather than substantive commitment to sustainability, which necessitates the integration of the SDGs into corporate business strategies. As Heras-Saizarbitoria et al. (2022) rightly noted, "SDGs might be integrated or operationalised in the organisation in a measurable, accountable and assessable manner, with adequate monitoring and assessment systems in place". Taking the above into account, we formulated the following research hypothesis:

H4. The higher the number of SDGs declared by WSE-listed companies in their non-financial reports, the higher the number of SDG indicators disclosed.

2. Research methodology

2.1. Core SDG indicators for enterprises according to UNCTAD as a framework for the empirical study

This study adopts a set of core indicators for sustainability and SDG reporting as indicated by the United Nations Conference on Trade and Development (UNCTAD, 2022).

UNCTAD initiated the development of a limited number of core SDG indicators for enterprise reporting in 2016 during its 14th ministerial conference in Kenya. *Guidance on Core Indicators for Entity Reporting on Contribution Towards Implementation of the Sustainable Development Goals* (hereinafter GCI) was then issued in 2019 under the agreed conclusions during three annual sessions of the Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting (ISAR). The GCI contained 33 indicators divided into four groups: economic, environmental, social and institutional (UNCTAD, 2019). The main objective of the GCI "is to provide practical information on how these indicators could be measured in a consistent manner and in alignment with countries' needs on monitoring the attainment of the SDG Agenda" (UNCTAD, 2019, p. 8). This document serves as a tool to assist governments in assessing the private sector's contribution to the 2030 Agenda implementation, enabling them to report on SDG indicator 12.6.1 – "Number of companies publishing sustainability reports" (see UNSD, 2021b, p. 15). The GCI² also assists businesses in providing baseline data on sustainability issues consistently and comparably (UNCTAD, 2019, 2022).

² The GCI is expanded upon in a comprehensive training manual, which includes explanations of how to determine each indicator (UNCTAD, 2020). The materials include definitions of indicators, measurement methodologies, the identification of potential sources of information, examples, and review questions with answers. By showing the links between the micro level (core indicators at the company level) and the macro level (SDG indicators at the global level), the manual makes it easier to understand the impact of companies on implementation of the SDGs (Szychta, 2022, p. 86).

UNCTAD (2022) revised the core SDG indicators in *Guidance on Core Indicators for Sustainability and SDG Impact Reporting*, released in 2022. Modifications include minor changes in measurement methodology, normalisation, clarifications, and the removal of inconsistencies. In addition, an indicator on land and biodiversity was added (B.6.1) (see Table 3). The GCI is, therefore, a helpful instrument for governments in their efforts to develop policy frameworks on SDG reporting by companies. They enhance the capacity to measure and monitor the private sector's contribution to the implementation of the 2030 Agenda (UNCTAD, 2022, p. 3).

Thirty-four core SDG indicators for enterprises are divided into four areas: economic (A), with eight indicators; environmental (B), with twelve indicators; social (C) and institutional (D), with seven indicators each. Table 3 presents the indicators identified in each of these areas. Indicators for micro-enterprises are related to certain targets within the SDGs and specific indicators intended to measure the SDGs from a macro perspective (see UNCTAD, 2019; Szychta, 2022, pp. 81–84). They are contained in a document entitled *Global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development* prepared by the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs) and adopted by the UN General Assembly in July 2017 (UNSD, 2021b³).

Table 3. Core Sustainable Development Goal indicators for enterprises according to UNCTAD

Economic area (A)	Environmental area (B)
<p>A.1. Revenue and Value added A.1.1. Revenue A.1.2. Value added (gross value added, GVA) A.1.3. Net value added (NVA)</p> <p>A.2. Payments to Government A.2.1. Taxes and other payments to the Government</p> <p>A.3. New investment/expenditures A.3.1. Green investment A.3.2. Community investment A.3.3. Expenditures on research and development</p> <p>A.4. Local supplier/purchasing programmes A.4.1. Share of local procurement</p>	<p>B.1. Sustainable use of water B.1.1. Water recycling and reuse B.1.2. Water use efficiency B.1.3. Water stress</p> <p>B.2. Waste management B.2.1. Waste generation B.2.2. Waste reused, re-manufactured and recycled B.2.3. Hazardous waste generation</p> <p>B.3. Greenhouse gas emissions B.3.1. Greenhouse gas emissions scope 1 B.3.2. Greenhouse gas emissions scope 2</p> <p>B.4. Ozone-depleting substances and chemicals B.4.1. Ozone-depleting substances and chemicals dependency</p> <p>B.5. Energy consumption B.5.1. Share of renewable energy B.5.2. Energy efficiency</p> <p>B.6. Land and biodiversity B.6.1. Land used adjacent to biodiversity-sensitive areas</p>

³ The 248 indicators proposed in this document apply to all SDGs and related targets. They are refined annually and comprehensively reviewed by the Statistical Commission on the 2030 Agenda, which was done at the 51st session of the Commission in 2020 and will be done at the 56th session in 2025 (UNSD, 2021a).

cont. tab. 3

Social area (C)	Institutional area (D)
C.1. Gender equality C.1.1. Share of women in managerial positions C.2. Human Capital C.2.1. Hours of employee training C.2.2. Expenditures on employee training C.2.3. Employee wages and benefits C.3. Employee health and safety C.3.1. Expenditures on employee health and safety C.3.2. Incidence rate of occupational injuries C.4. Coverage by collective agreements C.4.1. Share of employees covered by collective agreements	D.1. Corporate governance disclosures D.1.1. Board meetings and attendance D.1.2. Share of female board members D.1.3. Board members by age range D.1.4. Audit committee meetings and attendance D.1.5. Compensation per board member D.2. Anti-corruption practices D.2.1. Corruption incidence D.2.2. Management training on anti-corruption

Source: UNCTAD (2022).

2.2. Methods of data collection and analysis

To answer the research questions formulated in the *Introduction*, we analysed the reports of WSE-listed companies, which included information on sustainable development issues. They were integrated reports or separate statements on non-financial information prepared by listed companies under the provisions of the Accounting Act of 29 September 1994 (emended in December 2016)⁴, which incorporated Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 on the disclosure of non-financial information.

The content analysis of reports was carried out in two stages. In the second half of 2022, we analysed the reports for 2019 and 2020. In the first half of 2024, the content of reports for 2021 and 2022 was examined.

For the analysis, 78 of the 419 companies listed on the WSE in August 2022 were randomly selected (using Excel's "RANDBETWEEN" function). Of the selected 78 companies, 16 were discarded because they did not publish integrated reports or separate non-financial statements in 2020. Seven of the remaining 62 companies did not prepare such reports in 2019, and two companies (Novaturas and AB S.A.) failed to do so in 2021. In 2022, the analysis covered 58 companies because two companies did not issue separate reports, and two (Lotos SA and PGNiG SA) were merged into the Orlen Capital Group. A total of 235 reports were found on the websites of the analysed companies.

The details of the sample structure are presented in Appendix 1, and some basic data about the companies are presented in Table 4.

⁴ See Ustawa z dnia 15 grudnia 2016 r. o zmianie ustawy o rachunkowości, Dziennik Ustaw, 2017, poz. 61.

Table 4. Characteristics of companies listed on the WSE covered by the study

Characteristics	Number of companies	Per cent
Companies in year: 2019	55	100.0
2020	62	100.0
2021	60	100.0
2022	58	100.0
Data for 2022		
Number of employees in companies:		
– 251–1,000 (large 1)	14	24.1
– 1,001–5,000 (large 2)	19	32.8
– more than 5,000 (large 3)	25	43.1
– total	58	100.0
Companies belonging to sinful industries	35	60.3
Companies belonging to non-sinful industries	23	39.7
Companies that applied GRI Standards	42	72.4
Companies that applied other standards	16	27.6
Companies that declared implementation of the SDGs	39	67.2

Source: authors' own elaboration.

The composition of the studied companies varied over the four-year period, particularly in terms of employee numbers. For example, in 2020, companies that employed more than 250 people accounted for 92% of the total. Among the 62 companies, five were classed as medium-sized entities. In 2022, on the other hand, all 58 companies employed more than 250 people, i.e., they were large or very large entities. In 25 companies (approx. 43%), the number of workers was over 5,000.

Regarding industry classification, over 60% of companies belong to sinful industries, in particular chemical, energy and fuel, mining, metallurgy and construction. The remaining companies (39.7%) operate in industries not classified as sinful, i.e., financial services, telecommunications, tourism, medical materials and equipment, food, and textile trade.

Most companies used GRI Standards in particular years as the methodological basis for preparing an integrated report or a separate non-financial report. In 2022, there were 42 companies, i.e., 72.4% of the total. The remaining companies relied on the Non-financial Information Standard (SIN)⁵ guidelines for their reporting methodology.

⁵ SIN (Standard Informacji Niefinansowej) contains guidelines for companies, which relate to the management, environmental, social and employee areas in order to help Polish companies fulfil their obligations to report non-financial information specified in Directive 2014/95/EU, incorporated into the Accounting Act of 29 September 1994. SIN was approved by the Reporting Standards Foundation (SIN, 2017).

A total of 235 integrated and non-financial reports were subjected to quantitative content analysis, which is the quantitative investigation of message characteristics (Neuendorf, Skalski, 2009). The purpose of using this method was to determine data on SDGs and core SDG indicators according to UNCTAD's (2022) methodology. The characteristics sought, such as whether the company belongs to a sinful industry, the type of report published, the reporting standards used, the number of SDGs, and the number and types of corporate SDG indicators, were collected using coding in an Excel file. We used a binary variable, assigning "1" if the studied characteristic occurred in the report, and "0" otherwise.

In the next stage of the study, statistical methods were applied to verify the four research hypotheses. We used the panel regression as we had both cross-sectional and time-series data. The panels in our study are unbalanced due to the following reasons:

- 1) Seven companies in 2019, two companies in 2021, and two companies in 2022 did not publish reports containing non-financial data for unknown reasons.
- 2) Two companies (PGNiG and Lotos) published no reports in 2022 due to their acquisition by PKN Orlen.

Panel data are usually unbalanced or unequally spaced due to a lack of observations in particular years or firms not filing their data survey forms for a particular period (Baltagi, Liu, 2020). As extracting a balanced panel out of an unbalanced panel leads to a loss in efficiency, we decided not to balance the panels (Baltagi, 2021).

We had four time periods with up to 62 observations per period (year). Panel regression allows us to account for omitted, difficult-to-measure factors, such as managers' attitudes toward sustainability issues or their knowledge of sustainability reporting. Based on the results of the Breusch and Pagan test and the Hausman test, we employed fixed effects models. To test our hypotheses, we constructed two-panel regression models to determine the effects of each independent variable on the number of SDG indicators (Y) presented by the companies in their reports. The following models were estimated:

$$Y_1 = \beta_0 + \beta_1 \times \text{Sinfi}_{it} + \beta_2 \times \text{SizeE}_{it} + \beta_3 \times \text{Goals}_{it} + \beta_4 \times \text{Stand}_{it} + u_{it} \quad 1)$$

$$Y_2 = \delta_0 + \delta_1 \times \text{Sinfi}_{it} + \delta_2 \times \text{SizeA}_{it} + \delta_3 \times \text{Goals}_{it} + \delta_4 \times \text{Stand}_{it} + u_{it} \quad 2)$$

$$u_{it} = \varepsilon_{it} + \alpha_i, i = 1, \dots, N, t = 1, \dots, T,$$

where:

α_i – the fixed effect for the company, ε_{it} is the error,

β_i, δ_i – coefficients ($i = 1, \dots, 4$).

Independent variables:

Sinfi_{it} – sinful industry (dummy variable: 1 for sinful industry, 0 otherwise),

SizeE_{it} – company size measured as the log of employment,

SizeA_{it} – company size measured as the log of assets,

Goals_{it} – the percentage of SDGs declared by the companies relative to the total 17 SDGs,

Stand_{it} – reporting standard type (dummy variable: 1 for GRI, 0 for others).

3. Results of the study and discussion

3.1. SDGs communicated by companies listed on the WSE

Based on the content analysis of the reports, we determined that in 2020, 39 companies out of 62 (62.9%) communicated their engagement with the SDGs. In 2022, 39 out of 58 companies (67.2%) declared their commitment to the SDCs in their reports. Most companies (23; 58.9%) belonged to sinful industries, with the remainder (16) belonging to non-sinful industries. In the integrated and non-financial reports⁶ for 2022 and the previous three years, approximately one-third of business entities did not reference the SDGs (see Appendix 2).

Out of 39 in 2022, two companies (PKN Orlen and Bank Paribas) indicated that they implement all 17 SDGs; in contrast, one company mentioned only one SDG, i.e., 5. Gender equality. The remaining 36 entities declared their commitment to implementing between two and 13 SDGs. The average number of SDGs declared was approximately 9.

As shown in Figure 1, the most common five declared SDGs (UN, 2015) in reports from WSE-listed companies were:

- 12. Ensure sustainable consumption and production patterns,
- 13. Take urgent action to combat climate change and its impacts,
- 7. Ensure access to affordable, reliable, sustainable and modern energy for all,
- 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all,
- 9. Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.

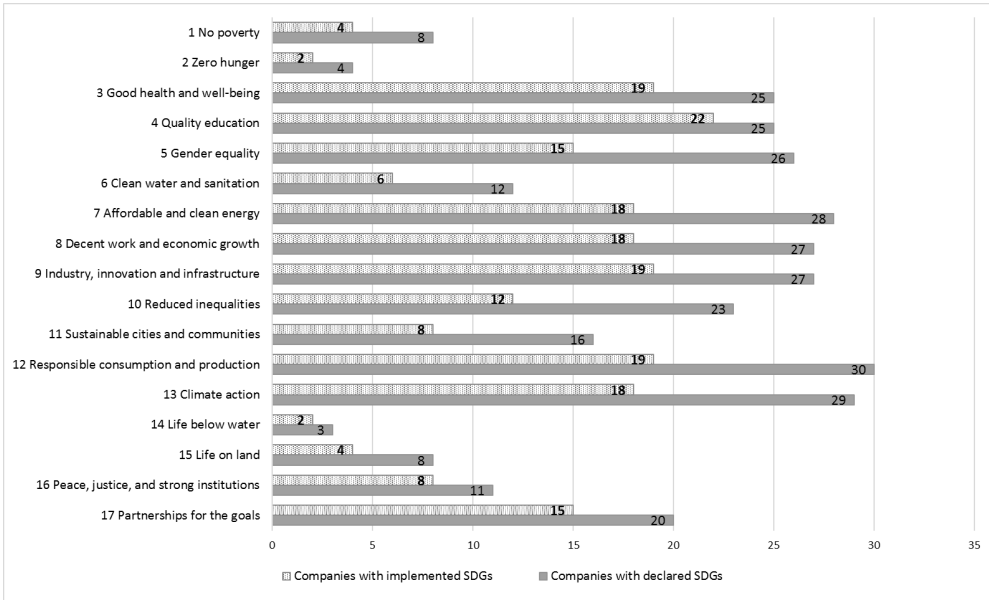
Three goals, i.e., 12, 13 and 8, were the most popular priorities mentioned by the majority of the largest listed companies from each participating country in a PwC study from 2018⁷. The only difference is that the order of priority of the SDGs in the PwC study was 8, 13 and 12.

SDG 14 (Life below water) and SDG 2 (Zero hunger) were mentioned in the reports of WSE-listed companies only three and four times, respectively. SDG 14 ranked last among the priority goals for these companies, similar to the PwC study.

⁶ Most companies prepared a separate report containing non-financial information in individual years (approx. 71% of all reporting in 2019, 76% in 2020, 80% in 2021, and 79% in 2022), which had different names, e.g. non-financial information report, sustainable development report, CSR report. An integrated report in PDF or interactive form was prepared by approx. 29% of companies in 2019, 24% in 2020, 20% in 2021, and 21% in 2022.

⁷ The PwC (2018) study of 729 global companies revealed that 72% mentioned the SDGs in their corporate and sustainability reporting, 50% identified priority SDGs, and 23% disclosed meaningful KPIs and related targets to the SDGs.

Figure 1. Number of companies listed on the WSE with declared and implemented SDGs in 2022



Source: authors' own elaboration.

During analysis of the reports, we found that the reports of some companies that indicated a commitment to the SDGs lacked information on actual activities or indicators related to the achievement of the declared goals or that the activities described were not directly related to the stated goals. In 2022, the number of companies that disclosed information on the implementation of SDGs was lower than the number of companies that declared commitment to the SDGs, as illustrated in Figure 1. For example, of the 30 entities that referred to SDG 12 (Responsible consumption and production), only 19 (63%) disclosed activities and/or indicators that demonstrated the implementation of this goal.

Stakeholders of corporations that have not made full disclosures are forced to look for information about the links between the SDGs and business activities throughout the report to assess the company's commitment to sustainable development. Sometimes, the information presented is not very transparent, too general, or presented in such a way as to create a positive impression. Examples of general phrases in the reports that are not supported by information on activities or indicators include: "our motto is sustainable development", "the company supports the implementation of the SDGs", "our strategy includes sustainable development initiatives", the company "processes valuable resources of the earth, providing the world with products that enable its sustainable development", "we will achieve full climate neutrality", "sustainable development is one of the company's priorities", and "we are building a corporate culture based on ESG values".

3.2. SDG indicators disclosed in the reports of WSE-listed companies

The findings of the content analysis of the non-financial reports in terms of disclosure of core SDG indicators by companies, as required by the UNCTAD GCI, are presented in Appendixes 2 and 3.

Of the 58 companies that prepared reports for 2022, in most cases (42 companies, i.e., about 72%), the number of SDG indicators disclosed in the report increased compared to the number of indicators in the first report available for the period under review, i.e., for either 2019 or 2020. There was a significant increase in several cases – from 7 to 11 indicators. In the remaining 16 companies (about 28%), the number of indicators either decreased by 1–3 measures or was the same in the compared years. These changes ultimately affected the increase in the average number of SDG indicators disclosed in the following years, which was 11 in 2019, 11 in 2020, 12 in 2021 and 13 in 2022 (see Appendixes 1 and 2).

On average, the companies presented only about 32% of the indicators in 2019 and 2020 and about 37% in 2021 and 2022 of the 34 core SDG indicators adopted in the UNCTAD methodology. In 2021 and 2022, the highest number of disclosed metrics was 22 in two large capital groups (PKN Orlen, which belongs to the fuel and gas sector, and PGE, from the energy sector). A report by construction company Budimex in 2020 included 20 SDG indicators, while six companies (Boryszew, JSW, Azoty, Izostal, Kepty and Orange Polska) each disclosed 19 metrics. With the exception of Orange Polska, these companies operate in sinful industries.

The companies most frequently reported economic and environmental indicators, although there were significant differences in the percentage of companies disclosing each indicator (see Appendix 3).

Two economic indicators, A.1.1. Revenue and A.3.2. Community investment, were disclosed most frequently. Data on gross value added (A.1.2) was sporadically disclosed in non-financial reports, and net value added (A.1.3) was not calculated except in one case in 2020.

All twelve environmental indicators were included in the analysed reports. Environmental metrics for B.2. Waste management, B.3. Greenhouse gas emissions, and B.5.1. Share of renewable energy were reported by more entities than the other indicators in this area. In addition, every year, more and more entities communicated about greenhouse direct emissions (B.3.1), greenhouse indirect emissions from purchased electricity, heat and process steam (B.3.2), and share of renewable energy (B.5.1). The percentage of enterprises that disclosed indicator B.3.1 increased from 75% in 2019 to 91% in 2022. In turn, the rate of companies reporting indicator B.3.2 increased from 45% in 2019 to 71% in 2022. The percentage of companies in this period that disclosed the share of renewable energy also rose – from 47% to 69%.

Of the seven social metrics, the largest number of companies disclosed indicator C.3.2. Incidence rate of occupational injuries, i.e., more than 70% of enterprises in the first two years and more than 80% of companies between 2021 and 2022. In second place was indicator C.2.1. Hours of employee training, followed by C.1.1. Share of women in managerial positions in third place. With exceptions in 2021 and 2022, WSE-listed companies did not disclose data on employee wages and

benefits as a proportion of net value added (C.2.3) or expenditures on employee health and safety as a proportion of net value added (C.3.1).

In the institutional area, most companies disclosed indicator D.1.2. Share of female board members. This was between 58% and 69% of reporting enterprises from 2019 to 2022. In contrast, the reports did not communicate the number of hours of management training on anti-corruption (D.2.2). The other institutional SDG indicators were rarely disclosed in the reports analysed.

Some reports lacked comparative data from the previous year. In rare cases, three or four years of comparative data were provided. This approach to report preparation does not provide information about the company's real contribution to the implementation of the declared SDGs.

3.3. Factors that affect the number of SDG indicators disclosed

The four hypotheses formulated in the first part of the article were tested to determine which factors influence the number of SDG indicators disclosed by the companies covered by the study. Two-panel regression models were constructed to determine which of the four factors included in the hypotheses (company size, affiliation to a sinful industry, the type of standards used in preparing the non-financial report, and the number of SDGs declared by the company) affect the number of SDG indicators. The first model considered the logarithm of employment as a measure of company size. The second model adopted a different measure of company size – the logarithm of assets. The parameters and characteristics of the regression models are shown in Table 5.

Table 5. Coefficients of the panel regression models for the dependent variable: number of SDG indicators (Y)

Independent variable	Model 1	Model 2
<i>Sinf</i>	3.85***	4.75***
<i>SizeE</i>	3.52***	
<i>SizeA</i>		2.00***
<i>Goals</i>	1.90**	2.03**
<i>Stand</i>	0.87	1.02
_cons	-4.52**	-6.34**
R-sq level		
R-sq between	0.03	0.64
R-sq within	0.40	0.34
R-sq overall	0.38	0.33

* significant on the level $\alpha < 0.1$;

** significant on the level $\alpha < 0.05$;

*** significant on the level $\alpha < 0.01$.

Explanation of independent variable designations as for regression models Y_1 and Y_2 in section 2.2.

Source: authors' own elaboration.

The panel regression analysis showed that the *Stand* variable is not statistically significant in the models. It allows us to conclude that the type of sustainability reporting standards adopted does not influence the number of measures presented in the reports of the analysed companies. The regression analysis indicates that companies in controversial industries report more SDG indicators. Additionally, the number of measures increases with the size of the company due to their more significant environmental, economic and social impact and because they have more resources and the capacity to measure the results of their activities (see Izzo et al., 2020a; Rosati, Faira, 2019). The number of metrics also depends on the number of sustainability goals the companies adopt. The more SDGs they commit to, the more issues they must measure and report. Many companies in our sample conduct activities unrelated to environmental issues. Therefore, we state that the type and number of SDGs the companies take determine the number of measures (SDG indicators) they report.

The high “between R squared” value in the second model indicates the particular significance of the dependent variables in explaining the number of measures in each year. This means that an increase in the number of metrics and reporting is more likely for larger companies (in terms of value of assets) and awareness of the relevance of sustainability goals. Other companies may not seek to change the scope of reporting to a similar extent, possibly due to more limited financial resources.

Therefore, the statistical analysis provides the basis for rejecting hypothesis H3 and accepting hypotheses H1, H2, and H4.

3.4. Discussion

Our study indicates that three factors (company size, belonging to a sinful industry and the number of defined sustainability goals) influence the number of measures of sustainability goals that are disclosed. At the same time, content analysis revealed several inconsistencies and difficulties in interpreting the data.

Many companies disclose some information, but not always in the form of measures. For example, for indicator B.6.1. Land used adjacent to biodiversity-sensitive areas, the number of hectares of protected areas on which the company operates or affects should be disclosed. However, companies merely write, for example: “some of the contracts executed in 2022 were conducted in areas of protected land, including one under a protected area” (Budimex, 2022) or “some operations are located directly in nature protection areas of European importance or Bird Areas NATURA 2000” (CEZ, 2022). Instead of providing the percentage of local orders in total orders, companies write, for example, “in accordance with legal regulations, we have a long-term preference for local suppliers” (CEZ, 2022). Performance indicators are often not provided by companies, but they can be calculated independently if the user of the report knows how to do it (e.g., energy consumption and revenue are given separately).

While companies also list SDGs in their reports, they do not define their own goals, which may indicate that they do not fully understand them or their role in achieving these objectives. Another problem is that we defined our dependent

variable as the number of measures of the SDGs overall. However, our model does not include the degree of variation in these measures. Some companies change measures yearly while keeping the same number of measures each year. Some companies listed SDGs but did not define the measures taken to achieve them. Hence, one should not conclude that a company's definition of sustainability goals implies that it understands and strives to achieve sustainability goals.

In addition, despite the relevance of company size, most of the companies in the sample were classified as large companies with more than 500 employees. Each company operates as a multinational company and should have a similar capacity and ability to measure its operations. In addition, the need to apply the European Sustainability Reporting Standards (ESRS) under Directive (EU) 2022/2464 and Commission delegated Regulation (EU) 2023/2772, effective from 2024, should motivate all companies in our sample to implement a system for measuring sustainable operations.

Concluding remarks

The article presents empirical research findings on whether and how companies listed on the WSE showed their commitment to the SDGs in their integrated or non-financial reports prepared from 2019 to 2022. Our research reveals an increase in SDG-related disclosures in the non-financial reports published by a randomly selected sample of WSE-listed companies over four years. Approximately two-thirds of the companies declared their commitment to the SDGs in the reports. Still, the number of companies that disclosed information on implementing the SDGs was lower, and some did not provide information on the actions taken to achieve these goals.

Of the 34 core SDG indicators intended for enterprises, according to the UNCTAD-ISAR, companies disclosed, on average, only 11 indicators in 2019 and 2020, 12 in 2021, and 13 in 2022. The highest number of disclosed metrics was 22 in two very large energy industry entities. Statistical analysis using panel regression showed that company size, operating in a sinful industry, and the number of declared SDGs influence the number of SDG indicators disclosed. In turn, the reporting standards used (GRI or other) did not affect the number of SDG indicators presented by the WSE-listed companies. The analysis of the content of the reports confirms the conclusions of empirical research carried out by other authors, who point out that there is a tendency to use SDG disclosures in reports for symbolic rather than substantive legitimacy of their activities. Report preparers focus on portraying companies in a favourable light, improving their reputation in environmental and social contexts, rather than presenting the changes being made to their management strategies and processes related to specific SDGs (e.g., Heras-Saizarbitoria et al., 2022; Izzo et al., 2020a; Nicolò et al., 2023; Silva, 2021).

Due to the lack of credibility, transparency and comparability in SDG disclosures, disclosure quality must still be improved. Thus, it is crucial that businesses select appropriate indicators to measure the SDGs and apply the new unified

sustainability reporting standards, i.e., ESRS adopted by the EU. This approach establishes the basis for transparent company-to-stakeholder communication regarding SDG performance and achievement, which has important implications for informed decision-making. Furthermore, from a practical perspective, our research provides insights into the necessary changes in SDG reporting to ensure that stakeholders receive comparable and reliable information about companies' commitments to sustainable development.

This article expands the existing literature on sustainable development reporting of business entities and measuring the implementation of SDGs at the micro level. However, our research is not without limitations. Firstly, the study only examined a subset of companies listed on the WSE in Poland. Therefore, future research should be extended to include the remaining listed companies. Secondly, the study focused on determining the relationship between the number of disclosed indicators and selected factors, such as company size, industry, type of guidelines used, and the number of declared SDGs. However, it did not consider other significant factors like stakeholder pressure, the region in which the company operates, management attitudes towards disclosures, experience in sustainable development reporting, and report length. These factors may also significantly impact disclosures in this area and should be explored in future research. Another critical area for future study is the analysis of the quality of SDG-related disclosures, including both positive and negative information, as well as the verification of these disclosures by an external auditor. A qualitative approach would help eliminate the symbolic rather than substantive nature of disclosures, often used merely to enhance a company's reputation (a practice commonly referred to as "SDG washing").

References

- Ali N.O.H., Radwan E.K.A., Györi Z. (2021), *Sustainable Development Goals disclosure practices through integrated reporting: An empirical analysis on European financial institutions*, "Education Economists and Managers", 62 (4), pp. 9–33.
- Awuah B., Yazdifar H., Elbardan H. (2023), *Corporate reporting on the Sustainable Development Goals: a structured literature review and research agenda*, "Journal of Accounting & Organizational Change", 20 (4), pp. 617–646; <https://doi.org/10.1108/JAOC-10-2022-0155>.
- Baltagi B.H. (2021), *Unbalanced Panel Data Models*, [in:] *Econometric Analysis of Panel Data. Springer Texts in Business and Economics*, Springer, Cham; pp. 229–257 https://doi.org/10.1007/978-3-030-53953-5_9.
- Baltagi B.H., Liu L. (2020), *Forecasting with unbalanced panel data*, "Journal of Forecasting", 39, pp. 709–724; <https://doi.org/10.1002/for.2646>.
- Bose S., Khan H.Z. (2022), *Sustainable development goals (SDGs) reporting and the role of country-level institutional factors: international evidence*, "Journal of Cleaner Production", 335, 130290; <https://doi.org/10.1016/j.jclepro.2021.130290>.
- Busco C. (2018), *Make Sustainable Development Goals happen through integrated thinking: an introduction*, [in:] Busco C., Granà F., Izzo M.F. (eds), *Sustainable Development Goals and Integrated Reporting*, Routledge, London, chapt. 1; <https://doi.org/10.4324/9780429027314>.
- Byrd J.W., Hickman K., Baker C.R., Cohanier B. (2017), *Corporate social responsibility reporting in controversial industries*, "International Review of Accounting, Banking and Finance", 8(2/3/4), pp. 1–14; http://www.irabf.org/upload/journal/prog/2016v8n2_1.pdf.

- Dissanayake D., Tilt C., Qian W. (2019), *Factors influencing sustainability reporting by Sri Lankan companies*, "Pacific Accounting Review", 31 (1), pp. 67–92.
- Du S., Vieira E.T. (2012), *Striving for legitimacy through corporate social responsibility: Insights from oil companies*, "Journal of Business Ethics", 110 (4), pp. 413–427.
- Elalfy A., Weber O., Geobey S. (2021), *The Sustainable Development Goals (SDGs): a rising tide lifts all boats? Global reporting implications in a post SDGs world*, "Journal of Applied Accounting Research", 22 (3), pp. 557–575; <https://doi.org/10.1108/jaar-06-2020-0116>.
- Erin O.A., Olojede P. (2024), *Do non-financial reporting practices matter in SDG disclosure? An exploratory study*, "Meditari Accountancy Research", 32 (4), pp. 1398–1422; <https://doi.org/10.1108/MEDAR-06-2023-2054>.
- Ferrero-Ferrero I., Munoz-Torres M.J., Rivera-Lirio J.M., Escrig-Olmedo E., Fernandez-Izquierdo M.A. (2023), *SDG reporting: an analysis of corporate sustainability leaders*, "Marketing Intelligence & Planning", 41 (4), pp. 457–472; <https://doi.org/10.1108/MIP-07-2022-0332>.
- Galeazzo A., Miandar T., Carraro M. (2024), *SDGs in corporate responsibility reporting: a longitudinal investigation of institutional determinants and financial performance*, "Journal of Management and Governance", 28, pp. 113–136; <https://doi.org/10.1007/s10997-023-09671-y>.
- García L.S., Bollas-Araya H.M., García Benau M.A. (2022), *Sustainable development goals and assurance of non-financial information reporting in Spain*, "Sustainability Accounting, Management and Policy Journal", 13 (4), pp. 878–898; <https://doi.org/10.1108/SAMPJ-04-2021-0131>.
- García-Meca E., Martínez-Ferrero J. (2021), *Is SDG reporting substantial or symbolic? An examination of controversial and environmentally sensitive industries*, "Journal of Cleaner Production", 298, 126781; <https://doi.org/10.1016/j.jclepro.2021.126781>.
- García-Sánchez I.M., Aibar-Guzmán B., Aibar-Guzmán C., Somohano-Rodríguez F.M. (2022), *The drivers of the integration of the sustainable development goals into the non-financial information system: Individual and joint analysis of their influence*, "Sustainable Development", 30 (4), pp. 513–524; <https://doi.org/10.1002/sd.2246>.
- García-Sánchez I.M., Amor-Esteban V., Galindo-Álvarez D. (2020), *Communication Strategies for the 2030 Agenda Commitments: A Multivariate Approach*, "Sustainability", 12 (24), 10554; <https://doi.org/10.3390/su122410554>.
- Günther E., Hüske A.K. (2015), *How stakeholder shape innovation in controversial industries: The biotechnology industry in Germany*, "Umwelt Wirtschafts Forum", 23 (3), pp. 77–86.
- Hamad S., Lai F.W., Shad M. K., Khatib S.F.A., Ali S. E.A. (2023), *Assessing the implementation of sustainable development goals: does integrated reporting matter?* "Sustainability Accounting, Management and Policy Journal", 14 (1), pp. 49–7; <https://doi.org/10.1108/SAMPJ-01-2022-0029>.
- Heras-Saizarbitoria I., Urbietta L., Boiral O. (2022), *Organisations' engagement with sustainable development goals: From cherry-picking to SDG-washing?* "Corporate Social Responsibility and Environmental Management", 29, pp. 316–328.
- Izzo M.F., Ciaburri M., Tiscini R. (2020a), *The challenge of sustainable development goal reporting: The first evidence from Italian listed companies*, "Sustainability", 12 (8), 3494; <https://doi.org/10.3390/su12083494>.
- Izzo M.F., Strologo A.D., Granà F. (2020b), *Learning from the Best: New Challenges and Trends in IR Reporters' Disclosure and the Role of SDGs*, "Sustainability", 12 (14), 5545; <https://doi.org/10.3390/su12145545>.
- Khan H.Z., Bose S., Mollik A.T., Harun H. (2021), *"Green washing" or "authentic effort"? An empirical investigation of the quality of sustainability reporting by banks*, "Accounting, Auditing and Accountability Journal", 34 (2), pp. 338–369; <https://doi.org/10.1108/AAAJ-01-2018-3330>.

- Krasodomska J., Zarzycka E., Dobija D. (2022), *Czynniki determinujące raportowanie przez przedsiębiorstwa informacji o działaniach na rzecz realizacji Celów Zrównoważonego Rozwoju*, "Zeszyty Teoretyczne Rachunkowości", 46 (3), pp. 99–118; <http://dx.doi.org/10.5604/01.3001.0015.9599>.
- Krasodomska J., Zieniuk P., Kostrzewska J. (2023), *Reporting on Sustainable Development Goals in the European Union: what drives companies' decisions?* "Competitiveness Review: An International Business Journal", 33 (1), pp. 120–146; <https://doi.org/10.1108/CR-12-2021-0179>.
- Lindorff M., Jonson E.P., McGuire L. (2012), *Strategic corporate social responsibility in controversial industry sectors: The social value of harm minimization*, "Journal of Business Ethics", 110 (4), pp. 457–467.
- Lodhia S., Kaur A., Kuruppu S.Ch. (2023), *The disclosure of sustainable development goals (SDGs) by the top 50 Australian companies: substantive or symbolic legitimation?* "Meditari Accountancy Research", 30, pp. 1–28; <https://doi.org/10.1108/MEDAR-05-2021-1297>.
- Nicolò G., Zanellato G., Tiron-Tudor A., Polcini P.T. (2023), *Revealing the corporate contribution to sustainable development goals through integrated reporting: a worldwide perspective*, "Social Responsibility Journal", 19 (5), pp. 829–857; <https://doi.org/10.1108/SRJ-09-2021-0373>.
- Oh H., Bae J., Kim S. (2017), *Can Sinful Firms Benefit from Advertising Their CSR Efforts? Adverse Effect of Advertising Sinful Firms' CSR Engagements on Firm Performance*, "Journal of Business Ethics", 143 (4), pp. 643–663.
- Pizzi S., Caputo A., Venturelli A. (2020), *Management research and the UN sustainable development Goals (SDGs): a bibliometric investigation and systematic review*, "Journal of Cleaner Production", 276, 124033; <https://doi.org/10.1016/j.jclepro.2020.124033>.
- Pizzi S., Del Baldo M., Caputo F., Venturelli A. (2022), *Voluntary disclosure of Sustainable Development Goals in mandatory non-financial reports: The moderating role of cultural dimension*, "Journal of International Financial Management & Accounting", 33 (1), pp. 83–106; <https://doi.org/10.1111/jifm.12139>.
- Pizzi S., Rosati F., Venturelli A. (2021), *The determinants of business contribution to the 2030 Agenda: Introducing the SDG Reporting Score*, "Business Strategy and the Environment", 30 (1), pp. 404–421; <https://doi.org/10.1002/bse.2628>.
- Rahdari A.H., Braendle U. (2016), *Linguistic perception of corporate responsibility disclosure: the case of Japanese Idemitsu*, "Social Responsibility Journal", 12 (2), pp. 335–347; <http://dx.doi.org/10.1108/SRJ-08-2015-0123>.
- Reverte C. (2009), *Determinants of Corporate Social Responsibility Disclosure Ratings by Spanish Listed Firms*, "Journal of Business Ethics", 88, pp. 351–366; [https://www.geos.ed.ac.uk/~sallen/ed-only/Reverte_\(2009\).pdf](https://www.geos.ed.ac.uk/~sallen/ed-only/Reverte_(2009).pdf) (accessed 31.07.2024).
- Rosati F., Faira L.G.D. (2019), *Addressing the SDGs in sustainability reports: The relationship with institutional factors*, "Journal of Cleaner Production", 215 (4), pp. 1312–1326; <https://doi.org/10.1016/j.jclepro.2018.12.107>.
- Santos M.J., Silva Bastos C. (2021), *The adoption of sustainable development goals by large Portuguese companies*, "Social Responsibility Journal", 17 (8), pp. 1079–1099.
- Sekarlangit L.D., Wardhani R. (2021), *The effect of the characteristics and activities of the board of directors on Sustainable Development Goal (SDG) disclosures: empirical evidence from Southeast Asia*, "Sustainability", 13 (14), 8007; <https://doi.org/10.3390/su13148007>.
- Sierra-Garcia L., Garcia-Benau M.A., Bolla-Araya H.M. (2018), *Empirical Analysis of Non-financial Reporting by Spanish Companies*, "Administrative Sciences", 8 (29), pp. 1–17.
- Silva S. (2021), *Corporate contributions to the sustainable development goals: an empirical analysis informed by legitimacy theory*, "Journal of Cleaner Production", 292; <https://doi.org/10.1016/j.jclepro.2021.125962>.

- Szadziewska A., Spigarska E., Majerowska E. (2018), *The disclosure of non-financial information by stock-exchange-listed companies in Poland, in the light of the changes introduced by the Directive 2014/95/EU*, „Zeszyty Teoretyczne Rachunkowości”, 99 (155), pp. 65–95; <https://dx.doi.org/10.5604/01.3001.0012.2933>.
- Szadziewska A., Szycha A., Waniak-Michalak H. (2023), *Pomiar realizacji Celów Zrównoważonego Rozwoju przez spółki notowane na Gieldzie Papierów Wartościowych w Warszawie w świetle wytycznych UNCTAD-ISAR*, „Zeszyty Teoretyczne Rachunkowości” 43 (3), pp. 157–185; <http://dx.doi.org/10.5604/01.3001.0053.7700>.
- Szycha A. (2022), *Rola wytycznych UNCTAD-ISAR w monitorowaniu realizacji Celów Zrównoważonego Rozwoju przez przedsiębiorstwa*, „Zeszyty Teoretyczne Rachunkowości” 46, (1), pp. 67–99; <http://dx.doi.org/10.5604/01.3001.0015.7989>.
- Van der Waal J.W., Thijssens T. (2020), *Corporate involvement in sustainable development goals: exploring the territory*, „Journal of Cleaner Production”, 252, 119625; <https://doi.org/10.1016/j.jclepro.2019.119625>.

Internet sources

- Budimex (2022), *Raport roczny 2022*, <https://raportroczny.budimex.pl/2022/raport-zintegrowany-2022.pdf> (access 2.05.2023).
- CEZ (2022), *Sustainability report 2022*, <https://www.cez.cz/webpublic/file/edee/esg/documents/sustainability-reports/cez-zour-aj-2022.pdf> (access 2.05.2023).
- KPMG (2018), *How to report on the SDGs. What good looks like and why it matters*, February, KPMG International, <https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2018/02/how-to-report-on-sdgs.pdf> (access 30.07.2024).
- KPMG (2022), *Big shifts, small steps: Survey of Sustainability Reporting 2022*, October, KPMG International, <https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2022/10/ssr-sm-all-steps-big-shifts.pdf> (access 30.07.2024).
- Neuendorf K.A., Skalski P.D. (2009), *Quantitative Content Analysis and the Measurement of Collective Identity*, https://www.researchgate.net/publication/278668301_Quantitative_content_analysis_and_the_measurement_of_collective_identity (access 2.05.2023).
- PwC (2018), Price Waterhouse Coopers, Scott L., McGill A., *From promise to reality: does business really care about the SDGs? And what needs to happen to turn words into action*, <https://www.pwc.com/gx/en/sustainability/SDG/sdg-reporting-2018.pdf>, (dostęp 6.12.2022).
- PwC (2019), Price Waterhouse Coopers, Scott L., McGill A., *SDG Challenge 2019, Creating a strategy for a better world*, <https://www.pwc.com/gx/en/sustainability/SDG/sdg-2019.pdf>, (dostęp 6.07.2024).
- SIN (2017), *Standard informacji niefinansowej*, Fundacja Standardów Raportowania, <https://standardy.org.pl/sin/> (dostęp: 1.05.2021).
- UN (2015), *Resolution adopted by the General Assembly on 25 September 2015, Transforming our world: the 2030 Agenda for Sustainable Development*, United Nations General Assembly, <https://documents.un.org/doc/undoc/gen/n15/291/89/pdf/n1529189.pdf> (access 10.12.2023).
- UNCTAD (2019), *Guidance on core indicators for entity reporting on contribution towards implementation of the Sustainable Development Goals*, <https://unctad.org/en/PublicationsLibrary/diae2019d1en.pdf> (access 01.03.2021).
- UNCTAD (2020), *Core SDG Indicators for Entity Reporting: Training manual*, United Nation, Geneva, https://unctad.org/system/files/official-document/diae2020d2_en.pdf (access 1.12.2021).

- UNCTAD (2021a), *Practical Implementation of Core Indicators for Sustainable Development Reporting. Volume 1*, Geneva 2021, https://unctad.org/system/files/official-document/diae2020d2vol1_en.pdf (access 2.04.2024).
- UNCTAD (2021b), *Practical Implementation of Core Indicators for Sustainable Development Reporting. Volume 2*, Geneva 2021, https://unctad.org/system/files/official-document/diae2020d2vol2_en.pdf (access 2.04.2024).
- UNCTAD (2021c), *Review of practical implementation, including measurement, of core indicators for entity reporting on the contribution towards the attainment of the Sustainable Development Goals. Note by the UNCTAD secretariat*, United Nations Conference on Trade and Development, TD/B/C.II/ISAR/97, https://unctad.org/system/files/official-document/ciisard97_en.pdf (access 2.04.2024).
- UNCTAD (2022), *Guidance on Core Indicators for Sustainability and SDG Impact Reporting*, United Nations Conference on Trade and Development, https://unctad.org/system/files/official-document/diae2022d1_en.pdf (access 20.10.2023).
- UNSD (2021a), *SDG Indicators. Global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development*, United Nations Statistics Division Development Data and Outreach Branch, <https://unstats.un.org/sdgs/indicators/indicators-list/> (access 10.07.2024).
- UNSD (2021b), *Global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development*, United Nations Statistics Division Development Data and Outreach Branch, <https://unstats.un.org/sdgs/indicators/Global-Indicator-Framework-after-2024-refinement-English.pdf> (access 10.07.2024).

Legal acts and standards

- Commission delegated Regulation (EU) 2023/2772 of 31 July 2023 supplementing Directive 2013/34/EU of the European Parliament and of the Council as regards sustainability reporting standards, Official Journal of the European Union, Series L, 2023/2772, 22.12.2023, <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32023R2772>
- Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups [2014] OJ L 330/1, 15.11.2014.
- Directive (EU) 2022/2464 of The European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting, Official Journal of the European Union, L 322/15, 16.12.2022, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32022L2464>.
- Ustawa z dnia 29 września 1994 r. o rachunkowości, Dziennik Ustaw, 1994, nr 121, poz. 591, z póź. zm. – consolidated text as amended, <https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU19941210591/U/D19940591Lj.pdf>
- Ustawa z dnia 15 grudnia 2016 r. o zmianie ustawy o rachunkowości, Dziennik Ustaw, 2017, poz. 61.

Appendix 1. Sample structure description

Specification	Max	Min	Average	Number of companies
Year 2019				
Assets in PLN thousands	3,643,772,750	200,700	99,749,299	55
Employees	84,245	187	10,271	55
Sinful companies	–	–	–	34
Number of measures	22	1	11	55
Year 2020				
Assets in PLN thousands	4,298,483,149	181,700	104,766,021	62
Employees	82,107	119	9,351	62
Sinful companies	–	–	–	37
Number of measures	22	1	11	62
Year 2021				
Assets in PLN thousands	4,207,519,890	187,153	111,891,617	60
Employees	85,675	201	9,493	60
Sinful companies	–	–	–	37
Number of measures	22	1	12	60
Year 2022				
Assets in PLN thousands	4,014,377,640	227,093	116,796,843	58
Employees	81,348	262	9,919	58
Sinful companies	–	–	–	35
Number of measures	22	3	13	58

Source: authors' own elaboration.

Appendix 2. Number of core SDG indicators and number of SDGs disclosed in non-financial reports of companies listed on the WSE

No.	Company name	Size of the company in 2022*	Sinful (1), non-sinful (0)	Type of standard: GRI (1), others (0)	Number of core SDG indicators in year				Number of SDGs in 2022	List of declared SDGs in 2022
					2019	2020	2021	2022		
1	Apator	large 2	1	0	16	16	14	13	8	3, 4, 5, 6, 7, 8, 9, 12
2	Boryszew	large 2	1	1	10	10	9	9	0	
3	Budimex	large 3	1	1	19	20	18	19	0	
4	CEZ	large 3	1	1	15	13	18	20	0	
5	Ciech	large 2	1	1	5	4	11	13	11	3, 4, 6, 7, 8, 9, 10, 12, 13, 16, 17
6	Cognor	large 2	1	1	8	11	14	14	8	3, 4, 7, 8, 9, 10, 12, 13
7	Decora	large 1	1	1	X	5	5	6	5	3, 4, 7, 12, 17
8	Dekpol	large 1	1	1	X	9	7	16	5	6, 7, 9, 12, 17
9	Enea	large 3	1	1	8	9	13	13	5	4, 7, 9, 12, 17
10	Energa	large 3	1	1	15	15	18	18	8	3, 4, 5, 6, 7, 9, 16, 17
11	Erbud	large 2	1	1	9	9	17	11	9	3, 5, 7, 8, 9, 10, 11, 12, 13
12	Fasing	large 1	1	0	6	5	11	11	10	3, 4, 5, 6, 7, 8, 9, 12, 13, 17
13	Famur/ Grenevia	large 2	1	0	8	10	14	11	12	3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 16, 17
14	Azoty	large 3	1	1	17	13	19	19	12	2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 17
15	Introl	large 2	1	0	1	1	1	5	3	5, 10, 16
16	Izostal/ Stalprofil	large 1	1	0	14	16	16	15	1	5
17	JSW	large 3	1	1	18	18	18	19	5	1, 4, 7, 9, 13
18	KGHM	large 3	1	1	14	16	16	15	11	3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15
19	Lentex	large 1	1	0	X	9	14	14	8	3, 4, 6, 7, 8, 9, 13, 16

cont. appendix 2

No.	Company name	Size of the company in 2022*	Sinful (1), non-sinful (0)	Type of standard: GRI (1), others (0)	Number of core SDG indicators in year				Number of SDGs in 2022	List of declared SDGs in 2022
					2019	2020	2021	2022		
20	Kęty	large 3	1	1	19	18	18	19	2	10, 12
21	Bogdanka	large 3	1	1	15	13	16	17	0	
22	Mirbud	large 1	1	1	13	14	11	15	11	1, 3, 5, 7, 8, 9, 10, 11, 12, 13, 16
23	Polimex Mostostal	large 2	1	1	10	9	10	10	0	
24	NEWAG	large 2	1	0	8	8	11	10	0	
25	PKN Orlen	large 3	1	1	22	21	22	22	17	1–17
26	PGE	large 3	1	1	19	19	22	22	5	7, 11, 12, 13, 15
27	Polenergia	large 1	1	0 by 2021, 1 in 2022	10	15	10	14	4	5, 7, 11, 17
28	RAFAKO	large 2	1	1	9	8	7	7	0	
29	Śnieżka	large 2	1	0	10	11	11	12	5	3, 7, 10, 12, 13
30	Tauron	large 3	1	1	16	17	16	18	5	7, 9, 11, 12, 13
31	Torpol	large 1	1	1	13	12	15	15	0	
32	Trakcja	large 2	1	0	12	11	8	10	0	
33	Unibep	large 2	1	1	11	12	13	14	0	
34	ZAMET	large 1	1	0	8	7	7	7	0	
35	ZPUE	large 2	1	0	7	7	6	6	0	
36	EURO-CASH	large 3	0	1	10	12	11	14	6	2, 4, 8, 9, 12, 13
37	LPP	large 3	0	1	15	15	16	16	7	4, 5, 8, 10, 12, 13, 17
38	Mercator Medical	large 2	0	0	8	11	11	11	0	
39	Alior Bank	large 3	0	1	2	2	4	5	0	
40	Bank Millenium	large 3	0	1	4	6	7	14	7	3, 4, 5, 8, 9, 13, 17
41	Bank BOŚ	large 2	0	1	X	8	9	7	11	3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15
42	Bank Paribas	large 3	0	1	4	10	11	15	17	1–17
43	ING	large 3	0	1	5	15	15	14	0	
44	mBank	large 3	0	1	12	10	14	9	13	1, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 16, 17

cont. appendix 2

No.	Company name	Size of the company in 2022*	Sinful (1), non-sinful (0)	Type of standard: GRI (1), others (0)	Number of core SDG indicators in year				Number of SDGs in 2022	List of declared SDGs in 2022
					2019	2020	2021	2022		
45	PZU	large 3	0	1	10	11	14	14	11	3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15
46	Santander	large 3	0	1	9	10	5	7	8	3, 4, 5, 8, 9, 11, 13, 17
47	Unicredit	large 3	0	1	15	14	15	14	11	1, 3, 4, 5, 7, 8, 9, 10, 11, 13, 17
48	Bank PKO	large 3	0	1	X	7	11	12	11	4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 17
49	Bank Handlowy	large 2	0	1	7	8	11	12	0	
50	XTB	large 1	0	0	X	4	4	5	0	
51	Ambra	large 1	0	0	9	10	10	10	9	3, 5, 6, 7, 8, 10, 12, 13, 17
52	Gobarto	large 1	0	0	7	7	4	6	0	
53	Grupa Żywiec	large 2	0	1	6	14	15	16	7	3, 5, 6, 7, 8, 12, 13
54	Wawel	large 1	0	0	4	10	10	8	0	
55	Orange Polska	large 3	0	1	16	15	19	19	12	1, 3, 4, 5, 8, 9, 10, 11, 12, 13, 16, 17
56	Agora	large 2	0	1	7	8	15	14	9	4, 5, 8, 10, 11, 12, 13, 16, 17
57	Rainbow	large 1	0	1	2	2	3	3	5	8, 10, 12, 14, 15
58	Cyfrowy Polsat	large 3	0	1	9	9	12	12	8	1, 3, 4, 7, 8, 9, 10, 13
59	Lotos	large 3**	1	1	19	14	12	X	X	X
60	PGNiG	large 3**	1	1	13	15	17	X	X	X
61	Novaturas	medium***	0	0	X	3	X	X	X	X
62	AB S.A.	large 2***	0	0	6	7	X	X	X	X
Average number of core SDG indicators/SDGs					11	11	12	13	9	X
					(10.6)	(10.8)	(12.2)	(12.7)	(8.5)	

* Size of the company as measured by the number of employees: up to 250 – medium; 251–1,000 – large 1; 1,001–5,000 – large 2; more than 5,000 – large 3;

** Number of employees in 2021;

*** Number of employees in 2020.

Source: authors' own elaboration.

Appendix 3. Core SDG indicators in companies listed on the WSE

Group of indicators	Indicators	Percentage of reporting companies in year			
		2019 (N = 55)	2020 (N = 62)	2021 (N = 60)	2022 (N = 58)
Group of economic indicators	Economic indicator				
A1. Revenue and Value added	A.1.1. Revenue	76	69	75	72
	A.1.2. Value added (gross value added, GVA)	11	10	8	5
	A.1.3. Net value added (NVA)	0	2	0	0
A.2. Payments to Government	A.2.1. Taxes and other payments to the Government	31	34	40	47
A.3. New investment/expenditures	A.3.1. Green investment	24	27	25	36
	A.3.2. Community investment	76	73	80	81
	A.3.3. Expenditures on research and development	15	11	7	10
A.4. Local supplier/purchasing programmes	A.4.1. Share of local procurement	11	5	12	16
Group of environmental indicators	Environmental indicator				
B.1. Sustainable use of water	B.1.1. Water recycling and reuse	18	15	18	17
	B.1.2. Water use efficiency	13	16	7	7
	B.1.3. Water stress	18	18	35	52
B.2. Waste management	B.2.1. Waste generation	45	39	45	41
	B.2.2. Waste reused, re-manufactured and recycled	53	53	60	69
	B.2.3. Hazardous waste generation	64	61	65	69
B.3. Greenhouse gas emissions	B.3.1. Greenhouse gas emissions scope 1	75	81	90	91
	B.3.2. Greenhouse gas emissions scope 2	45	56	67	71
B.4. Ozone-depleting substances and chemicals	B.4.1. Ozone depleting substances and chemicals	22	16	30	24
B.5. Energy consumption	B.5.1. Share of renewable energy	47	50	62	69
	B.5.2. Energy efficiency	20	23	17	21
B.6. Land and biodiversity	B.6.1. Land used adjacent to biodiversity sensitive areas	7	10	13	9
Group of social indicators	Social indicator				
C.1. Gender equality	C.1.1. Share of women in managerial positions	49	55	63	62

cont. appendix 3

Group of indicators	Indicators	Percentage of reporting companies in year			
		2019 (N = 55)	2020 (N = 62)	2021 (N = 60)	2022 (N = 58)
C.2. Human Capital	C.2.1. Hours of employee training	64	66	73	69
	C.2.2. Expenditures on employee training	11	10	17	9
	C.2.3. Employee wages and benefits	0	0	3	7
C.3. Employee health and safety	C.3.1. Expenditures on employee health and safety	0	0	2	0
	C.3.2. Incidence rate of occupational injuries	73	71	82	83
C.4. Coverage by collective agreements	C.4.1. Share of employees covered by collective agreements	42	35	48	53
Group of institutional indicators	Institutional indicator				
D.1. Corporate governance disclosures	D.1.1. Board meetings and attendance	11	13	17	21
	D.1.2. Share of female board members	58	66	60	69
	D.1.3. Board members by age range	36	37	33	31
	D.1.4. Audit committee meetings and attendance	9	15	8	12
	D.1.5. Compensation per board member	16	15	12	12
D.2. Anti-corruption practices	D.2.1. Corruption incidence	27	32	42	34
	D.2.2. Management training on anti-corruption	0	5	3	0

Source: authors' own elaboration.

