

Bridging ESG and SDGs Clean Air and Water through CSR Committee: A New Pathway for Sustainability in the Utility Sector

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Abstract

This study aims to bridge Environmental, Social, and Governance (ESG) principles with the Sustainable Development Goals (SDGs), particularly related to clean air and water, through the role of the Corporate Social Responsibility (CSR) committee in the utility sector. As global awareness of climate change rises, utility companies worldwide are adopting ESG strategies to reduce carbon emissions, improve energy efficiency, and manage water resources. This research proposes a new evaluation framework to assess the contribution of utility companies to achieving SDGs focused on air and water quality. Using data from annual reports and Refinitiv LSEG, the study examines the relationship between ESG scores, asset size, debt-to-equity ratio, and the moderating role of CSR committees in achieving SDG goals. Regression analysis results indicate that ESG scores have a significant positive influence on company contributions to achieving SDGs, especially in terms of clean air and water quality. Additionally, the CSR committee acts as an effective moderator in optimizing asset use and managing company debt to meet sustainability goals. This study provides both theoretical and practical contributions to support evidence-based decision-making for more sustainable policies in the utility sector.

Keywords: Environmental, Social, and Governance (ESG), Sustainable Development Goals (SDGs), CSR Committee, Utility Sector.

Introduction

The escalating issues of climate change, pollution, and dwindling natural resources necessitate immediate action on a global scale. The pressing global concern of clean air and safe water is intensified by growing industrial pollution and environmental destruction (World Health Organization, 2018). Irresponsible industrial activities hinder the achievement of sustainable development due to neglect of clean air and water quality (Naqvi et al., 2023). Due to the heightened awareness of climate change and social impacts through the Sustainable Development Goals, companies now prioritize fulfilling their commitments to sustainable development goals and adhering to more demanding ESG standards (Sullivan & Mackenzie, 2017). The global trend for utility companies incorporating Environmental, Social, and Governance (ESG) strategies has risen dramatically (Nicolo et al., 2023).

Adopting ESG principles offers companies the transparency needed to demonstrate their contributions to the SDGs via eco-friendly business practices. In response to the shift toward a low-carbon economy, utilities worldwide are dedicating resources to renewable energy, energy efficiency, and water management. Utilities are now adopting strategies to reduce carbon emissions, enhance community engagement, and promote transparency in governance (Zhang et al., 2020). Adhering to stricter government regulations and enhancing stakeholder reputation through ESG practices not only improves financial performance but also heightens competitiveness (Khan et al., 2019; El Ghouli et al., 2011).

In the transition to a low-carbon economy and the achievement of SDG goals, particularly climate action and clean energy delivery, the utility industry plays a pivotal role in natural resource use and energy production. Utilities' adoption of ESG standards enhances operational efficiency, lessens environmental impact, and addresses stakeholders' calls for transparency and sound management practices. The major challenges confronting the utilities sector in both developed and developing nations reveal the true concerns related to ESG and SDGs. Critics argue that emissions from fossil-based power plants in developed nations

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like the US negatively affect urban air quality (Brown et al., 2020). Industrial waste significantly contaminated water sources, leading to health hazards. In Flint, Michigan, ESG promises proved incorrect due to infrastructure failures that led to the water crisis (Hanna & Zuberi, 2016).

In developing nations like India and Indonesia, water pollution intensifies the issue of inadequate clean water access (Kumar & Singh, 2021). Untreated industrial and domestic waste is the leading contributor of pollution. The poor air quality caused by the combustion of fossil fuels and deforestation worsens the problem. In both countries, utilities grapple with ESG commitments, economic challenges, and insufficient infrastructure. Strengthening policy, increasing green infrastructure investment, and integrating technological advancements into the utilities sector are essential to attain the desired air and water quality improvements necessary to achieve SDGs targets.

An environmental economics perspective is essential for researching clean water and air as it relates these environmental issues to socio-economic well-being and sustainable development (Agarwal & Sharma, 2022). Clean water and quality air, regarded as essential resources from an economic perspective, are termed as public goods. Economic sectors like public health, labor productivity, and mitigation costs are adversely affected when degradation such as pollution or water shortages occurs. This research is essential for evaluating ESG strategies' effectiveness in managing environmental risks and promoting sustainable economic growth within the SDG framework.

This research adds significant value to effective, evidence-based policy-making that fosters economic resilience, particularly in response to global challenges. This study aims to connect ESG strategies to SDG targets, focusing particularly on those associated with "Clean air and water". Financial metrics and corporate governance mechanisms, including total assets and debt-to-equity ratio, as well as CSR Sustainability Committees, contribute to achieving certain environmental goals.

Utility companies' financial viability and environmental responsibility management is crucial for the success of the SDGs, presenting a detailed perspective through this approach. This model's financial integration underscores both the significance of sustainable business practices and the accountability of companies, particularly those in the utilities sector, for their role in advancing the SDGs and reducing pollution. In the utilities sector, which significantly affects ecosystems, this research underscores a recent development where firms must prioritize profitability and social/environmental concerns. Many previous investigations have expedited the examination of ESG's general influence, mostly disregarding the individual contribution of each ESG component to specific Sustainable Development Goals. Zhang et al.'s (2020) study demonstrated that ESG practices support sustainability overall, yet failed to clarify precisely how environmental elements embellish clean air and water quality. Studies are more frequent in developed countries, whereas utilities research is scant in developing countries. The SDGs present unique challenges for developing countries that require further exploration (Khan et al., 2019).

Studies have primarily examined the relationship between financial and ESG factors. El Ghouli et al. (2011) research revealed a positive correlation between financial performance and sustainability, yet it failed to examine the influence of financial factors, such as total assets and debt ratios, on the realization of the SDGs. Although several studies evaluate sustainability in the utility sector using common indicators, they fail to introduce indicators that are unique and encompassing for the water and air-related SDGs. This study proposes a more accurate and contextual evaluation framework to fill the gap in existing research.

This study makes significant contributions to the sustainability of the utility sector, both theoretically and in practice. This study contributes to sustainability theory's literature by examining the correlation between financial indicators and the attainment of SDGs, while integrating ESG factors into decision making through the introduction of the CSR Committee variable as a moderator. This study offers utilities clear guidance on managing assets, debt, and equity to support the achievement of SDGs, shaping public policy and enhancing stakeholder awareness. This study offers a point of reference for benchmarking and sharing best practices among companies, promoting collaboration towards global sustainability objectives. This paper contributes to both environmental economics theory and practice, as well as global initiatives to achieve SDGs, specifically with regards to clean air and water quality.

Literature Review

Sustainability Theory

Sustainability Theory prioritizes development that allows present needs to be met without impairing the ability of future generations to fulfill their own needs (Brundtland Commission, 1987). A holistic management approach that harmoniously balances economic, social, and environmental factors in a company or organization. An entity should generate economic profits for shareholders while considering its societal and environmental responsibilities. This theory aligns with the Triple Bottom Line principle, introduced by John Elkington in 1997, which measures a company's success in terms of people, planet, and profit. Ensuring long-term sustainability involves managing natural resource use, social impacts, and economic activity within the ecosystem's capacity. According to Sustainability Theory, companies can achieve growth and development in an ideal state, preserving both environmental quality and social justice.

Studies on ESG factors, SDGs, and economic indicators have begun revealing their intricate connections. The study of BRICS-11 nations indicated disparate influences of ESG factors on SDGs, necessitating tailored strategies (Cem Işık et al., 2024). An empirical analysis of global companies revealed that ESG performance negatively impacted sustainability (Rajesh & Rajendran, 2020). In ASEAN economies, promoting green investment, clean energy consumption, and green economic growth enhance ESG practices and advance towards SDGs across sectors (Thuy Chung Phan, 2024). The implementation of the 2030 Agenda for Sustainable Development with a greater emphasis on ESG strategies has yet to yield significant progress towards achieving SDG goals in several areas (Ensign, 2022). The significance of customized sustainability tactics and uniform metrics in accurately assessing advancement is underscored by these results.

Sustainability theory, integrating various perspectives and disciplines, has grown to be a candidate grand theory. Through a historical and interdisciplinary lens, classical political economy offers a foundation for analyzing sustainable development (Manioudis & Meramveliotakis, 2022). An effective sustainability vision for businesses should be concise, clear, and future-oriented (Kantabutra, 2020). Simultaneously, systems-based approaches to corporate sustainability highlight the interconnected nature of sustainability culture, resilience, and performance (Kantabutra, 2022). The significance of choice, place, scale, systems, boundaries, and change are essential concepts in sustainability theory, applicable to various contexts, including rural areas (Harrington, 2016).

An effective sustainability vision, proposed by Kantabutra in (2020), possesses conciseness, clarity, and inspiring capability. Kantabutra and Ketprapakorn (2020) demonstrated that the incorporation of sustainability vision and values enhances emotional commitment and results in five essential sustainability behaviors. According to Sánchez-Planelles et al. (2022), firms with formal sustainability structures are more effective in integrating sustainable practices than those with a silo approach. Kantabutra (2022) advanced a theory of corporate sustainability, integrating Sustainability Culture, Resilience, and Corporate Sustainability Performance as interconnected subsystems. This dynamic model delivers continuous learning and adaptation to complex sustainability challenges, providing essential insights for professionals and scholars in the field.

The SDGs are a comprehensive framework for global sustainability, addressing the interrelated themes of people, planet, peace, prosperity, and partnerships (Rosa et al., 2020). The SDGs are a global agenda set by the United Nations (UN) to achieve sustainable development. However, achieving these goals requires a systems-based approach that recognizes the Earth as a complex and integrated system (Skene, 2020). Educational institutions are a strategic tool to accelerate the achievement of the SDGs, with quality education contributing to poverty reduction and improved health outcomes (Pasara, 2021). A goals-based approach that links societal goals to Essential Transformation Variables can support policy development and validation for SDG progress (Plag & Jules-Plag, 2020). While most SDG targets focus on transforming society and the built environment, there is a need for more explicit targets that address the Earth's life

support systems to ensure long-term sustainability (Plag & Jules-Plag, 2020). Implementing the SDGs requires a holistic approach that considers the interrelationships between goals and causality between variables (Pasara, 2021).

Sustainable Development Goals (SDG)

The utilities industry's implementation of Environmental, Social, and Governance (ESG) principles aligns with the United Nations' Sustainable Development Goals (SDGs). The United Nations' sustainable development goals are significantly furthered by the role of the utilities industry, which encompasses energy, water, and waste management sectors. The significance of a comprehensive approach to sustainability within the utilities industry lies in the connection between ESG and SDG. Effectively incorporating Environmental, Social, and Governance (ESG) factors into business strategies advances both sustainable development objectives and the long-term stability and resilience of companies. In the utilities sector, ESG concerns assume prominence due to its considerable influence on both the environment and society.

Utility companies' management of greenhouse gas emissions, efficient use of natural resources, and development of renewable energy significantly impacts the environmental aspect. SDG 7 and SDG 13 are significantly impacted by this. In the utility industry, implementing robust ESG practices can facilitate the shift to cleaner energy sources, lessen carbon emissions, and contribute to fulfilling climate change objectives. Utility companies, viewed from a social standpoint, are essential in providing equitable access to fundamental services like electricity and clean water, fulfilling targets for SDG 6 (Clean Water and Sanitation) and SDG 10 (Reduced Inequality). Utility infrastructure construction necessitates consideration for the social impact on nearby communities. Adopting socially responsible practices enhances social sustainability and promotes inclusion. The management of utility companies encompasses transparency, accountability, and good governance practices. Ensuring good governance in a company contributes to investor confidence and ethical, sustainable decisions that align with SDG 16 (Peace, Justice and Strong Institutions). Effective governance directs infrastructure investments and technology development towards sustainable, long-term societal benefits.

Environmental, Social, and Governance (ESG)

With globalization and heightened concerns for the environment, the framework of Environmental, Social, and Governance (ESG) has grown crucial to measuring a company's sustainability and ethical impact (Elkington, 1997; Khan & Moorthy, 2022). One of the main objectives of ESG is to support the Sustainable Development Goals (SDGs), especially those related to air quality and clean water (United Nations Development Programme [UNDP], 2020), which are related to Clean Air and Water (SDG 6 and 11), are greatly influenced by the implementation of ESG principles (UNDP, 2020). Companies integrating ESG strategies can achieve goals, like carbon reduction, water management, clean technology, community engagement, and regulatory compliance, as well as generating enduring value for stakeholders (Khan & Moorthy, 2022).

According to McKinsey & Company (2021), environmental management refers to how a company manages the impact of its operational activities on the environment. Carbon emission reduction, waste management, and sustainable resource use are the focus areas considered by Khan and Moorthy (2022). Adopting eco-friendly business practices can significantly contribute to enhancing air quality and lessening water contamination (WHO, 2019).

Social relationships are established between companies and their employees, suppliers, and nearby communities, according to Voss & Voss (2021). Corporate social responsibility encompasses initiatives enhancing local access to clean water and improving air quality (UNDP, 2020). Actively engaging in society can heighten public consciousness about the significance of preserving clean air and water (Elkington, 1997).

McKinsey & Company (2021) defines governance as the management and decision-making aspect of a company. Companies with good governance are more transparent and accountable, particularly with regard

to their environmental impact (Khan & Moorthy, 2022). Companies can be steered towards investing in cleaner, more efficient technologies with the help of sustainability-focused policies (WHO, 2019).

Corporate Social Responsibility (CSR) Committee

Corporate Social Responsibility (CSR) is a concept where companies voluntarily integrate social, environmental, and economic issues into their business activities and interactions with stakeholders. CSR not only aims to improve the company's image, but also to ensure that its business operations make a positive contribution to society and the environment. According to Carroll (1979), CSR includes four main dimensions: economic, legal, ethical, and philanthropic responsibilities. Economic responsibilities require companies to operate efficiently and profitably, while legal responsibilities ensure that they comply with all applicable laws. On the other hand, ethical responsibilities relate to behaving in accordance with moral norms, and philanthropic responsibilities include voluntary activities for the social good.

The development of the CSR concept has undergone significant changes along with the increasing global awareness of the importance of sustainability and the impact of business on the environment and society. Companies today are expected to not only focus on achieving financial profits but also consider their impact on other stakeholders such as consumers, employees, surrounding communities, and the environment. CSR in the modern era focuses more on a more strategic and integrated approach, where companies adopt socially and environmentally responsible business practices as part of their long-term strategy.

Studies reveal long-term benefits such as improved reputation, greater consumer loyalty, and enhanced financial gains for organizations actively implementing Corporate Social Responsibility (CSR) programs. Based on Porter and Kramer (2006), companies can distinguish themselves competitively by weaving social responsibility into their innovation and operational excellence through strategic CSR. Corporate Social Responsibility (CSR) now significantly contributes to improved business performance and benefits both the company and the community.

The CSR Committee is instrumental in aligning the company's operations with sustainability principles per Sustainability Theory. In this context, Sustainability Theory requires companies to not only prioritize financial gains but also consider social and environmental consequences. The CSR Committee manages the company's social responsibility initiatives, focusing on carbon reduction, community welfare, and environmental preservation. This committee enables the company to not only meet regulatory requirements but also actively participate in the advancement of sustainable development goals (SDGs). By adhering to a robust CSR strategy, corporations reduce environmental hazards, enhance their public image, and build long-term value for stakeholders, aligning with the principles of Sustainability Theory focusing on the economic, social, and environmental balance within corporate management.

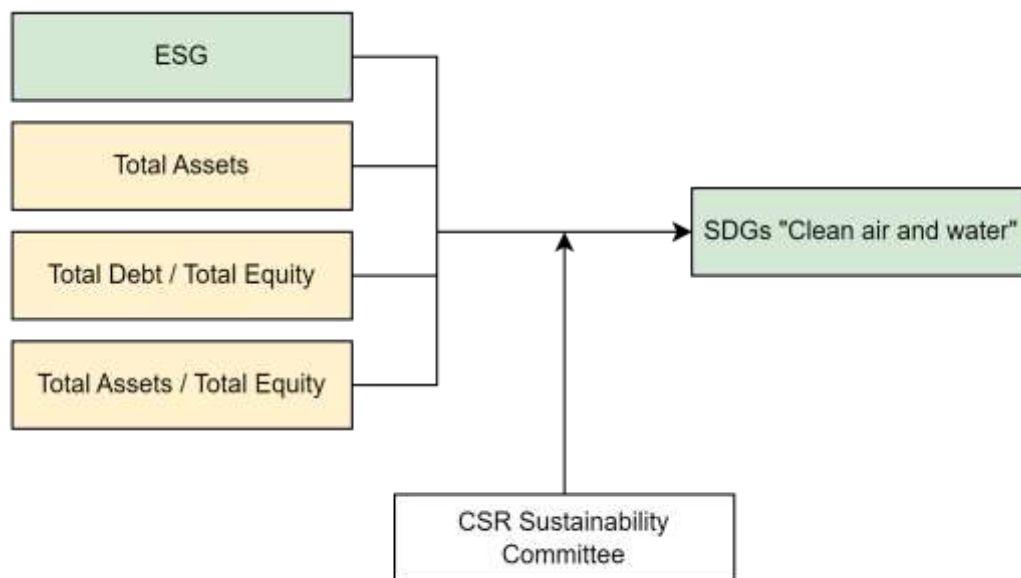
The CSR Committee is vital in implementing sustainability practices consistent with Sustainability Theory (Carroll, 1999). According to Elkington (1997), Sustainability Theory underscores the significance of companies addressing both financial profitability and the social and environmental consequences of their operations. The CSR Committee is responsible for leading the company's efforts to minimize carbon footprints, promote local community welfare, and protect the environment through its social responsibility policies and programs (Freeman, 1984). The committee guarantees both regulatory compliance and active participation in the accomplishment of sustainable development goals (SDGs) (Porter & Kramer, 2006). Through implementing CSR strategies, companies reduce environmental risks, enhance public image, and deliver long-term value to stakeholders, adhering to the sustainability theory's triple bottom line perspective (Dyllick & Hockerts, 2002).

Research Hypothesis

- **H1:** The higher a company's ESG score, the higher the company's contribution to achieving the SDGs "Clean Air and Water".

- **H2:** Companies with larger total assets tend to have a greater contribution to the achievement of SDGs "Clean Air and Water".
- **H3:** Lower debt to equity ratio (Total Debt/Total Equity) is associated with a greater contribution to the achievement of SDGs "Clean Air and Water".
- **H4:** Companies with higher capital utilization efficiency (Total Assets/Total Equity) tend to have a greater contribution to the achievement of SDGs "Clean Air and Water".
- **H5:** CSR Committee moderates the relationship between ESG score variables, finance (Total Assets, Total Debt/Total Equity, Total Assets/Total Equity) in achieving SDGs "Clean Air and Water".

Conceptual Framework



Research Methodology

This study examines the correlation between ESG factors and SDGs. This approach quantifies the interlinkage between ESG factors, financial metrics including Total Assets, Total Debt to Equity Ratio, and Total Assets to Equity Ratio, and the attainment of clean air and water SDGs. The CSR Committee's role in moderating the relationship between ESG variables and corporate finance towards the achievement of SDGs related to clean air and water is analyzed.

The financial and ESG information for data collection was sourced from the company's published annual reports and Refinitiv LSEG. This data is specifically linked to environmental Sustainable Development Goals (SDGs). This analysis examines the company's contribution to the SDGs through an evaluation of its relationship with key variables, emphasizing environmental indicators like "Clean air and water" and their broader implications. The SDGs clean air and water index utilized in this study originated from the Sachs et al. (2019) article, which discusses six transformations to meet the SDGs and highlights necessary interventions. The sample data used in this study consisted of 2,154 companies in the utilities sector globally, collected from 2017 to 2023. These companies were selected based on their active participation in sustainability reporting and the availability of comprehensive financial and ESG data. The data set includes firm-year observations across multiple geographical regions, ensuring a diverse representation of the utilities sector. The CSR Sustainability Committee is essential for guiding and assessing the company's sustainability policy during the analysis phase. This committee influences sustainability-related decisions concerning asset

allocation and debt financing. The controlled aspects of the committee were assessed in this study for their impact on the SDG targets.

The study employs linear regression methods to determine the importance of Total Assets, Debt/Equity Ratio, and Asset/Equity Ratio in relation to "Clean air and water SDG contributions." This study qualitatively assesses the CSR Sustainability Committee's contribution to environmental SDGs through their role and effectiveness.

Dependent Variable

SDGs (Sustainable Development Goals)

Ensuring access to clean water and quality air through sustainable practices is the primary goal in this model for SDGs. This variable is particularly relevant to SDGs 6 and 13, which emphasize clean water, sanitation, and air quality improvement. A company's efforts towards reducing the negative impact on air and water quality are quantified by the Clean Air and Water variable as part of its environmental responsibility.

Independent Variable

ESG

A company's ESG Score reflects its level of achievement in the areas of Environment, Social Responsibility, and Corporate Governance. A third-party rating agency's assessment of a company's responsible management of environmental, social, and governance impacts is conveyed through this score. ESG signifies the three pivotal elements in evaluating a company's sustainability and ethical stature. Investors frequently utilize this metric to assess a company's level of environmental, social, and governance responsibility.

Variable Controls

Total Assets

Total Assets refers to the total value of a company's resources at any given time, whether in liquid (cash and cash equivalents) or non-liquid (fixed assets, inventory, and other investments). Total assets refer to everything a company owns, both long-term and short-term assets, that have economic value. The total value of these assets provides an overview of the size and financial capacity of the company. Total assets are used as a control variable or indicator of a company's financial strength. This ratio describes how much a company's total assets are compared to the equity held by shareholders. This ratio is often used to assess the efficiency of a company's use of capital. Total assets refer to everything a company owns, both long-term and short-term assets, that have economic value. Total assets are used as a control variable or indicator of a company's financial strength. Companies with larger assets may be better able to carry out sustainability initiatives and CSR programs effectively.

Total Debt of Total Equity

The Total Debt Percentage of Total Equity symbolizes the degree of a company's debt financing in comparison to its equity. A company's financial leverage is measured by this ratio. The debt-to-equity ratio measures the relationship between a company's debt and equity. The financial leverage of a company is commonly assessed using this ratio.

Total Assets to Total Equity

This ratio expresses the degree to which a company's equity supports its assets. The debt-equity ratio provides investors insight into a company's capital structure and its degree of financing through debt.

*Moderating Variable**CSR Sustainability Committee*

A company's CSR Sustainability Committee oversees policies and program implementation related to corporate social responsibility and sustainability. This committee oversees the company's adherence to sustainability and social responsibility targets, while evaluating the social, environmental, and economic repercussions of its operations. The sustainability or CSR committee coordinates the company's social and environmental responsibility initiatives, including their design, implementation, and monitoring.

Analysis Results**Table 1. Descriptive Statistics**

	N	Min	Max	Mean	Std. Dev
SACHS3_IDX	2154	0	1.014	0.281	0.361
ESG_SCORE	2154	2.15	94.73	48.86	19.91
Ln_TA	2154	14.76	26.27	22.84	1.56
DEBT_EQUITY	2154	0	2021.12	126.34	112.38
ASSET_EQUITY	2154	1	27.77	3.13	1.77
Valid N (listwise)	2154				

The mean SACHS3_IDX of 0.281 indicates that, on average, companies have a relatively low sustainability index (close to 0). However, there is considerable variation, as shown by the standard deviation of 0.361. The maximum value of 1.014 indicates that some companies have achieved a very high sustainability level, while others have a minimum index value (0).

The mean ESG score of 48.86 suggests that most companies are in the mid-range of environmental, social, and governance (ESG) performance. The standard deviation of 19.91 indicates significant variability among companies. The minimum score (2.15) and maximum score (94.73) reflect a wide difference in the implementation of ESG practices across companies.

The mean logarithm of total assets (Ln_TA) of 22.84 indicates that the companies are relatively large. A standard deviation of 1.56 shows that company size varies but not too drastically. The largest company has a value of 26.27, while the smallest company has a value of 14.76.

The average debt-to-equity ratio of 126.34 suggests that most companies have a higher proportion of debt compared to equity. However, there is considerable variability with a standard deviation of 112.38, and an extreme maximum value of 2021.12. This shows that some companies carry a very high debt burden compared to their equity.

The average asset-to-equity ratio of 3.13 indicates that, on average, companies in this sample have assets three times larger than their equity. However, the minimum value of 1.00 and the maximum of 27.77 show that there is significant variation, with some companies having very high asset-to-equity ratios.

Table 2. Pearson Correlation Matrix

	SACHS3_IDX	ESG_Score	Ln_TA	Debt_Equity	Asset_Equity
SACHS3_IDX	1.000				
ESG_Score	0.316	1.000			

Ln_TA	0.126	0.457	1.000		
Debt_Equity	0.058	0.098	0.249	1.000	
Asset_Equity	0.045	0.172	0.299	0.784	1.000

The significant positive correlation between ESG_SCORE and SACHS3_IDX is notable, though the model accounts for a modest portion of the variation in SACHS3_IDX. ESG_SCORE is a significant factor, though not the sole determinant.

The Pearson correlation coefficient between ESG_SCORE and SACHS3_IDX is approximately 0.316. This indicates a moderate positive correlation between the two variables, meaning that as ESG_SCORE increases, SACHS3_IDX tends to increase as well, although the strength of this relationship is not particularly strong.

Table 3. Multiple Linear Regression Results

Variable	Coefficient	Standard Error	t-value	P-value
const	0.1353	0.115	1.172	0.241
ESG_SCORE	0.0060	0.000	14.395	0.000
Ln_TA	-0.006	0.005	-1.089	0.276
DEBT_EQUITY	0.0003	0.000	2.782	0.005
ASSET_EQUITY	-0.0155	0.007	-2.272	0.023

The ESG_SCORE has a positive and highly significant impact on SACHS3_IDX ($p < 0.001$). For every one-unit increase in the ESG score, the SACHS3_IDX increases by 0.0060. This indicates that companies with better ESG scores tend to have higher values in the SACHS3_IDX index, confirming the relevance of environmental, social, and governance factors in explaining SACHS3_IDX performance.

The Ln_TA (firm size) has a negative but statistically insignificant effect on SACHS3_IDX ($p = 0.276$). This suggests that firm size does not have a meaningful impact on SACHS3_IDX in this model, indicating that larger firms do not necessarily perform better or worse on this index.

The DEBT_EQUITY (debt-to-equity ratio) shows a small but statistically significant positive effect on SACHS3_IDX ($p = 0.005$). This means that for every one-unit increase in the debt-to-equity ratio, SACHS3_IDX increases by 0.0003. Although the impact is small, it suggests that companies with higher leverage may experience slight improvements in SACHS3_IDX performance.

The ASSET_EQUITY (asset-to-equity ratio) has a negative and statistically significant effect on SACHS3_IDX ($p = 0.023$). This means that for every one-unit increase in this ratio, the SACHS3_IDX decreases by 0.0155. This suggests that companies with higher asset-to-equity ratios may perform worse on SACHS3_IDX, potentially indicating inefficiencies or less optimal capital structures.

Table 4. Moderating Regression Analysis

Variable	Coefficient	Standard Error	t-value	P-value
const	0.1472	0.1167	1.2613	0.2073
ESG_SCORE	0.0060	0.000	14.395	0.0006
CSR_COM	0.1369	0.0424	3.2288	0.0012
ESGScore*CSR_COM	-4.8544	0.0010	-0.0475	0.9620
Ln_TA	-0.0073	0.0054	-1.3604	0.1738
DEBT_EQUITY	0.0002	0.0001	2.2655	0.0235
ASSET_EQUITY	-0.0150	0.0067	-2.2315	0.0257

The coefficient for ESG_SCORE is positive (0.0045) and highly significant ($p < 0.001$). This indicates that as a company's ESG score increases, its SACHS3_IDX (dependent variable) also tends to increase, suggesting a positive relationship between the company's ESG performance and its sustainable index score.

The coefficient for CSR_COM is also positive (0.1369) and significant ($p = 0.001$). This suggests that companies with higher CSR (Corporate Social Responsibility) commitment scores tend to have higher SACHS3_IDX values. CSR commitment appears to positively influence the sustainable index score.

The interaction term between ESG_SCORE and CSR_COM has a very small negative coefficient (-0.00005) and is not statistically significant ($p = 0.962$). This implies that CSR_COM does not significantly moderate the relationship between ESG_SCORE and SACHS3_IDX. In other words, the impact of ESG_SCORE on SACHS3_IDX does not depend on CSR_COM in this model.

Ln_TA (logarithm of total assets) has a negative but insignificant effect on SACHS3_IDX ($p = 0.174$), indicating that firm size, as measured by total assets, does not have a significant influence on the index score. DEBT_EQUITY has a positive and significant effect ($p = 0.024$), suggesting that a higher debt-to-equity ratio is associated with a higher SACHS3_IDX. ASSET_EQUITY has a negative and significant effect ($p = 0.026$), indicating that companies with higher asset-to-equity ratios tend to have lower SACHS3_IDX scores.

The results show that both ESG_SCORE and CSR_COM have significant and positive individual effects on SACHS3_IDX, highlighting the importance of both ESG performance and CSR commitment in improving sustainable index scores. However, the interaction between ESG_SCORE and CSR_COM is not significant, suggesting that CSR commitment does not moderate the effect of ESG performance on SACHS3_IDX. Control variables such as DEBT_EQUITY and ASSET_EQUITY also play significant roles, while firm size (Ln_TA) does not have a notable impact on the dependent variable. These findings provide important insights into the dynamics between corporate sustainability efforts, financial structure, and their impact on sustainable performance metrics.

Discussion

The study's findings indicate that companies with superior ESG scores significantly contribute to attaining the "Clean Air and Water" SDG. The study by Eccles et al. (2014) indicates that ESG excellence signifies a company's dedication to the environment and its effective management of natural resources, particularly with regard to clean air and water. Companies with high environmental, social, and governance (ESG) scores typically undertake initiatives to cut carbon emissions, decrease industrial waste, and improve water and energy efficiency (Porter & Kramer, 2006). In terms of the SDGs, corporations prioritizing robust ESG practices adopt stringent regulations on air and water pollution, via eco-friendly technology implementation and efficient waste management (Kolk et al., 2017). Companies' ESG initiatives that actively manage environmental impacts significantly advance sustainable development goals, particularly concerning air quality and clean water, as mentioned in the literature (Farooq et al., 2022). High ESG scores are linked to significant contributions of companies to the SDGs, particularly concerning environmental issues.

Although companies with extensive assets theoretically possess greater sustainability resources, not all effectively utilize their assets for environmental purposes (Kolk et al., 2017). Instead of investing in green infrastructure and technologies, large corporations prioritize short-term growth and profitability (Porter & Kramer, 2011). Besides asset size, sustainability dedication hinges on internal policies, corporate governance, and external regulations. (Eccles et al., 2014) Companies with substantial assets lack motivation to advance SDG clean air and water targets unless proper incentives or regulations are in place (Dyllick & Hockerts, 2002).

A lower debt-to-equity ratio leads to the achievement of SDGs related to Clean Air and Water. Companies with a lower debt ratio can invest more in environmental sustainability and reduction of carbon emissions and water pollution (Benlemlih & Bitar, 2018). A lighter debt load enables companies to prioritize long-

term environmental management (Dyllick & Muff, 2016). Companies with stronger financial positions tend to fulfill their social and environmental responsibilities more effectively (Khan & Moorthy, 2022). Research suggests that companies with stronger financial positions, as indicated by lower debt ratios, are more inclined to adopt green technologies and practices aligning with the SDGs (Phan, 2024). This finding aligns with the literature stressing the significance of balancing capital structure to support global environmental goals.

Higher capital efficiency, as measured by the Total Assets/Total Equity ratio, has a positive effect on achieving the SDGs "Clean Air and Water". This can be explained through the principle of more optimal resource allocation. Companies that are able to maximize their assets in relation to equity tend to be more efficient in managing their investments, including investments in environmentally friendly initiatives, such as low-carbon technologies and clean water management (Farooq et al., 2022). Companies with a high Total Assets/Total Equity ratio also have greater financial capacity to invest in sustainability projects, which ultimately helps them contribute more significantly to achieving the SDGs "Clean Air and Water" (Khan & Moorthy, 2022). In addition, capital efficiency allows companies to maintain sufficient liquidity to implement effective CSR strategies without burdening short-term profitability (Benlemlih & Bitar, 2018). In other words, higher capital efficiency facilitates a more effective allocation of resources towards environmental initiatives, supporting the argument that corporate financial efficiency can support environmental sustainability.

The CSR Committee's role in monitoring and strategic decision-making enables more responsible use of capital and environmental risk management, leading to stronger connections between ESG scores and financial variables in the pursuit of "Clean Air and Water" SDGs (Eccles et al., 2014). The CSR Committee significantly influences companies' implementation of effective sustainability policies, adhering to ESG values and the company's dedication to sustainable development goals (Dyllick & Muff, 2016). The CSR Committee's role includes optimizing the use of assets and managing debt ratios sustainably to allocate resources effectively and significantly enhance the company's contribution to the SDGs (Bansal & DesJardine, 2024). With their role in monitoring and strategic decision-making, the CSR Committee is able to direct the use of capital and environmental risk management more responsibly, which ultimately strengthens the relationship between ESG scores and financial variables in achieving the SDGs "Clean Air and Water" (Eccles et al., 2014). The CSR Committee plays a crucial role in merging financial and sustainability policies to amplify the company's environmental footprint.

Conclusion

This study demonstrates that the implementation of Environmental, Social, and Governance (ESG) principles significantly contributes to the achievement of the Sustainable Development Goals (SDGs), particularly concerning clean air and water in the utility sector. Higher ESG scores have been shown to enhance companies' contributions to achieving SDG targets, especially in reducing carbon emissions and improving water quality. Furthermore, the results highlight the critical role of the Corporate Social Responsibility (CSR) committee as a moderator that strengthens the relationship between financial indicators, such as total assets and debt-to-equity ratio, and environmental sustainability goals. The CSR committee enables companies to manage resources more responsibly and enhance their positive environmental impact through more targeted policies and more efficient asset utilization.

This study provides new insights for utility companies in integrating ESG into their business strategies, as well as the importance of the CSR committee in reinforcing sustainability commitments. The practical implications of this research include the need for utility companies to prioritize investment in green infrastructure and environmentally friendly technologies to meet sustainability goals. From a theoretical perspective, this study reaffirms the importance of examining the roles of ESG and CSR in supporting the SDG agenda and encourages a more comprehensive approach to evaluating corporate sustainability in this sector.

Implications

This hypothesis yields significant practical and theoretical consequences. The CSR Committee significantly impacts the correlation between the ESG score and a company's financial indicators (Total Assets, Total Debt/Total Equity, Total Assets/Total Equity) regarding the progress towards the "Clean Air and Water" SDG. Establishing and strengthening a CSR Committee can enhance a company's sustainability policy effectiveness and ensure ESG initiatives align with significant environmental goals. The committee can help companies distribute resources effectively to reduce environmental hazards and enhance their contributions to SDGs concerning clean water and air quality (Dyllick & Muff, 2016). Companies strengthening their reputation as socially and environmentally responsible entities, can also reduce legal risks and enhance long-term performance.

The CSR Committee significantly influences the corporate sustainability model. This strengthens the alignment of corporate strategy with social and environmental responsibilities, as per Sustainability and Stakeholder Theories (Freeman, 1984; Elkington, 1997). The Triple Bottom Line theory, which evaluates companies based on financial, social, and environmental performance (Elkington, 1997), is supported by this research. This research advances the CSR and ESG field by shedding light on how CSR Committees can enhance corporate performance in alignment with the SDGs.

Recommendation

For future research, there are several areas that can be further explored. First, research could examine the moderating role of the CSR Committee on the relationship between ESG variables and financial performance across different industries or geographic contexts, to determine whether the same effects apply across sectors or are limited to certain industries. Second, further exploration of how other factors, such as organizational culture, corporate governance, or even green innovation, influence the moderating role of the CSR Committee in achieving the SDGs would be valuable. In-depth research on the impact of the CSR Committee on other SDG dimensions, such as "Life on Land" or "Climate Action," could also be an important direction for future studies (Bansal & DesJardine, 2024). Third, longitudinal research that measures changes in ESG performance and its impact on the SDGs over the long term would provide more comprehensive insights into the effectiveness of the CSR Committee.

References

- Bansal, P., & DesJardine, M. R. (2024). Business sustainability: Balancing short-term and long-term goals. *Strategic Organization*. <https://doi.org/10.1177/14761270211061474>
- Benlemlih, M., & Bitar, M. (2018). Corporate social responsibility and investment efficiency. *Journal of Business Ethics*, 148(3), 647–671. <https://doi.org/10.1007/s10551-016-3034-4>
- Bhat, G., & Hope, O.-K. (2016). The effect of firm-level corporate governance on accounting conservatism: Evidence from the adoption of governance reforms in a developing country. *Contemporary Accounting Research*. Wiley. <https://doi.org/10.1111/1911-3846.12147>
- Brundtland, G. H. (1987). *Our common future: World commission on environment and development*. Oxford University Press. <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>
- Burritt, R. L., & Schaltegger, S. (2014). Sustainability accounting and reporting: Fad or trend? *Accounting, Auditing & Accountability Journal*, 23(7), 829–860. <https://doi.org/10.1108/09513571111184755>
- Carroll, A. B. (1999). Corporate social responsibility: Evolution of a definitional construct. *Business & Society*, 38(3), 268–295. <https://doi.org/10.1177/000765039903800303>
- Deloitte. (2023). Navigating sustainability risks in energy companies. *Deloitte Insights*. <https://www2.deloitte.com/us/en/insights/industry/power-and-utilities/navigating-sustainability-risks-in-energy-companies.html>
- Dyllick, T., & Hockerts, K. (2002). Beyond the business case for corporate sustainability. *Business Strategy and the Environment*, 11(2), 130–141. <https://doi.org/10.1002/bse.323>
- Dyllick, T., & Muff, K. (2016). Clarifying the meaning of sustainable business: Introducing a typology from business-as-usual to true business sustainability. *Organization & Environment*, 29(2), 156–174. <https://doi.org/10.1177/1086026615575176>
- Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. *Management Science*. Wiley. <https://doi.org/10.1287/mnsc.2014.1984>
- Elkington, J. (1997). *Cannibals with forks: The triple bottom line of 21st-century business*. Capstone Publishing.

- Fama, E. F., & French, K. R. (2002). Testing trade-off and pecking order predictions about dividends and debt. *Review of Financial Studies*, Wiley. <https://doi.org/10.1093/rfs/15.1.1>
- Farooq, M. B., Cherian, J., & Alvi, S. (2022). Environmental sustainability in business: The role of responsible corporate practices. *Journal of Cleaner Production*, 347, 131213. <https://doi.org/10.1016/j.jclepro.2022.131213>
- Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Pitman.
- GRI (Global Reporting Initiative). (2020). Sustainability reporting standards. Retrieved from <https://www.globalreporting.org/standards>
- Harrington, L. M. B. (2016). Sustainability theory and conceptual considerations: A review of key ideas for sustainability, and the rural context. *Papers in Applied Geography*, 2(4), 365–382. <https://doi.org/10.1080/23754931.2016.1239222>
- Harris, M., & Raviv, A. (1991). The theory of capital structure. *Journal of Finance*, Wiley. <https://doi.org/10.1111/j.1540-6261.1991.tb03753>
- Hart, S. L., & Milstein, M. B. (2003). Creating sustainable value. *Academy of Management Perspectives*, 17(2), 56–67. <https://doi.org/10.5465/ame.2003.10025194>
- Hoang, D., & Castka, P. (2019). CSR and water management: Corporate strategies for sustainable water management in the industrial sector. *Journal of Cleaner Production*, 225, 568–578. <https://doi.org/10.1016/j.jclepro.2019.03.351>
- Işık, C., Ongan, S., Islam, H., Pinzon, S., & Jabeen, G. (2024). Navigating sustainability: Unveiling the interconnected dynamics of ESG factors and SDGs in BRICS-11. *Sustainable Development*. <https://doi.org/10.1002/sd.2356>
- Kantabutra, S. (2020). Toward an organizational theory of sustainability vision. *Sustainability*, 12(3), 1125. <https://doi.org/10.3390/su12031125>
- Kantabutra, S. (2022). Toward a system theory of corporate sustainability: An interim struggle. *Sustainability*, 14, 15931. <https://doi.org/10.3390/su142315931>
- Kantabutra, S., & Ketprapakorn, N. (2020). Toward a theory of corporate sustainability: A theoretical integration and exploration. *Journal of Cleaner Production*, 270, 122292. <https://doi.org/10.1016/j.jclepro.2020.122292>
- Khan, T., & Moorthy, R. (2022). ESG and corporate financial performance: A review of the literature. *Journal of Sustainable Finance & Investment*, 12(3), 183–202. <https://doi.org/10.1080/20430795.2020.1723380>
- Kolk, A., Kourula, A., & Pisani, N. (2017). Multinational enterprises and the Sustainable Development Goals: What do we know and how to proceed? *Transnational Corporations*, 24(3), 9–32. <https://doi.org/10.18356/d613c24e-en>
- KPMG. (2023). ESG performance and its impact on business resilience. KPMG Reports. <https://home.kpmg/xx/en/home/insights/2023/04/esg-performance-impact-on-business-resilience.html>
- Li, Z., & Zhou, Z. (2019). Environmental, social, and governance and corporate innovation. *Research in International Business and Finance*. Elsevier. <https://doi.org/10.1016/j.ribaf.2019.01.004>
- Lozano, R., et al. (2013). Are companies embracing their stakeholders in their sustainability reports? *Corporate Social Responsibility and Environmental Management*, 20(3), 133–144. <https://doi.org/10.1002/csr.1285>
- Manioudis, M., & Meramveliotakis, G. (2022). Broad strokes towards a grand theory in the analysis of sustainable development: A return to the classical political economy. *New Political Economy*, 27(5), 866–878. <https://doi.org/10.1080/13563467.2021.1895721>
- McKinsey & Company. (2021). How companies can lead on sustainability. McKinsey Insights. <https://www.mckinsey.com/business-functions/sustainability/our-insights/how-companies-can-lead-on-sustainability>
- Michelon, G., & Parbonetti, A. (2012). The effect of corporate governance on sustainability disclosure. *Journal of Management & Governance*. Springer. <https://doi.org/10.1007/s10997-011-9160-3>
- Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*. Elsevier. [https://doi.org/10.1016/0304-405X\(84\)90023-0](https://doi.org/10.1016/0304-405X(84)90023-0)
- Naqvi, S. L. H., Ayub, F., Yasar, A., Tabinda, A. B., Nawaz, H., & Tanveer, R. (2023). Pollution status monitoring and indices development for evaluating sustainable environmental management practices (SEMP) in Quaid-e-Azam Industrial Estate, Pakistan. *Journal of Cleaner Production*, 405, 136944. <https://doi.org/10.1016/j.jclepro.2023.136944>
- Pasara, M. T. (2021). Economic growth, governance and educational sustainability: A VAR analysis. *Education Sciences*, 11(7), 343. <https://doi.org/10.3390/educsci11070343>
- Phan, T. C. (2024). Impact of green investments, green economic growth and renewable energy consumption on environmental, social, and governance practices to achieve the sustainable development goals: A sectoral analysis in the ASEAN economies. *International Journal of Engineering Business Management*, 16, 18479790241231725. <https://doi.org/10.1177/18479790241231725>
- Plag, H. P., & Jules-Plag, S. A. (2020). A goal-based approach to the identification of essential transformation variables in support of the implementation of the 2030 agenda for sustainable development. *International Journal of Digital Earth*. <https://doi.org/10.1080/17538947.2019.1678482>
- Porter, M. E., & Kramer, M. R. (2006). Strategy and society: The link between competitive advantage and corporate social responsibility. *Harvard Business Review*. <https://hbr.org/2006/12/strategy-and-society-the-link-between-competitive-advantage-and-corporate-social-responsibility>
- Porter, M. E., & Kramer, M. R. (2011). Creating shared value: How to reinvent capitalism—and unleash a wave of innovation and growth. *Harvard Business Review*, 89(1/2), 62–77. <https://hbr.org/2011/01/the-big-idea-creating-shared-value>
- Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *Journal of Finance*, Wiley. <https://doi.org/10.1111/j.1540-6261.1995.tb05184.x>
- Rajesh, R., & Rajendran, C. (2020). Relating environmental, social, and governance scores and sustainability performances of firms: An empirical analysis. *Business Strategy and the Environment*, 29(3), 1247–1267. <https://doi.org/10.1002/bse.2435>

- Sanchez-Planelles, J., Segarra-Oña, M., & Peiro-Signes, A. (2022). Identifying different sustainable practices to help companies to contribute to the sustainable development: Holistic sustainability, sustainable business and operations models. *Corporate Social Responsibility and Environmental Management*, 29(4), 904–917. <https://doi.org/10.1002/csr.2257>
- Schaltegger, S., & Burritt, R. L. (2018). Business cases and corporate engagement with sustainability: Differentiating ethical motivations. *Journal of Business Ethics*, 147(2), 241–259. <https://doi.org/10.1007/s10551-015-2938-0>
- Skene, K. R. (2021). No goal is an island: The implications of systems theory for the Sustainable Development Goals. *Environment, Development and Sustainability*, 23(7), 9993–10012. <https://doi.org/10.1007/s10668-020-01038-y>
- Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *Journal of Finance*. Wiley. <https://doi.org/10.1111/j.1540-6261.1988.tb02585.x>
- United Nations Development Programme (UNDP). (2020). Sustainable development goals. Retrieved from <https://www.undp.org/sustainable-development-goals>
- United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. United Nations General Assembly. <https://sdgs.un.org/2030agenda>
- Valverde, J. M., & Avilés-Palacios, C. (2021). Circular economy as a catalyst for progress towards the Sustainable Development Goals: A positive relationship between two self-sufficient variables. *Sustainability*, 13(22), 12652. <https://doi.org/10.3390/su132212652>
- Voss, K., & Voss, C. (2021). The role of corporate social responsibility in sustainable development goals: A global perspective. *Corporate Governance: The International Journal of Business in Society*, 21(4), 657–669. <https://doi.org/10.1108/CG-11-2020-0522>
- Wang, H., & Qian, C. (2011). Corporate philanthropy and corporate financial performance: The roles of stakeholder response and political access. *Journal of Business Ethics*. Elsevier. <https://doi.org/10.1007/s10551-010-0634-3>
- World Health Organization (WHO). (2018). Ambient air pollution: A global assessment of exposure and burden of disease. WHO Press. <https://www.who.int/publications/i/item/9789241511353>
- World Health Organization (WHO). (2019). Air quality and health. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/air-quality-and-health>