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## Article

# A holistic approach to sustainability: Sustainable Development Goals (SDGs) and corporate sustainability

Contemporary Economics

## Provided in Cooperation with:

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*Suggested Citation:* Banelienė, Rūta; Strazdas, Rolandas (2025) : A holistic approach to sustainability: Sustainable Development Goals (SDGs) and corporate sustainability, Contemporary Economics, ISSN 2300-8814, VIZJA University, Warsaw, Vol. 19, Iss. 2, pp. 186-207, <https://doi.org/10.5709/ce.1897-9254.561>

This Version is available at:

<https://hdl.handle.net/10419/323490>

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Primary submission: 17.11.2024 | Final acceptance: 08.03.2025

# A Holistic Approach to Sustainability: Sustainable Development Goals (SDGs) and Corporate Sustainability

Rūta Banelienė  and Rolandas Strazdas 

## ABSTRACT

Human activities are having an increasingly negative impact on the environment at all scales. This situation creates an urgent need to shift human activities toward sustainable development at all levels—company, sector, country, region and global. However, national efforts to improve sustainability, as measured by national rankings on sustainable development goals (SDGs), may have a positive impact on the sustainability of one sector, including economic sustainability, while negatively affecting other sectors or even harming the social, economic, and environmental situation in other countries. Investing in a company's environmental sustainability may have a negative effect on its economic sustainability and overall environmental, social, and governance (ESG) score. This research focuses on the vertical dimension, from companies to global sustainability, and takes a holistic approach to fill a gap in the study of the link between a company's sustainability and the SDG scores at the national level. This study examines the impact of prioritizing sustainability at the national level on the profitability of Fortune 500 companies in Europe. Two comparable sectors, Industrials and Motor Vehicles & Parts, were selected to investigate the proposed hypotheses. The findings reveal that prioritizing sustainability can have a negative effect on the profitability of companies in sectors dependent on employee skills while benefiting companies in asset-dependent sectors. This study confirms that the implementation of the Sustainable Development Goals may have varying impacts on different sectors within the same country and region. Modeling was conducted via the least squares method and EViews software.

## KEY WORDS:

SDG, holistic approach, vertical integration, Fortune 500 Europe.

**JEL Classification:** A10, C30, D04, D20, E17, F61, F63, L16, O30, O40.

Rūta Banelienė, Vilnius Gediminas Technical University

## 1. Introduction

Human activities are having increasingly negative impacts on the environment at all scales (Allan et al., 2021; Cirman et al., 2009). Therefore, there is an urgent need to shift human activity toward sustainable development. To achieve this goal, countries have adopted the Paris Agreement on climate change, with the goal of limiting global warming to well below 2 °C, preferably 1.5 °C, compared with preindustrial levels (European Commission, 2020;

United Nations Environment Programme, 2024; United Nations Environment Programme, 2023). The European Union adopted its inaugural European Climate Law in 2021, which established the continent's objective of attaining climate neutrality by 2050 (Regulation (EU), 2021). As a pivotal component of the European Green Deal and the EU Biodiversity Strategy, the Regulation on Nature Restoration (Nature Restoration Law) was brought into force in 2024 (Regulation (EU), 2024). Current global environmental crises have not escaped the

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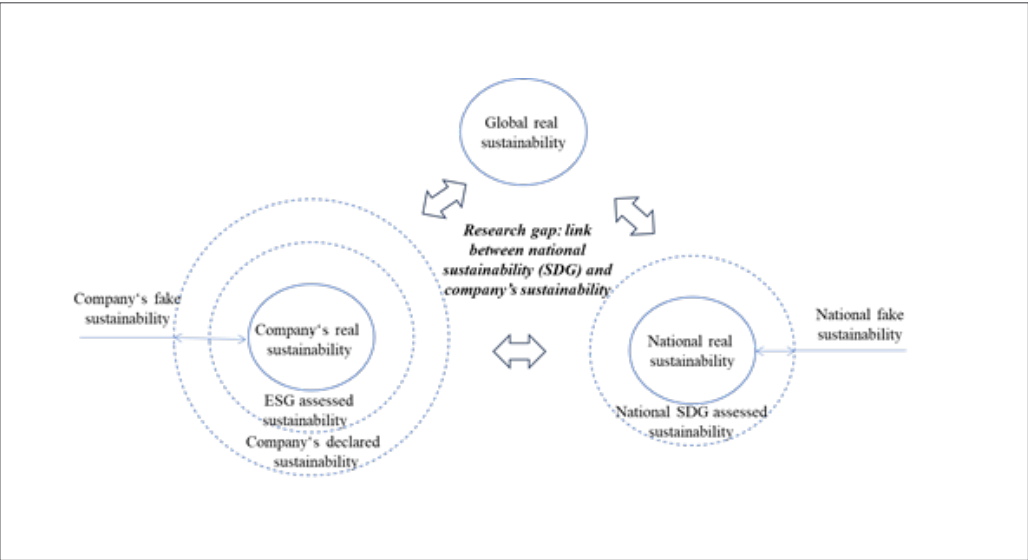
attention of business leaders (Bocken et al., 2020). Businesses are increasingly addressing sustainability issues for normative and instrumental reasons. Normative reasons include responding to global environmental degradation and social problems. Instrumental reasons include regulatory compliance, competitiveness, new revenue streams, cost savings, and talent attraction (Bernal-Torres, et al., 2023; Nidumolu et al., 2009). Despite this, the report published annually by the United Nations Statistics Division (UNSD), in collaboration with over 50 international organizations, shows limited progress toward achieving the 17 sustainable development goals of the 2030 Agenda for Sustainable Development (UNSD, 2023).

The report and progress chart show that progress on nearly half (48%) of the 138 SDG targets that can be assessed is weak and insufficient, and 37% of the measurable SDG targets have either stalled or reversed, including key targets related to poverty, hunger, quality education, clean water and sanitation, decent work and economic growth, industry, innovation and infrastructure, inequalities,

responsible consumption and production, climate action, life under water and on land, peace, justice and strong institutions (Ishida, 2023). These findings suggest that efforts by businesses, nation states, and international organizations, including financial investments, to promote global sustainability are not effective or may even have a negative impact. This suggests that the assumption that improving a company's sustainability will lead to an increase in national and global sustainability is not entirely accurate.

Focusing on environmental issues, such as climate change, energy, water, biodiversity, and air pollution, can be challenging for companies that must also meet economic and social sustainability goals. Investing in a company's environmental sustainability may have a negative effect on its economic sustainability and overall environmental, social, and governance (ESG) score (UNSD, 2023). Increasing a company's sustainability in one sector may have adverse effects on another sector and the country's overall sustainability; the SDG ranking, which is based on an overall score, assesses a

**Figure 1**  
*Visualization of the Research Gap: Linking National Sustainability to Company Sustainability*



country's overall progress toward the achievement of all 17 SDGs, which encompass 169 targets. Similarly, increasing the sustainability of one country may have negative impacts on the sustainability of other countries. For example, developed countries consume more global energy and contribute more to global emissions than do developing countries, resulting in global inequalities in energy consumption. Additionally, climate change disproportionately affects developing countries compared with developed countries (Wijaya, 2014).

National efforts to improve sustainability, as measured by national SDG rankings, may have a positive effect on one sector's sustainability, including economic sustainability, while negatively affecting other sectors or even harming the social, economic, and environmental situation in other countries (Bernal-Torres et al., 2023). It is important to consider the potential unintended consequences of national sustainability efforts. This may partly explain the weak or negative progress toward achieving the global SDGs.

To address sustainability issues at the company, national, and global levels, a holistic approach to sustainable development is necessary. This approach has been utilized to address various aspects of sustainable development, including the assessment of corporate sustainability performance (Pecas et al., 2023); the adoption of sustainable long-term policies (Harik, 2015); the development of holistic sustainability assessment tools for manufacturing small and medium enterprises (SMEs) (Chen et al., 2014); the examination of the impact of corporate social responsibility (CSR) (Nguyen & Ngo, 2022); and the development of initiatives related to competitive advantage, performance, and the sustainability of microenterprises (Mamun et al., 2021). The holistic approach requires a clear understanding of the relationships between different actors at different levels of sustainability, especially between national and corporate sustainability, as shown in Figure 1. The research problem is that there is no clear relationship between national SDGs and corporate sustainability. The complexity of understanding these relationships lies in the interrelationships between the variables. For example, national initiatives aimed at achieving the SDGs may impact company performance, while simultaneously, company performance may also impact the national

SDGs (Billedeau & Wilson, 2023).

The aim of this study is to examine the relationship between national sustainability (SDGs) and corporate sustainability, which is one element of a complex global sustainability system. The research question is as follows: How do national sustainability goals affect corporate sustainability? Of particular interest is the impact of national sustainability goals on the performance of companies in different sectors. This study analyzes the performance of Fortune 500 companies in Europe and their relationships with national SDGs.

The paper is divided into seven sections. The first section aims to define 'balanced sustainability' and uncover a holistic approach from the company to global sustainability. The second section presents empirical evidence by reviewing scientific studies and their insights into the field of the SDGs. The third section covers the methodology, providing graphical and mathematical expressions of the developed model and data analysis. The results and answers to the proposed hypotheses are presented in the fourth section. The last three sections provide the research findings in the discussion and conclusion sections, as well as limitations.

## 2. Theoretical Approach

Over the past two decades, sustainability has become a prominent topic in business, politics, and academia. The global sustainability system is a complex research object and can be analyzed from different perspectives, including microindividual, mesocorporate and macronational, regional and global levels. 'Sustainability science' has emerged as a distinct field (Kajikawa et al., 2014; Kates, 2011; Kates et al., 2001; Komiyama & Takeuchi, 2006; Purvis et al., 2018). However, the concept of sustainability remains unclear in various contexts. The phrase 'sustainable business' is often linked to environmentally friendly or green practices that address current environmental concerns in all processes, products, and manufacturing activities.

### 2.1. Concept of Balanced Sustainability

At the mesocorporate level, the concept of sustainability includes three interrelated dimensions: social, economic, and environmental. These dimensions are represented by three

intersecting circles that center on overall sustainability (Purvis et al., 2018) (see Figure 2). This concept assumes that all three dimensions—economic, social, and environmental—are equally important for sustainability. According to this concept, the elimination of even one of these dimensions undermines sustainability. Therefore, a company that lacks any of these dimensions cannot be considered sustainable.

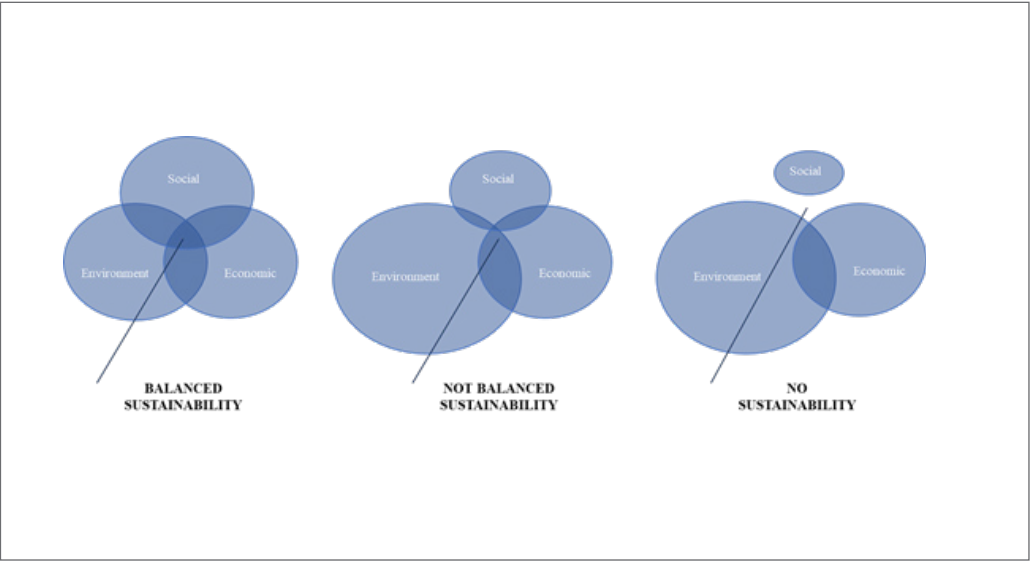
Balanced sustainability is the ideal state when all dimensions are equally developed. This concept suggests that the dominance of one dimension can negatively impact the overall sustainability and long-term performance of a company. Figure 2 illustrates 'balanced sustainability', 'unbalanced sustainability', and 'no sustainability' as the intersection of the three main dimensions. 'Balanced sustainability' occurs when all dimensions (social, environmental and economic) are equally developed in a company; 'unbalanced sustainability' occurs when one or two dimensions are neglected in a company; and 'no sustainability' occurs when the social dimension is completely neglected in a company, and the focus is mainly

on environmental issues. The concept of balanced sustainability is important not only at the company level but also at the national and global levels and is crucial for achieving a better understanding of the holistic approach to sustainability.

2.2. Holistic Approach to Sustainability

Scholars use the term 'holistic sustainability' to define various aspects of sustainability. Holistic sustainability can be understood as a holistic approach to sustainability promotion and marketing that aims to integrate and involve key actors—national and local authorities, organizations and residents—in various sustainability actions (Rakic, & Rakic, 2015; Segarra-Moliner & Bel-Oms, 2023; Tacconi & Tisdell, 1993). The concept of 'holistic sustainability' is also used to emphasize the importance of focusing on all three dimensions of sustainability: social, economic and environmental. The concept could be applied to sustainable products, as demonstrated by Stoffels et al. (2018) and Wang et al. (2021), as well as sustainable business development. Pecas et al. (2023) and Harik et al. (2015) employed a holistic concept to develop

Figure 2  
Concept of Balanced Sustainability



sustainability assessment tools and frameworks for industrial companies. Concurrently, Chen et al. (2014) focused their attention on the realm of sustainability development in manufacturing SMEs. Al Mamun et al. (2021) analyzed the impact of participation in development initiatives on the competitive advantage, performance, and sustainability of microenterprises. Nguyen and Ngo (2022) examined the impact of corporate social responsibility (CSR) along with renewable energy consumption, energy use and imports, and carbon emissions on sustainable economic development in the Association of Southeast Asian Nations (ASEAN). Aluchna and Kuszewski (2021) examined the impact of pyramidal ownership of nonfinancial companies listed on the Warsaw Stock Exchange. A holistic understanding of corporate sustainability is important for our study, as efforts to improve sustainability (SDGs) at the national level can have a negative effect on the economic dimension (one of the three main dimensions) of holistic corporate sustainability.

At the macro and global levels, the term 'holistic sustainability' is used as a comprehensive approach to implementing the 17 UN SDGs. These goals include 169 targets and 231 indicators and aim to bring about transformational change to increase global sustainability (UN General Assembly, 2015).

The SDG framework was developed as a horizontal platform in which 17 global goals define the sustainable development aspirations of UN member states and their key stakeholders (Bierman et al., 2017). One of the key assumptions underlying the strategic engagement of multinational companies (MNCs) in the framework was the belief that they could be strategic actors for global sustainable development. MNCs are expected to integrate SDG missions into their business practices and support global sustainability (Van Tulder, 2021). These expectations have not been met, as the 2023 report shows that little progress has been made toward achieving the 17 sustainable development goals (UN Statistics Division, 2023).

### 2.3. Research Gap and Hypothesis

The above analysis reveals that there is a lack of understanding from a global sustainability development perspective. Efforts to improve

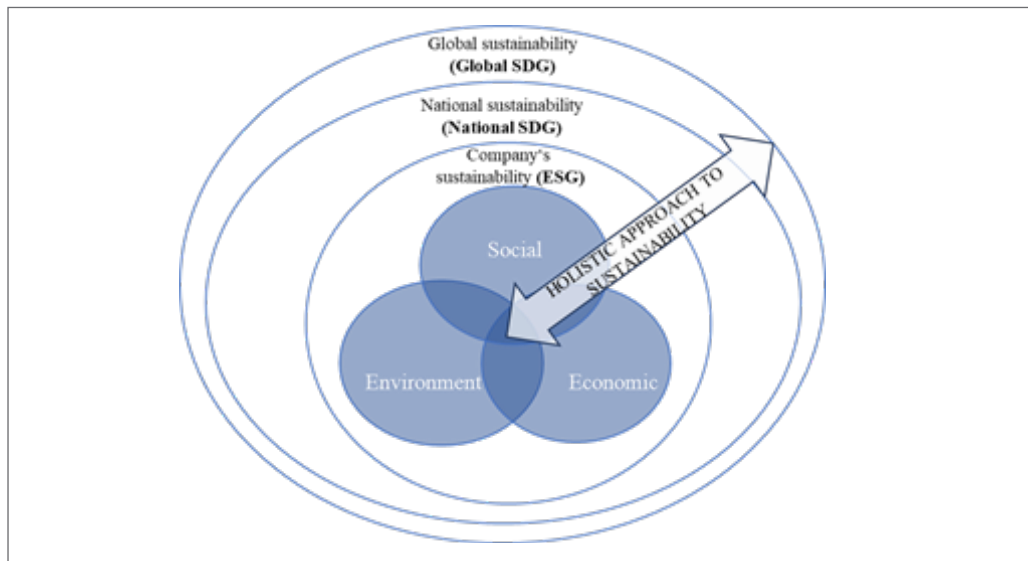
national sustainability (SDG) in one country can have a negative impact on sustainability in another country. Additionally, efforts to improve national sustainability can have a negative effect on corporate sustainability (ESG) in different sectors. The vast majority of existing studies have focused on mesocorporate or macronational sustainability analysis. Studies conducted by Pecas et al. (2023) and Harik et al. (2015) focused on holistic sustainability assessments of industrial companies. Chen et al. (2014) developed a holistic sustainability assessment tool for manufacturing SMEs. Al Mamun et al. (2021) focused their research on the sustainability of microenterprises. Nguyen and Ngo (2022) examined the impact of corporate social responsibility (CSR) along with renewable energy consumption, energy consumption and imports, and carbon emissions on sustainable economic development.

A holistic approach at the macronational level was used to identify the impact of green innovation on economic growth in an innovative environment and under digitalization conditions (Banelienė & Strazdas, 2023). Streimikiene (2022) analyzed the main drivers of greenhouse gas emissions in Visegrad Group (V4) countries and forecasted future greenhouse gas emissions. Bierman et al. (2017) and Van Tulder (2021) provide an analysis and assessment of the evolution, rationale, and future prospects of the SDGs. The concept of holistic mesocorporate or macronational analysis can be characterized as a horizontal approach, indicating that the analysis is conducted within a specific level of sustainability (micro, meso, or macro). There is a clear gap in the understanding of the relationships between the levels of sustainability. This approach could be called the vertical approach in sustainability studies (see Figure 3).

Therefore, our research is focused on filling the gap in better understanding the relationships between the levels of sustainability (national sustainability and corporate sustainability (ESG)) and finding answers to the following hypotheses raised: Does focusing on sustainability at the national level have different impacts (negative/positive) on the profitability of companies within the same country? Could this effect depend on two factors of the production function – labor and capital?

**Figure 3**

*The Vertical Dimension of a Holistic Approach to Sustainability: From Company to Global Sustainability*



### 3. Empirical Background: Fields of Study, Models Used, and Major Findings

The relationships between the SDGs and economic growth as well as environmental protection have been widely analyzed (Akrofi et al., 2022; Fairbrass et al., 2024; Gupta & Vegelin, 2016; Meran, 2023; Santika et al., 2019; Spaiser et al., 2016; Stremikiene, 2024; Tiba & Omri, 2017; Van Vuuren et al., 2015; Von Stechow et al., 2015; Wang et al., 2019; Zhang et al., 2019). However, there is a lack of research on the relationship between the SDGs and company performance. Recent studies have focused mainly on broad SDG analysis. Van Vuuren et al. (2015) conducted a study on the contribution of technological measures and behavioral changes to achieving sustainability goals, considering their linkages. Their study revealed that significant transformations in energy and food systems are necessary to achieve the SDGs. The authors utilized the IMAGE integrated assessment model in conjunction with other models, including the Modular Applied GeNeral Equilibrium Tool (MAGNET). According to one of their modeling results in the area of climate change, the global mean temperature is projected to exceed the 2 °C target well before 2050 and to exceed 4 °C by the end of the 21st century.

Santika et al. (2019) focused on the energy sector, emphasizing its central role in ending poverty and hunger; providing health care, education, and water; sustaining economic growth; and protecting the environment. Twenty-five SDG targets with direct links to energy were identified in this study with the help of the Google Scholar search engine, and a map of the multidimensional interaction between them was presented. Tiba and Omri (2017) investigated the relationships among energy, the environment, and economic growth. Their findings suggest that energy consumption can increase economic growth by increasing productivity, but it can also lead to environmental damage by increasing pollutant emissions. The authors used comparative literature analysis for their findings. Akrofi et al. (2022) conducted an analysis of the energy sector in relation to the SDGs and Paris Agreement goals. They used a systematic review method following the Preferred Report Items for Systematic Reviews and Meta-analysis (PRISMA) procedure to identify emerging trends in energy debates and policy discourses in academic discussions. It was concluded that further research is needed on the progress of implementation, its impacts, and critical lessons from current policy efforts to achieve



these global agendas, and country case studies can facilitate policy learning through cross-country comparisons.

Von Stechow et al. (2015) conducted a comprehensive review and synthesis of literature on mitigation effects to inform climate policy choices at different governance levels. The authors emphasized the importance of reducing energy demand to achieve synergies across multiple sustainability objectives.

The transportation sector has been extensively analyzed in terms of energy consumption and its impact on the environment. Zhang et al. (2019) validated the carbon Kuznets curve (CKC) hypothesis by presenting the changing status of CO<sub>2</sub> emissions in the literature. They used data recording the CO<sub>2</sub> emissions of the transportation sectors of 119 countries from 1995-2014.

Spaiser et al. (2016) investigated the potential incompatibility between the SDGs in the areas of socioeconomic development and environmental sustainability. They used dynamic system models to demonstrate that the inconsistency arises from the emphasis on economic growth and consumption as a means of development (Spaiser et al., 2016).

Gupta and Vegelin (2016) analyzed the SDGs in relation to economic growth, social well-being, and environmental viability. They reported that goals perform well in terms of social inclusiveness but fall short in terms of ecological and relational inclusiveness. This implies that the SDG implementation process may prioritize social inclusiveness over ecological and relational inclusiveness. The authors applied SDG text analysis for priority identification.

Moyer and Bohl (2019) analyzed three policy pathways for achieving the SDGs: technology, lifestyle change, and decentralized governance. The authors used an integrated assessment platform to explore the achievability of nine human development-related SDGs by 2050, scaling alternative pathways in countries that have historically developed rapidly. Their study revealed that the global technology pathway is the most effective in improving human development, whereas the reduced consumption pathway is the least effective. Additionally, the authors provided evidence that the

geographic level of analysis is crucial in assessing the achievability of the SDGs. While many SDGs seem achievable when assessed at the global population level, several small poor countries fail to meet the targets when assessed at the country level. Researchers have utilized the International Futures (IFs) model to analyze SDG human development targets on the basis of current trends and multiple policy scenarios (Moyer & Bohl, 2019).

Scharlemann et al. (2020) reviewed previous assessments of interactions between SDGs. They applied an influence matrix to assess pairwise interactions between all the SDGs and reported that the environment and environment-human linkages have the greatest influence on interactions among the SDGs.

Pradhan et al. (2017), analyzing SDG data from 227 countries, reported that no poverty indicator has a significant positive correlation with most of the other SDGs, whereas responsible consumption and production are most commonly associated with a significant negative correlation. The authors used nonparametric Spearman's rank correlation analysis to assess monotonic relationships between all possible combinations of unique indicator data pairs for each country.

Thammaraksa et al. (2024) analyzed data from more than 8,500 enterprises from the London Stock Exchange Group (LSEG) and Analytics from 2019-2021. The authors used a three-step method: 1) descriptive and regression analysis for trends identification in the field of the SDGs reported by enterprises, 2) co-occurrence analysis for identifying the relationships among companies' performance and SDGs, and 3) inferential statistics for identifying the relationships between ESGs and SDGs. This research identified the top 5 of the 17 SDGs most frequently reported by companies: decent work and economic growth; climate action; responsible consumption and production; good health and well-being; and gender equality, which are strongly interlinked with other SDG indicators, although other SDGs lack strong interrelations. There was no significant correlation between specific ESGs reported by enterprises and SDGs in 70% of the relationships.

Fairbrass et al. (2024) used the UN's SDG Indi-



cators Database and the generalized linear regression model (GLRM) to evaluate environmental and social impacts in relation to environmental factors such as environmental pressure, policy and state, the population and GDP. The authors found no evidence that environmental policies lead to wider social benefits.

Schmidt-Traub et al. (2017) demonstrated the analytical usefulness of the SDG index by analyzing its correlation with other commonly used development indices and demonstrating how it explains cross-national variations in subjective well-being. The authors used correlation analysis for their findings.

Sušnik and van der Zaag (2017) examined the relationship between the SDGs and the UN human development index (HDI). This research was based on comparative data from 193 countries and correlation analysis. They reported that the overall HDI is not correlated with national wealth or resource use totals but is strongly correlated with personal wealth and resource access.

Meran (2023) emphasized that perpetual growth can be ensured by increasing resource efficiency and focusing on value creation. The results were derived from models using production functions that allow asymptotically complete decoupling of the economy from its resource base by substituting physical and knowledge capital for natural resources. The article presents a semiendogenous growth model utilizing a linear-exponential production function (Meran, 2023).

Studies on the SDGs have also focused on individual countries, regions, or cities. Ross et al. (2022) analyzed the progress of individual countries toward environmental sustainability in relation to the SDGs, identifying the best and worst performers. Allen et al. (2024) proposed six transformation pathways for Australia to improve performance on the SDGs by 2030. The authors suggested maximizing transformation synergies through investments in energy decarbonization, resilience, social protection, and sustainable food systems. They also recommended managing trade-offs for income and employment, with the support of technological, social, and political enabling conditions. Regression analysis was applied

for modeling scenarios (Allen et al., 2024). Wang et al. (2019) investigated the causal relationship between carbon dioxide (CO<sub>2</sub>) emissions and economic factors in Chinese provinces and reported unidirectional causality between the variables. Researchers concluded that to reduce CO<sub>2</sub> emissions, China should implement strict laws and regulations and advocate for green investment, technological innovation, circular economy development, and sustainable development. This study is based on a comparative analysis of the eastern, central, and western provinces via a vector autoregressive model and panel data for 1997–2015 (Wang et al., 2019). Hossain et al. (2023) evaluated the impact of regulatory and reputational pressures on corporate environmental performance in China, where financial penalties for environmental violations are low. Their study revealed a significant negative stock price reaction to news about corporate environmental violations. Additionally, it was concluded that the negative stock market reaction is lessened for companies with strong voluntary environmental commitments. A multivariate regression model was used for these findings (Hossain et al., 2023). Bo et al. (2024) investigated the nonlinear relationship between environmental technology and green entrepreneurship in China from 1995 to 2021. Their study revealed that environmental technology promotes both short- and long-term green entrepreneurship. The authors applied an autoregressive distributed lag stationarity (ARDL) model and nonlinear autoregressive distributed lag (NARDL) estimation to capture the nonlinear dynamics between variables (Bo et al., 2024). Cheng et al. (2023) researched the relationships among the government subsidies, green innovation, and sustainable development performance of 142 listed companies in China's highly polluting industry. The results revealed a significant correlation between subsidies and the improved financial, environmental, and social performance of these companies. The authors applied ordinary least squares (OLS) regression as a modeling method (Cheng et al., 2023). Neier (2023) conducted a spatial analysis of segregation-based environmental inequality in Vienna. The research applied two innovative segregation-based inequality indices to measure

environmental inequalities within urban areas. The study revealed that ethnic minorities consistently experience higher levels of segregation from urban vegetation than nonminorities do, even when accounting for interactions with wider neighborhoods (Neier, 2023).

De Souza Barbosa et al. (2023) conducted a literature review on the impact of ESG integration on corporate sustainability performance from various perspectives. Their study followed PRISMA guidelines and included a critical analysis. According to the authors, the integration of ESG criteria from various perspectives enhances companies' sustainability performance and provides several benefits (de Souza Barbosa et al., 2023).

Ferro-Soto et al. (2018) examined stakeholder-oriented behavior in relation to organizational culture and behavior and its impact on the performance of sustainable organizations managed according to corporate social responsibility (CSR) criteria. Their study utilized structural equation modeling and primary data collected from large and medium-sized multisector Colombian companies engaged in corporate sustainability practices. Their findings indicate that norms and artifacts have direct effects on stakeholder-oriented organizational behavior and that stakeholder-oriented organizational behaviors predict market performance and commitment. The authors' research was based on a survey questionnaire (Ferro-Soto et al., 2018).

Peretz and Strønen (2024) conducted research with a narrow focus on CSR by examining grocery retail chains that are answering calls for increased responsibility and sustainability by developing profitable food waste reduction programs. Their case study was conducted in 2021 on three retail chains in Norway: Coop, Meny, and Kiwi, which represent approximately 70% of the revenue in the Norwegian retail industry. This study used primary data from interviews and observations and secondary sources such as documents and available digital sources. However, this survey revealed no specific evidence that CSR or waste management form the basis for competitive advantages.

Billedeau and Wilson (2023) analyzed the effect of the SDGs on community investment (CI), also known as corporate philanthropic expenditures,

among Canada's top private sector corporations. Their study utilized descriptive statistics to compare the mean and standard deviation of CI as a percentage of net profit after tax (NPAT) across 58 companies. Their data indicate a small reduction in CI as a percentage of NPAT after the implementation of the SDGs in 2015. Additionally, companies that have committed to the SDGs have lower average CI amounts (Billedeau & Wilson, 2023).

Scheyvens et al. (2016) argued that businesses should not be expected to act as superheroes for development while simultaneously maximizing profits and also developing policies to regulate potentially harmful activities and implementing programs to ensure equitable and sustainable development. The majority of companies do not respond to the vague language of corporate responsibility and intend to make substantial changes only when required by regulations (Scheyvens et al., 2016).

Wiessner et al. (2023) examined the relationship between pressure on multinational enterprises (MNEs) to engage more extensively with societal and environmental impacts and foreign direct investment (FDI). They noted the lack of research in this area and suggested that further studies should focus on 'win-win' assumptions about the complementarity of corporate societal and financial performance. Additionally, they recommended examining the societal impacts of FDI over longer time horizons, using innovative approaches from allied sciences, and considering interactions between different types of societal impacts. The authors used literature analysis for their study (Wiessner et al., 2023).

On the basis of empirical studies, it can be concluded that many researchers have focused on macrolevel analyses of the SDGs in relation to economic growth and environmental impact, with a particular emphasis on the energy, food, and transportation sectors. Additionally, researchers have analyzed the compatibility of SDG targets and their relationships with other global indices, such as the HDI. Furthermore, numerous studies have been conducted on the SDGs for specific countries, geographical areas, or cities. At the company level, many studies have focused on literature reviews, stakeholder attitudes, companies' philanthropic expenditures, and FDI behavior. However, analy-

ses of companies' profit maximization in relation to the implementation of the SDGs are lacking. Therefore, our research helps to fill this gap in understanding the impact of the SDGs on companies' performance.

4. Methodology: Model and Data

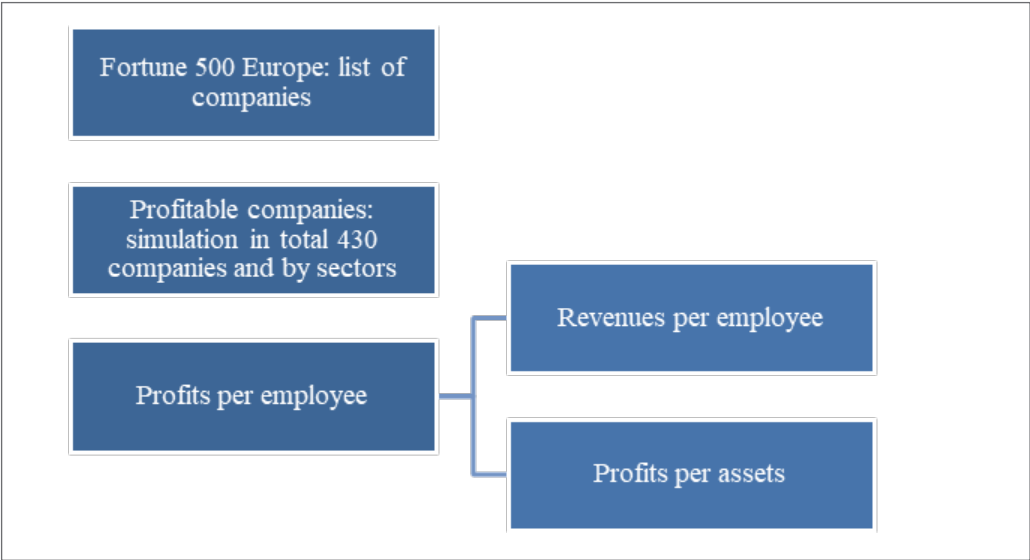
A review of the research methods employed in the field of interest reveals the frequent use of regression analysis, correlation analysis, comparative data, and literature analysis. These methods are applied in the context of structural equation modeling, multivariate regression models, and dynamic system models. These models include a semiendogenous growth model utilizing a linear–exponential production function, the carbon Kuznets curve (CKC), the generalized linear regression model (GLRM), ordinary least squares (OLS) regression, a vector autoregressive (VAR) model, an autoregressive distributed lag stationarity (ARDL) model, and a nonlinear autoregressive distributed lag (NARDL) model. Additionally, correlation analysis, compara-

tive data, and literature analysis are frequently employed through the use of various analytical tools, including nonparametric Spearman's rank correlation analysis, an influence matrix, the international futures (IFs) model, the Preferred Report Items for Systematic Reviews and Meta-analysis (PRISMA), the IMAGE integrated assessment model, and the Modular Applied GeNeral Equilibrium Tool (MAGNET).

Consequently, given our comprehensive methodology and the intention to utilize secondary data for modeling purposes, regression analysis was selected as the optimal methodology for this research, given its suitability for analyzing complex relationships between variables.

The methodology chosen aims to establish a relationship between successful businesses and sustainable growth. To reflect business success, Fortune 500 Europe companies were selected, while the sustainable development goal indicators of the countries where the companies are established serve as a factor of sustainability in our model.

Figure 4  
Model Structure: First Step



**Table 1***Initial Simulation on the Impact of Labor and Capital Factors Identification and Data Normality*

Sector	Number of obser- vations	Coefficient			R-squared	Adjusted R-squared	Durbin-Watson stat	Normal data distribution
		C	log (R/ EMPL)	log (P/A)				
Aerospace & Defence	7	-5.0581	1.4044		0.9001	0.8801	2.6166	
Apparel	9		1.0164	0.9277	0.9108	0.8980	3.1626	
Business Services	18		0.8850	0.7564	0.7832	0.7696	1.6086	
Chemicals	21	2.6043*	0.6200	0.9916	0.8577	0.8419	2.1458	
Energy	63	1.6229	0.7825	0.9440	0.8504	0.8455	2.1687	No
Engineering & Con- struction	14		0.8892	0.7806	0.8709	0.8601	2.5542	
Financials	79		0.8960	0.3321	0.4961	0.4896	1.9491	
Food & Drug Stores	17	-2.8990*	1.3351	0.8221	0.8891	0.8732	1.9357	No
Food, Beverages & Tobacco	26		1.0359	1.0197	0.6496	0.6350	1.8137	
Health Care	21		1.0414	0.8923	0.8856	0.8796	2.3503	No
Hotels, Restaurants & Leisure	8		1.0870	1.1788	0.9236	0.9109	1.2788	
Household Products	7		0.9959	0.8244*	0.7889	0.7467	3.1906	
Industrials	21	-3.6505*	1.5683	0.7367	0.7419	0.7132	1.6105	
Materials	27	3.5766	0.4605	1.0937	0.8364	0.8228	2.2923	
Media	3			Too low number of observations for modeling				
Motor Vehicles & Parts	19		1.0399	1.0232	0.9587	0.9563	1.2433	
Retailing	17	4.7278		0.7822	0.9068	0.9006	1.7812	
Technology	14		0.9308	0.7959*	0.5912	0.5571	2.1506	
Telecommunications	13		1.1177	0.9344	0.9484	0.9437	2.3638	
Transportation	16	-3.6888*	1.3639	0.4002	0.9135	0.9002	1.9885	
Wholesalers	10		1.0321	1.2726	0.9349	0.9267	0.8791	
Total observations	430							
Profitable as total	430	-0.8503	0.9481	0.4839	0.5837	0.5818	1.0648	No
Profitable without energy companies	367	-2.7397	1.1986	0.3648	0.5539	0.5514	1.0810	No
Profitable manufac- turing and materi- als companies	159		0.9708	0.8860	0.8249	0.8238	1.7628	

Note: \*  $p < 0.05$ ; for other coefficients (without \*)  $p < 0.01$ .

The initial step involved selecting 430 profitable companies from the Fortune 500 Europe list. Simulations were conducted for all companies and by sector to gain a better understanding of the impact of labor and capital factors on company success and data normality (see Figure 4). The mathematical ex-

pression for the model in the first step is as follows:

$$\log(P/EMP) = c + \log(R/EMP) + \log(P/A) + \varepsilon \quad (1)$$

The simulation output provided by Formula 1 is shown in Table 1, where  $P$  represents profits in

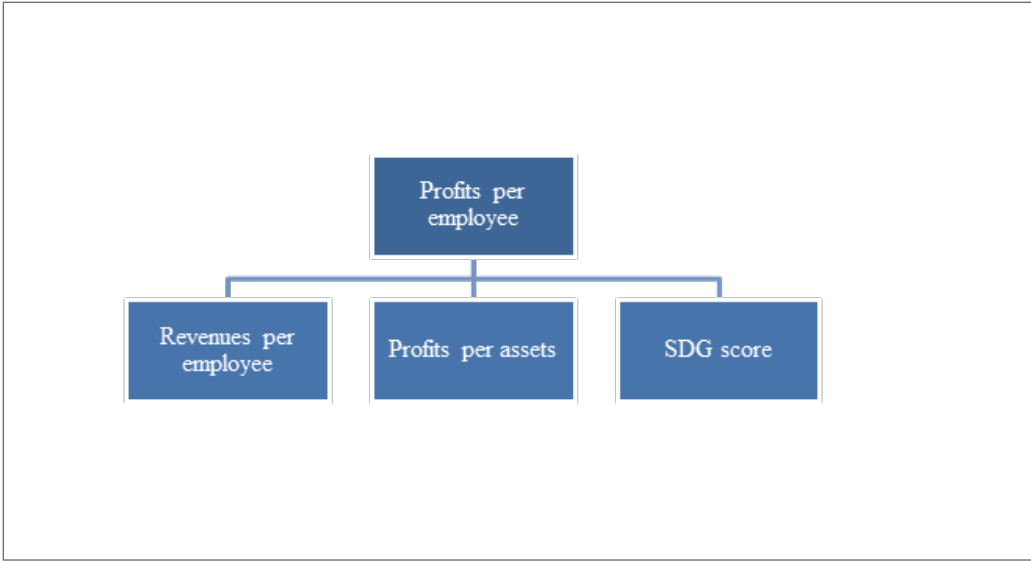
millions of U.S. dollars, *EMP* represents employees in thousands, *A* represents assets in millions of dollars, and  $\varepsilon$  is an error term. The simulation employed data pertaining to the annual profit (in \$M), revenue (in \$M), assets (in \$M), and employees (in thousands) of 430 profitable Fortune 500 Europe companies. The preparation and publication of these data were performed by Fortune magazine at the end of 2023 (Fortune 500 Europe, 2023, December 18).

Twenty-four simulations were conducted in the first step: 3 at a broad data accumulation level and 21 at a sector level. The revenue per employee metric indicates a greater than average impact of the labor factor in 10 sectors. The top 5 sectors with the highest coefficients are Industrials (1.57), Aerospace & Defense (1.40), Transportation (1.36), Food & Drug Stores (1.34), and Telecommunications (1.12). These findings suggest that these sectors are highly dependent on skilled employees. On the other hand, the top five industries whose profits are highly dependent on assets are Wholesalers with a coefficient of 1.27; Hotels, Restaurants & Leisure (1.18); Materials (1.09); Motor Vehicles & Parts (1.02); and Food, Beverages & Tobacco

(1.02). Upon analyzing the normality of the data by sector, three sectors, namely, Energy (with 63 companies on the Fortune 500 Europe list), Food & Drug Stores (17 companies), and Health Care (21 companies), lacked normality. This is the primary reason why the simulation of the total pull of profitable companies (430) and simulation without the Energy sector (367 companies) also lack a normal data distribution. Cleaning data and selecting profitable manufacturing and materials companies (159) demonstrated the ability to use such data for further simulation.

In the second step, two sectors were selected for further analysis. These sectors had a similar number of companies on the list of profitable companies in Fortune 500 Europe. The first sector was Industrials, which had 21 companies and relied heavily on highly skilled employees. The second sector was Motor Vehicles & Parts, which had 19 companies and was highly dependent on its assets. The selected companies included data on their country of origin and countries' progress toward achieving the SDGs (see Figure 5). However, one company from the Industrials sector, Ingersoll-Rand Company, had to be eliminated due to unclear information about its

**Figure 5**  
*Model Structure for Industrials and Motor Vehicles & Parts Sectors*



European country of origin (see Appendix A).

The model (see Figure 5) formula is expressed mathematically as follows:

$$\log (P/EMP) = c + \log (R/EMP) + \log (P/A) + SDG + \varepsilon \quad (2)$$

where SDG is the score for sustainable development goals calculated by the United Nations (UN) for its member states.

At this stage of the modeling process, the focus has shifted to the exploration of more precise hypotheses concerning national sustainability and corporate profitability. These hypotheses are contingent on two primary factors—labor and capital:

H1. Focusing on sustainability at the national level can have a negative effect on the profitability of companies in sectors that rely heavily on employee skills.

H2. Focusing on sustainability at the national level can have a positive effect on the profitability of companies operating in asset-dependent sectors.

The modeling for Industrials companies and Motor Vehicles & Parts companies from the Fortune 500 Europe list was conducted via the least squares method. The dataset consisted of 20 observations

for Industrials companies and 19 observations for Motor Vehicles & Parts companies (see Appendix A). The estimation was conducted via EViews econometric software (EViews®, 2024) by applying regression analysis and the ordinary least squares (OLS) method for simulation.

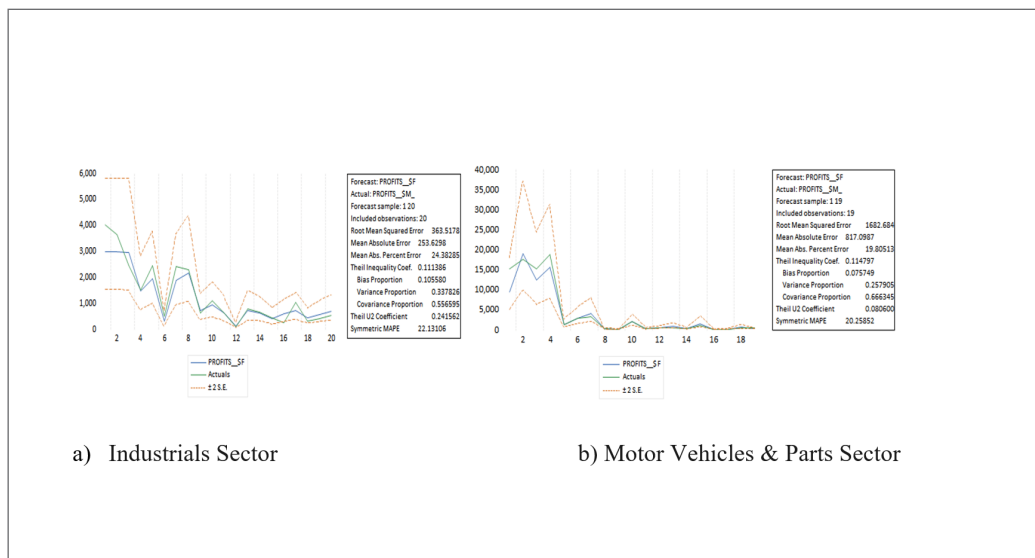
## 5. Results

The modeling results are based on two simulations for selected industries: Industrials and Motor Vehicles & Parts. Regression analysis and OLS were used for simulation. The estimation results clearly demonstrate the right direction for unclosing the problem of the relationship between national sustainability (SDGs) and corporate sustainability and answering the research question of how national sustainability goals affect corporate sustainability in different sectors.

The estimation output for the Industrials sector, which is highly dependent on employees' skills, indicates a negative impact of sustainability factors on companies' profits (refer to Equation (3), Table 2).

$$\log (P/EMP) = 1.81 * \log (R/EMP) + 0.84 * \log (P/A) - 0.06 * SDG + \varepsilon \quad (3)$$

**Figure 6**  
*Estimation Output: Forecast.*



**Table 2**  
*Estimation Output: Industrials Sector*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
log (R/EMP)	1.814312	0.306992	5.909965	0.0000
log (P/A)	0.840773	0.111844	7.517340	0.0000
SDG	-0.056649	0.018015	-3.144509	0.0059
R-squared	0.767136	Mean dependent var		2.754629
Adjusted R-squared	0.739741	S.D. dependent var		0.622298
S.E. of regression	0.317469	Akaike info criterion		0.680609
Sum squared resid	1.713373	Schwarz criterion		0.829969
Log likelihood	-3.806089	Hannan-Quinn criter.		0.709765
Durbin-Watson stat	1.963632			

**Table 3**  
*Estimation Output: Motor Vehicles & Parts Sector*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.102688	2.012611	-2.535357	0.0229
log (R/EMP)	1.048119	0.144995	7.228647	0.0000
log (P/A)	1.085384	0.079942	13.57716	0.0000
SDG	0.064484	0.026070	2.473475	0.0258
R-squared	0.971455	Mean dependent var		2.270076
Adjusted R-squared	0.965746	S.D. dependent var		1.654567
S.E. of regression	0.306223	Akaike info criterion		0.655657
Sum squared resid	1.406587	Schwarz criterion		0.854486
Log likelihood	-2.228742	Hannan-Quinn criter.		0.689307
F-statistic	170.1638	Durbin-Watson stat		1.364738
Prob(F-statistic)	0.000000			

Therefore, our simulation confirmed both Hypotheses H1 and H2. Focusing on sustainability at the national level can negatively impact the profitability of companies in sectors that rely heavily on employee skills while positively impacting the profitability of companies operating in asset-dependent sectors. Normality tests for both estimations support the validity of the modeling results, indicating that the hypothesis of a normal data distribution is not rejected (refer to Appendix C).

Notably, profitable Industrials companies on the list of Fortune 500, which rely heavily on highly skilled employees with an average 1324 \$M profit, are 3.2 times less profitable than the Motor Vehicles & Parts industry, with an average profit of 4251 \$M, which

is highly dependent on its assets despite all of them being on the list of Fortune 500 Europe (see Figure 6). Moreover, national SDG progress has a positive impact on more profitable companies but a negative impact on less profitable companies despite the nature of their multinational corporations.

Therefore, the initial idea of this research, which explores the potential disparate effects of national sustainability goals (SDGs) on corporate sustainability across diverse economic sectors, has been validated by the findings. Furthermore, initiatives aimed at enhancing national sustainability may inadvertently have a detrimental effect on corporate sustainability (ESG) across a range of industries, particularly those that rely heavily on highly skilled personnel, as evi-



denced by this research. In light of these findings, it can be concluded that a vertical approach, encompassing both meso- and macrolevels, is a crucial element in the field of sustainability studies and policy implementation. Moreover, the need for a comprehensive, holistic perspective on global sustainable development is substantiated.

## 6. Discussion

Empirical studies suggest that many researchers have focused primarily on macrolevel analyses of the SDGs in relation to economic growth and environmental impact, with a particular emphasis on the energy, food, and transportation sectors (Akrofi et al., 2022; Santika et al., 2019; Tiba & Omri, 2017; Von Stechow et al., 2015; Zhang et al., 2019). Researchers have analyzed the compatibility of SDGs and their relationships with other global indices, such as the HDI (Sušnik & van der Zaag, 2017). Furthermore, numerous studies have been conducted on SDGs for specific countries, geographical areas, or cities (Ross et al., 2022; Allen et al., 2024; Wang et al., 2019; Cheng et al.; Neier, 2023). At the company level, several studies have focused on literature reviews, stakeholder attitudes, and companies' philanthropic expenditures, as well as their behavior with respect to foreign direct investment (De Souza Barbosa et al., 2023; Ferro-Soto et al., 2018; Billedeau & Wilson, 2023; Wiessner et al., 2023).

However, our research revealed a lack of analysis of corporate profit maximization in the context of SDG implementation. Therefore, our research helps fill this gap in understanding the impact of the SDGs on corporate performance.

Our study proves that national efforts to improve sustainability, as measured by national SDG rankings, may have a positive impact on the sustainability of one industry, including economic sustainability, while negatively affecting other industries—the same was found in other studies, such as Billedeau, & Wilson (2023) and Biermann et al. (2017). Our study also supports the statement that a holistic approach to sustainable development is needed to address sustainability issues at the corporate, national, and global levels, as shown by Thammaraksa et al. (2024) and Allen et al. (2024). This approach requires a clear understanding of the relationships between different actors at different levels of sustainability. Therefore, it is important to focus on

the vertical dimensions, from the company to global sustainability levels.

## 7. Conclusion

This research fills a gap in the research on the interconnection between a company's sustainability and its SDG scores at the national level. This study applies a novel vertical approach (from the meso- to the macrolevel) to holistic sustainability research focused on Fortune 500 European companies.

### 7.1. Implications

The modeling results are based on two simulations for selected industries: Industrials and Motor Vehicles & Parts. The estimation results show the relationship between national sustainability (SDGs) and corporate sustainability and answer the research question of how national sustainability goals affect corporate sustainability in different industries. The estimation results for the Industrial sector, which is highly dependent on employee skills, indicate the negative impact of sustainability factors on company profits, whereas the estimation results for the Motor Vehicles & Parts sector, which is highly dependent on assets, indicate the positive impact of sustainability factors on company profits. The results of our study confirm both hypotheses that focusing on sustainability at the national level can negatively affect the profitability of companies in industries that rely heavily on labor factors while positively affecting the profitability of companies operating in capital-dependent industries.

Additionally, this research revealed that national SDG progress has a positive effect on more profitable companies but a negative effect on less profitable companies despite the nature of successful multinational corporations.

### 7.2. Theoretical and Practical Contributions

The findings improve the understanding of the impact of national sustainability (SDG) on corporate sustainability (ESG) and demonstrate the importance of a holistic approach to global sustainability development. Moreover, more attention needs to be given to the vertical dimension of a holistic approach to sustainability by policy-makers, academics and experts.

Further research is necessary to explain these outcomes. However, the findings emphasize that efforts

to increase national sustainability could have negative impacts on certain companies. This underscores the importance of considering the vertical dimension of a holistic approach to sustainability. It is crucial to ensure that SDG implementation programs and measures are well-coordinated with each other. Additionally, it is important to analyze the sustainability impacts vertically. The national sustainability development programs and measures should be analyzed at three levels: impact on other national sectors, impact on the region (e.g., the European Union), and global impact (e.g., impact on developing countries). The incorporation of vertical impact coordination and impact assessment of sustainable development into SDG monitoring systems can help conserve resources to achieve global sustainability.

## 8. Limitations

The present study is subject to certain limitations. It examines only the impact of European countries' national sustainability goals on the profitability of Fortune 500 Europe companies. The objective of this examination is to underscore the importance of vertical sustainability impact assessment and coordination. However, further detailed sectoral and intersectoral sustainability analyses are needed to comprehensively understand vertical sustainability relationships. The SDG annual report (UNSD, 2023) corroborates the lack of comprehension regarding vertical sustainability linkages, as evidenced by the report's demonstration of inadequate progress in achieving the SDGs.

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Appendix A

Table A.1  
Data Used for Modeling: Fortune 500 Europe Profitable Companies in Industrials Sector

Fortune 500 Europe rank	Company	Country of origin	Profits (\$M)	Revenues (\$M)	Assets (\$M)	Employees (in thousands)	SDG score
35	Siemens	Germany	4027	77860	148184	311.0	83.36
98	Schneider Electric	France	3657	35945	62279	135.0	82.05
128	ABB	Switzerland	2475	29446	39148	105.1	80.54
150	Johnson Controls International	Ireland	1532	25299	42158	102.0	80.15
187	Eaton Corporation	Ireland	2462	20752	35014	91.9	80.15
223	Prysmian	Italy	530	16941	136107	30.0	78.79
234	TE Connectivity	Switzerland	2428	16281	20782	92.0	80.54
260	Atlas Copco	Sweden	2322	13977	16535	45.8	85.98
283	Freudenberg Group	Germany	659	12361	14032	51.5	83.36
288	Sandvik	Sweden	1109	12210	16955	42.3	85.98
296	Schindler Holding	Switzerland	639	11888	12768	70.0	80.54
301	KION Group	Germany	103	11712	17636	41.1	83.36
308	Kone	Finland	815	11471	9700	63.3	86.76
330	Danfoss	Denmark	665	10787	12514	41.9	85.68
350	SKF	Sweden	442	9587	10645	42.1	85.98
378	Nexans	France	258	8802	6831	26.9	82.05
380	Legrand	France	1051	8771	15381	37.5	82.05
393	Groupe SEB	France	333	8372	9739	31.6	82.05
400	Andritz	Austria	431	8085	9061	29.1	82.28
405	Signify	Netherlands	550	7903	8841	35.3	79.42

Source: Fortune 500 Europe (2023, December 18), Sustainable Development Report 2023, (n.d.).

Table A.2  
Data Used for Modeling: Fortune 500 Europe Profitable Companies in Motor Vehicles & Parts Sector

Fortune 500 Europe rank	Company	Country of origin	Profits (\$M)	Revenues (\$M)	Assets (\$M)	Employees (in thousands)	SDG score
2	Volkswagen	Germany	15223	293685	602612	675.8	83.36
7	Stellantis	Netherlands	17669	188888	198629	272.4	79.42
9	Mercedes-Benz Group	Germany	15252	157782	277436	168.8	83.36
12	BMW Group	Germany	18870	149991	263470	149.5	83.36
23	Bosch Group	Germany	1367	92766	106964	421.3	83.36
56	Daimler Truck Holding	Germany	2803	53582	68255	102.9	83.36
67	Volvo	Sweden	3236	46828	60369	94.9	85.98
70	ZF Friedrichshafen	Germany	239	46068	41553	161.9	83.36
87	Continental	Germany	70	41449	40468	199.0	83.36
123	Michelin	France	2105	30070	37714	124.9	82.05
184	Valeo	France	242	21074	23505	104.0	82.05
214	Aptiv	Ireland	594	17489	21884	181.0	80.15
229	Schaeffler	Germany	586	16627	15241	82.8	83.36
313	Gestamp Automocion	Spain	273	11282	10714	42.7	80.43
338	Ford Otosan	Turkey	1124	10376	5133	20.9	70.78
353	Vitesco Technologies Group	Germany	25	9540	8113	38.0	83.36
373	Burelle	France	133	8991	8290	30.2	82.05
412	Knorr-Bremse	Germany	513	7662	8549	31.6	83.36
426	Pirelli	Italy	439	7306	14829	31.2	78.79

Source: Fortune 500 Europe (2023, December 18), Sustainable Development Report 2023, (n.d.).



Appendix B

Figure B.1

Actual, Fitted and Residuals: Industrials Sector

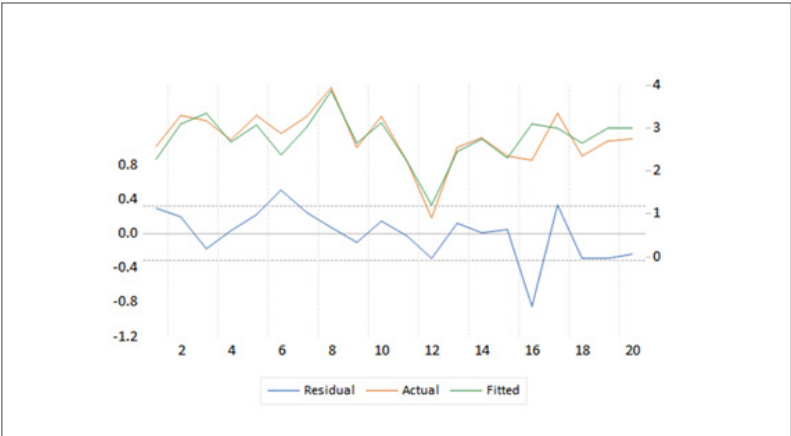
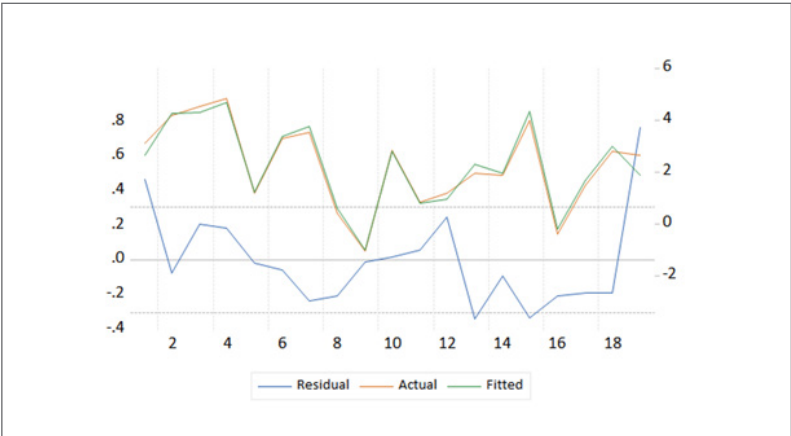


Figure B.2

Actual, Fitted and Residuals: Motor Vehicles & Parts Sector





Appendix C

Figure C.1  
Normality Test: Industrials Sector

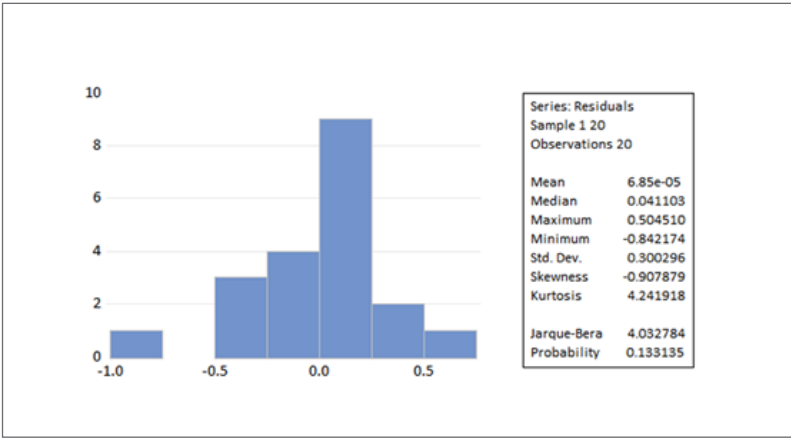


Figure C.2  
Normality Test: Motor Vehicles & Parts Sector

