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ul. Powstańców Wielkopolskich 16, 61-895 Poznań, Poland
phone +48 61 854 31 54, +48 61 854 31 55
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Relationship between corporate sustainability performance and corporate financial performance: The case of companies from the WIG-ESG Index

Agnieszka Matuszewska-Pierzynka[1]

Abstract

The aim of this paper is to identify the effect of corporate sustainability performance (CSP) on corporate financial performance (CFP) among Polish companies in all dimensions of sustainability. The main research hypothesis states that the relationship between CSP and corporate sales performance is positive. The empirical verification of this hypothesis was conducted among 21 companies from the WIG-ESG Index in two periods: 2012–2021 and 2016–2021. The main finding is that sales revenues are positively affected by environmental sustainability performance (years 2012–2021), while governance sustainability performance has a positive impact on the return on sales (years 2016–2021).

Keywords

- sustainable development
- corporate sustainability
- ESG scores
- productivity effect

JEL codes: D24, F23, M14

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[1] Department of International Business and Trade, University of Lodz, Narutowicza St. 68, 90-136 Lodz, Poland, agnieszka.matuszewska@uni.lodz.pl, https://orcid.org/0000-0003-1119-6347.

Introduction

Corporate sustainability (CS), understood as meeting the needs of all of a firm's current stakeholders without compromising the needs of its future stakeholders (Dyllick & Hockerts, 2002), requires the inclusion of global sustainable development goals (SDGs) (SDSN, 2013) into the business strategy of a company (Giovannoni & Fabietti, 2013). To achieve these SDGs, which express the global concept of balance between economic growth, environmental integrity, and social welfare recognising established institutional framework (Mensah, 2019; UN, 2012; WCED, 1987), the company should consider the environmental and social costs of its business activity and do so in the decision-making process at the strategic level (Aluchna, 2015; Gray, 2010; Knežević & Škrobot, 2021). This implies that the company should build financial, natural, and human capital in compliance with the rules of law (Burchard-Dziubińska, 2014; Gond et al., 2012) to mitigate the negative effects of its business activity and to create long-term value for all stakeholders (Oželienė, 2017; Witkowska, 2016).

In terms of these issues, CS is a trend aimed at the business success in terms of economic, environmental, social, and governance performance of a company (Sanders & Wood, 2015). However, previous empirical studies on the relationship between corporate sustainability performance (CSP) and corporate financial performance (CFP) tended to focus on sustainability in environmental, social, and governance dimensions, overlooking the economic dimension. Additionally, these studies did not typically consider sales performance as CFP. The purpose of this paper is to identify the effect of CSP on CFP as represented by sales performance among Polish companies, including all dimensions of sustainability. The general research hypothesis states that the relationship between CSP and corporate sales performance is positive. Empirical verification of this hypothesis was conducted among 21 Polish companies from the WIG-ESG Index in the periods 2012–2021 and 2016–2021. The main research method was panel regression estimation. The empirical data was retrieved from the Refinitiv (Thomson Reuters) Eikon database and the Emerging Market Information Service (EMIS). The estimation results indicate that sales revenues (SR) are positively affected by environmental sustainability performance in the long run, while in the short run, governance sustainability performance has a positive impact on the return on sales (ROS).

The paper is structured as follows: Section 1 provides a literature review; Section 2 describes the research hypotheses, data and methodology; Section 3 reveals the estimation results and discusses the research findings. The final Section presents the conclusions.

1. Literature review

According to the Triple Bottom Line (TBL) Approach (Elkington, 1997, pp. 70–92), CS encompasses three main dimensions: economic, environmental, and social, which should be fully and authentically integrated, as they are interdependent. This interdependence cannot be ignored because companies can address issues arising in "shear zones" only when sustainability dimensions are not treated in isolation from one another. Therefore, companies must revise their growth strategies to incorporate all sustainability dimensions and find a balance between them. Such changes in corporate strategies seem crucial to meet the expectations of various stakeholder groups simultaneously.

The TBL Approach is a fundamental concept of CS, which has been modified by other authors (Oželienė, 2017), who have added new dimensions of sustainable development, creating various multiple bottom-line models (Brockett & Rezaee, 2012). However, the most commonly used approach today is the Quadruple Bottom Line (QBL) model (Budsaratragoon & Jitmaneeroj, 2019), which includes governance as a fourth sustainability dimension alongside the economic, environmental, and social ones. This model aligns with the sustainable development policy of the United Nations (Mensah, 2019), where the implementation of good governance practices is a prerequisite for sustainability in the other dimensions (SDSN, 2013).

The research that focuses on explaining the relationship between corporate sustainability performance (CSP) and corporate financial performance (CFP) is interdisciplinary and multidirectional. Theoretical studies aim to create the integrated business model describing the mechanisms by which CS efforts in particular dimensions can enhance stakeholder satisfaction and improve a company's profitability and market value (Kantabutra & Ketprapakorn, 2020; Perrini et al., 2011). At the same time, as shown in detail in Table 1, empirical studies apply quantitative research methods:

- to verify the CSP-CFP relationship in non-financial corporations and financial institutions;
- to test the bidirectional and non-linear relationship between CSP and CFP;
- to determine how the sustainability of a country or an industry affects the CSP-CFP relationship;
- to compare the effect of CSP on CFP across different countries and industries.

The empirical studies on the relationship between CSP and CFP are very extensive (Li et al., 2024), but they do not provide clear conclusions. Lu and Taylor (2016), who analysed 198 previous studies on the CSP-CFP relationship, claim that the main reason for this is variation in the adopted research methodology. The CSP-CFP link is found to be positive, especially when re-

Table 1. The main empirical findings on the CSP-CFP link

Authors	Sample/Period/Data/Empirical model	Main results
Wagner (2010)	The U.S. companies listed on the S&P 500 Index/ 1992–2003/ KLD database/ Panel regression model	The effect of joint sustainability performance on Tobin's *Q* is positive and moderated by the intensity of advertising. The impact of environmental performance on Tobin's *Q* is positive and direct. The impact of social performance on Tobin's *Q* is positive and indirect.
Nollet et al. (2016)	Companies listed on the S&P 500 Index/ 2007–2011/ Bloomberg database/ Panel regression model	The U-shaped relationship between CSP and CFP exists only in the case of CFP expressed as the return on assets (ROA) and the return on capital (ROC) and CSP measured by the overall ESG score and the governance score.
Zhao and Murrell (2016)	Companies listed on the S&P 500 Index/ 1991–2013/ KLD database/ Panel regression model	The original study (Waddock & Graves, 1997) reports a positive bidirectional relationship between CSP and CFP, measured by three profitability ratios—return on assets (ROA), return on equity (ROE), and return on sales (ROS). The replication results of Zhao and Murrell are: the accounting financial performance (ROA, ROE, and ROS) has a positive impact on CSP, but it is smaller than in the original research; the financial market performance, measured as Tobin's *Q*, market-to-book value (MTB) and market value added (MVA), could have a positive impact on CSP (the reported effect is very small); the impact of CSP on accounting financial performance is positive but statistically insignificant for ROE and ROS—the significant effect on ROA is smaller than in the original research; the impact of CSP on market financial performance is positive but statistically insignificant for all measures.
Agnese et al. (2024)	The Canadian companies listed on the S&P/TSX Composite Index/ 2014–2021/ LSEG Workspace and Bloomberg Termina Database/ Dynamic panel regression model	ESG engagement significantly affects profitability, measured as the return on assets (ROA) and the EBITDA margin (earnings before interest, taxes and depreciation as a percent of total revenues). The environmental dimension improves profitability—its effect increases with the social dimension and decreases with the governance dimension.

Authors	Sample/Period/Data/Empirical model	Main results
Jha & Rangarajan (2020)	The Indian companies listed on the S&P BSE 500 Index/ 2008–2018/ Bloomberg database/ Panel regression model	The return on assets (ROA) is negatively affected by the aggregate ESG score and the environmental score. Tobin's *Q* is negatively affected by the aggregate ESG score and the environmental score, as well as the governance score. The CSP-CFP link is bidirectional.
Behl et al. (2022)	The Indian energy companies listed on Nifty 500 Index/ 2016–2019/ Bloomberg database/ Cross-lagged panel model	The overall ESG score and its particular components have significant impact on Tobin's *Q*—this impact is negative in the short run (the first two lags) and positive in the long run (the last lag). The relationship between ESG scores and Tobin's *Q* is not bidirectional.
Tuppura et al. (2016)	Different industries in the U.S./ 1991–2009/ MSCI ESG Research database/ Panel regression model	Bidirectional causality between CSP and CFP exists in the clothing, energy and forest industries, but not in the food industry. The bidirectional causality between CSP and CFP in the clothing and energy sectors is evident both in the case of the return on assets (ROA) and market capitalisation. The bidirectional causality between CSP and CFP in the forest sector is evident only in the case of ROA.
Soana (2011)	International and the Italian banks/ 2005/ Three agencies: Ethibel, Axia and AEI/ Correlation analysis	Correlations between CSP, measured by global ethical ratings, and CFP are not significant in both international and Italian banks. Correlations between CSP, measured by analytical ethical ratings, and CFP are significant only in international banks—the significant correlations in international banks, which are negative, exist between the internal social rating and CFP, expressed as return on assets (ROA), the price-to-book ratio (P/B), and the price-to-earnings ratio (P/E).
Nizam et al. (2019)	Banks from different countries/ 2013–2015/ MSCI ESG Research database/ Cross-sectional regression model	The banks' return on equity (ROE) is positively influenced by social performance (access to finance) and environmental performance (environmental financing). The impact of access to finance on the banks' ROE is shaped by the management quality and the growth of loans. The impact of environmental financing on the banks' ROE is shaped only by the loan growth.

Authors	Sample/Period/Data/Empirical model	Main results
Xiao et al. (2018)	Different countries/ 2013/ United Nations and Yale University Panel regression model	The effect of country-level sustainability performance (CLSP) on the positive relationship between CSP and CFP is negative—the positive CSP-CFP link is insignificant when the CLSP is high, and significant when it is low.
Tran and Pham (2022)	Global companies from the ranking of Fortune World's Most Admired Firms/ 2005–2011/ Bloomberg database/ Panel regression model	The ESG score has a positive influence on sales performance, measured as sales revenues. The effect of a firm's social disclosure on sales revenues is significantly positive, while there is no significant effect of the environmental and governance disclosures. Research results do not change when only non-financial companies are investigated, or when the analysis is conducted separately in crisis and non-crisis years.
Yilmaz (2021)	Non-financial companies from BRICS/ 2014–2018/ Sustainalytics database/ Panel regression model	The total ESG score has a significantly positive effect on return on assets (ROA) and return on equity (ROE)—the effect on operating profit margin (OPM) and net profit margin (NPM) is not significant. Individual ESG scores reveal mostly insignificant effects—the social score has a significantly positive effect on ROE and OPM, while the governance score has a significantly positive effect only on ROE.
A. Ziegler et al. (2007)	The European companies/ 1996–2001/ Swiss bank Sarasin & Cie in Basle/ Cross-sectional regression model	The relative sustainability performance of the company within a given industry—neither environmental nor social performance—has no significant effect on the average monthly stock return. The average environmental performance of the industry has a significantly positive impact on the average monthly stock return. The average social performance of the industry has a significantly negative impact on the average monthly stock return.

Authors	Sample/Period/Data/Empirical model	Main results
W. Przychodzeń (2013)	The largest companies from the U.S. (S&P 500), U.K. (FTSE 350), Polish (WIG) and Hungarian (BUX) markets/ 2006–2010/ Non-financial reports available on the corporate websites/ Descriptive statistics and testing the significance of differences Cross-sectional regression model	The average annual rate of return on the market portfolio is lower than this rate on the portfolio of companies regarded as sustainable—the average stability of valuation for the market index is lower than for sustainable companies. The rate of return on the portfolio of sustainable companies does not reveal the countercyclicality to this rate on the market portfolio—there are some significant differences between the countries analysed. The average annual rate of revenues growth for non-sustainable companies is higher than this rate for sustainable companies—sales revenues in non-sustainable companies are less stable than in sustainable companies. The investment in sustainable companies generates benefits for shareholders—the scale of these benefits depends on the level of market development.
M. Mikołajek-Gocejna (2024)	Companies listed on the Polish capital market in WIG-ESG/ 2019–2022 Refinitiv database/ Cross-sectional regression model	ESG ratings (both overall ESGR and partial ratings) have a negative impact on a company's value, measured by Tobin's *Q* (market value to book value), but this impact is not statistically significant.
Bumin and Ertuğrul (2024)	Companies listed on the BIST Sustainability Index/ 2022/ Refinitiv database/ Cross-sectional regression model	The association with sales profitability, measured as the net profit margin (NPM), is positive for the environmental score and negative for the social score—both effects are statistically significant. The earning per share is positively affected only by the social score.

Source: own elaboration.

searchers use simple methods of analysis and when studies are conducted in the long period before 2,000 among non-U.S. companies operating in various industries. What is more, the positive effect of CSP on CFP occurs, especially when CSP refers to the environmental dimension and CFP is expressed in accounting measures. However, it is important to mention that differences in research results may stem from both the selected CFP measures and the rating agency providing the CSP measures (Berg et al., 2022).

Summarising, the results of empirical studies on the CSP-CFP relationship can differ due to methodological reasons (Bruna & Lahouel, 2022). It should also be emphasised that previous research has not considered all dimensions of CS outlined in the QBL Approach. Thus far, researchers have focused on CSP in the environmental, social, and governance (ESG) dimensions, overlooking the economic one. Additionally, most studies are based on CFP measures such as Tobin's *Q*, ROE, and ROA, frequently neglecting the impact of CSP on sales performance (Tran & Pham, 2022). Given that an improvement in sales revenues is one of the first signs of the positive impact of a company's increasing involvement in sustainable initiatives (Agnese et al., 2024; Kantabutra & Ketprapakorn, 2020; Perrini et al., 2011; Waddock & Graves, 1997; Witkowska, 2016), the relationship between CSP and sales performance should also be investigated.

Furthermore, an analysis of previous research highlights that the CSP-CFP relationship has not been sufficiently examined on the Polish market. Przychodzeń (2013) found that sustainable companies have lower but more stable sales growth than unsustainable companies, without assessing the impact of CSP on the growth rate of revenues. Sikacz and Wołczek (2018) used ESG data to evaluate the sustainability level in companies on the Respect Index, but they did not investigate the CSP-CFP relationship at all. Daszyńska-Żygadło (2019) revealed that the inclusion in the Respect Index improves ROA. Mikołajek-Gocejna (2024) analysed companies on the WIG-ESG Index, identifying no impact of ESG scores on Tobin's *Q*. Overall, these studies did not examine the effect of CSP on sales performance or incorporate economic sustainability performance.

2. Research hypotheses, data and methodology

The identification of the research gap has become a motivation to conduct own empirical studies on the CSP-CFP link. This study incorporates economic performance as the possible fourth determinant of CFP, alongside environmental, social, and governance ones to examine the impact of all sustainability dimensions on sales revenues and profitability in Polish companies. The

main research hypothesis states that the effect of CSP on the CFP, as represented by sales performance, is positive. To specify this hypothesis, the following five sub-hypotheses have been formulated:

H1: The impact of joint environmental, social, and governance performance on sales performance is positive.
H2: The impact of environmental performance on sales performance is positive.
H3: The impact of social performance on sales performance is positive.
H4: The impact of governance performance on sales performance is positive.
H5: The impact of economic performance on sales performance is positive.

The relationship between CSP and sales performance appears to be positive, as suggested by stakeholder theory, which is the most widely used framework to explain the effects of ESG disclosures on CFP (Li et al., 2024). Stakeholder theory asserts that a company should take action to protect the natural environment, maintain social relations, and provide adequate disclosures about its activities to meet the expectations of all stakeholder groups, without whose support its functioning and development would be impossible (Freeman & McVea, 2001). A company's involvement in sustainable initiatives enhances its brand image and reputation, as well as the trust and loyalty of various stakeholders, ultimately leading to cost savings, revenue growth, and higher profitability (Agnese et al., 2024; Waddock & Graves, 1997).

The research hypotheses are verified empirically using companies from the WIG-ESG Index (GPW Benchmark, 2022a), which has been calculated since September 3, 2019, and includes 60 companies from the WIG20 and mWIG40 indices, taking into account share prices, dividend income, ESG ratings from Sustainalytics, and compliance with the Warsaw Stock Exchange's 2002 Best Practice principles. Unfortunately, the final research sample consists of 21 companies, not 60 (GPW Benchmark, 2022b), due to the lack of data on CSP for all companies from the WIG-ESG Index in at least a ten-year period. What is more, the ten-year period had to be shortened when CSP in the economic dimension is analysed because the data on economic sustainability performance is available only for six years. To summarise, the empirical investigation is conducted in two periods:

- in the years 2012–2021 (the ten-year period) when just environmental, social, and governance sustainability performance is analysed (210 firm-year observations: panel A);
- in the years of 2016–2021 (the six-year period) when economic sustainability performance is incorporated in the analysis (126 firm-year observations: panel B).

According to the sector classification of EMIS, the companies examined operate across various sectors, with the majority involved in finance and insurance (eight companies), as well as energy and utilities (eight companies).

Additionally, three companies are active in telecommunications, media and technology, while one company is engaged in food and beverage production and another in wholesale. Considering financial and insurance companies in the study was important because they play a dual role in achieving SDGs. They not only adopt sustainable practices within their own operations, but also offer preferential services to customers who implement sustainable projects. To ensure the comparability of sustainability pillar scores between companies, weighted scores were used in the study. The weights assigned to particular ESG pillar scores reflect their importance in a company's business activities and vary depending on the sector in which the company primarily operates.

The financial data was retrieved from EMIS, while the sustainability data, including the weights for particular ESG pillar scores, was sourced from the Refinitiv Eikon database (data access: 27.06.2022). The CSP in the economic dimension was collected from the Sustainable Leadership Monitor (SLM), which is the specialised application of the Refinitiv Eikon database. To the best of the author's knowledge, this database is the only one that provides assessments of CSP (Galbreath, 2013) across all four dimensions of sustainable development: environmental, social, governance, and economic. Economic sustainability performance is represented by the long-term returns pillar score.

The empirical verification of five sub-hypotheses is based on the extended Cobb-Douglas (1928) production function, which in a logarithmic form, after denoting companies by i, the time period in years by t ($t = 1, 2, \ldots$), and the residual by μ, is as follows (Jones, 1993):

$$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln K_{i,t} + \alpha_2 \ln L_{i,t} + \beta \mathbf{X}_{i,t-1} + \mu_{i,t} \tag{1}$$

where:

- V (output): CFP measured by the real value of sales revenues (*SR*) in thousands of PLN ($CPI_{2010=100}$);
- K (capital input): the average real value of tangible fixed assets (*ATFA*) in thousands of PLN ($CPI_{2010=100}$) calculated as the arithmetic mean of TFA_t and TFA_{t-1};
- L (labour input): the average full-time employment (*AFTE*) in the number of full-time employees calculated as the arithmetic mean of FTE_t and FTE_{t-1};
- $\mathbf{X}$: a vector of CSP, which covers one-year lagged corporate sustainability scores.

In this research, it is crucial to apply sales revenues as the dependent variable because, as mentioned, an improvement in sales revenues is one of the first signs of the positive impact of a company's increasing involvement in sustainable initiatives. Additionally, this positive impact may not be fully captured when measures of CFP that account for the costs of sustainability activities are used.

With regard to the extended Cobb-Douglas production function, sixteen panel regression models, which differ from each other by the vector $\mathbf{X}$, are proposed. These models are presented in Table 2. The vector $\mathbf{X}$ can consist of the following sustainability variables[2]:

- $ESGS$ is the joint environmental, social, and governance score, calculated as the sum of weighted scores in particular sustainability pillars;
- w_{EPS} is the weight for EPS: the environmental pillar score, which measures a company's impact on living and non-living natural systems (resource use, emissions, innovations);

Table 2. Panel regression models

No.	Formula
1	$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln K_{i,t} + \alpha_2 \ln L_{i,t} + \beta_1 ESGS_{i,t-1} + \mu_{i,t}$
2	$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln K_{i,t} + \alpha_2 \ln L_{i,t} + \beta_1 w_{EPS} EPS_{i,t-1} + \mu_{i,t}$
3	$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln K_{i,t} + \alpha_2 \ln L_{i,t} + \beta_1 w_{SPS} SPS_{i,t-1} + \mu_{i,t}$
4	$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln K_{i,t} + \alpha_2 \ln L_{i,t} + \beta_1 w_{GPS} GPS_{i,t-1} + \mu_{i,t}$
5	$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln K_{i,t} + \alpha_2 \ln L_{i,t} + \beta_1 w_{EPS} EPS_{i,t-1} + \beta_2 w_{SPS} SPS_{i,t-1} + \mu_{i,t}$
6	$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln K_{i,t} + \alpha_2 \ln L_{i,t} + \beta_1 w_{EPS} EPS_{i,t-1} + \beta_2 w_{GPS} GPS_{i,t-1} + \mu_{i,t}$
7	$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln K_{i,t} + \alpha_2 \ln L_{i,t} + \beta_1 w_{SPS} SPS_{i,t-1} + \beta_2 w_{GPS} GPS_{i,t-1} + \mu_{i,t}$
8	$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln K_{i,t} + \alpha_2 \ln L_{i,t} + \beta_1 w_{EPS} EPS_{i,t-1} + \beta_2 w_{SPS} SPS_{i,t-1} + \beta_3 w_{GPS} GPS_{i,t-1} + + \mu_{i,t}$
9	$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln K_{i,t} + \alpha_2 \ln L_{i,t} + \beta_1 LTRPS_{i,t-1} + \mu_{i,t}$
10	$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln K_{i,t} + \alpha_2 \ln L_{i,t} + \beta_1 LTRPS_{i,t-1} + \beta_2 w_{EPS} EPS_{i,t-1} + \mu_{i,t}$
11	$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln K_{i,t} + \alpha_2 \ln L_{i,t} + \beta_1 LTRPS_{i,t-1} + \beta_2 w_{SPS} SPS_{i,t-1} + \mu_{i,t}$
12	$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln K_{i,t} + \alpha_2 \ln L_{i,t} + \beta_1 LTRPS_{i,t-1} + \beta_2 w_{GPS} GPS_{i,t-1} + \mu_{i,t}$
13	$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln K_{i,t} + \alpha_2 \ln L_{i,t} + \beta_1 LTRPS_{i,t-1} + \beta_2 w_{EPS} EPS_{i,t-1} + \beta_3 w_{SPS} SPS_{i,t-1} + + \mu_{i,t}$
14	$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln K_{i,t} + \alpha_2 \ln L_{i,t} + \beta_1 LTRPS_{i,t-1} + \beta_2 w_{EPS} EPS_{i,t-1} + \beta_3 w_{GPS} GPS_{i,t-1} + + \mu_{i,t}$
15	$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln K_{i,t} + \alpha_2 \ln L_{i,t} + \beta_1 LTRPS_{i,t-1} + \beta_2 w_{SPS} SPS_{i,t-1} + \beta_3 w_{GPS} GPS_{i,t-1} + + \mu_{i,t}$
16	$\ln V_{i,t} = \alpha_0 + \alpha_1 \ln K_{i,t} + \alpha_2 \ln L_{i,t} + \beta_1 LTRPS_{i,t-1} + \beta_2 w_{EPS} EPS_{i,t-1} + \beta_3 w_{SPS} SPS_{i,t-1} + + \beta_4 w_{GPS} GPS_{i,t-1} + \mu_{i,t}$

Source: own elaboration.

[2] The description of corporate sustainability variables is based on information from the Revinitiv Eikon database and SLM.

- w_{SPS} is the weight for SPS: the social pillar score, which measures a company's capacity to generate trust and loyalty with its workforce, customers, and society (workforce, community, human rights, product responsibility);
- w_{GPS} is the weight for GPS: the governance pillar score, which measures the effectiveness of corporate systems and processes ensuring that board members and executives act in the best interests of long-term shareholders of a company (management, shareholders, corporate social responsibility);
- $LTRPS$ is the long-term returns pillar score, which measures the ability of a company to manage its long-term economic sustainability (earnings sustainability, credit risk, investment).

The sustainability scores take values between 0 and 100.

The proposed models were estimated with the use of two balanced panels for 21 companies analysed in periods of ten (panel A: models 1–8) and six years (panel B: models 9–16). To deepen the analysis based on all four dimensions of sustainable development, the models with $LTRPS$ (models 9–16) were also estimated for CSP measured by the net profit margin (NPM), which reflects sales profitability. Using profitability of sales as a dependent variable instead of other profitability indicators counts for a sensitivity check.

NPM represents the return on sales (ROS) in percent and is calculated as the ratio of net profit to sales revenues. In this case, 14 firm-year observations had to be excluded from panel B because the profitability of sales revenues was negative and therefore inappropriate for logarithmic transformation. This means that the models with $LTRPS$ (models 9–16), where ROS is the dependent variable, were estimated for the unbalanced panel of 112 observations (corrected panel B). The decision of which kind of a panel model should be chosen—specifically, pooled OLS, fixed-effects, or random-effects model—was taken by analysing the results of the *F* test, the Breusch-Pagan test, and the Hausman test.

3. Results and discussion

The descriptive statistics of dependent and independent variables in the ten-year period (panel A) and in the six-year period (panel B) are presented in Table 3. The mean of sales revenues (SR) for a ten-year period is lower than that of a six-year period. For the ten-year period, the mean of $ESGS$ is satisfactory. All average particular sustainability pillar scores, being the sub-components of $ESGS$, are higher for the six-year period than for the ten-year period. The values of $LTRPS$, an additional sustainability variable considered in a six-year period, fluctuate from the satisfactory to the excellent level of sustainability. Finally, the mean of return on sales (ROS) for the six-year period exceeds 13%.

Table 3. Descriptive statistics

Spec.	Dependent variable V		Independent variables					
			operating variables		sustainability variables			
Panel A								
Metrics	SR		$K = ATFA$	$L = AFTE$	$ESGS$	EPS	SPS	GPS
Mean	17,069,670.69		9,820,522.37	18,394.98	48.14	40.82	45.12	55.69
Standard deviation	19,504,829.34		12,995,130.26	10,941.62	16.89	21.28	23.88	18.45
Min	1,222,849.88		142,638.07	1,360.50	5.28	0.00	0.00	11.30
Max	111,205,138.89		54,643,238.36	42,796.50	87.03	78.07	91.08	94.18
Q1	6,731,977.34		698,073.61	8,107.88	34.71	23.61	28.05	41.79
Median	10,395,387.32		2,777,075.45	16,882.25	50.24	41.40	42.53	56.08
Q3	19,999,085.70		15,580,154.20	26,741.88	58.41	58.12	64.06	69.29
N	210		210	210	210	210	210	210
Panel B								
Metrics	ROS	SR	$K = ATFA$	$L = AFTE$	$LTRPS$	EPS	SPS	GPS
Mean	13.40	17,553,630.28	10,486,281.98	18,922.08	58.01	47.80	52.09	57.35
Standard deviation	10.35	18,910,805.15	13,856,220.51	11,037.19	11.70	18.70	22.66	18.09
Min	0.07	1,222,849.88	148,695.82	2,948.50	31.67	0.00	0.00	17.96
Max	46.86	106,005,649.72	54,643,238.36	42,391.00	79.67	78.07	91.08	94.18
Q1	6.33	7,543,663.10	751,703.10	8,071.00	51.33	32.89	34.37	43.93
Median	9.57	10,611,581.94	3,362,650.13	17,045.00	59.00	49.91	51.67	57.94
Q3	22.12	206,142,89.03	17,758,872.50	26,529.88	67.08	62.26	71.27	71.05
N	112	126	126	126	126	126	126	126

Note: $V = ROS$ is presented in %; $V = SR$ and K are expressed in thousands of PLN ($CPI_{2010=100}$); L is measured as the number of employees.

Source: own calculations.

The coefficients of pairwise correlation between variables in two analysed research periods are shown in Table 4. In the analysis of the ten-year period, all correlations between the dependent variable, measured as SR, and independent variables are significant at 1%, apart from $ESGS$. Correlations between SR and operating variables (K and L) are positive. The dependence with $WEPS$ is positive while correlations for both $WSPS$ and $WGPS$ are negative. In the six-year period, the same correlations between SR and independent variables are significant at 1%. The dependence with $LTRPS$ is positive and significant at 1%. When the dependent variable is measured as ROS, all correlations for independent variables are significant, except for the one with $LTRPS$. The dependence of ROS with $WEPS$ is negative, while it is positive with both $WSPS$ and $WGPS$. Additionally, this analysis reveals that correlations among the independent variables selected for individual panel regression models are not strong in either of the two research periods, as none exceed the critical threshold of |0.8| (Fooladi, 2012, pp. 691–692).

Table 5 demonstrates the estimation results of eight panel regression models (models 1–8), where the dependent variable is SR and sustainability variables are represented by the basic dimensions of *CS*. Model 1 shows that the coefficient on $ESGS$ is positive and statistically significant at 1%. This means that an improvement in the sustainability score for integrated environmental, social, and governance pillars leads to an increase in sales revenues. In models 2–8, sub-components of $ESGS$ are considered. The estimation results reveal that the coefficients at $WEPS$ and $WSPS$ are positive and statistically significant in all models. However, their significance becomes lower when both scores are included in the same model (models 5 and 8). What is more, the social effect in these models is weaker than the environmental effect. The coefficient on $WGPS$ is positive but statistically insignificant in all models, thus the governance pillar score has no discernible impact on sales revenues. Models 9–16 incorporate $LTRPS$ as the additional sustainability variable reflecting sustainability in the economic dimension. These models were estimated using two different dependent variables.

Table 6 shows the estimation results of eight panel regression models on SR. Model 9 reveals how the coefficient at $LTRPS$ is positive but statistically insignificant, and this result does not change when sub-components of $ESGS$ are added to the subsequent models. The coefficient on $WEPS$ is positive in all models, but it is statistically significant only in two of them, which do not include $WSPS$ (models 10 and 14). The coefficient at $WSPS$ is positive and statistically significant in all models, but its significance is higher in models where $WEPS$ is not included (models 11 and 15). The coefficient on $WGPS$ is not statistically significant in any model.

Table 7 presents the estimation results of eight panel regression models on ROS. Model 9 reveals that the coefficient on $LTRPS$ is positive and statistically significant, and it remains unchanged in all subsequent models ex-

Table 4. Pearson correlation matrix

Spec.	Dependent variable ln *V*		Independent variables					
			operating variables		sustainability variables			
Panel A								
Variables	**ln *SR***		**ln *K***	**ln *L***	***ESGS***	***WEPS***	***WSPS***	***WGPS***
ln *SR*	1.0000							
ln *K*	0.7501***		1.0000					
ln *L*	0.6088***		0.5740***	1.0000				
ESGS	–0.0379		–0.1562**	–0.0980	1.0000			
WEPS	0.5113***		0.6230***	0.2305***	0.3171***	1.0000		
WSPS	–0.1960***		–0.2877***	–0.2469***	0.8872***	0.0734	1.0000	
WGPS	–0.2404***		–0.4633***	–0.0256	0.4957***	–0.3444***	0.2761***	1.0000
Panel B								
Variables	**ln *ROS***	**ln *SR***	**ln *K***	**ln *L***	***LTRPS***	***WEPS***	***WSPS***	***WGPS***
ln *ROS*	1.000							
ln *SR*	–0.2923***	1.0000						
ln *K*	–0.2939***	0.7488***	1.0000					
ln *L*	–0.2082**	0.6274***	0.5388***	1.0000				
LTRPS	0.0573	0.2855***	0.4150***	–0.0924	1.0000			
WEPS	–0.1684*	0.4707***	0.6448***	0.1770**	0.3550***	1.0000		
WSPS	0.2526***	–0.2655***	–0.4088***	–0.3051***	–0.2016**	–0.1599*	1.0000	
WGPS	0.3129***	–0.2331***	–0.5094***	0.0131	–0.3601***	–0.4493***	0.3213***	1.0000

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Source: own calculations.

Table 5. Estimation results of random-effects models without *LTRPS* where the dependent variable is *SR* (panel A)

Specification	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Intercept	9.928*** (17.060)	9.614*** (17.020)	9.739*** (16.820)	9.339*** (16.180)	9.871*** (17.090)	9.699*** (16.870)	9.845*** (16.730)	9.937*** (16.950)
ln *K*	0.184*** (3.514)	0.156*** (2.821)	0.197*** (3.752)	0.236*** (4.503)	0.153*** (2.770)	0.160*** (2.854)	0.199*** (3.753)	0.156*** (2.771)
ln *L*	0.350*** (4.760)	0.435*** (5.794)	0.359*** (4.843)	0.343*** (4.356)	0.408*** (5.340)	0.416*** (5.207)	0.340*** (4.398)	0.395*** (4.892)
WEPS		0.012*** (3.633)			0.009** (2.269)	0.012*** (3.361)		0.008** (2.145)
WSPS			0.005*** (3.389)		0.003* (1.877)		0.005*** (3.156)	0.003* (1.821)
WGPS				0.004 (1.538)		0.002 (0.757)	0.003 (0.928)	0.002 (0.588)
ESGS	0.004*** (3.939)							
F test (*p*-value)	120.933 (0.000)	117.100 (0.000)	119.713 (0.000)	112.228 (0.000)	119.692 (0.000)	116.020 (0.000)	119.231 (0.000)	118.470 (0.000)
Breusch-Pagan; $\chi 2(1)$ (*p*-value)	786.804 (0.000)	787.327 (0.000)	789.764 (0.000)	783.796 (0.000)	787.520 (0.000)	778.807 (0.000)	786.112 (0.000)	778.756 (0.000)
Hausman; $\chi 2(K)$ (*p*-value)	4.760 (0.190)	3.076 (0.380)	4.053 (0.256)	2.035 (0.565)	4.339 (0.362)	3.481 (0.481)	4.371 (0.358)	4.676 (0.457)
R^2	0.601	0.600	0.596	0.605	0.596	0.602	0.597	0.597
N	210	210	210	210	210	210	210	210

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively; *t*-statistic in parentheses.

Source: own estimations.

Table 6. Estimation results of random-effects models with *LTRPS* where the dependent variable is *SR* (panel B)

Specification	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Intercept	10.474*** (9.778)	10.656*** (10.050)	10.834*** (10.220)	10.579*** (9.706)	10.904*** (10.270)	10.668*** (9.876)	10.861*** (10.060)	10.892*** (10.070)
ln *K*	0.252*** (4.069)	0.192*** (2.921)	0.230*** (3.720)	0.254*** (4.048)	0.196*** (2.970)	0.190*** (2.840)	0.228*** (3.626)	0.191*** (2.849)
ln *L*	0.192 (1.531)	0.254** (1.995)	0.165 (1.328)	0.174 (1.328)	0.209 (1.623)	0.256* (1.898)	0.167 (1.288)	0.219 (1.622)
WEPS	0.003 (0.957)	0.003 (0.950)	0.004 (1.513)	0.003 (0.970)	0.004 (1.358)	0.003 (0.939)	0.004 (1.507)	0.004 (1.349)
WSPS		0.012** (2.521)			0.008 (1.448)	0.012** (2.471)		0.008 (1.472)
WGPS			0.006*** (2.815)		0.005* (1.924)		0.006*** (2.784)	0.005** (1.960)
ESGS				0.002 (0.439)		0.000 (–0.076)	–0.001 (–0.146)	–0.002 (–0.336)
F test (*p*-value)	65.867 (0.000)	69.003 (0.000)	71.920 (0.000)	64.639 (0.000)	71.714 (0.000)	67.055 (0.000)	70.511 (0.000)	70.076 (0.000)
Breusch-Pagan; $\chi 2(1)$ (*p*-value)	255.698 (0.000)	258.270 (0.000)	256.214 (0.000)	250.844 (0.000)	257.055 (0.000)	251.634 (0.000)	251.714 (0.000)	251.301 (0.000)
Hausman; $\chi 2$(K) (*p*-value)	5.388 (0.146)	5.385 (0.250)	9.863 (0.056)	6.452 (0.168)	8.569 (0.128)	6.018 (0.304)	9.972 (0.076)	8.776 (0.187)
R^2	0.625	0.634	0.625	0.627	0.636	0.633	0.623	0.634
N	126	126	126	126	126	126	126	126

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively; *t*-statistic in parentheses.

Source: own estimations.

Table 7. Estimation results of fixed-effects models with *LTRPS* where the dependent variable is *ROS* (corrected panel B)

Specification	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Intercept	22.785** (2.278)	24.053** (2.417)	24.957** (2.557)	27.767*** (3.310)	24.563** (2.554)	27.917*** (3.293)	28.895*** (3.321)	28.208*** (3.331)
ln *K*	–1.797*** (–3.805)	–2.194*** (–4.171)	–1.929*** (–4.573)	–1.823*** (–4.750)	–2.196*** (–4.231)	–2.100*** (–4.597)	–1.908*** (–5.448)	–2.102*** (–4.639)
ln *L*	0.481 (0.563)	0.922 (1.080)	0.393 (0.470)	–0.131 (–0.177)	0.858 (0.996)	0.274 (0.359)	–0.153 (–0.199)	0.238 (0.294)
WEPS	0.029* (1.868)	0.025* (1.728)	0.033* (2.060)	0.030* (2.001)	0.027 (1.713)	0.027* (1.832)	0.033** (2.151)	0.028* (1.824)
WSPS		0.060 (1.469)			0.055 (1.179)	0.042 (1.020)		0.039 (0.846)
WGPS			0.017 (1.568)		0.005 (0.488)		0.011 (1.001)	0.003 (0.275)
ESGS				0.068** (2.423)		0.058** (2.173)	0.064** (2.344)	0.057** (2.154)
F test (*p*-value)	6.828 (0.000)	7.253 (0.000)	6.619 (0.000)	6.759 (0.000)	6.846 (0.000)	6.918 (0.000)	6.599 (0.000)	6.683 (0.000)
Breusch-Pagan; $\chi 2(1)$ (*p*-value)	32.077 (0.000)	32.197 (0.000)	26.473 (0.000)	24.854 (0.000)	26.089 (0.000)	25.046 (0.000)	21.733 (0.000)	21.742 (0.000)
Hausman; $\chi 2(K)$ (*p*-value)	10.476 (0.015)	13.886 (0.008)	13.278) (0.009)	16.215 (0.003)	15.373 (0.009)	17.860 (0.003)	18.126 (0.003)	18.873 (0.004)
R^2	0.659	0.674	0.665	0.683	0.674	0.690	0.685	0.690
N	112	112	112	112	112	112	112	112

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively; *t*-statistic in parentheses.

Source: own estimations.

cept for one, which considers both $WEPS$ and $WSPS$ (model 13). Moreover, the significance of $LTRPS$ is highest when $WEPS$ is not included in the model (model 15). The coefficients on $WEPS$ and $WSPS$ are not statistically significant in any model, indicating that the environmental and social pillar scores have no impact on the return on sales. The coefficient on $WGPS$ is positive and statistically significant at 5% in all models.

Comparing the results of model estimations and correlation analysis, two main findings regarding the relationship between CSP and sales performance among Polish companies listed in the WIG-ESG Index can be presented. Firstly, environmental sustainability performance has a positive impact on sales revenues in years 2012–2021. Secondly, governance sustainability performance positively influences the return on sales in years 2016–2021. The other results regarding the relationship between CSP and sales performance are inconsistent.

These results partially correspond with the findings of Yilmaz (2021), who identified no significant effect of CSP on the net profit margin across particular dimensions. His results differ only in the case of governance sustainability performance, which the current research found to exert a significantly positive impact on NPM. Meanwhile, the findings of this study are completely contrary to those of Bumin and Ertuğrul (2024), who not only found that NPM is significantly affected by both the environmental and social scores, but also revealed that the impact of the governance score is insignificant. On the other hand, the results of this study are in line with the findings of Agnese et al. (2024), who demonstrated that governance performance has a significantly positive effect on the EBITDA margin, while environmental and social performance has no impact.

The possible explanation for the positive effect of governance sustainability performance on NPM is that the relationship between board management and shareholders determines what proportion of the profit will be reinvested in the company and allocated to pro-development projects. The implementation of these projects positively impacts the relationship between sales revenues and costs, thereby enhancing ROS. Additionally, the company's commitment to corporate social responsibility—particularly ensuring transparency in its activities—is regarded favourably by various stakeholders, who are more willing to support the company in different ways.

Considering the research results for sales revenues, the findings of this study are not fully aligned with those of Tram and Pham (2022), who found that a firm's social disclosure has a significantly positive impact on SR, while the impact of environmental and governance disclosures is insignificant. In this study, no sustainability performance showed a significant effect on SR. However, it must be emphasised that when considering years 2012–2021, SR is significantly influenced by environmental sustainability performance.

The positive effect of environmental sustainability performance on SR presumably stems from the company's involvement in eco-friendly initiatives,

which enhance its reputation. In times of climate crisis, a company that prioritises environmental sustainability is viewed much more favourably than its competitors, making customers more inclined to purchase its products. Additionally, current and potential employees are more motivated to work for a company with a strong reputation for sustainability, as it enhances their standing in the labour market. Highly motivated employees tend to work harder, improving customer service and satisfaction. In turn, satisfied customers are more likely to make repeat purchases, ultimately boosting sales revenues.

Conclusions

The paper presents the results of empirical research on the relationship between CSP and CFP conducted among Polish companies listed on the WIG-ESG Index. This research reveals that sales revenues in the long run are positively affected by environmental sustainability performance, while in the short run, they do not depend on any dimension of CSP. Governance sustainability performance has no impact on sales revenues in either the long or short run, but it influences the return on sales, expressed by the net profit margin. Referring to the five sub-hypotheses, it can be concluded that the impact of environmental sustainability performance on sales performance in terms of sales is positive only for long run, while the impact of governance sustainability performance on sales performance in terms of return on sales is positive for the short run.

In this paper, in line with the Quadruple Bottom Line Approach, economic sustainability performance was included as an additional dimension of CSP influencing CFP. Moreover, the study examines the effect of CSP on CFP, measured by sales performance—specifically, sales revenues and return on sales. The core limitation of this study is the small research sample and the short period of analysis, which arise from the lack of sustainability data on Polish companies over a longer timeframe, therefore preventing the application of more sophisticated research methods.

Given that the sustainability data provided by rating agencies is often incomplete and not freely available to a wide range of stakeholders, international institutions and national governments should work to tighten and harmonise requirements for companies to disclose sustainability information. At the same time, managers should create holistic strategies for CS, monitoring the results of their implementation over short-, medium-, and long-term horizons for the company and all its stakeholder groups as the effect of particular sustainability performance can vary across different sales performance measures and analytical periods.

Furthermore, researchers should broaden and deepen the analysis of the relationship between CSP and CFP, especially on the Polish market, as it has not yet been sufficiently examined. For instance, future studies could aim to verify a reverse or U-shaped relationship, but this would require a larger research sample and a longer analysis period.

References

Agnese, P., Carè, R., Cerciello, M., & Taddeo, S. (2024). Reconsidering the impact of environmental, social and governance practices on firm profitability. *Management Decision*, in press. https://doi.org/10.1108/MD-10-2023-1943

Aluchna, M. (2015). *Strategies of sustainable business*. Warsaw School of Economics.

Behl, A., Kumari, P. S. R., Makhija, H., & Sharma, D. (2022). Exploring the relationship of ESG score and firm value using cross-lagged panel analysis: Case of the Indian energy sector. *Annals of Operations Research*, *313*, 231–256. https://doi.org/10.1007/s10479-021-04189-8

Berg, F., Kölbel J. F., & Rigobon, R. (2022). Aggregate confusion: The divergence of ESG ratings. *Review of Finance*, *26*(6), 1315–1344. https://doi.org/10.1093/rof/rfac033

Brockett, A., & Rezaee, Z. (2012). *Corporate sustainability: Integrating performance and reporting*. John Wiley & Sons.

Bruna, M. G., & Lahouel, B. B. (2022). CSR & financial performance: Facing methodological and modeling issues commentary paper to the eponymous FRL article collection. *Finance Research Letters*, *44*(2), 102036. https://doi.org/10.1016/j.frl.2021.102036

Budsaratragoon, P., & Jitmaneeroj, B. (2019). Measuring causal relations and identifying critical drivers for corporate sustainability: The quadruple bottom line approach. *Measuring Business Excellence*, *23*(3), 292–316. https://doi.org/10.1108/MBE-10-2017-0080

Bumin, M., & Ertugrul, A. (2024). Effect of ESG scores on firm performance: Evidence from Borsa Istanbul Sustainability Index. *International Journal of Academic Research in Business and Social Sciences*, *14*(4), 1033–1047. https://doi.org/10.6007/IJARBSS/v14-i4/21379

Burchard-Dziubińska, M. (2014). Idea zrównoważonego rozwoju. In M. Burchard-Dziubińska, A. Rzeńca & D. Drzazga, *Zrównoważony rozwój – naturalny wybór* (pp. 9–33). Wydawnictwo Uniwersytetu Łódzkiego.

Cobb, C. W., & Douglas, P. H. (1928). A theory of production. *The American Economic Review*, *18*(1), 139–165.

Daszyńska-Żygadło, K. (2013). Impact of CSR on operating financial results: The case of companies from RESPECT Index. In A. Długopolska-Mikonowicz, S. Przytuła, C. Stehr (Eds.), *Corporate social responsibility in Poland* (pp. 59–72). Springer. https://doi.org/10.1007/978-3-030-00440-8_5

Dyllick, T., & Hockerts, K. (2002). Beyond the case for corporate sustainability. *Business Strategy and the Environment*, *11*(2), 130–141. https://doi.org/10.1002/bse.323

Elkington, J. (1997). *Cannibals with forks: The triple bottom line of 21st century business*. John Wiley & Sons.

Fooladi, M. (2012). Board characteristics and firm performance. *Journal of Modern Accounting and Auditing*, *8*(5), 688–694.

Freeman, R. E., & McVea, J. (2001). *A stakeholder approach to strategic management*. Darden School of Business Administration: University of Virginia, Working Paper, 01-02. https://doi.org/10.2139/ssrn.263511

Galbreath, J. (2013). ESG in focus: The Australian evidence. *Journal Business Ethics*, *118*, 529–541. https://doi.org/10.1007/s10551-012-1607-9

Giovannoni, E., & Fabietti, G. (2013). What is sustainability? A review of the concept and its applications. In C. Busco, M. L. Frigo, P. Quattrone & A. Riccaboni (Eds.), *Integrated reporting. Concepts and cases that redefine corporate accountability* (pp. 21–40). Springer. https://doi.org/10.1007/978-3-319-02168-3_2

Gond, J., Grubnic, S., Herzig, C., & Moon, J. (2012). Configuring management control systems: Theorizing the integration of strategy and sustainability. *Management Accounting Research*, *23*(3), 205–223. https://doi.org/10.1016/j.mar.2012.06.003

GPW Benchmark. (2022a). *Card of the ESG-WIG Index*. https://gpwbenchmark.pl/en-karta-indeksu?isin=PL9999998955

GPW Benchmark. (2022b). *Composition of the WIG-ESG Index after revision on March 18, 2022*. https://gpwbenchmark.pl/pub/BENCHMARK/files/PDF/komunikaty_indeksowe/Portfele_WIG_WIG-Poland_WIG-CEE_WIG-Ukraine_WIGdiv_WIG-ESG_2022_03_11.pdf

Gray, R. (2010). Is accounting for sustainability actually accounting for sustainability... and how would we know? An exploration of narratives of organisations and the planet. *Accounting Organizations and Society*, *35*(1), 47–62. https://doi.org/10.1080/0969160X.2011.556420

Jha, M. K., & Rangarajan, K. (2020). Analysis of corporate sustainability performance and corporate financial performance causal linkage in the Indian context. *Asian Journal of Sustainability and Social Responsibility*, *5*(1), 1–30. https://doi.org/10.1186/s41180-020-00038-z

Jones, D. C. (1993). The productivity effects of employee ownership within command economies: Evidence from Poland. *Managerial and Decision Economics*, *14*(5), 475–485. https://doi.org/10.1002/mde.4090140511

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

Knežević, B., & Škrobot, P. (2021). Sustainable development in corporate strategy. In M. Stefańska (Ed.), *Sustainability and sustainable development* (pp. 71–82). Poznań University of Economics and Business Press. https://doi.org/10.18559/978-83-8211-074-6/II1

Li, L., Saat, M. M., Khatib, S. F. A., Chu, P., & Sulimany, H. G. H. (2024). Navigating the impact: A comprehensive analysis of ESG disclosure consequences through systematic review. *Business Strategy & Development*, *7*(2), e382. https://doi.org/10.1002/bsd2.382

Lu, L., & Taylor, M. (2016). Which factors moderate the relationship between sustainability performance and financial performance? A meta-analysis study. *Journal of International Accounting Research*, *15*(1), 1–15. https://doi.org/10.2308/jiar-51103

Mensah, J. (2019). Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review. *Cogent Social Sciences*, *5*(1), 1–21. https://doi.org/10.1080/23311886.2019.1653531

Mikołajek-Gocejna, M. (2024). The relationship between ESG rating and firm value—evidence from companies listed on Polish Capital Market in the WIG-ESG index. *Central European Economic Journal*, *11*(58), 141–158. https://doi.org/10.2478/ceej-2024-0011

Nizam, E., Ng, A., Dewandaru, G., Nagayev, R., & Nikoba, M. A. (2019). The impact of social and environmental sustainability on financial performance: a global analysis of the banking sector. *Journal of Multinational Financial Management*, *49*, 35–53. https://doi.org/10.1016/j.mulfin.2019.01.002

Nollet, J., Filis, G., & Mitrokostas, E. (2016). Corporate social responsibility and financial performance: A non-linear and disaggregated approach. *Economic Modelling*, *52*, 400–407. https://doi.org/10.1016/j.econmod.2015.09.019

Oželienė, D. (2017). A review of enterprise sustainable development models: Critical appraisal. *International Scientific Journal "Science. Business. Society"*, *2*(2), 257–263.

Perrini, F., Russo, A., Tencati, A., & Vurro, C. (2011). Deconstructing the relationship between corporate social and financial performance. *Journal of Business Ethics*, *102*(1), 59–76. https://doi.org/10.1007/s10551-011-1194-1

Przychodzeń, W. (2013). *Zrównoważone przedsiębiorstwo. Teoria, praktyka, wycena, nauczanie*. Poltext.

Sanders, N. R., & Wood, J. D. (2015). *Foundations of sustainable business*. John Wiley & Sons.

SDSN (Sustainable Development Solution Network). (2013). *An action agenda for sustainable development*. United Nations Publishing.

Sikacz, H., & Wołczek, P. (2018). ESG analysis of companies included in the RESPECT Index based on Thomson Reuters EIKON database. *Research Papers of Wroclaw University of Economics, 520*, 115–127. https://doi.org/10.15611/pn.2018.520.10

Soana, M. -G. (2011). The relationship between corporate social performance and corporate financial performance in the bank sector. *Journal of Business Ethics, 104*(1), 133–148. https://doi.org/10.1007/s10551-011-0894-x

Tran, T. H., & Pham, H. (2022). How do environmental, social and governance reporting promote sales? Empirical evidence from global firms. *Journal of Strategic Marketing*, *32*(1), 1–19. https://doi.org/10.1080/0965254X.2022.2118816

Tuppura, A., Arminen H., Pätäri, S., & Jantunen, A. (2016). Corporate social and financial performance in different industry contexts: The chicken or the egg? *Social Responsibility Journal*, *12*(4), 672–686. https://doi.org/10.1108/SRJ-12-2015-0181

UN (United Nations). (2012). *Future we want*. United Nations Publishing.

Waddock, S. A., & Graves, S. B. (1997). The corporate social performance financial performance link. *Strategic Management Journal*, *18*(4), 303–319. https://doi.org/10.1002/(SICI)1097-0266(199704)18:4<303::AID-SMJ869>3.0.CO;2-G

Wagner, M. (2010). The role of corporate sustainability performance for economic performance: A firm-level analysis of moderation effects. *Ecological Economics*, *69*(7), 1553–1560. https://doi.org/10.1016/j.ecolecon.2010.02.017

WCED (World Commission on Environment and Development). (1987). *Our common future*. Oxford University Press.

Witkowska, J. (2016). Koszty i korzyści społecznej odpowiedzialności przedsiębiorstw. In Z. Wysokińska & J. Witkowska, *Zrównoważony rozwój. Wybrane aspekty makro- i mikroekonomiczne* (pp. 155–160). Wydawnictwo Uniwersytetu Łódzkiego.

Xiao, C., Wang, Q., van der Vaart, T., & van Donk, D. P. (2018). When does corporate sustainability performance pay off? The impact of country-level sustainability performance. *Ecological Economics*, *146*, 325–333. https://doi.org/10.1016/j.ecolecon.2017.11.025

Yilmaz, I. (2021). Sustainability and financial performance relationship: International evidence. *World Journal of Entrepreneurship, Management and Sustainable Development*, *17*(3), 537–549. https://doi.org/10.1108/WJEMSD-10-2020-0133

Zhao, X., & Murrell, A. J. (2016). Revisiting the corporate social performance-financial performance link: A replication of Waddock and Graves. *Strategic Management Journal*, *37*(11), 2378–2388. https://doi.org/10.1002/smj.2579

Ziegler, A., Schröder, M., & Rennings, K. (2007). The effects of environmental and social performance on the stock performance of European corporations. *Environmental and Resource Economics*, *37*(4), 661–680. https://doi.org/10.1007/s10640-007-9082-y