

MODELLING OF THE RELATIONSHIP BETWEEN SUSTAINABILITY AND SHAREHOLDER WEALTH

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Abstract. A structural model for the verification of the causal relationship between sustainability and economic value added is presented in this paper. The study has shown that there is no definite and unique relationship between corporate sustainability and economic value. Based on the results of the structural modelling, sustainable value model ESGVA is methodologically improved. The model expresses all four dimensions of corporate sustainability: environmental, social, corporate governance and economic. The case study demonstrates how different the results are if a purely economic concept of company value is used compared to value that takes into account environmental, social and corporate governance factors. The model is applicable to comparative analysis of socially responsible investments. Sustainable value provides extra information on corporate performance and can be used for decision-making of individual investors.

Keywords: economic value added, sustainability, environmental, social, corporate governance factors, sustainable value.

JEL Classification: G32, M14.

Introduction

The growing consensus that sustainability approaches and practices have a positive impact on corporate competitiveness (e.g. Bernal-Conesa et al., 2017; Branco & Rodrigues, 2006; Fombrun et al., 2000; Kashmanian et al., 2011; Konar & Cohen, 2001; Kruse & Lundbergh, 2010; Spirig, 2006) leads to growing interest of companies in sustainable development and accelerates their participation in it (Nirino et al., 2021). At the same time, the corporate management must cope with the legislative pressures for higher sustainability and individual stakeholder groups exert an ever-growing influence on the business community, which must not only defend its activities but also demonstrate how they contribute to sustainability. In-

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creasing number of companies integrate non-financial measures with financial information in their corporate reporting (e.g., Dong & Wong-On-Wing, 2021).

Corporate sustainability is defined as “a systematic business approach and strategy that takes into consideration the long-term social and environmental impact of all economically motivated behaviors of a firm in the interest of consumers, employees, and owners or shareholders” (Bergman et al., 2017). Companies adjust their business models in response to social needs, and to secure long-term prospects. Sustainability thus becomes a key concept in corporate management and permeates the entire value chain (Global Reporting Initiative [GRI], United Nations Global Compact [UNGC], & World Business Council for Sustainable Development [WBCSD], 2015). In 2015, the United Nations announced launch of Sustainable Development Goals 2015–2030 (SDGs), which cover a broad range of environmental, social, and economic development issues. These include ending poverty and hunger, improving health and education, making cities more sustainable, combating climate change, and protecting oceans and forests. 17 SDGs are specified to 169 targets which progress is measured by 232 individual Sustainable Development Goals Indicators (United Nations [UN], 2017). According to SDGs sustainability stands on four interdependent pillars: environmental, social, economic, and governance. Business sector was declared as a key partner in achieving SDGs. Nearly 60% of the SDGs targets (99 targets) are directly relevant to industry (United Nations Industrial Development Organization [UNIDO], 2016). It is industry who can provide technology solutions to tackle global problems, e.g., pollution prevention technologies; medical devices and pharmaceutical products; the efficient use of natural resources and application of circular economy (Axon & James, 2018).

The value created for the society through corporate sustainability practices is demonstrable (see, e.g., voluntary sustainability standards) (Potts et al., 2014). The question remains whether higher sustainable value leads to an increase in value for the owners, i.e., for those who have invested their financial capital in business activities and are the principal bearers of business risk. Research to date has not come up with clear-cut results (e.g., Fernández-Guadano & Sarria-Pedroza, 2018; Raimo et al., 2020; Schaltegger & Synnestvedt, 2002; Wagner, 2010).

The aim of the paper is to investigate whether there is a causal relationship between sustainable value measured by environmental, social and corporate governance (ESG) value and economic value added (EVA). A case study is then used to demonstrate the difference in the calculation of the value created by the company for the owners and in the creation of corporate sustainable value.

1. Literature and hypotheses

The theory and practice of current business management focuses on value management, which is based on the premise that the primary purpose of business activity is to grow the company's value – in literature, this approach is called *value-based management* (VBM) (Burkert & Lueg, 2013; Ittner & Larcker, 2001; Malmi & Granlund, 2009). In VBM, two types of value created by the company are distinguished – shareholder value and stakeholder value. *Shareholder value* represents the wealth of shareholders and in this sense, socially responsible activities are perceived as activities carried out for the benefit of stakeholder groups but at

the expense of the owners. Resources spent on corporate social responsibility projects mean a reduction in the profitability and wealth for the owners, and investing in such projects may be contrary to the owners' best interests. In that case, the benefits won by stakeholder groups are at the cost of the shareholders' wealth, and the shareholders' wealth is being transferred to other stakeholder groups (Cronqvist et al., 2009; Deng et al., 2013; Friedman, 1998; Pagano & Volpin, 2005; Ren et al., 2020; Surroca & Tribo, 2008; Vance, 1975). Concentration purely on the shareholder wealth growth often led to ethical, social and environmental issues and that is the main reason for including in the value creation also other criteria taking into account the ESG impacts and influences (Pavláková Dočekalová & Kocmanová, 2016). *Stakeholder value* is the value created for all participating groups that have some interest in the company's activities. The concept of stakeholder value places greater emphasis on responsibility than on mere profitability. In responsible companies, the interests of owners and stakeholders are more balanced. The value for stakeholder groups is supported by the theory of the firm that sees organizations as coalitions that should serve all stakeholders. According to this theory, a company is a kind of a nexus of contracts between the owners and stakeholder groups that supply resources. These contracts are both in the form of legally binding contracts (e.g., employment contracts) and implicit contracts (e.g., the promise of job security). The value of implicit contracts is determined by stakeholder groups' expectations that the company will meet its obligations (Cornell & Shapiro, 1987; Deng et al., 2013). Companies that invest in social responsibility (SR) enjoy a better reputation when it comes to complying with obligations under implicit contracts, and stakeholder groups in such companies are more motivated to contribute resources and their efforts (Deng et al., 2013; Freeman et al., 2004; Jawahar & McLaughlin, 2001; Jensen, 2001; Nirino et al., 2021). Stakeholder value creation is therefore linked to sustainability and sustainable value (Tapaninaho & Kujala, 2019). Progressive approach to sustainability leads to value creation which is shared with stakeholders and at the same time stakeholders are co-creators of the value (Freudenreich et al., 2020). Traditional financial reporting is no longer adequate for decision making of today's stakeholders, and new methods to assess corporate performance and value are needed (Lev & Gu, 2016).

Sustainable value is a trend in business management orientation in terms of value creation. Sustainable value expresses the utilization of environmental and social resources in monetary terms. It is based on the fundamental economic theory which says that value is created when a company utilizes resources more efficiently than their alternative uses. Sustainable value is based on a comparison between resource utilization and opportunity costs. This idea is applicable to all resources that the company uses. Sustainability is thus expressed in a way that is in line with the thinking of investors and managers. *Sustainable Value Added* (SVA) takes into account efficiency of environmental and social resources in relation to the economic performance of the company. The principal idea of the SVA model is to determine the difference between the value added created by the company and a specific benchmark, i.e., to quantify the efficiency with which the company consumes resources relative to that benchmark. Environmental and social value added reduces or increases sustainable value depending on the amount of resources consumed by the company relative to the benchmark (Figge & Hahn, 2002). Improving efficiency leads to increased corporate sustainability and value creation (Callens & Tyteca, 1999). Figge and Hahn based their model of SVA on the theory of capital and opportunity costs assuming that the cost of environmental and social

capital can be calculated similarly to the cost of financial capital. SVA compares the value of alternative uses of capital (opportunity costs) expressed by the benchmark and shows whether the value added created by the company exceeds the cost of the capital used. Since enterprise uses n different forms of capital, SVA can be expressed as follows (based on Figge & Hahn, 2008):

$$SVA = \frac{1}{n} \sum_{i=1}^n \left(\frac{y}{x_i} - \frac{y^*}{x_i^*} \right) x_i, \quad (1)$$

where $y/x_i - y^*/x_i^*$ is the value spread, n is the number of forms of capital, y is the company's value added (output), y^* is the value added (output) set by the benchmark, x_i is the amount of capital i used by the company, x_i^* is the amount i set in the benchmark, and y^*/x_i^* expresses the opportunity costs.

The SVA model has been subjected to criticism (Ang & Van Passel 2010; T. Kuosmanen & N. Kuosmanen, 2009). Pavláková Dočekalová and Kocmanová (2018) and Kocmanová et al. (2016) further elaborated the SVA model in order that it better reflects the current concept of corporate sustainability as a phenomenon integrating economic and ESG business performance.

1.1. Environmental performance

The International Organization for Standardization (2013) defines corporate environmental performance (CEP) as “the measurable results of an organization’s management of its environmental aspects”. ISO 14000 series and Eco-Management and Audit Scheme (EMAS) are international standards for environmental performance management. Al-Tuwaijri, Christensen and Hughes (2004) studied relationship between environmental reporting, CEP and economic performance. In their study they applied structural equation modelling and concluded that better CEP results in significantly better economic performance and is also conducive to the provision of broader quantitative environmental data. Implementing Industry 4.0 technologies (internet of things, robotic systems, 3D printing, virtual reality, cloud computing, and simulation) and lean manufacturing have the potential to increase CEP through energy, emission, and waste reduction and at the same time improve economic performance through reducing manufacturing costs (Kamble et al., 2018).

The assumption of a relationship between environmental performance and economic added value is formulated by hypothesis H_1 .

H_1 : *Companies with better environmental performance achieve higher economic value added.*

1.2. Social performance

Corporate social performance (CSP) is defined by the social impact of corporate activities on stakeholder groups, since stakeholders are the recipients of corporate activities and they are also a source of expectations of what is desirable corporate performance and, ultimately, they assess the company’s conduct – to what extent their expectations have been met (Spirig, 2006; Wood & Jones, 1995). Standards applicable in social area are ISO 26000 – Social Responsibility, AA1000 Stakeholder Engagement Standard, SA8000 Social Accountability Standard, and

ISO 4500 – Occupational Health and Safety. SR positively influence corporate reputation (Lu et al., 2020). The positive relationship between SR and economic performance has been described and discussed in many studies (e.g., Carroll & Shabana, 2010; Falck & Hebllich, 2007; Perrini et al., 2011) and confirmed by research (e.g., Margolis et al., 2009; Orlitzky et al., 2003). Emilsson et al. (2012) confirmed a positive relationship between SR and EVA in a sample of Swedish companies. Lisi (2018) found that use of social performance indicators for decision-making and control is economically motivated and the use of social performance indicators influences a firm's social performance and its bottom line.

The assumption of a relationship between social performance and economic added value is formulated by hypothesis H_2 .

H_2 : *Companies with better social performance achieve higher economic value added.*

1.3. Corporate governance performance

Corporate governance performance (CGP) fundamentally affects environmental, social and economic pillars of corporate sustainability because it creates a structure through which the company's goals are defined and sets the means to achieve these goals (Hussain et al., 2018; Munir et al., 2019). In their research in a sample of listed companies from travel and tourism industry, Ionescu et al. (2019) found that corporate governance (CG) is from ESG factors the most important one influencing firm market value. Deev and Khazalia (2017) investigated the impact of CG and SR on the economic performance of European financial companies. In their study they focused especially on such aspects of CG as the structure and diversity of the board of directors, the duality of the chief executive officer (CEO) and the chair of the board. The results of their research corroborate the significantly positive effect of these aspects on economic results in a sample of European financial companies.

The assumption of a relationship between CG performance and economic value added is formulated by hypothesis H_3 .

H_3 : *Companies with a higher CG performance achieve higher economic value added.*

2. Method

The aim of the paper is to investigate whether there is a causal relationship between sustainable value and shareholder wealth measured by economic value added. The results of previous research into the impact of sustainability on shareholder wealth have not come up with clear-cut answers (e.g., Fernández-Guadaño & Sarria-Pedroza, 2018; Raimo et al., 2020; Schaltegger & Synnestvedt, 2002; Wagner, 2010). What can also be considered problematic is the fact that a number of studies continue to focus only on the sustainability's individual pillars without respecting its multidimensional character. Corporate sustainability is by definition (e.g., Artiach et al., 2010; Bergman et al., 2017; van Marrewijk & Werre, 2003), a multidimensional phenomenon integrating the ESG pillars of business activities. This fact must be reflected in the methods used to model their mutual relationships. The scope of using single-dimensional methods for sustainability modelling is very limited, and multidimensional statistical methods must be used instead. *Structural equation modelling* (SEM) makes it possible to statistically model and test complex relationships and is therefore particularly

suitable for modelling relationships related to sustainable development. SEM includes statistical methods designed to build causal models. The goal of confirmatory factor analysis and structural modelling is to identify latent variables using a set of manifest variables, and then to evaluate hypotheses about the relationships between latent variables (Gallagher & Brown, 2013). To determine the model validity, the so-called goodness-of-fit indices have been developed, which are also used in modelling to modify and refine the model (Bowen & Guo, 2011; Schreiber et al., 2006). If the goodness-of-fit values are adequate, then we have a statistical argument for the acceptability of the model and for the relationships it expresses. The SPSS Amos 26 software was used to process SEM.

2.1. Theoretical model

The graphical representation of proposed hypotheses ($H_1 - H_3$) is in Figure 1. In Figure 1, regression effects are represented as single-headed arrows. Works by Kocmanová (2015) and Schaltegger et al. (2006) also demonstrate how necessary it is to consider the mutual relationships between the individual pillars of sustainability, insofar as we assume that CEP, CSP and CGP interact and influence each other. These relationships (correlations: a , b , c) between pillars of sustainability are thus included into theoretical model (Figure 1) and are indicated as double-headed arrows. The theoretical model has been tested by SEM, which is suitable for testing such complex relationships.

2.2. Sample

The subjects of our research are companies whose shares were traded on the London Stock Exchange (LSE) as at 30 May 2018 and which issue reports on sustainability and social responsibility, or release ESG information using some other form of corporate reporting. The companies were selected based on the availability of ESG data in the Bloomberg database. In this research, secondary data for 2016 were used.

As at the date of data collection, we identified 2170 companies whose shares had been admitted to the London Stock Exchange. From among those companies, 280 were selected whose ESG Disclosure Score is published in the Bloomberg database, i.e., ESG data of these companies are available. The ESG Disclosure Score is based on the range of ESG information that a company publishes and takes values from 0.1 to 100. According to the Industry Classification Benchmark (ICB), companies are divided into ten industries, see Table 1.

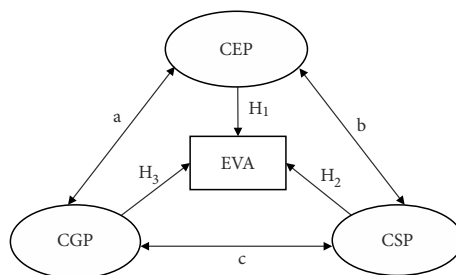


Figure 1. Theoretical model of the structure of the relationships between ESG performance and EVA

Table 1. Scope of activities of the companies investigated

ICB Industry	<i>n</i>	%
Industrials	76	27.143
Consumer Services	69	24.643
Financials	51	18.214
Consumer Goods	31	11.071
Basic Materials	14	5.000
Technology	10	3.571
Health Care	9	3.214
Oil & Gas	8	2.857
Utilities	7	2.500
Telecommunications	5	1.786
Σ	280	100.000

2.3. Measurement

Dependent variable: The best known value-based indicator used is Economic Value Added. EVA expresses economic profit and takes into account the opportunity cost of the invested equity. For that reason, it is used to express the wealth of the owners.

EVA may be calculated as follows (Stewart, 1991):

$$EVA = \text{Net Operating Profit After Taxes} - \text{Capital Charge.} \quad (2)$$

Independent variables: ESG indicators were selected based on the availability of data from the Bloomberg database to capture the dimensionality of corporate sustainability. Data in the Bloomberg database are collected from released company reports. We selected 14 environmental indicators I_{Envik} , 11 social indicators I_{Socik} and 17 corporate governance indicators I_{Cgk} , see Table 2.

A total of 42 ESG indicators were selected. The definitions of the ESG indicators (I_{Envik} , I_{Socik} , I_{Cgk}) correspond to the Bloomberg methodology. The SEM also includes confirmatory factor analysis, which allows for the selection of key sustainability indicators. The key sustainability indicators are those that should be used to calculate sustainable value added.

3. Results and discussion

The result of SEM is a structural model that includes the assumption of the causality of the relationship between ESG areas of corporate sustainability and EVA as expressed by the above hypotheses H_1 , H_2 and H_3 . The structural model shown in Figure 2 consists of a measurement model which is given by factor analysis, and of a relationship model, which in graphical format shows a regression analysis of ESG factors and EVA. For the purpose of clarity, correlations between residual variables (errors) $e_1 - e_{10}$ are omitted.

Table 2. A basic set of ESG indicators

Environmental Indicators I_{Envik}	Social Indicators I_{Soc}	CG Indicators I_{Cgk}
I_{Envi1} Environmental Supply Chain Management	I_{Soc1} Social Disclosure Score	I_{Cg1} Board Meeting Attendance
I_{Envi2} Environmental Quality Management Policy	I_{Soc2} Percentage of Women in Workforce	I_{Cg2} Size of the Board
I_{Envi3} UN Global Compact Signatory	I_{Soc3} Community Spending	I_{Cg3} Number of Board Meetings for the Year
I_{Envi4} GRI Criteria Compliance	I_{Soc4} Lost Time Incident Rate	I_{Cg4} Board Duration
I_{Envi5} Emissions Reduction Initiatives	I_{Soc5} Fatalities per 1000 employees	I_{Cg5} Independent Chairperson
I_{Envi6} Waste Reduction Policy	I_{Soc6} Employee Turnover	I_{Cg6} CEO Duality
I_{Envi7} Climate Change Policy	I_{Soc7} Business Ethics Policy	I_{Cg7} Total Compensation Paid to CEO and Equivalent
I_{Envi8} Total GHG Emissions	I_{Soc8} Human Rights Policy	I_{Cg8} Percentage of Independent Directors
I_{Envi9} Total Waste	I_{Soc9} Training Policy	I_{Cg9} Total Salaries and Bonuses Paid to Executives
I_{Envi10} Total Carbon Dioxide Emissions	I_{Soc10} Anti-Bribery Ethics Policy	I_{Cg10} Executive Compensation Linked to ESG
I_{Envi11} Energy Efficiency Policy	I_{Soc11} Policy Against Child Labor	I_{Cg11} Executive Director with Responsibility for CSR
I_{Envi12} Total Energy Consumption		I_{Cg12} CSR/Sustainability Committee
I_{Envi13} Total Water Use		I_{Cg13} Audit Committee Meetings
I_{Envi14} Biodiversity Policy		I_{Cg14} Size of Audit Committee
		I_{Cg15} Audit Committee Meeting Attendance Percentage
		I_{Cg16} Percentage of Female Executives
		I_{Cg17} Number of Women on Board

To balance the model, we used methodology developed by Hair et al. (2010). The model balance is assessed by the goodness-of-fit indices. The indices used are: chi-squared divided by degrees of freedom (χ^2/df), CFI (Comparative Fit Index), RMSEA (Root Mean Square Error of Approximation), NFI (Normed Fit Index), TLI (Tucker Lewis Index), GFI (Goodness of Fit Index) a IFI (Incremental Fix Index), see Table 3. According to the values of the criteria, the structural model can be accepted.

Based on the modelling of the relationships between ESG performance expressed by ESG factors and EVA, it can be argued that *ESG factors have a positive effect on EVA*. In the case of the social factor ($\beta = 0.02, p > 0.05$), however, the effect is statistically insignificant and thus does not unequivocally support the conclusions expressed in 1.2. Hypothesis H_2 formulating the assumption of a relationship between CSP and EVA is not supported by the data. The effect of environmental performance ($\beta = 0.44, p < 0.05$) and corporate governance ($\beta = 0.35, p < 0.05$) is statistically significant. Hypotheses H_1 and H_3 are supported.

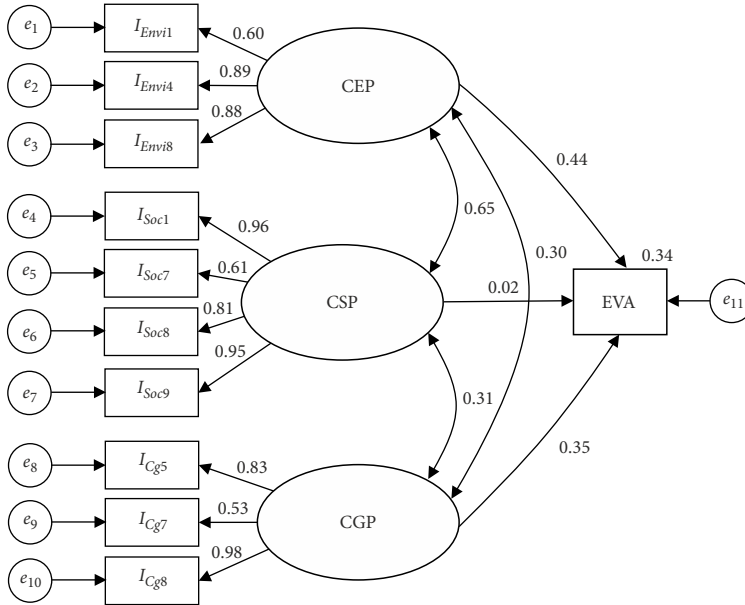


Figure 2. Structural model of the relationships between ESG factors and EVA

Table 3. Goodness-of-fit indices for the structure model between ESG factors and EVA

Index	Level of Acceptance (Bowen & Guo, 2011)	Results
χ^2	-	83.628
df	-	36
χ^2/df	≤ 3	2.323
CFI	> 0.9	0.922
RMSEA	< 0.08	0.069
NFI	> 0.9	0.908
TLI	> 0.9	0.937
GFI	> 0.9	0.965
IFI	> 0.9	0.925

The results of regression analysis, which is part of the structural model (Figure 2), showed that the ESG factors measured by selected indicators explain 34% of the variance of EVA ($R^2 = 0.34$). ESG factors express corporate responsibility and according to the theory (see e.g. Deng et al., 2013; Freudenreich et al., 2020) stakeholders are more willing to support the company and participate on value creation which leads to increased shareholder wealth (expressed by EVA). The model also shows the relationships between latent variables, i.e., factors CEP, CSP and CGP (relationships *a*, *b* and *c* in Figure 1). These relationships are statistically significant ($p < 0.05$): $a = 0.30$, $b = 0.65$, $c = 0.31$.

The measurement model consists of 10 key sustainability indicators. Using the factor analysis, the basic set of ESG indicators was therefore reduced by 76%. Two key indicators (I_{Env4} and I_{Soc1}) in the reduced set of ESG indicators are related to corporate reporting.

The theory asserts that these are indicators that positively affect sustainability (e.g., Orlitzky et al., 2003; Spirig, 2006). In their empirical study, Rao and Holt (2005) showed that green supply chain management (measured by I_{Envi1}) enhances competitiveness and leads to better economic performance. Khaksar et al. (2016) confirmed positive relationship between I_{Envi1} and environmental performance but their analysis revealed negative correlation with economic performance. I_{Envi8} expresses the negative output of a company’s activities whose minimization is thus desirable. I_{Soc7} and I_{Soc8} are in line with the basic responsible business principles of the UN Global Compact (UNGC, 2011), and are therefore positive indicators, i.e., indicators increasing sustainable value. Career development and employee training reflect positively upon employee satisfaction, work ethic, motivation, and productivity (Aguinis & Kraiger, 2009). For these reasons, I_{Soc9} is considered an indicator that positively affects sustainable value. The corporate governance indicators I_{Cg5} and I_{Cg8} relate to the structure and/or the independence of the Board of Directors. According to the principles of the G20/OECD (2017) and the recommendations of the European Commission (2005/162/EC), the element of independence should be part of the best practice and is generally considered a measure that protects the interests of shareholders and other stakeholders. The task of independent members, i.e., members who are not closely related to the controlling shareholders and management of the company through significant economic, family or other ties, is to monitor the performance and management of the company and, if necessary, challenge management decisions. In companies with distributed ownership, the primary concern is to ensure management responsibility.

Indicators I_{Envi1} , I_{Envi4} , I_{Envi8} , I_{Soc1} , I_{Soc7} , I_{Soc8} , I_{Soc9} , I_{Cg5} , I_{Cg7} and I_{Cg8} identified by the structural model (Figure 2). are used to calculate sustainable value ESGVA. If value-based indicators are referred to as the fourth development stage in the evaluation of corporate performance (e.g., Dluhošová, 2007), then the inclusion of sustainability is the next step. The ESGVA model is based on the integration of EVA and ESG indicators.

3.1. Case study

The presented case study demonstrates the difference in creating EVA and sustainable value ESGVA. Sustainable value is calculated according to the formula of Kocmanová et al. (2016).

Environmental, Social and Corporate Governance Value Added *ESGVA* is the sum of Environmental Value Added *ENVIVA*, Social Value Added *SOCVA* and Corporate Governance Value Added *CGVA*:

$$ESGVA = ENVIVA + SOCVA + CGVA; \tag{3}$$

$$ENVIVA = \sum_{k=1}^n w_k \left(\frac{EVA}{I_{Envik}} - \frac{EVA^*}{I_{Envik}^*} \right); \tag{4}$$

$$SOCVA = \sum_{k=1}^n w_k \left(\frac{EVA}{I_{Soc k}} - \frac{EVA^*}{I_{Soc k}^*} \right) I_{Soc k}; \tag{5}$$

$$CGVA = \sum_{k=1}^n w_k \left(\frac{EVA}{I_{Cgk}} - \frac{EVA^*}{I_{Cgk}^*} \right) I_{Cgk}. \tag{6}$$

On condition: $f(x) = \begin{cases} x, & x \neq 0 \\ EVA, & x = 0 \end{cases}$, where $x = \left(\frac{EVA}{I_{ESGk}} - \frac{EVA^*}{I_{ESGk}^*} \right) I_{ESGk}$. (7)

Then $ESGVA = \sum_{k=1}^n w_k x$, (8)

where n is the number of ESG indicators I_{ESGk} , EVA^* is the target value of economic value added EVA , I_{Envik}^* is the target value of the environmental indicator I_{Envik} , I_{Soc}^* is the target value of the social indicator I_{Soc} , I_{Cgk}^* is the target value of the CG indicator I_{Cgk} , and w_k is the weight of the k -th ESG of the indicator I_{ESGk} (I_{Envik} , I_{Soc} and I_{Cgk}), given that:

$$\sum_{k=1}^n w_k = 1 \text{ and } 0 \leq w_k \leq 1 \text{ for every } k = 1, \dots, n. \tag{9}$$

I_{ESGk} indicators (I_{ESGk} (I_{Env1} , I_{Env4} , I_{Env8} , I_{Soc1} , I_{Soc7} , I_{Soc8} , I_{Soc9} , I_{Cg5} , I_{Cg7} and I_{Cg8})) are identified by the structural model (Figure 2). Weights w_k of I_{ESGk} are determined from factor loadings and their values are presented in Table 4.

Table 4. Weights w_k of I_{ESGk}

I_{ESGk}	Factor loadings	w_k
I_{Env1}	0.544	0.100
I_{Env4}	0.594	0.109
I_{Env8}	0.641	0.118
I_{Soc1}	0.780	0.143
I_{Soc7}	0.555	0.102
I_{Soc8}	0.659	0.121
I_{Soc9}	0.393	0.072
I_{Cg5}	0.375	0.070
I_{Cg7}	0.470	0.086
I_{Cg8}	0.430	0.079
Σ	5.441	1.000

I_{ESGk} are used in the ESGVA model as input indicators. The fundamental idea of the sustainable value model is that inputs (resources) need to be minimized. For that reason, I_{Env1} , I_{Env4} , I_{Soc1} , I_{Soc7} , I_{Soc8} , I_{Soc9} , I_{Cg5} and I_{Cg8} indicators are transformed in such a way that they could be used as input indicators in the ESGVA model. The transformation of the I_{ESGk} indicators is performed in two ways:

- I_{Env1} , I_{Env4} , I_{Soc7} , I_{Soc8} and I_{Cg5} enter the ESGVA model negatively defined and the “not” value of these indicators is desirable, e.g., I_{Env1} is transformed as “The company does not have any environmental supply chain management”, I_{Env4} as “The company’s reporting does not comply with GRI criteria”, etc.
- I_{Soc1} reaches values (0; 1; 100) and I_{Cg8} with values (0; 100) in % are transformed to minimization indicators as $100 - x$.

Indicators that do not need to be transformed are I_{Env8} and I_{Cg7} .

The target values of EVA^* , I_{Envik}^* , I_{Sock}^* and I_{Cgk}^* are determined by the Data Envelopment Analysis (DEA). The DEA approach is used in benchmarking. The advantage of the method is that it can simultaneously handle multiple inputs and outputs which can be expressed in different units. The DEA method not only analyses efficiency, but part of the output is also the determination of target values of input and output variables for companies that are not efficient and does it for each and every company separately. The disadvantage of this approach is that its results are determined relative to the other companies in the sample and are therefore sensitive to what companies were selected. A perceived obstacle for the practical use of this approach could be the limited number of companies willing to release relevant data. In this work, the benchmark target values are set by the Slacks-Based Measure model (Cooper et al., 2006, 2011). Target values can also be set by other methods commonly employed in benchmarking: by using a fictitious company, average values, or the company with the best economic results.

The concept of sustainable value makes it possible to manage and evaluate sustainable performance in a similar way as economic capital, and expresses sustainability in monetary units (The Advance Project, 2006). The ESGVA model is applied to industrial enterprises. For benchmarking, 76 companies were selected. Data are obtained from the Bloomberg database. For decision making, it is appropriate to visualize the results in the context of selected competitors (Figure 3). Although AHT LN Equity, KLR LN Equity and SNR LN Equity have a positive EVA, the sustainable value ESGVA is negative, indicating that economic value is achieved at the expense of ESG sustainability prospects. HWDN LN Equity, HAS LN Equity, SMIN LN Equity and STHR LN Equity show a positive sustainable value ESGVA as well as a positive EVA.

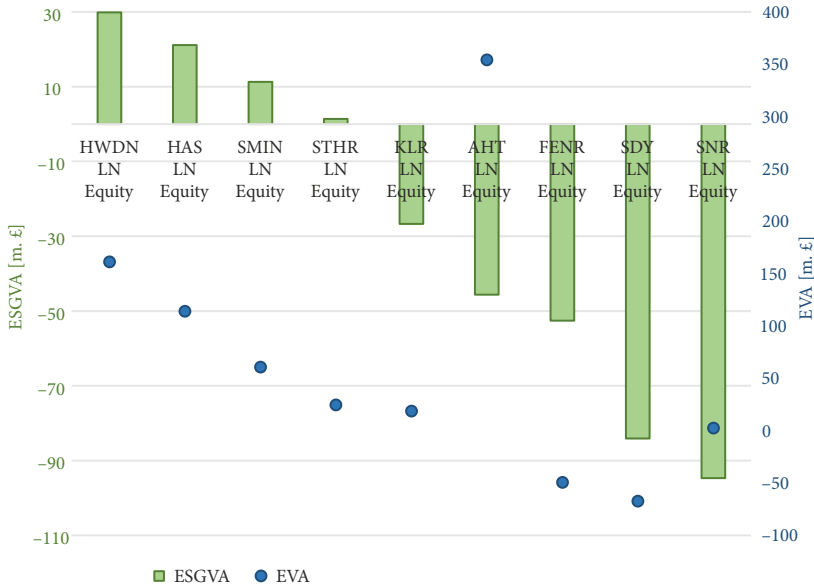


Figure 3. Added value in selected companies according to the ESGVA model and EVA

Conclusions

Value-oriented management focused on owners with the aim of maximizing equity value and the value-based indicators used do not reflect the sustainability of the company. Increasing emphasis on sustainable development intensifies stakeholder groups' demands for information on companies' sustainability and their non-financial performance (e.g., Socially Responsible Investing). Due to the pressure of stakeholder groups, value-creating effects of ESG factors are being increasingly appreciated in value management.

The aim of the paper was to investigate a relationship between sustainable value measured by ESG indicators and EVA. Structural modelling has answered the question of whether higher sustainability leads to an increase in shareholder wealth. The study has shown that there is no definite and unique relationship between corporate sustainability and economic value. Verification of the validity of the model does not unequivocally confirm the assumption of a causal relationship between ESG factors and EVA assumed by the stakeholder value theory. Based on the structural model, an ESGVA model is methodologically improved. The construction of the ESGVA model is based on the ESG integration strategy and value-based indicator EVA which is based on the basic idea that the invested capital must have a greater benefit than the cost of this capital. Values of the EVA and the ESG indicators are benchmarked against the values calculated by DEA method. The advantage of this approach is that the values are set specifically for each company which also makes the model data demanding.

The ESGVA model draws on the concept of SVA (Figge & Hahn, 2002, 2004, 2008; Hahn et al., 2007). Methodologically, sustainable value is based on the concept of opportunity costs. In the current corporate management, the concept of opportunity costs is applied only to the use of economic capital. Sustainable value extends the concept of opportunity costs to include other resources used for business activities and provides information on sustainability in the way managers and investors are used to. ESGVA model provides extra information on corporate performance and can be used for decision-making of individual investors. ESGVA model could also serve as a tool to measure, benchmark, and communicate corporate sustainability. The model is also applicable to comparative analysis of socially responsible investments. The case study demonstrates how different are the results obtained when the company value concept also incorporates ESG factors.

The ESGVA model is designed to measure and manage the sustainable value of listed companies for only one period which can be seen as a limitation of the model. Future research will be focused on development of a dynamic model which would calculate relative sustainable value of period t_1 and period t_0 . The result would help to better understand a change in the use of resources that contribute to increasing sustainable value.

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Author contributions

MPD and AK did conceptualization and methodology. AK and MPD performed formal analysis. MPD, AK, TM and SŠ were responsible for data collection, analysis, and interpretation. MPD wrote the first draft of the article and AK, TM and SŠ wrote review and did editing.

Disclosure statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- ADVANCE-project. (2006). *Sustainable value of European industry: A value-based analysis of environmental performance of European manufacturing companies* (Full version). www.advance-project.org/
- Aguinis, H., & Kraiger, K. (2009). Benefits of training and development for individuals and teams, organizations, and society. *Annual Review of Psychology*, 60(1), 451–474. <https://doi.org/10.1146/annurev.psych.60.110707.163505>
- Al-Tuwaijri, S., Christensen, T., & Hughes, K. E. (2004). The relations among environmental disclosure, environmental performance, and economic performance: A simultaneous equations approach. *Accounting, Organizations and Society*, 29(5), 447–471. [https://doi.org/10.1016/S0361-3682\(03\)00032-1](https://doi.org/10.1016/S0361-3682(03)00032-1)
- Ang, F., & Van Passel, S. (2010). The Sustainable Value approach: A clarifying and constructive comment. *Ecological Economics*, 69(12), 2303–2306. <https://doi.org/10.1016/j.ecolecon.2010.05.016>
- Artiach, T., Nelson, D., & Walker, J. (2010). The determinants of corporate sustainability performance. *Accounting & Finance*, 50(1), 31–51. <https://doi.org/10.1111/j.1467-629X.2009.00315.x>
- Axon, S., & James, D. (2018). The UN Sustainable Development Goals: How can sustainable chemistry contribute? A view from the chemical industry. *Current Opinion in Green and Sustainable Chemistry*, 13, 140–145. <https://doi.org/10.1016/j.cogsc.2018.04.010>
- Bergman, M. M., Bergman, Z., & Berger, L. (2017). An empirical exploration, typology, and definition of corporate sustainability. *Sustainability*, 9(5), 753. <https://doi.org/10.3390/su9050753>
- Bernal-Conesa, J., Nieves Nieto, C., & Briones-Penalver, A. (2017). CSR strategy in technology companies: Its influence on performance, competitiveness and sustainability. *Corporate Social Responsibility and Environmental Management*, 24(2), 96–107. <https://doi.org/10.1002/csr.1393>
- Bowen, K. N., & Guo, Sh. (2011). *Structural equation modeling*. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780195367621.001.0001>
- Branco, M. C., & Rodrigues, L. L. (2006). Corporate social responsibility and resource-based perspectives. *Journal of Business Ethics*, 69(2), 111–132. <https://doi.org/10.1007/s10551-006-9071-z>
- Burkert, M., & Lueg, R. (2013). Differences in the sophistication of value-based management – The role of top executives. *Management Accounting Research*, 24(1), 3–22. <https://doi.org/10.1016/j.mar.2012.10.001>
- Callens, I., & Tyteca, D. (1999). Towards indicators of sustainable development for firms: A productive efficiency perspective. *Ecological Economics*, 28(1), 41–53. [https://doi.org/10.1016/S0921-8009\(98\)00035-4](https://doi.org/10.1016/S0921-8009(98)00035-4)
- Carroll, B. A., & Shabana, K. (2010). The business case for corporate social responsibility: A review of concepts, research and practice. *International Journal of Management Reviews*, 12(1), 85–105. <https://doi.org/10.1111/j.1468-2370.2009.00275.x>

- Cooper, W. W., Seiford, L. M., & Tone, K. (2006). Introduction to Data Envelopment Analysis and its uses: With DEA-solver software and references. Springer.
- Cooper, W. W., Seiford, L. M., & Zhu, J. (2011). *Handbook on data envelopment analysis: International series in operations research & management science*. Springer.
<https://doi.org/10.1007/978-1-4419-6151-8>
- Cornell, B., & Shapiro, A. C. (1987). Corporate stakeholder and corporate finance. *Financial Management*, 16(1), 5–14.
- Cronqvist, H., Heyman, F., Nilsson, M., Svaleryd, H., & Vlachos, J. (2009). Do entrenched managers pay their workers more? *Journal of Finance*, 64(1), 309–339.
<https://doi.org/10.1111/j.1540-6261.2008.01435.x>
- Deev, O., & Khazalia, N. (2017). Corporate governance, social responsibility and financial performance of European insurers. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 65(6), 1873–1888. <https://doi.org/10.11118/actaun201765061873>
- Deng, X., Kang, J., & Sin Low, B. (2013). Corporate social responsibility and stakeholder value maximization: Evidence from mergers. *Journal of Financial Economics*, 110(1), 87–109.
<https://doi.org/10.1016/j.jfineco.2013.04.014>
- Dluhošová, D. (2007). Nové přístupy k měření finanční výkonnosti podniku. *Ekonomická revue*, X(2/3), 21–39.
- Dong, L., & Wong-On-Wing, B. (2021). Does causally linking nonfinancial measures influence investors' use of management's disclosures of nonfinancial information? *Accounting & Finance*, 61(S1), 2269–2299. <https://doi.org/10.1111/acfi.12662>
- Emilsson, L. M., Classon, M., & Bredmar, K. (2012). CSR and the quest for profitability: Using Economic Value Added to trace profitability. *International Journal of Economics and Management Sciences*, 2(3), 43–54.
- European Commission. (2005). *Commission Recommendation of 15 February 2005 on the role of non-executive or supervisory directors of listed companies and on the committees of the (supervisory) board (Text with EEA relevance) (2005/162/EC)*. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32005H0162>
- Falck, O., & Heblich, S. (2007). Corporate social responsibility: Doing well by doing good. *Business Horizons*, 50(3), 247–254. <https://doi.org/10.1016/j.bushor.2006.12.002>
- Fernández-Guadano, J., & Sarria-Pedroza, J. (2018). Impact of corporate social responsibility on value creation from a stakeholder perspective. *Sustainability*, 10(6), 2062.
<https://doi.org/10.3390/su10062062>
- Figge, F., & Hahn, T. (2002). *Sustainable value added – Measuring corporate sustainable performance beyond eco-efficiency*. Centrum Für Nachhaltigkeitsmanagement, Lüneburg, Germany.
- Figge, F., & Hahn, T. (2004). Sustainable Value Added – Measuring corporate contributions to sustainability beyond eco-efficiency. *Ecological Economics*, 48(2), 173–187.
<https://doi.org/10.1016/j.ecolecon.2003.08.005>
- Figge, F., & Hahn, T. (2008). The cost of sustainability capital and the creation of sustainable value by companies. *Journal of Industrial Ecology*, 9(4), 47–58. <https://doi.org/10.1162/108819805775247936>
- Fombrun, J. C., Gardberg, N. A., & Barnett, M. L. (2000). Opportunity platforms and safety nets: Corporate citizenship and reputational risk. *Business and Society Review*, 105(1), 85–106.
<https://doi.org/10.1111/0045-3609.00066>
- Freeman, R. E., Wicks, A. C., & Parmar, B. (2004). Stakeholder theory and “The corporate objective revisited”. *Organization Science*, 15(3), 364–369. <https://doi.org/10.1287/orsc.1040.0066>
- Freudenreich, B., Lüdeke-Freund, F., & Schaltegger, S. (2020). A stakeholder theory perspective on business models: Value creation for sustainability. *Journal of Business Ethics*, 166, 3–18.
<https://doi.org/10.1007/s10551-019-04112-z>

- Friedman, M. (1998). The social responsibility of business is to increase its profits. In L. B. Pincus (Ed.), *Perspectives in business ethics* (pp. 246–251). McGraw-Hill.
- Gallagher, W. M., & Brown, T. A. (2013). Introduction to confirmatory factor analysis and structural equation modeling. In T. Teo (Ed.), *Handbook of quantitative methods for educational research* (pp. 289–314). SensePublishers. https://doi.org/10.1007/978-94-6209-404-8_14
- Global Reporting Initiative, United Nations Global Compact, & World Business Council for Sustainable Development. (2015). *SDG Compass: The guide for business action on the SDGs*. (GRI, UNGC, WBCSD). https://sdgcompass.org/wp-content/uploads/2015/12/019104_SDG_Compass_Guide_2015.pdf
- Hahn, T., Figge, F., & Barkemeyer, R. (2007). Sustainable Value creation among companies in the manufacturing sector. *International Journal of Environmental Technology and Management*, 7(5–6), 496–512. <https://doi.org/10.1504/IJETM.2007.015627>
- Hair, F. J., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis. A global perspective*. Prentice Hall, Pearson Education.
- Hussain, N., Rigoni, U., & Orij, R. P. (2018). Corporate governance and sustainability performance: Analysis of triple bottom line performance. *Journal of Business Ethics*, 149, 411–432. <https://doi.org/10.1007/s10551-016-3099-5>
- Ionescu, G. H., Firoiu, D., Pirvu, R., & Vilag, R. D. (2019). The impact of ESG factors on market value of companies from travel and tourism industry. *Technological and Economic Development of Economy*, 25(5), 820–849. <https://doi.org/10.3846/tede.2019.10294>
- International Organization for Standardization. (2013). *Environmental management – Environmental performance evaluation – Guidelines* (ISO 14031:2013). <https://www.iso.org/obp/ui/#iso:std:iso:14031:ed-2:v1:en>
- Ittner, D. C., & Larcker, D. F. (2001). Assessing empirical research in managerial accounting: A value-based management perspective. *Journal of Accounting and Economics*, 32(1–3), 349–410. [https://doi.org/10.1016/S0165-4101\(01\)00026-X](https://doi.org/10.1016/S0165-4101(01)00026-X)
- Jawahar, I. M., & McLaughlin, G. L. (2001). Toward a descriptive stakeholder theory: An organizational life cycle approach. *Academy of Management Review*, 26(3), 397–414. <https://doi.org/10.5465/amr.2001.4845803>
- Jensen, C. M. (2001). Value maximization, stakeholder theory, and the corporate objective function. *Journal of Applied Corporate Finance*, 14(3), 8–21. <https://doi.org/10.1111/j.1745-6622.2001.tb00434.x>
- Kamble, S. S., Gunasekaran, A., & Gawankar, S. A. (2018). Sustainable industry 4.0 framework: A systematic literature review identifying the current trends and future perspectives. *Process Safety and Environmental Protection*, 117, 408–425. <https://doi.org/10.1016/j.psep.2018.05.009>
- Kashmanian, M. R., Wells, R. P., & Keenan, C. (2011). Corporate environmental sustainability strategy. *The Journal of Corporate Citizenship*, 44, 107–130.
- Khaksar, E., Abbasnejad, T., Esmaeili, A., & Tamošaitienė, J. (2016). The effect of green supply chain management practices on environmental performance and competitive advantage: A case study of the cement industry. *Technological and Economic Development of Economy*, 22(2), 293–308. <https://doi.org/10.3846/20294913.2015.1065521>
- Kocmanová, A. (2015). *Integrované hodnocení udržitelné výkonnosti podniku* [Integrated evaluation of sustainable corporate performance]. VUTIUM, Brno.
- Kocmanová, A., Pavláková Dočekalová, M., Škapa, S., & Smolíková, L. (2016). Measuring corporate sustainability and environmental, social, and corporate governance value added. *Sustainability*, 8(9), 1–13. <https://doi.org/10.3390/su8090945>
- Konar, S., & Cohen, M. A. (2001). Does the market value environmental performance? *Review of Economics and Statistics*, 83(2), 281–289. <https://doi.org/10.1162/00346530151143815>
- Kruse, C., & Lundbergh, S. (2010). The governance of corporate sustainability. *Rotman International Journal of Pension Management*, 3(2), 46–51. <https://doi.org/10.1007/s10551-013-1750-y>

- Kuosmanen, T., & Kuosmanen, N. (2009). How not to measure sustainable value (and how one might). *Ecological Economics*, 69(2), 235–243. <https://doi.org/10.1016/j.ecolecon.2009.08.008>
- Lev, B., & Gu, F. (2016). *The end of accounting and the path forward for investors and managers*. John Wiley & Sons. <https://doi.org/10.1002/9781119270041>
- Lisi, I. (2018). Determinants and performance effects of social performance measurement systems. *Journal of Business Ethics*, 152(1), 225–251. <https://doi.org/10.1007/s10551-016-3287-3>
- Lu, J., Ren, L., Zhang, C., Qiao, J., Kovacova, M., & Streimikis, J. (2020). Assessment of corporate social responsibility and its impacts on corporate reputation of companies in selected Balkan Countries former Yugoslavia States. *Technological and Economic Development of Economy*, 26(2), 504–524. <https://doi.org/10.3846/tede.2020.12069>
- Malmi, T., & Granlund, M. (2009). In search of management accounting theory. *European Accounting Review*, 18(3), 597–620. <https://doi.org/10.1080/09638180902863779>
- Margolis, D. J., Elfenbein, H. A., & Walsh, J. P. (2009). *Does it pay to be good...and does it matter? A meta-analysis of the relationship between corporate social and financial performance*. SSRN. <https://doi.org/10.2139/ssrn.1866371>
- Munir, A., Khan, F. U., Usman, M., & Khuram, S. (2019). Relationship between corporate governance, corporate sustainability and financial performance. *Pakistan Journal of Commerce and Social Sciences*, 13(4), 915–933.
- Nirino, N., Santoro, G., Miglietta, N., & Quaglia, R. (2021). Corporate controversies and company's financial performance: Exploring the moderating role of ESG practices. *Technological Forecasting and Social Change*, 162, 120341. <https://doi.org/10.1016/j.techfore.2020.120341>
- OECD. (2017). *Země G20/OECD Principy správy a řízení společností*. OECD Publishing. <https://doi.org/10.1787/9789264274075-cs>
- Orlitzky, M., Schmidt, F. L., & Rynes, S. L. (2003). Corporate social and financial performance: A meta-analysis. *Organization Studies*, 24(3), 403–441. <https://doi.org/10.1177/0170840603024003910>
- Pagano, M., & Volpin, P. F. (2005). Managers, workers, and corporate control. *Journal of Finance*, 60(2), 841–868. <https://doi.org/10.1111/j.1540-6261.2005.00748.x>
- Pavláková Dočekalová, M., & Kocmanová, A. (2016). Composite indicator for measuring corporate sustainability. *Ecological Indicators*, 61, 612–623. <https://doi.org/10.1016/j.ecolind.2015.10.012>
- Pavláková Dočekalová, M., & Kocmanová, A. (2018). Comparison of sustainable environmental, social, and corporate governance value added models for investors decision making. *Sustainability*, 10(3), 1–13. <https://doi.org/10.3390/su10030649>
- Perrini, F., Russo, A., Tencati, A., & Vurro, C. (2011). Deconstructing the relationship between corporate social and financial performance. *Journal of Business Ethics*, 102, 59–76. <https://doi.org/10.1007/s10551-011-1194-1>
- Potts, J., Lynch, M., Wilkings, A., Huppé, G., Cunningham, M., & Voora, V. (2014). *The state of sustainability initiatives review 2014: Standards and the green economy*. International Institute for Sustainable Development. https://www.iisd.org/system/files/pdf/2014/ssi_2014.pdf
- Raimo, N., de Nuccio, E., Giakoumelou, A., Petruzzella, F., & Vitolla, F. (2020). Non-financial information and cost of equity capital: An empirical analysis in the food and beverage industry. *British Food Journal*, 123(1), 49–65. <https://doi.org/10.1108/BFJ-03-2020-0278>
- Rao, P., & Holt, D. (2005). Do green supply chains lead to competitiveness and economic performance? *International Journal of Operations & Production Management*, 25(9), 898–916. <https://doi.org/10.1108/01443570510613956>
- Ren, S., Wei, W., Sun, H., Hu, Y., & Chen, X. (2020). Can mandatory environmental information disclosure achieve a win-win for a firm's environmental and economic performance? *Journal of Cleaner Production*, 250, 119530. <https://doi.org/10.1016/j.jclepro.2019.119530>

- Schaltegger, S., & Synnestvedt, T. (2002). The link between “green” and economic success: Environmental management as the crucial trigger between environmental and economic performance. *Journal of Environmental Management*, 65(4), 339–346. <https://doi.org/10.1006/jema.2002.0555>
- Schaltegger, S., Bennett, M., & Buritt, R. (2006). *Sustainability accounting and reporting*. Springer. <https://doi.org/10.1007/978-1-4020-4974-3>
- Schreiber, B. J., Amaury, N., Stage, F. K., Barlow, E. A., & King, J. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. *The Journal of Educational Research*, 99(6), 323–338. <https://doi.org/10.3200/JOER.99.6.323-338>
- Spirig, K. (2006). Social performance and competitiveness, a socio-competitive framework. In S. Schaltegger & M. Wagner (Eds.), *Managing the business case for sustainability* (pp. 82–106). Greenleaf Publishing.
- Stewart, G. B. (1991). *The quest for value*. HarperCollins Publishers.
- Surroca, J., & Tribó, J. A. (2008). Managerial entrenchment and corporate social performance. *Journal of Business Finance and Accounting*, 35(5–6), 748–789. <https://doi.org/10.1111/j.1468-5957.2008.02090.x>
- Tapaninaho, R., & Kujala, J. (2019). Reviewing the stakeholder value creation literature: Towards a sustainability approach. In Leal Filho, W. (Eds), *World sustainability series. Social responsibility and sustainability* (pp. 3–36). Springer, Cham. <https://doi.org/10.1007/978-3-030-03562-4>
- United Nations. (2017). *Global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development*. https://unstats.un.org/sdgs/indicators/Global%20Indicator%20Framework_A.RES.71.313%20Annex.pdf
- United Nations Global Compact (UNGC). (2011). *The ten principles of the UN Global Compact*. <https://www.unglobalcompact.org/what-is-gc/mission/principles>
- United Nations Industrial Development Organization (UNIDO). (2016). *The 2030 agenda and the Sustainable Development Goals: Achieving the industry-related goals and targets*. https://www.unido.org/sites/default/files/2015-12/ISID_SDG_brochure_final_0.pdf
- Vance, S. (1975). Are socially responsible firms good investment risks? *Management Review*, 64, 18–24.
- van Marrewijk, M., & Werre, M. (2003). Multiple levels of corporate sustainability. *Journal of Business Ethics*, 44(2–3), 107–119. <https://doi.org/10.1023/A:1023383229086>
- 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>
- Wood, J. D., & Jones, R. E. (1995). Stakeholder mismatching: A theoretical problem in empirical research on corporate social performance. *International Journal of Organizational Analysis*, 3(3), 229–267. <https://doi.org/10.1108/eb028831>