THE SUSTAINABILITY OF INNOVATION DRIVEN BY KPI: AN EMPIRICAL ANALYSIS

Graziella Sicoli *, Maria Assunta Baldini **, Maurizio Rija *

* Department of Business Administration and Law, University of Calabria, Rende, Italy
** *Corresponding author,* Department of Economics, Business and Statistics, University of Palermo, Palermo, Italy
Contact details: Department of Economics, Business and Statistics, University of Palermo, Viale delle Scienze, Building 13, 90128 Palermo, Italy

How to cite this paper:
Sicoli, S., Baldini, M. A., & Rija, M. (2025). The sustainability of innovation driven by KPI: An empirical analysis. *Corporate Ownership & Control, 22*(3), 169–176.
https://doi.org/10.22495/cocv22i3art13

ISSN Online: 1810-3057
ISSN Print: 1727-9232

Received: 13.07.2025
Revised: 10.10.2025; 25.10.2025
Accepted: 03.11.2025

JEL Classification: M14, Q56
DOI: 10.22495/cocv22i3art13

Abstract

Topics such as sustainable development, corporate social responsibility (CSR), and corporate innovation are increasingly important for maintaining corporate competitiveness. A growing number of companies recognize the need to inform their stakeholders about sustainable initiatives undertaken to safeguard the environment and the local area by adopting various approaches and strategies: cleaner technologies, new environmental management systems, energy efficiency initiatives, and carbon dioxide emission reductions. All these approaches are based on corporate innovation. We are facing a significant evolution that requires a paradigm shift in the way business is conducted, where innovation must not be oriented solely towards improving economic performance, but must also be geared towards achieving positive environmental and social outcomes. This is the context in which the two main drivers of corporate sustainable innovation emerge: sustainability on the one hand and innovation on the other. Both are of interest to companies regardless of size or sector. The challenge is daunting and requires communicating investments in sustainable innovation to gain greater market recognition and ensure a competitive advantage. Sustainable innovation has quickly attracted the attention of the academic world because, by integrating environmental, social, and economic dimensions, it can promote long-term value creation by balancing profit with social and environmental well-being, driving development towards more resilient and innovative business models. Studies empirically addressing the impact of sustainable innovation on corporate performance appear limited to date. For this reason, this paper aims to examine, on a sample of companies listed on the Italian Stock Exchange (Borsa Italiana), the extent to which investments in sustainable innovation improve corporate performance according to the sustainable innovation approach of "triple bottom line" (TBL). Three key performance indicators were established to delineate, in accordance with the TBL framework, the sustainable environmental, economic, and social performance of each organisation in the sample.

Keywords: Sustainability, Innovation, KPI, CSR, ESG

Authors' individual contribution: Conceptualization — G.S., M.A.B., and M.R.; Methodology — G.S., M.A.B., and M.R.; Validation — G.S., M.A.B., and M.R.; Formal Analysis — G.S., M.A.B., and M.R.; Investigation — G.S., M.A.B., and M.R.; Writing — Original Draft — G.S., M.A.B., and M.R.; Writing — Review & Editing — G.S., M.A.B., and M.R.; Visualization — G.S., M.A.B., and M.R.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

1. INTRODUCTION

Global challenges affecting the natural environment and society require companies to respond in both an innovative and sustainable way (Cillo et al., 2019). Companies are increasingly called upon to be leaders in social and environmental innovations, i.e., solutions designed to creatively address complex environmental and social issues, as well as prevent and manage the resulting business risks (Aghion et al., 2019). This phenomenon is rooted in multiple historical factors that have strongly influenced the sector, primarily environmental and social challenges, such as climate change and the depletion of natural resources, critical issues that have highlighted the need to rethink traditional production and consumption models. These issues require alternative solutions, favoring expedients that minimize negative impacts on the environment and society (Boons, 2013).

Sustainable innovation is becoming a fundamental concept supporting corporate strategies. This approach, aimed at ensuring business benefits, providing environmental benefits, and promoting social well-being, aims to meet the growing pressure from consumers and stakeholders who demand ethical and sustainable products and services (Carrillo-Hermosilla, 2010; Jha & Cox, 2015).

A growing number of companies feel the need to communicate to their stakeholders the sustainable innovative activities undertaken and implemented to protect the environment and the territory (Scott & McGill, 2018).

To promote the sustainability of innovation, companies use different approaches and strategies, both with reference to production processes and business practices. They adopt cleaner technologies, implement new environmental management systems, promote energy efficiency, and CO2 reduction measures.

It is a series of activities that, on the one hand, promote the sustainability of innovation and, on the other hand, help to increase the market share and revenues from the sales of the company's products, which incentivize innovations in the future (Triguero & Córcoles, 2013).

There are two drivers that play a central role in the sustainability of corporate innovation: sustainability on the one hand and innovation on the other. Both concern companies regardless of the production sector and company size. The challenge is demanding because it requires a new production and consumption model which, integrating as much as possible with the fourth industrial revolution, uses all the opportunities of digital transformation, makes the business system more efficient, guarantees a better quality of life and the environment, and safeguards the three pillars on which sustainability is based: economic, social and environmental.

It is difficult to accurately measure the effects of innovation sustainability on corporate performance; it can only be said that, thanks to innovations, companies use their inputs more efficiently, eliminate useless materials, and reduce the emission of polluting substances. All this creates value for the company and for the stakeholders (Ambec & Lanoie, 2008).

Firms that promote sustainable innovation are expected to perform better than others in the market (Bewleye & Li, 2000).

Disclosure of sustainable innovations communicated in sustainability reports allows companies to be more appreciated by the market, to have lower financial volatility, and to achieve greater sales growth (Schramade, 2017). For this reason, some authors have analyzed whether and to what extent the disclosure of sustainable innovation communicated through the sustainability report influences the competitiveness and success of the company by improving its performance levels (Hermundsdottir & Aspelund, 2020).

The study we propose intends to analyze the effects of innovation on the performance of economic, environmental, and social sustainability for a sample of companies listed on the Italian Stock Exchange (Borsa Italiana). The hypothesis formulated is the following:

H1: There is a relationship between the disclosure of environmental, economic, and social sustainable innovation and the corporate performance of companies.

Through a detailed analysis of the sustainability reports of the sample companies, the paper aims to analyze whether there is a positive relationship between the disclosure of innovation sustainability and company performance.

Three key performance indexes (KPI) were developed with the aim of describing, following the triple bottom line (TBL) approach, the sustainable environmental performance, the sustainable economic performance, and the sustainable social performance of each company in the sample.

The results of the analysis contribute to the existing literature on the topic and demonstrate that companies listed on the Italian Stock Exchange pay varying degrees of attention to sustainable innovation activities and investments. Interest in strategic choices that incentivize good environmental and economic sustainability practices appears to prevail over the attention paid to the social sphere by the companies in the sample.

The paper is organized as follows: after a brief introduction to the topic, Section 2 analyzes the main studies in the literature. Section 3 defines the sample and provides the methodology used to implement the study. Section 4 presents the research results and discusses them. Section 5 concludes the paper.

2. LITERATURE REVIEW

Companies need to strengthen their image through the disclosure of the sustainability of innovation. Bradford et al. (2017) argue that the corporate sustainability report represents a useful tool in this sense.

Due to the lack of reporting standards on sustainable innovative disclosure, a great variability is observed among companies in the forms, levels, and quality of the information provided to stakeholders, which, at times, also casts doubts on the reliability of the tool (Tschopp, 2005). Nyquist (2003), in fact, underlines the importance of the reliability of this type of information.

The disclosure of innovative best practices that promote the sustainability of innovation is also often used as a tool to improve the legitimacy of a company in the event of poor performance. In fact, the dissemination of qualitative and quantitative information that measures the sustainable innovative impact of a company on the territory in which it operates is of particular importance (Burritt, 2002).

Some scholars believe that disclosure on sustainable innovation reduces information asymmetry and the cost of capital. As a result, it improves the company's ability to tap into external finance, thus influencing sustainable innovative investments. Richardson and Welker (2001), in their research, have also found that the disclosure of information on sustainable innovation reduces the information asymmetry and, therefore, the cost of equity.

Greater disclosure of information on sustainable innovation improves the quality of accounting information, thereby reducing information asymmetries between executives and shareholders. A better accounting and non-accounting information environment helps to accelerate the decision-making process of sustainable innovation (Jensen & Meckling, 1976; Hoepner et al., 2016; Benlemlih & Girerd-Potin, 2017).

Peters (2009) conducted a regression analysis on the impact of research and development (R&D) expenditures on business innovation and found that the higher the R&D investment made by firms in the past, the higher the probability that the same companies continue to invest in sustainable innovation activities also in the future.

Information on sustainable innovations can be disseminated and communicated in physical quantities or in value and through various channels: from corporate websites to narrative reporting where companies can choose which information to disseminate and which to suppress (Dye, 1985; Carrión-Flores & Innes, 2010).

In the literature, one often wonders whether the sustainable innovation in which companies invest has an impact on company performance results. The results that empirical research arrives at are often contradictory.

Clarkson et al. (2008), Dawkins and Fraas (2011), and Al-Tuwaijri et al. (2004) all observe a positive correlation, Cho and Patten (2007) and Hughes et al. (2001) in disagreement.

While Ingram and Frazier (1980), Freedman and Wasley (1990), and Fekrat et al. (1996) find no significant link between these factors, Aerts and Cormier (2009) and Clarkson et al. (2011) show a negative relationship.

Le Bas and Poussing (2014) in their studies found that the size of the company affects the sustainability of innovation; in fact, the bigger the company, the greater the investments made in this sense.

For Christensen (2019), innovation becomes an important asset that helps to ensure sustainability. Other scholars are also of the same opinion and underline the importance of innovation in the pursuit of sustainability and the Sustainable Development Goals (SDGs) of Agenda 2030 (Christensen, 2019; Nill & Kemp, 2009; Nidumolu et al., 2013).

Dealing with environmental problems is considered the main challenge that companies are called upon to respond to. Unsustainable behavior causes the depletion and depletion of natural resources (Hall et al., 2010). Organizational actions and corporate behaviors that respect the environment and the local area have become of vital importance also by virtue of the external and internal pressures for which governments, environmental and local agencies, shareholders, employees, and customers are the spokesmen (Weng et al., 2015). Therefore, all companies are called to implement actions to protect the environment from the effects of their activities; only in this way will they have a central role in the creation of value and a more sustainable future.

Despite the studies that analyze how innovation contributes to sustainability, helping to generate economic, social, and environmental objectives, the results to which research leads are often difficult to demonstrate in different contexts (Nill & Kemp, 2009).

Studies addressing the transition from innovation to sustainability (Leach et al., 2012); others, however, analyze environmental innovation as a transition towards sustainability (Truffer & Coenen, 2012); still others, through empirical analyses, demonstrate the impact of innovation and the sustainable approach on corporate sustainability performance (De et al., 2019).

Carnegie et al. (2022) in their studies underline the importance of an accounting that is conceived as a technical, social, and moral practice that deals with the sustainable use of resources and correct accountability towards stakeholders.

To understand the contribution of each company to the sustainability of innovation and to the realization of the three dimensions of the TBL, some studies suggest (Topple et al., 2017; Gomez-Bezares et al., 2017; Sullivan et al., 2018; Ike et al., 2019) that the sustainability report, prepared according to the standards of the Global Reporting Initiative (GRI), represents the most suitable tool (Bebbington & Unerman, 2018; Rosati & Faria, 2019; Szennay et al., 2019; García-Sanchez et al., 2020).

It has a very important role in the disclosure of the sustainability of innovation. The disclosure of the sustainability of innovations allows companies to be more appreciated by the market, to have less financial volatility, and to achieve greater sales growth (Schramade, 2017).

For this reason, several authors have analyzed whether and to what extent the disclosure of the sustainability of the innovation communicated through the sustainability report affects the company's competitiveness and success, improving its performance levels (Hermundsdottir & Aspelund, 2020).

Boons (2013) argue that sustainable innovations, when communicated to stakeholders, improve competitiveness and performance results. Carrillo-Hermosilla et al. (2010) argue that comprehensive communication of sustainable innovation improves environmental performance.

3. SAMPLE AND METHODOLOGY

3.1. Sample

The research analyzed the sustainability reports drawn up in the period 2018–2021 by companies listed on the Italian Stock Exchange, as well as their websites, to understand if they contain information on innovative sustainability. The analysis was conducted on listed companies because they were larger; in fact, companies with greater capitalization and larger size are more careful in communicating this type of information to the public (Hahn & Kühnen, 2013).

The companies listed on the Italian Stock Exchange are currently 229, grouped in relation to 20 different sectors. It was not possible to find a sustainability report for all listed companies and for all years. Therefore, the sample studied is made

up of 119 companies that draw up a Sustainability Report for the period in question, which contains information on the three areas of sustainable development (economic, social, and environmental) as well as on the innovative activities associated with it.

3.2. Methodology

To achieve the research objective, three linear regression models (ordinary least squares, OLS) were used. The data was collected through content analysis (Krippendorff, 2004). The content analysis was done on sustainability reports since these are the most used disclosure documents to disseminate voluntary information on sustainable innovative activity (Morioka et al., 2018; Lozano, 2012).

The content analysis made it possible to assign a score to each of the companies examined, both in relation to their ability to report information with respect to the three different areas of sustainable development (economic, social, and environmental) and with reference to the attention that each company pays to sustainable innovative activities, as also stated by the Italian Ministry of Economic Development.

3.3. Data collection

A careful reading of the sustainability reports (Guthrie et al., 2004) has brought to light a set of detailed information, even if not always concentrated in the same section of the document, concerning activities and investments made in the three different areas of sustainable development.

To more specifically identify all the activities and investments in sustainable innovation promoted by each company in the sample, account was taken of the descriptions provided by the Ministry of Economic Development and other bodies that deal with sustainability in an innovative key and a study conducted by Censimprese in collaboration with Istat on the subject of innovation and sustainable development and the KPI built based on a study conducted by Hristov and Chirico (2019).

Subsequently, a dataset of words was built, the most representative of the sustainability of innovation (Calabrese et al., 2021), which was used for the content analysis (Guthrie et al., 2004).

In the study conducted, in relation to the documents analysed, the quality of the space dedicated by each company to sustainable innovative activity was not taken into account. For this type of information, among other things, companies adapt the form, type, and length, based on various reference standards (such as the GRI standards) and stakeholder expectations (maternity analysis). Therefore, the quantity and quality of information can vary from one company to another.

4. RESULTS AND DISCUSSION

4.1. Analysis and descriptive statistics

To achieve the research objective, the following basic equations have been defined to represent the main variables that influence the company's sustainable performance:

$$Score = \alpha + \beta_1(ln\_size) + \beta_2(regulatory) + \beta_3(collocation) + \beta_4(s.index\_social) + \varepsilon \quad (1)$$

$$Score = \alpha + \beta_1(ln\_size) + \beta_2(regulatory) + \beta_3(collocation) + \beta_4(s.index\_environ) + \varepsilon \quad (2)$$

$$Score = \alpha + \beta_1(ln\_size) + \beta_2(regulatory) + \beta_3(collocation) + \beta_4(s.index\_economic) + \varepsilon \quad (3)$$

The dependent variable used in the OLS model is represented by a score representative of the scores assigned to the disclosure of sustainable innovation following the TBL approach (environmental, economic, and social sustainability).

The main explanatory variables are made up of three different KPI, each of which has the objective of describing the sustainable performance of companies in terms of environmental, economic, and social sustainability.

The first KPI concerns environmental sustainability performance and was constructed by comparing the CO2 emissions of each listed company with the related share capital.

$$S.index\_environ = (CO2/CS) * 1000 \quad (4)$$

The KPI of economic sustainability performance is simply an expression of the operating profit achieved by each company for each year under study.

Finally, the KPI of social sustainability performance was constructed by relating the number of female employees to the number of male employees:

$$S.index\_social = n.femal\ employees / n.male\ employees \quad (5)$$

The remaining explanatory variables collected are the result of a dichotomization (necessary to investigate the qualitative aspects). The regulatory variable aimed at representing the implementation of the legislation takes on the value 1 if the non-financial statement (NFS) is drawn up in accordance with the legislative decree that determines its obligation (Legislative Decree No. 254 of 2016[1]) or if the document is drawn up on a voluntary basis.

The collocation variable takes on the value 1 if the NFS is drawn up as an independent document in its own right, 0 if it is an integral part of another corporate document.

As control variables, a variable *ln_size* was taken into account, expressing the size of the company in terms of total assets.

4.2. Results discussion

Table 1, with reference to the 119 companies analyzed that draw up the Sustainability Report, observed for 2018–2021, reports the model estimates.

[1] Italy's Legislative Decree No. 254 of 2016 (or Decreto Legislativo 254/2016) is the national law that implemented the European Union's Directive 2014/95/EU (the Non-Financial Reporting Directive). This decree mandates certain large public interest entities to publish an annual non-financial statement (NFS) regarding their operations.

Table 1. Regression model, sustainability performance, and sustainability disclosure

Variable	*Score (1)*	*Score (2)*	*Score (3)*
Const	98.443** (43.5035)	83.5329* (42.6779)	89.5234** (40.0631)
Ln_size	4.63832*** (1.52408)	5.04208*** (1.44931)	4.36466*** (1.42036)
Regulatory	-55.5609** (26.8987)	-65.4218** (26.7632)	-69.1773*** (25.2345)
Collocation	69.3093*** (24.8427)	65.1075*** (24.2745)	64.2143*** (22.7012)
S.index_social	-22.6710*** (7.23106)		
S.index_environ		0.0727838 (0.261826)	
S.index_economic			0.0621700*** (0.0078409)
R-squared	0.061748	0.049242	0.155207
Observation	463	475	471

*Note: * p < 0.10; ** p < 0.05; *** p < 0.01.*
Source: Authors' elaboration.

For the first model, the *s.index_social* variable, representative of social sustainable performance, is assigned a negative coefficient, which denotes a negative link between social sustainable performance and sustainable disclosure. The variable is significant for alpha values of 0.10, 0.05, and 0.01. This result leads us to think that the link that exists between the disclosure of sustainable innovation and social performance is negative and that the disclosure of this type of information does not bring any advantage to sustainable social performance, as various studies on the subject demonstrate (Yang et al., 2022; Ingram & Frazier, 1980; Fekrat et al., 1996).

The control variable *ln_size*, representative of the company size, returns a positive coefficient, highlighting a positive influence on sustainable disclosure. The same turns out to be significant for alpha values equal to 0.10, 0.05, and 0.01.

As regards the regulatory and collocation variables, the coefficients returned show opposite values. In the first case, there is a negative link between the variable and sustainable disclosure, and it is significant for alpha values of 0.10 and 0.05. In the second case, however, the coefficient highlights a positive link with sustainable disclosure; furthermore, as emerges from a comparison between the critical values of alpha (0.10, 0.05, and 0.01) and the p-value, the variable is significant.

As regards the second model, the variable *s.index_environ*, representative of the sustainable environmental performance, is assigned a positive coefficient. From this, it can be stated that there is a positive, albeit not significant, link between sustainable environmental performance and sustainable disclosure. This relationship, although not significant, denotes how the disclosure of sustainable innovation is linked to the competitiveness of companies and to performance, having a positive impact and promoting healthy sustainable development (Chouaibi et al., 2021; Boons, 2013; Danish, 2021).

The *ln_size* control variable also returns a positive coefficient, positively influencing sustainable disclosure. The same turns out to be significant for alpha values equal to 0.10, 0.05, and 0.01.

As far as the regulatory and collocation variables are concerned, the coefficients returned are once again with the opposite sign. In the first case, there is a negative link between the variable and sustainable disclosure; the same turns out to be significant for alpha values equal to 0.10 and 0.05. In the second case, the coefficient highlights a positive link with sustainable disclosure; this variable is also significant.

Finally, for the third model, the variable *s.index_economic*, representative of the sustainable economic performance, is assigned a positive coefficient, which denotes a positive connection between the sustainable economic performance and the sustainable disclosure. This positive relationship between the sustainable disclosure of innovation and firm performance is in line with some studies on the subject, which argue that the disclosure of this type of information for firms positively affects performance (Yin et al., 2019; Dawkins & Fraas, 2011; Clarkson et al., 2008; Al-Tuwaijri et al., 2004).

The *ln_size* control variable returns a positive coefficient, highlighting a positive link with the sustainable disclosure.

As far as the regulatory and collocation variables are concerned, the coefficients returned have the opposite sign. In the first case, there is a negative link between the variable and sustainable disclosure. In the second case, the coefficient highlights a positive link with sustainable disclosure. All the variables of the third of the last model also turn out to be significant, as emerges from a comparison between the critical values of alpha (0.10, 0.05, and 0.01) and the p-value.

As regards the goodness of fit of the three models, the largest R-squared is highlighted for the third and last model, with a value equal to 0.155207. Furthermore, to avoid collinearity problems, the variance inflation factor (VIF) test was performed on each single model, finding values that are around one and which, therefore, highlight the absence of collinearity between the variables (Table 2).

Table 2. VIF test for models

Variable	*(1)*	*(2)*	*(3)*
Ln_size	1.023	1.012	1.016
Regulatory	1.020	1.010	1.011
Collocation	1.022	1.039	1.022
S.index_social	1.021		
S.index_environ		1.017	
S.index_economic			1.005

Source: Authors' elaboration.

The results to which the work arrives support our research question. In fact, the activities and investments in sustainable innovation carried out by the sample companies and communicated in the sustainability reports improve the companies' performance.

With reference to the sustainable environmental and economic sphere, we can state that there is a positive relationship between the disclosure of innovation in a sustainable key and sustainable corporate performance. As attention grows towards best practices that protect the environment, health, and the local area, disclosure increases with a positive impact on the company's sustainable performance.

This attention does not represent a trend for companies, but a development guideline necessary to respond to an increasingly attentive consumer and an increasingly stringent regulatory framework. All of this can open up the possibility of new business opportunities for companies and become a competitive lever.

The same thing cannot be said with reference to the social sphere, since the results that the analysis returns show a negative relationship between socially sustainable performance and the disclosure of sustainable innovation.

In fact, contrary to what one might imagine, the more companies pay attention to the disclosure of the social sphere, the more the relationship with sustainable social performance tends to shrink.

The analysis carried out shows that the attention of the companies in the sample with respect to the sustainability of innovation is different. Despite everything, the interest in strategic choices that encourage good environmental and economic sustainability practices by each company seems to prevail over the attention dedicated to the social sphere.

In any case, companies can only benefit from the disclosure of the sustainability of innovation, which can inhibit corporate irregularities and improve the transparency of information, increasing the trust of stakeholders by making them understand the actual conditions of good functioning of companies, the corporate reputation thus increasing the motivation to invest in the sustainability of innovation.

Our analysis allows us to affirm that innovation is one of the best tools available for companies today to achieve organizational and economic growth, as it provides key differentiators to meet or create a need and compete in the market, surviving, growing, and thriving sustainably. Companies committed to sustainable innovation go beyond immediate revenues, as investments in sustainable innovation, if well-managed, generate rapid returns.

Any innovation that promotes sustainable development models protects the environment and the land, improves the quality of life, increases levels of profitability, eases the pressures of stakeholders without sacrificing profit.

5. CONCLUSION

The studies that empirically address the impact that the sustainability of innovation has on business performance still appear limited and certainly require further investigation in the future.

The work contributes to the scientific debate on the topic of sustainability-oriented innovation by suggesting to what extent investments in sustainable activities and innovation, carefully considered by each company, if appropriately communicated, influence the performance of companies according to the TBL approach.

Based on the data collected through the content analysis, three linear regression models (OLS) were implemented. For each of the three areas of the TBL (environmental, economic, and social sustainability), three different KPIs have been constructed, taking into account the studies proposed by Hristov and Chirico (2019).

In light of the analysis conducted, the work allows us to suggest to all companies a greater effort in promoting the disclosure of their economic, environmental, and social responsibilities, not only to meet the requirements of the policy, but above all to provide the market with a positive example of their responsible action.

To encourage disclosure of the sustainability of innovation, we encourage listed companies to improve their sense of responsibility towards society and to combine their development by pursuing their economic advantages while protecting the interests of stakeholders interested in the company itself.

Governments should also do their part by issuing laws, regulations, and rigorous policies to improve the disclosure of the sustainability of innovation, not only by large companies, but with reference to every company's production reality, in order to promote its image and reliability.

Although the research offers food for thought, it does not lack some limitations. First, the analysis should be extended to a wider range of companies; secondly, the behavior of the variables observed with reference to companies present in different countries could be studied in more detail. Future studies could take this into consideration and improve on existing knowledge.

Compared to existing studies, this paper approaches sustainable innovation as a new business model aimed at creating long-term value by integrating environmental, social, and economic aspects, redefining products, processes, and operating models to decouple economic growth from negative environmental impacts. This model increases competitiveness and efficiency, while also enhancing reputation and opening up new growth opportunities, while also addressing growing consumer demand for more sustainable products and services.

REFERENCES

Aerts, W., & Cormier, D. (2009). Media legitimacy and corporate environmental communication. Accounting. *Organizations and Society, 34*(1), 1–27. https://doi.org/10.1016/j.aos.2008.02.005

Aghion, P., Akcigit, U., Bergeaud, A., Blundell, R., & Hermous, D. (2019). Innovation and top income inequality. *The Review of Economic Studies, 86*(1), 1–45. https://doi.org/10.1093/restud/rdy027

Al-Tuwaijri, S. A., Christensen, T. E., & Hughes, K. E. (2004). The relations among environmental disclosure, environmental performance, and economic performance: A simultaneous equations approach. *Accounting, Organizations and Society, 29*(5–6), 447–471. https://doi.org/10.1016/S0361-3682(03)00032-1

Ambec, S., & Lanoie, P. (2008). Does it pay to be green? A systematic overview. *Academy of Management Perspectives, 22*(4), 45–62. https://doi.org/10.5465/amp.2008.35590353

Bebbington, J., & Unerman, J. (2018). Achieving the United Nations Sustainable Development Goals: An enabling role for accounting research. *Accounting Auditing & Accountability Journal, 31*(1), 2–24. https://doi.org/10.1108/AAAJ-05-2017-2929

Benlemlih, M., & Girerd-Potin, I. (2017). Corporate social responsibility and firm financial risk reduction: On the moderating role of the legal environment. *Journal Business Finance & Accounting, 44*(7–8), 1137–1166. https://doi.org/10.1111/jbfa.12251

Bewley, K., & Li, Y. (2000). Disclosure of environmental information by Canadian manufacturing companies: A voluntary disclosure perspective. In *Advances in environmental accounting & management* (Vol. 1, pp. 201–226). https://doi.org/10.1016/S1479-3598(00)01011-6

Boons, F. M. (2013). Sustainable innovation, business models and economic performance: An overview. *Journal of Cleaner Production, 45*, 1–8. https://doi.org/10.1016/j.jclepro.2012.08.013

Bradford, M., Earp, J. B., Showalter, D. S., & Williams, P. F. (2017). Corporate sustainability reporting and stakeholder concerns: Is there a disconnect? *Accounting Horizons, 31*(1), 83–102. https://doi.org/10.2308/acch-51639

Burritt, R. L. (2002). Environmental reporting in Australia: current practices and issues for the future. *Business Strategy and the Environment, 11*(6), 391–406. https://doi.org/10.1002/bse.343

Calabrese, A., Costa, R., Gastaldi, M., Levialdi Ghiron, N., & Villazon Montalvan, R. A. (2021). Implications for Sustainable Development Goals: A framework to assess company disclosure in sustainability reporting. *Journal of Cleaner Production, 319*, Article 128624. https://doi.org/10.1016/j.jclepro.2021.128624

Carnegie, G. D., Ferri, P., Parker, L. D., Sidaway, S. I. L., & Tsahuridu, E. E. (2022). Accounting as technical, social and moral practice: The monetary valuation of public cultural, heritage and scientific collections in financial reports. *Australian Accounting Review, 32*(4), 460–472. https://doi.org/10.1111/auar.12371

Carrillo-Hermosilla, J. D. (2010). Diversity of eco-innovations: Reflections from selected case studies. *Journal of Cleaner Production, 18*(10–11), 1073–1083. https://doi.org/10.1016/j.jclepro.2010.02.014

Carrión-Flores, C. E., & Innes, R. (2010). Environmental innovation and environmental performance. *Journal of Environmental Economics and Management, 59*(1), 27–42. https://doi.org/10.1016/j.jeem.2009.05.003

Cho, C. H., & Patten, D. M. (2007). The role of environmental disclosures as tools of legitimacy: A research note. *Accounting, Organizations and Society, 32*(7–8), 639–647. https://doi.org/10.1016/j.aos.2006.09.009

Chouaibi, S., Rossi, M., Siggia, D., & Chouaibi, J. (2021). Exploring the moderating role of social and ethical practices in the relationship between environmental disclosure and financial performance: Evidence from ESG companies. *Sustainability, 14*(1), Article 209. https://doi.org/10.3390/su14010209

Christensen, C. M. (2019). *O dilema da inovação. Quando as novas tecnologias levam as empresas ao fracasso* [The innovation dilemma: When new technologies lead companies to failure]. M.Books.

Cillo, V., Petruzzelli, A. M., Ardito, L., & Del Giudice, M. (2019). Understanding sustainable innovation: A systematic literature review. C*orporate Social Responsibility and Environmental Management, 26*(5), 1012–1025. https://doi.org/10.1002/csr.1783

Clarkson, P. M., Li, Y., Richardson, G. D., & Vasvari, F. P. (2008). Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis. *Accounting, Organizations and Society, 33*(4–5), 303–327. https://doi.org/10.1016/j.aos.2007.05.003

Clarkson, P. M., Overell, M. B., & Chapple, L. (2011). Environmental reporting and its relation to corporate environmental performance. *Abacus, 47*(1), 27–60. https://doi.org/10.1111/j.1467-6281.2011.00330.x

Danisch, C. (2021). The relationship of CSR performance and voluntary CSR disclosure extent in the German DAX Indices. *Sustainability, 13*(9), Article 4904. https://doi.org/10.3390/su13094904

Dawkins, C, & Fraas, J. W. (2011). Coming clean: The impact of environmental performance and visibility on corporate climate change disclosure. *Journal of Business Ethics, 100*(2), 303–322. https://doi.org/10.1007/s10551-010-0681-0

De, D., Chowdhury, S., Dey, P. K., & Ghosh, S. K. (2019). Impact of lean and sustainability oriented innovation on sustainability performance of small and medium sized enterprises: A data envelopment analysis-based framework. *International Journal of Production Economics, 219*, 416–430. https://doi.org/10.1016/j.ijpe.2018.07.003

Dye, R. A. (1985). Disclosure of nonproprietary information. *Journal of Accounting Research, 23*(1), 123–145. https://doi.org/10.2307/2490910

Fekrat, M. A., Inclan, C., & Petroni, D. (1996). Corporate environmental disclosures: Competitive disclosure hypothesis using 1991 annual report data. *The International Journal of Accounting, 31*(2), 175–195. https://doi.org/10.1016/S0020-7063(96)90003-5

Freedman, M., & Wasley, C. E. (1990). The association between environmental performance and environmental disclosure in annual reports and 10Ks. *Advances in Public Interest Accounting, 3*(2), 183–193. https://www.econbiz.de/Record/the-association-between-environmental-performance-and-environmental-disclosure-in-annual-reports-and-10ks-freedman-martin/10001090913

García-Sánchez, I.-M., Rodríguez-Ariza, L., Aibar-Guzmán, B., & Aibar-Guzmán, C. (2020). Do institutional investors drive corporate transparency regarding business contribution to the Sustainable Development Goals? *Business Strategic Environment, 29*(5), 2019–2036. https://doi.org/10.1002/bse.2485

Gomez-Bezares, F., Przychodzen, W., & Przychodzen, J. (2017). Bridging the gap: How sustainable development can help companies create shareholder value and improve financial performance. *Business Ethics: A European Review, 26*(1), 1–17. https://doi.org/10.1111/beer.12135

Guthrie, J., Petty, R., Younguanich, K., & Ricceri, F. (2004). Using content analysis as a research method to inquire into intellectual capital reporting. *Journal of Intellectual Capital, 5*(2), 282–293. https://doi.org/10.1108/14691930410533704

Hahn, R., & Kühnen, M. (2013). Determinants of sustainability reporting: A review of results, trends, theory, and opportunities in an expanding field of research. *Journal of Cleaner Production, 59*, 5–21. https://doi.org/10.1016/j.jclepro.2013.07.005

Hall, J. K., Daneke, G. A., & Lenox, M. J. (2010). Sustainable development and entrepreneurship: past contributions and future directions. *Journal of Business Venturing, 25*(5), 439–448. https://doi.org/10.1016/j.jbusvent.2010.01.002

Hermundsdottir, F., & Aspelund, A. (2020). Sustainability innovations and firm competitiveness: A review. *Journal of Cleaner Production, 280*, Article 124715. https://doi.org/10.1016/j.jclepro.2020.124715

Hoepner, A., Oikonomou, I., Scholtens, B., & Schröder, M. (2016). The effects of corporate and country sustainability characteristics on the cost of debt: An international investigation. *Journal Business Finance & Accounting, 43*(1–2), 158–190. https://doi.org/10.1111/jbfa.12183
Hristov, I., & Chirico, A. (2019). The role of sustainability Key Performance Indicators (KPIs) in implementing sustainable strategies. *Sustainability, 11*(20), Article 5742. https://doi.org/10.3390/su11205742
Hughes, S. B., Anderson, A., & Golden, S. (2001). Corporate environmental disclosures: Are they useful in determining environmental performance? *Journal of Accounting and Public Policy, 20*(3), 217–240. https://doi.org/10.1016/S0278-4254(01)00031-X
Ike, M., Donovan, J. D., Topple, C., & Masli, E. K. (2019). The process of selecting and prioritising corporate sustainability issues: Insights for achieving the sustainable development goals. *Journal Cleaner Production, 236*, Article 117661. https://doi.org/10.1016/j.jclepro.2019.117661
Ingram, R. W., & Frazier, K. B. (1980). Environmental performance and corporate disclosure. *Journal of Accounting Research, 18*(2), 614–622. https://doi.org/10.2307/2490597
Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Management behavior, agency cost and ownership structure. *Journal of Financial Economics, 3*(4), 305–360. https://doi.org/10.1016/0304-405X(76)90026-X
Jha, A., & Cox, J. (2015). Corporate social responsibility and social capital. *Journal of Banking & Finance, 60*, 252–270. https://doi.org/10.1016/j.jbankfin.2015.08.003
Krippendorff, K. (2004). *Content analysis: An introduction to its methodology*. SAGE Publications. https://shorturl.at/T9hjn
Le Bas, C., & Poussing, N. (2014). Are complex innovators more persistent than single innovators? An empirical analysis of innovation persistence drivers. *International Journal of Innovation Management, 18*(1), Article 1450008. https://doi.org/10.1142/S136391961450008X
Leach, M., Rockström, J., Raskin, P., Scoones, I., Stirling, A. C., Smith, A., Thompson, J., Millstone, E., Ely, A., Arond, E., Folke, C., & Olsson, P. (2012). Transforming innovation for sustainability. *Ecology and Society, 17*(2), Article 11. https://doi.org/10.5751/ES-04933-170211
Lozano, R. (2012). Towards better embedding sustainability into companies' systems: An analysis of voluntary corporate initiatives. *Journal of Cleaner Production, 25*, 14–26. https://doi.org/10.1016/j.jclepro.2011.11.060
Morioka, S. N., Bolis, I., & Monteiro de Carvalho, M. (2018). From an ideal dream towards reality analysis: Proposing Sustainable Value Exchange Matrix (SVEM) from systematic literature review on sustainable business models and face validation. *Journal of Cleaner Production, 178*, 76–88. https://doi.org/10.1016/j.jclepro.2017.12.078
Nidumolu, R., Prahalad, C. K., & Rangaswami, M. R. (2013). Why sustainability is now the key driver of innovation. *IEEE Engineering Management Review, 41*(2), 30–37. https://doi.org/10.1109/EMR.2013.6601104
Nill, J., & Kemp, R. (2009). Evolutionary approaches for sustainable innovation policies: From niche to paradigm? *Research Policy, 38*(4), 668–680. https://doi.org/10.1016/j.respol.2009.01.011
Nyquist, S. (2003). The legislation of environmental disclosures in three Nordic countries — A comparison. *Business Strategy and the Environment, 12*(1), 12–25. https://doi.org/10.1002/bse.344
Peters, B. (2009). Persistence of innovation: Stylised facts and panel data evidence. *Journal of* Technology Transfer, 34(2), *226–243*. https://doi.org/10.1007/s10961-007-9072-9
Richardson, A. J., & Welker, M. (2001). Social disclosure, financial disclosure and the cost of equity capita. *Accounting Organizations and Society, 26*(7–8), 597–616. https://doi.org/10.1016/S0361-3682(01)00025-3
Rosati, F., Faria, L. G. D. (2019). Addressing the SDGs in sustainability reports: The relationship with institutional factors. *Journal of Cleaner Production, 215*, 1312–1326. https://doi.org/10.1016/j.jclepro.2018.12.107
Schramade, W. (2017). Investing in the UN Sustainable Development Goals: Opportunities for companies and investors. *Journal of Applied Corporate Finance, 29*(2), 87–99. https://doi.org/10.1111/jacf.12236
Scott, L., & McGill, A. (2018). *From promise to reality: Does business really care about the SDGs? And what needs to happen to turn words into action.* Pricewaterhousecoopers (PwC). https://www.pwc.com/gx/en/sustainability/SDG/sdg-reporting-2018.pdf
Sullivan, K., Thomas, S., & Rosano, M. (2018). Using industrial ecology and strategic management concepts to pursue the Sustainable Development Goals. *Journal Cleaner Production, 174*, 237–246. https://doi.org/10.1016/j.jclepro.2017.10.201
Szennay, A., Szigeti, C., Kovacs, N., & Szabo, D. R. (2019). Through the blurry looking glass — SDGs in the GRI reports. *Resources, 8*(2), Article 101. https://doi.org/10.3390/resources8020101
Topple, C., Donovan, J. D., Masli, E. K., & Borgert, T. (2017). Corporate sustainability assessments: MNE engagement with sustainable development and the SDGs. *Transnational Corporations, 24*(3), 61–72. https://doi.org/10.18356/2ae5911c-en
Triguero, A., & Córcoles, D. (2013). Understanding innovation: An analysis of persistence for Spanish manufacturing firms. *Research Policy, 42*(2), 340–352. https://doi.org/10.1016/j.respol.2012.08.003
Truffer, B., & Coenen, L. (2012). Environmental innovation and sustainability transitions in regional studies. *Regional Studies, 46*(1), 1–21. https://doi.org/10.1080/00343404.2012.646164
Tschopp, D. J. (2005). Corporate social responsibility: A comparison between the United States and the European Union. *Corporate Social Responsibility and Environmental Management, 12*(1), 55–59. https://doi.org/10.1002/csr.69
Weng, H.-H., Chen, J.-S., & Chen, P.-C. (2015). Effects of green innovation on environmental and corporate performance: A stakeholder perspective. *Sustainability, 7*(5), 4997–5026. https://doi.org/10.3390/su7054997
Yang, Y., Yang, F., & Zhao, X. (2022). The impact of the quality of environmental information disclosure on financial performance: The moderating effect of internal and external stakeholders. *Environmental Science and Pollution Research, 29*(45), 68796–68814. https://doi.org/10.1007/s11356-022-20553-y
Yin, H., Li, M., Ma, Y., & Zhang, Q. (2019). The relationship between environmental information disclosure and profitability: A comparison between different disclosure styles. *International Journal of Environmental Research Public Health, 16*(9), Article 1556. https://doi.org/10.3390/ijerph16091556