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Abstract

This paper investigated the nexus between sustainability-oriented innovation (SOI) initiatives and exceptional profitability in high-performing companies. To this aim, employing a multiple comparative case study methodology, we analyzed 10 cases that excel in both return-on-sales (ROS) compared to industry medians and are actively engaged in SOI initiatives with public evidence. The findings of the study are categorized into internal and external factors affecting company performance, shedding light on managerial practices, organizational culture, and industry-specific variables. From a managerial standpoint, this paper offers valuable insights for managers seeking to balance between sustainable practices, encompassing multiple social and environmental aspects of corporate initiatives, while optimizing economic performance. The paper's originality lies in its contribution to a deeper understanding of the factors influencing the profitability of SOI and their implications for company management. This exploratory research seeks to expand the knowledge of the relationship between SOI and financial performance (FP), providing a foundation for future research in this domain.

Keywords

profitability, manufacturing industry, R&D, innovation management, corporate sustainability

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Approaches to Sustainability-Driven Innovation in High-Performing Italian Firms: A Cross-Case Analysis

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Abstract

This paper investigated the nexus between sustainability-oriented innovation (SOI) initiatives and exceptional profitability in high-performing companies. To this aim, employing a multiple comparative case study methodology, we analyzed 10 cases that excel in both return-on-sales (ROS) compared to industry medians and are actively engaged in SOI initiatives with public evidence. The findings of the study are categorized into internal and external factors affecting company performance, shedding light on managerial practices, organizational culture, and industry-specific variables. From a managerial standpoint, this paper offers valuable insights for managers seeking to balance between sustainable practices, encompassing multiple social and environmental aspects of corporate initiatives, while optimizing economic performance. The paper's originality lies in its contribution to a deeper understanding of the factors influencing the profitability of SOI and their implications for company management. This exploratory research seeks to expand the knowledge of the relationship between SOI and financial performance (FP), providing a foundation for future research in this domain.

Keywords: profitability, manufacturing industry, R&D, innovation management, corporate sustainability

Introduction

The growing concern about the degraded state of the environment due to the tangible effects of climate change and social inequality is calling for urgent initiatives and solutions (Citterio et al., 2007, Swid et al., 2023). In this systematic shift, company innovations represent the frontline (Silvestre & Tirca, 2019). If they encompass sustainability best practices, these innovations can provide products, processes, and services compatible with the preservation of the ecosystem, mitigating and neutralizing the impact on the environment as well as providing social benefits (Nadkarni et al., 2023). But what in the past has been seen as an opportunity to enjoy a competitive advantage (Borga et al., 2009; Manzini et al., 2006) is now rapidly becoming a requirement to survive (Chen et al., 2012).

Termed in the literature for decades as sustainability-oriented innovation (SOI), this concept is debating intensively the augmented role of corporate sustainability and its relationship with

innovation outcomes, understood as the ability to develop and launch successful new (either radical or incremental) sustainable products and processes (Geradts & Bocken, 2019).

Recent literature provides important theoretical reasons to consider SOI as differing from other types of innovation, as it is shaped by its own dimensions and architecture (Adams et al., 2016). Recent studies have focused extensively on SOI, examining the innovation processes, configurations, and settings that foster social and green innovations (Berkowitz, 2018; Chen et al., 2012; Silvestre & Tirca, 2019). Evidence suggests a positive correlation between firms' environmental and social performances and their engagement in external collaborations and open innovation, alongside competence building and learning (Berkowitz, 2018; Geradts & Bocken, 2019; Silvestre & Tirca, 2019).

While the literature on SOI has expanded considerably, a crucial gap remains in understanding its direct impact on financial performance (FP). Theoretical frameworks and conceptual models have suggested positive relationships between SOI and profitability, yet empirical evidence validating these claims remains scarce. This study aims to bridge this gap by examining high-performing companies that have actively embraced SOI initiatives. The guiding research question, "How do operating and strategic factors enable companies with established SOI practices to effectively integrate social and environmental performance with superior economic outcomes?" directs our exploration into understanding how sustainability can coincide with financial success. To effectively address the research question, this paper provides a holistic understanding of the integration of social and environmental performance into corporate strategies and practices.

Literature Review

Corporate Sustainability

Extant literature (such as Cheng et al., 2014; Hahn & Scheermesser, 2006) has investigated this topic widely since it is a key issue; in fact, company activities have been largely proven to be responsible for a number of environmental and social negative externalities, threatening both the ecosystem and society, in different ways. For this reason, several corporations –such as Bosch, Google, or Wells Fargo– have promoted and supported numerous sustainable initiatives for decades, both on the social and/or environmental sides, while preserving the profitability of their operations (Baumgartner & Ebner, 2010; Hahn and Scheermesser, 2006). In Table 1, some of the most diffused initiatives reported in the literature are listed. Several companies have transformed these constraints into a competitive opportunity to reduce operative costs, increase sales, or improve their corporate image (Borga et al., 2009; Manzini et al., 2006).

Even if these initiatives are widespread among companies and industries of different sizes, several scholars hold that these efforts cannot be considered resolutive since the environment is facing a faster degradation, highlighting two main clusters of reasons:

- The impact: since the initiatives are often just an incremental improvement of the state of the art or marginal, even if they have a positive impact, it is very limited (Ponte, 2019) or even simply greenwashing (Delmas & Burbano, 2011).
- The diffusion, of the aforementioned initiatives is a common ground only for some companies, largely far from being considered as widespread common practice (see –for instance, Hahn & Scheermesser, 2006; Nidumolu et al., 2009).

Table 1. Corporate Sustainable Initiatives

Category	Reference
Environmental	
Resources (materials, energy) including recycling	Baumgartner and Ebner, 2010
Emissions into the air, water, and ground	
Waste and hazardous waste	
Biodiversity	
Environmental issues of the product	
Process innovations (cleaner production, waste management, etc.)	Klewitz and Hansen, 2014
Organizational innovations (environmental certifications, environmental policy, environmental accounting, etc.)	Fussler and James, 1996
Product innovations (eco-design/design for the environment, ecolabels, reduce, replace, sustainable and recycled resources, etc.)	
Ecological procurement guidelines	Hahn and Scheermesser, 2006
Environmental reporting	
Environmental cost accounting	
Eco-control	
Intellectual property policy	
Life-cycle analysis	
Eco-Marketing	
Environmental certifications	
Social	
Ethical behavior and human rights	Baumgartner and Ebner, 2010
No controversial activities	
No corruption and cartel	
Corporate citizenship	
Corporate governance	
Motivation and incentives	
Health and safety	
Human capital development	
Organizational innovations (local sourcing and production, stakeholder management, employee development and training, code of conduct, employee engagement, health, and safety, etc.)	Klewitz and Hansen, 2014
Sustainability Reporting	Hahn and Scheermesser, 2006
Social procurement guidelines	
Social reporting	
Social certifications	
Employee training programs	
Health and prevention programs	
Women promotion programs	

Therefore, the stream of SOI has developed into new spaces (Hansen & Grosse-Dunker, 2012; Klewitz & Hansen, 2014; Nidumolu et al., 2009; Silvestre & Tirca, 2019) since it would appear to be of paramount importance to pass swiftly over to higher and more effective impacts as well as to a more widespread diffusion.

Sustainability and Innovation

The SOI could be the answer to the first point (impact). According to Adams et al. (2016, p. 1), SOI can be defined as "Making intentional changes to an organization's philosophy and values, as well as to its products, processes or practices, to serve the specific purpose of creating and realizing social and environmental value in addition to economic returns". In this field, the available systematic reviews of the SOI literature (such as Adams et al., 2016; Klewitz & Hansen, 2014) provide a comprehensive overview of this topic showing commonalities and providing a clear picture of the most diffused strategies and practices which drive the conceptual position of a company into a proposed SOI evolutionary framework.

This new improved level of environmental and social performance, while maintaining/improving the economic performance of the company, can be reached through an intensive renovation. Such renovation has the potential to be extensive and multifaced. Indeed, Klewitz and Hansen's (2014) meticulous analysis discerns three stratified dimensions of innovation strategies and practices:

process innovation, organizational innovation, and product innovation. These tiers encompass a nuanced spectrum of methodologies, approaches, and tools. Adams et al. (2016) expound upon these strata, accentuating:

- Operational optimization, characterized by incremental enhancements to conventional business practices,
- Organizational transformations, encapsulating novel products, services, or business models, and
- Systems building, denoting the creation of new products, services, or business models that transcend solitary achievement.

Each echelon navigates more profound considerations of strategy, process, learning, linkages, and innovative organizational structures. These comprehensive contributions depict a complex picture of SOI and the diverse range of configurations available to companies striving to recalibrate their activities and outputs for enhanced sustainability. This broad spectrum of conceivable approaches to SOI signifies the existence of potential opportunities for all enterprises, albeit occasionally involving delicate trade-offs between seemingly conflicting objectives, as elucidated by Jay et al. (2015) –such as the delicate balance between performance versus impact, profit versus purpose, and human well-being versus environmental protection.

Internal and External Factors Relevant to Sustainability-Oriented Innovation

Several studies, including those conducted by Arnold and Hockerts (2010), Alderin and Do (2016), and Román et al. (2022), delineate the factors influencing the adoption of SOIs, categorizing them into internal and external factors through their frameworks and findings. The identified factors and their respective contributions are compiled in a comprehensive Table 2 for reference.

Table 2. Internal and External Factors Influencing the Adoption of Sustainability-Oriented Innovation

Internal Factor	**Reference**
Corporate culture of sustainability Corporate strategy and strategic alignment Flexible and ambidextrous strategy Internal capabilities and in-house skills development Top management training Investments in R&D Patents Funding capacity and funding structure for sustainable innovations Business opportunities	Alderin and Do, 2016; Arnold and Hockerts, 2010; Cainelli et al., 2015; Cao and Chen, 2019; del Río González, 2005; Long et al., 2018; Luqmani et al., 2017; Román et al., 2022; Zhang et al., 2022; Zhou et al., 2021
External Factor	**Reference**
Inter-organizational collaborations and relationships: network system Relationships with suppliers, customers, NGOs and academia, investors, and policy makers Market trends and stakeholders' pressures Political and regulatory pressures	Alderin and Do, 2016; Cainelli et al., 2015; Cao and Chen, 2019; del Río González, 2005; Long et al., 2018; Luqmani et al., 2017; Román et al., 2022

Internal Factors for Sustainability-Oriented Innovation

Internal factors are defined as all factors that can be controlled by the company and at the same time have a discretionary nature (Román et al., 2022). To enable SOIs it is necessary to adopt the corporate culture of sustainability, defined by a set of "quality values" that guide the "right behavior" and "the hierarchy of values" defines priorities for the development of SOIs (Román et al., 2022, p. 943). In fact, the environmental dimension is considered by several authors as the

basis that defines the organizations' design objectives (Arnold & Hockerts, 2010, del Río González, 2005, Luqmani et al., 2017, Román et al., 2022).

Moreover, as pointed out by Long et al. (2018), the success of sustainable innovations is made possible by strategic alignment that enables a clear sharing and transmission of corporate strategy within the organization. Regarding corporate strategy, Román et al. (2022) also say that a flexible and ambidextrous strategy is needed to allow companies to introduce SOIs to the market. In fact, consumers and retailers are very often hostile to adopting new sustainable products over the products they already use. The flexible and ambidextrous strategy avoids making extreme choices, such as a complete change of product portfolio, allowing for a more gradual migration, because it allows to leverage of existing business and building future business (Román et al., 2022). With respect to the strategic sphere the Oslo Manual (Organisation for Economic Cooperation and Development, 2018) stresses that human, intangible, material, financial, and technological resources are the internal capabilities that enable the achievement of the enterprise's strategic goals and enable innovation processes, and in-house skills development, is a potential driver for the development of such capabilities. However, for Cainelli et al. (2015), employee training is only a supporting factor for SOIs and is limited to enabling technological knowledge by increasing awareness of environmental challenges. This finding is confirmed by the quantitative results of Alderin and Do (2016). Their study shows that out of four companies actively involved in sustainable innovation within their business (two from the telecommunications industry, one from the fashion industry, and one from the furniture industry); only one in four organizations provides their employees with knowledge to improve and differentiate their products and gain a competitive advantage from applying eco-design techniques in their work. However, these observations are not confirmed by Rio's triangular model and Arnold and Hockerts's (2010) findings. They identify the main factors for the development and adoption of SOI and in-house skills development is the main internal factor to be considered, especially since this knowledge base allows components from different suppliers to be integrated into the processes.

Regarding capabilities, Cao and Chen (2019) emphasize the importance of top management training for SOIs. Training CEOs enables them to interpret environmental and social pressures more quickly and reduces staff resistance to change (Arnold & Hockerts, 2010, Zhou et al., 2021). Two other factors analyzed in the literature are R&D investment and patents. The R&D investments and consequently the likelihood of developing patents and green projects have the potential to boost SOI performance (Cao & Chen, 2019, Zhang et al., 2022). Patents have a significant impact on environmental and social performance through product differentiation and improved production processes (e.g., increased energy efficiency).

In contrast, R&D investments do not show the same impact on social performance; this result is due to the fact that companies very often experience less pressure from government policies and stakeholders to implement social activities (Zhang et al., 2022). Moreover, Cao and Chen (2019) and Cainelli et al. (2015) underline another important result regarding the R&D area and the environmental dimension of the SOI: the financing of research and the development of internal R&D capacities significantly influence the introduction and development of environmental innovations. To successfully initiate and implement environmental and social strategies, it is also necessary to consider the economic value they can generate (Long et al., 2018). However, as evidenced by the studies of Río González (2005) SOIs are often embedded in expensive equipment and companies do not always have sufficient economic resources to finance these projects. For

this reason, funding capacity can be a barrier to implementation, and as highlighted by Alderin and Do (2016) it would be appropriate to establish a funding structure for sustainable innovations. Despite those obstacles to sustainable transition, companies' awareness of the economic benefits and advantages is increasing. Business opportunities (e.g., cost reduction and gaining competitive advantage) are recognized as an internal factor that drives, stimulates, and self-reinforces the process of sustainable innovation (Alderin & Do, 2016; del Río González, 2005). Cost reduction is due to improved processes to reduce consumption in volume (e.g., energy, water) or in purchasing prices (using recycled materials). Moreover, due to increasing levels of resource scarcity globally, making processes more efficient increases the degree of independence from third parties, and the effects are already visible in the short term (Alderin & Do, 2016). Moreover, investment in SOI can generate valuable intangible assets (technologies, reputation, and knowledge) that could improve market competitiveness by providing superior returns and premium prices.

External Factors for Sustainability-Oriented Innovation

External factors are defined as those outside the immediate control of management and that create challenges and opportunities that managers must consider when making strategic choices (Organisation for Economic Cooperation and Development, 2018). Collaboration and inter-organizational relationships fuel efforts toward sustainable innovations (Alderin & Do, 2016; Cainelli et al., 2015; Long et al., 2018). Different forms of network are critical because they enable rapid access to needed expertise and technologies, and integration of customer issues. (Alderin & Do, 2016; Cainelli et al., 2015, del Río González, 2005). Networks can involve all actors in the supply chain, and their support is critical to the sustainable transition. Collaboration with suppliers allows them to introduce new ideas, provide recommendations on new sustainable inputs, and collaboration is more important the more radical the technology to be implemented (del Río González, 2005, Long et al., 2018). Good customer relationships foster new perspectives on products and services and prepare the market through information exchange and co-creation (Long et al., 2018). The collaborations can also involve other partners, such as NGOs and academia (Luqmani et al., 2017). As Long et al. (2018) point out, it is crucial to collaborate with investors in order to be able to explore alternative business approaches and obtain the necessary investment and capital. In addition, collaboration with policymakers is an opportunity to work on common interests for sustainable development.

Market trends and stakeholder pressures are considered in the literature to be important external factors in the successful implementation of SOIs (Román et al., 2022). Consumers have always exerted one of the greatest pressures for change; they define demand, and if they value sustainable performance (SP), the greater the likelihood of adoption of these types of products. In other cases, however, companies, making more sustainable alternatives of their products, bring a change in market behavior. Competitors could be an additional driver of change especially when implementing sustainable technologies resulting in increasing business competitiveness (Cao & Chen 2019). Moreover, not only stakeholders but also regulatory pressure and incentives have a significant impact on innovation strategy (Cao & Chen 2019, del Río González, 2005), however, their effects depend on the countries where the activity takes place Alderin and Do (2016).

Sustainability and Performance

The measurement of the SP is a rich stream of research, largely covered by several scholars (among others: Calik & Bardudeen, 2016; Hussain et al., 2018b; Kianian et al., 2018; Pislaru et al., 2019). Many of these previous studies have primarily aimed to assess:

- The environmental and social impact, and
- The effectiveness of the operational tools is suitable for demonstrating the efforts made and the SP targets, achieved by the organizations (Ali et al., 2019; Zaid et al., 2018).

Another relevant field of research, with a huge amount of publications, investigates the relations between SP and FP to gain a deeper understanding of the links between social and environmental practices and economic results (Al Abri et al., 2016; Boons et al., 2013; Hussain et al., 2018a). Conversely, there has been a lack of comprehensive economic perspective in the investigation of SOI, and the current understanding of performance-related issues in this area remains limited. Nonetheless, it is crucial to gain a better understanding of the mechanisms that enable companies to overcome critical challenges and barriers in achieving SOI, as well as to establish a direct link between SOI and economic performance. This understanding is essential for promoting the widespread adoption of sustainable practices. Furthermore, highlighting avenues for generating profitability alongside promoting SOI initiatives can incentivize companies to invest in and pursue strategies and practices that drive the transformation of products, processes, and business models toward greater sustainability. Based on these premises, the aim of this paper is to address the following research question:

- How do operating and strategic factors enable companies with established SOI practices to effectively integrate social and environmental performance with superior economic outcomes?

Methods

The research methodology employed in this study is grounded in a meticulous multiple comparative case study approach, drawing theoretical underpinnings from seminal works by Bartlett and Vavrus (2017), Mills et al., (2010), and Yin (2014). This methodological choice, informed by its ability to offer nuanced insights into complex phenomena, facilitated the in-depth exploration of SOI initiatives within manufacturing companies and it is consistent with the research question of the present study.

A rigorous selection process identified ten cases for analysis, each carefully chosen based on a dual set of criteria. Firstly, companies were required to surpass industry medians in return-on-sales (ROS; Spiceland et al., 2021) over a consecutive five-year period (2017-2021), showcasing a remarkable ROS exceeding 50% of the industry median (as detailed in Table 3). More than 1,000 companies (Bureau van Dijk, 2022) were analyzed in the second semester of 2022. This initial screening resulted in a cohort termed *profitable companies,* forming the foundation of the subsequent investigation.

The second tier of selection involved a detailed analysis to ensure the active involvement of chosen companies in the field of SOI. Evidence of ongoing initiatives was gathered through diverse sources, including company websites, business publications, and grey literature. To validate and supplement this information, direct interviews (one-to-one, in person, via telephone or video call)

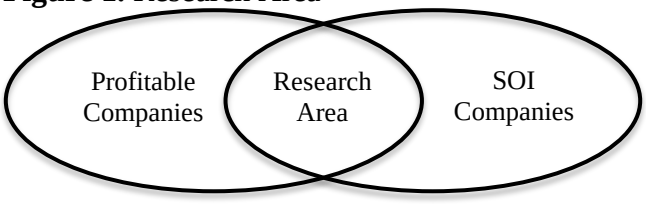
with key informants—typically directors, top managers, or entrepreneurs—were conducted. The companies meeting both criteria were integrated into the research panel, as depicted in Figure 1, showcasing the overlap of high ROS performance and robust engagement in SOI initiatives.

Table 3. Return-on-Sales of the Selected Cases*

Case Code	2017	Industry *M*	2018	Industry *M*	2019	Industry *M*	2020	Industry *M*	2021	Industry *M*
Case #1	24.00	3.53	19.84	3.34	26.67	3.33	23.89	4.10	24.10	4.23
Case #2	11.63	3.37	8.52	3.46	14.27	3.03	11.22	3.58	10.12	2.88
Case #3	5.57	2.12	20.47	1.77	27.75	2.88	19.24	2.47	10.2	1.1
Case #4	4.99	2.40	7.16	3.46	4.99	2.67	2.94	1.39	2.02	1.21
Case #5	6.39	3.05	7.23	3.37	5.25	2.73	5.90	3.55	6.17	2.99
Case #6	3.15	1.85	2.02	1.23	2.54	0.88	0.58	0.07	0.43	-2.02
Case #7	3.15	1.50	3.65	2.01	2.88	1.36	1.32	0.83	2.2	1.34
Case #8	18.29	4.49	16.65	2.96	13.44	3.70	15.84	4.32	7.94	3.32
Case #9	3.67	2.36	4.72	2.72	4.22	2.20	3.72	2.17	4.99	3.27
Case #10	6.77	3.61	7.01	3.35	12.60	2.55	12.31	3.22	5.56	1.1

Note. * +50% on the industry median for five consecutive years.
Source. Bureau van Dijk, 2022

Figure 1. Research Area



Note. SOI = Sustainability-oriented innovation. The companies showing both SOI initiatives both high return-on-sale performance.

To enhance internal validity and mitigate potential biases, several measures were implemented throughout the study. Firstly, efforts were made to minimize selection bias by ensuring a diverse representation of industries within the final panel, encompassing different sectors of manufacturing. Additionally, the use of a comparative case study design allowed for the identification and control of confounding variables, contributing to the study's internal validity.

The data collection process unfolded in multiple stages, adhering to established best practices. Initial background information on each company was gathered through an unobtrusive desk analysis of secondary data and public documents, encompassing corporate websites, grey literature, and financial reports (Miles & Huberman, 1994). This comprehensive desk analysis was complemented by semi-structured interviews conducted with company leaders. The interviews, guided by a meticulously designed open questionnaire sent in advance, delved into specific aspects of SOI initiatives, including type, social and environmental impacts, and effects on FP. Given that SOI initiatives coexist within a diverse portfolio of various endeavors, a comprehensive examination of each case holds the advantage of elucidating the distinct contributions of SOI initiatives, alongside others, to the overall economic performance of the company. The use of semi-structured interviews allowed for flexibility while ensuring the systematic collection of relevant information.

Given the transparent disclosure of financial details by the participating companies regarding SOI investments –capital expenditures, additional revenues, and cost savings, specific company names and locations have been withheld to maintain confidentiality. The ethical considerations throughout the study adhered to the highest standards, encompassing practices related to informed

consent, anonymity, confidentiality, data security, and the transparent disclosure of any conflicts of interest. This approach ensures the integrity and credibility of the research findings. The data analysis employs a mixed-methods approach:

- Quantitative analysis: use descriptive statistics to summarize and present key financial metrics, such as ROS, for each of the selected companies. This will provide a clear overview of the quantitative aspects of economic performance.
- Thematic analysis: analysis of qualitative data obtained from interviews. Identify and analyze recurring themes related to SOI initiatives, social/environmental impacts, and their influence on economic outcomes. This qualitative approach aligns well with the in-depth exploration of complex issues in real life.
- Triangulation of data sources: incorporation of a diverse set of data sources, such as public and reserved internal documentation, interviews, direct observation, and physical artifacts (Yin, 2014), enhancing the study's methodological robustness and the reliability of its outcomes.
- Case-by-case analysis: analysis of each case individually to provide a detailed understanding of the unique context, challenges, and outcomes associated with each company's SOI initiatives.
- Pattern recognition: identification of patterns or trends across the ten cases in both quantitative and qualitative data. This involves identifying common internal and external factors, challenges, or variations in the impact of SOI initiatives on economic performance.

The Case Studies

The case selection, presented in the previous paragraph, led to the following 10 cases. Table 4 presents the basic information of the ten companies –in terms of (a) year of foundation, (b) industry sub-sector, (c) number of 2021 employees and (d) 2021 sales. The ten companies are all SMEs, however, according to the definition of SMEs by the European Union (2003), only one company out of the ten can be classified as a small company (Case #3), while nine can be classified as medium-sized companies. Since there is a large presence of economic and financial data, the names of the companies are blinded and the data about sales have been rounded off.

Table 4. Cases Description

Case Code	Foundation	Industry	Number of Employee	Sale*
Case #1	1998	Food	55	12
Case #2	1981	Masterbatches	56	14
Case #3	1983	Textile finishing	20	4
Case #4	1970	Leather chemicals	68	23
Case #5	1952	Cosmetics	107	27
Case #6	1968	Apparel and clothing	41	12
Case #7	1986	Textile chemicals	36	15
Case #8	1961	Mechanics	57	12
Case #9	1974	Solar shadings	116	29
Case #10	1926	Machine tools	169	48

Note. *In million Euros.

The cases under examination share several commonalities and differences. Commonalities include:

- Activity: All selected companies are involved in manufacturing, ensuring a more comparable analysis by avoiding major differences like those present in service or financial sectors.
- Location: All companies are based in Italy with both headquarters and production facilities. Additionally, they all engage in some degree of international activities, ranging from simple exporting to a more extensive presence in foreign markets.
- High Performing (ROS): Each of the ten companies demonstrates a ROS exceeding 50% of the industry median. ROS serves as a key profitability metric before accounting for financial and tax influences, making it sensitive to SOI initiatives.
- SOI initiatives: These initiatives align with literature-defined criteria, indicating intentional changes to organizational philosophy, products, processes, or practices to create and realize social and environmental value. (Adams et al., 2016)

However, there are also notable dissimilarities:

- Industry: While all companies operate in manufacturing, they belong to different industries or sub-sectors. This discrepancy introduces variations in product, competition dynamics, and stakeholder involvement. (Manzini et al., 2006)
- Firm dimensions: The companies range from small to medium-sized, with employee counts ranging from 20 to 169 and sales volumes from €3.8 million to €48.3 million. These differences impact resource availability, competencies, and organizational structures. (Manzini et al., 2006)
- Year of foundation: Companies have been established between 1926 and 1999, suggesting varying innovation paces and potential benefits from research and development investments. (Coad et al., 2016)

By acknowledging these commonalities and dissimilarities, the analysis can provide insights into the impact of strategic orientation and innovation on manufacturing companies of different sizes, industries, and historical backgrounds within the Italian context.

Findings

The SOI initiatives recorded are reported in the following comparative Table 5. In total 25 SOI initiatives were mapped and detailed. Smaller initiatives with a limited impact on the revenues and costs of the company and/or with a limited social and environmental impact were excluded (for instance, the acquisition of one electric car in a large fleet, a small once-a-year initiative with a local NGO, the introduction of some recyclable paper for printers in the offices, etc.). After having mapped the most significant SOI initiatives, as reported in the methodology section, a study of the impact of those initiatives on the income statements of the ten companies was developed. The impact was measured in terms of:

- Generation of additional revenues, and
- Reduction of operating costs.

The aforementioned SOI initiatives contributed substantially to the economic performance of the ten companies; this contribution was demonstrated by the interviews and/or by internal documents available. The major findings emerging from the interviews are reported hereafter and clustered in

two dimensions (internal and external factors), considering the topics most frequently discussed with and brought up by the interviewed managers, according to the literature framework (see Internal and External Factors Relevant to Sustainability-Oriented Innovation section above).

Table 5. SOI Initiatives in the Selected Cases

Case No	SOI Initiative		Incremental/ Radical	Business Model/ Product/Process	Environmental/ Social
1	1.a	Photovoltaic energy production	Incremental	Process	Environmental
	1.b	Large and profound improvement of energy and waste saving machines	Radical	Process	Environmental
2	2.a	Circular economy practices	Radical	Business Model	Environmental
	2.b	New eco-product line	Radical	Product	Environmental
3	3.a	Certified feedstock	Incremental	Product	Environmental/Social
	3.b	Energy efficiency program	Incremental	Process	Environmental
4	4.a	New eco-product line	Radical	Product	Environmental
5	5.a	New stable training program on social programs	Incremental	Process	Social
	5.b	Sourcing from social NGO	Incremental	Process	Social
6	6.a	Stakeholder management	Incremental	Process	Social
	6.b	New eco-product line	Radical	Product	Environmental
	6.c	Improvement of recycling	Incremental	Process	Environmental
7	7.a	Energy efficiency program	Incremental	Process	Environmental
	7.b	Recyclable sourcing from NGO	Incremental	Product	Environmental/Social
8	8.a	Life-cycle analysis	Incremental	Product	Environmental
	8.b	Regional sourcing	Incremental	Process	Environmental/Social
	8.c	Stakeholder management	Incremental	Process	Social
9	9.a	New eco-product line	Radical	Product	Environmental
	9.b	Circular economy practices	Radical	Business Model	Environmental
	9.c	Energy efficiency program	Incremental	Process	Environmental
	9.d	Widespread adoption of environmentally friendly technologies	Incremental	Process	Environmental
10	10.a	Social and environmental ISO certifications	Incremental	Process	Environmental/ Social
	10.b	Improvement of recycling	Incremental	Process	Environmental

Note. SOI = Sustainability-oriented innovation.

Internal Factors

At this level, five factors emerged as relevant.

Sustainability-Oriented Decision-Making Process

In eight out of 10 companies, environmental and social issues are formally and explicitly taken into consideration in the most relevant decision-making points (for instance: meetings of the board of directors, decisions by the CEO, approval of investments) with scoring methods and other less structured tools. The common pattern on this point can be summarized by the quote of an interviewed manager, Mr. A. L. (personal communication, September 1, 2022): “We also think about whether we can improve social and environmental impacts with our investments, in the worst case we can’t. However, it was surprising how often it is possible, it is just a matter of thinking about it.”

R&D Expenditure

In seven out of 10 companies, a certain effort (aligned with or superior to the industry average) on R&D activities was highlighted by interviewed managers. In those companies, it was found that the R&D department has a certain well-defined shape (for instance, it has a formally assigned manager – even if not in all cases one full-time equivalent, sometimes less – and tangible resources

like offices/laboratories/equipment/etc.). So, the R&D intensity tends to be high. This quote is explanatory in this sense (Mr. E. G., personal communication, July 19, 2022):

> We cannot afford the costs and the investments related to a strong R&D department; however, we believe that only if a team of some competent people are for a certain period of time dedicated to innovation, can we successfully implement something new.

Open Innovation

As SOI involves the adoption of new technologies and materials, leading to the radical redesign of the company's output or activities, all ten cases reported a strong network of collaborations, along with robust internal R&D. This point has been already highlighted by prior literature (Melane-Lavado & Álvarez-Herranz, 2020; Wehnert et al., 2018) and it was confirmed by Mrs. I. T. (personal communication, October 24, 2022):

> Once we discovered the opportunity for collaboration, about 5 years ago, we never had an innovation project without partners. At the beginning we were skeptical but then step by step we became more prone and open. The occasion to exploit external specific competencies is of paramount importance.

Exploitation of Incentives and Grants

Another common trait (nine out of 10) is the capacity (in terms of devoted human resources, and skills) to exploit all the available public incentives and calls even if the company has the financial strength to afford investments. The availability moderates the requirement of financial resources as a relevant factor, otherwise present. These schemes have two pros in the view of the companies:

- They open their eyes to specific goals (reduction of emissions, self-production of renewable energy, R&D, etc.) that were neglected or under-evaluated and
- Reduce the risk associated with the investments.

With reference to this second point, here are the words of an interviewed manager, Mr. M. R. (personal communication, November 4, 2022): "Luckily the public grants and funds are largely addressed to sustainable issues. The investments are risky, they are about something new, and these kinds of support are fuel for our R&D engine."

Intellectual Property Policy

Six out of 10 companies show an intellectual property (IP) protection policy; it goes from a single-patent action to more sophisticated and complete IP strategies. So, from this point of view, it seems to be an essential complement to SOI projects. A relevant quote on this topic is (Mr. D. S., personal communication, July 7, 2022): "If we hadn't been protected by patents, competitors could have replicated our solutions more easily. Patents are fundamental, they always help you, and the costs are not high. All companies can and must get them."

Type of Sustainability-Oriented Innovation Projects

Radical Sustainability-Oriented Innovation

A strong role of industry- and business-specific radical innovation is emerging. In five out of 10 cases, the superior performance can largely be attributed to radical innovation. In fact, even if a

part (sometimes a large part) of margins is generated by traditional and incrementally innovated processes, the step forward can be explained only by radical innovations. Here are a couple of quotes recorded during interviews (Mrs. E. F., personal communication, September 16, 2022): "Only when we launched this new green product line did our sales and profits really grow. Never in the past have we experienced an acceleration like this, a real success!" –Mr. M. R. (personal communication, November 4, 2022): "Innovating so much was a risk, calculated but always a risk. The results reward us: less emissions, more hires, and more profits."

Incremental SOI

Even if there is a large bundle of incremental innovations, these are useful but have less impact. None of the interviewed companies reported one of its incremental innovations as crucial in the income statement results. An explanatory quote in this sense is the following by Mr. F. D. S., (personal communication, November 16, 2022): "This [incremental] innovation was good and a source of efficiency and cost saving, and it will have a long-term impact. But I will never say it is of paramount importance for our profit. It has a small impact."

External Factors

At this level, two factors emerge as relevant.

Active Stakeholders

The role of stakeholders, even if in different terms, was considered relevant by all companies. The sensibility of the stakeholders (clients, competitors, and policymakers above all) is a factor boosting the impact of SOI (as in Collins & Saliba, 2019; Ghassim & Bogers, 2019). In fact, from the point of view of clients, serving a market sensitive to these issues drives the return on SOI investments. From the point of view of policymakers, it implies the availability of a certain amount of the aforementioned incentives, and for some companies, green public procurement is a robust source of revenue. Finally, the behavior of the competitors and the rivalry in the industry can reduce the competitive advantage given by the specific SOI investment. Mr. M. D. C. (personal communication, July 26, 2022): "We invite all clients for an annual full-day meeting, 100% devoted to sustainability practices and benefits. It is not a commercial event; it is just a dissemination and cultural opportunity. The participation is always high and enthusiastic."

Suppliers have to be included in the category of stakeholders. Supply chain collaboration practices help the data collection, the co-development and reduce the company's effort to develop SOI, downsizing costs, and investments. Mrs. S. M. (personal communication, October 10, 2022): "Our SOI heavily depends on [Company A], which specializes in paints. We rely entirely on their technical expertise, and they are committed to investing in new projects alongside us. Our collaboration is a true symbiotic relationship."

Market Growth

The growth of the economies where the company is or aims to be present has a strong influence on the ROS. So, the economic situation is a relevant factor. Economic slumps, even temporary, do not allow solid margins to be maintained. Mrs. F. V. (personal communication, December 2, 2022): "In the midst of the 2018-2019 crisis in Argentina, our product range experienced a 30%

decrease in sales. In order to maintain our market share, we had to sacrifice a significant portion of our profit margins." The following section elucidates both the convergences and divergences in our findings when compared with prior literature, while also introducing newly emerged themes. In the following Table 6, the factors that emerged from the case studies and the factors from the literature review were related based on the similarity of their characteristics.

Table 6. A Comparison Between Internal and External Factors From the Literature Review and the Case Studies

Internal and External Factor (Cross-Case Analysis)	Internal and External Factor (Literature Review)
Sustainability-oriented decision-making	Corporate culture of sustainability; top management training
R&D expenditure	Investments in R&D; internal capabilities and in-house skills development
Intellectual property policy	Patents; business opportunities (gaining competitive advantage)
Type of sustainability-oriented innovation projects	Flexible and ambidextrous strategy; business opportunities
Exploitation of incentives	Funding capacity and funding structure for sustainable innovation
Open innovation	Inter-organizational collaborations and relationships: network system
Active stakeholders (clients)	Relationships with customers; market trends and stakeholder pressure
Active stakeholder (policy maker)	Political and regulatory pressures; market trends and stakeholder pressure
Suppliers	Relationships with suppliers
Market growth	Market trends and stakeholder pressure

The juxtaposition of our research findings with the existing literature reveals a congruent depiction, aligning closely with the outcomes of scholarly debates that have thoroughly examined various pertinent factors related to SOI. While our study reinforces the established discourse, the significance lies in the nuanced emphasis and prioritization of specific factors evident in successful enterprises, diverging from others in their importance for profitability.

Sustainability-oriented decision-making is a multifaceted process influenced by internal and external factors, as evidenced by insights from interviews and existing literature. Corporate culture stands out as a pivotal internal factor shaping decision-making paradigms within organizations. Román et al. (2022) highlight how corporate culture, with a focus on quality values in the environmental dimension, serves as a guiding force for ethical and sustainable decision-making. Additionally, Alderin and Do (2016), and Arnold and Hockerts (2010) underscore the significance of embedding environmental and social considerations at critical decision points.

Top management training emerges as another crucial internal factor, with profound implications for sustainability-oriented decision-making. CEOs, equipped with comprehensive training, exhibit a heightened capacity to swiftly interpret and address environmental and social needs. This capability not only enhances the corporate image but also has a tangible impact on revenue generation. Acknowledging the influence of top management on decision-making aligns with the findings of Luqmani et al. (2017), emphasizing the pivotal role of leadership in fostering a sustainability-oriented mindset.

In the realm of R&D, the nexus between expenditures, internal capabilities, and skills development unveils a dynamic interplay. The literature, as articulated by Cao and Chen (2019) and Cainelli et al. (2015), associates high R&D expenditures with the successful implementation of novel initiatives. This nexus, complemented by a competent team and substantial R&D investments, yields an intangible value that bolsters competitiveness and fosters superior economic performance. However, the notable absence of emphasis on employee training in the literature signals a potential research gap deserving further exploration.

The IP policies surface as a strategic element in decision-making, aligning with the works of Cao and Chen (2019) and Zhang et al. (2022). Patents, as a manifestation of IP policies, not only impact environmental and social performance but also act as protective shields, preserving a company's margins against competitive forces. This underscores the multifaceted role of IP policies beyond mere legal framework.

Delving into the realm of innovation, the type of project assumes significance in shaping sustainability outcomes. Radical innovations, as gleaned from the interviews, correlate with higher returns, reduced environmental impacts, and expanded social performance. The corroborative evidence from Román et al. (2022) underscores the importance of a flexible ambidextrous strategy, where incremental innovations complement radical ones, facilitating a strategic balance between current and future business needs.

Market trends and stakeholder pressures, identified as external factors, exert considerable influence on sustainability-oriented decision-making. The market, acting as a potent force for change, defines demand and serves as a driver for superior performance and investment returns. This aligns with the literature stressing the importance of building relationships with customers for information exchange and co-creation, especially in the context of introducing sustainable products (Long et al., 2018).

The external factor landscape expands to include active stakeholders, encompassing customers, competitors, and policymakers. Analyzing market trends and stakeholder pressures, as highlighted by Román et al. (2022), underlines the importance of understanding the regulatory landscape and responding to evolving market dynamics. Collaborative practices with suppliers emerge as crucial in reducing the company's effort in developing sustainability-oriented initiatives. The findings resonate with the works of del Río González (2005) and Long et al. (2018), indicating that collaborative practices not only introduce new ideas but also provide sustainable inputs, thereby reducing costs and fostering innovation. Moreover, the significance of inter-organizational relationships extends beyond suppliers to encompass collaborations with NGOs and academia. The literature, as noted by Long et al. (2018) and Luqmani et al. (2017), underscores the critical role of such collaborations in value co-creation, signaling a broader ecosystem approach to sustainable business practices. Lastly, the external factor of market growth intertwines with market trends, emphasizing the pivotal role of economic conditions. Organizations, faced with dynamic market scenarios, may need to make strategic decisions that involve sacrificing part of their profits to maintain market share. This underscores the adaptive nature of sustainability-oriented decision-making in response to economic challenges. In conclusion, sustainability-oriented decision-making is a complex process influenced by an intricate web of internal and external factors. Understanding the nuanced interplay of these factors is crucial for organizations seeking to navigate the sustainability landscape effectively and profitably. The amalgamation of insights from interviews and existing literature provides a comprehensive framework for organizations to formulate strategies that not only align with environmental and social considerations but also foster long-term economic resilience.

Discussion and Conclusions

The empirical analysis has unveiled findings with significant theoretical and managerial implications. SOI initiatives are pivotal in contributing to the reduction of human impact on the

environment and enhancing societal well-being globally. However, the adoption of sustainable practices remains sluggish despite alarming signals from influential international bodies and research institutions regarding environmental degradation and social inequalities, with limited signs of reversal. While one approach involves a strict regulatory system, the other entails fostering a *virtuous circle* wherein all stakeholders proactively engage. It was imperative to delve into factors, strategic decisions, and operational strategies explaining how companies merge tangible reductions in negative impacts or enhancements in positive impacts on ecosystems or society with superior economic performance. This research fills a gap in existing literature, potentially catalyzing the diffusion of SOI practices for societal benefit. Specifically, it sheds light on the nexus between SOI practices and company performance, laying the groundwork for future investigations.

From a theoretical perspective, this paper contributes by pinpointing the precise factors pursued by high-performing companies in SOI. While prior studies outlined SOI initiatives, the economic analysis and viability aspects were lacking. Contrary to some scholars' suggestions, a complete business model redesign isn't the primary innovation challenge for SP, nor does circular economy centrality hold true universally. Instead, a flexible framework is advocated, tailored to specific contexts. Expanding on the theoretical implications, the study sheds light on the intricacies of SOI initiatives, offering insights into the precise mechanisms driving superior economic performance. By dissecting the factors underpinning companies' success in integrating sustainability into their operations, it paves the way for a nuanced understanding of how businesses can thrive while simultaneously contributing to environmental and societal well-being. This theoretical framework not only enriches academic discourse but also provides practical guidance for businesses seeking to navigate the complex landscape of sustainability.

Managerially, the paper underscores key areas of focus for managers cognizant of sustainable practices amid financial constraints and shareholder pressures. These include innovation processes and the pivotal role of government policies in incentivizing sustainable shifts in corporate operations. Furthermore, the practical implications of the study are profound. It highlights actionable steps that managers can take to foster a culture of sustainability within their organizations. From prioritizing innovation processes to leveraging government policies, the paper offers pragmatic strategies for driving meaningful change. By elucidating the link between sustainable practices and economic performance, it empowers decision-makers to make informed choices that align with both financial and ethical imperatives.

Acknowledged limitations include the sample's restriction. Indeed, although the study sample was collected from different industries, the variety is limited to certain manufacturing business sectors. Moreover, the sample consists of Italian firms which restricts generalizability to companies in that geographic area. Furthermore, the partial impact of SOI initiatives on economic performance and the difficulty in measuring SP present additional constraints, highlighting the necessity for further investigation in this domain. Subsequent research should explore various contexts and thoroughly examine the correlation between economic performance and SOI, incorporating social and environmental metrics for a comprehensive analysis. By addressing these limitations and building upon the insights gleaned from this study, future research can continue to advance our comprehension of the intricate relationship between sustainability, innovation, and economic performance.

In conclusion, this paper represents a significant contribution to the ongoing discourse on SOI. By synthesizing empirical evidence with theoretical frameworks, it offers valuable insights into the potential of SOI initiatives to drive superior economic performance. Moreover, delineating practical strategies for implementation provides a roadmap for businesses seeking to embrace sustainability as a core tenet of their operations. While acknowledging its limitations, the study sets the stage for future research to build upon its findings and further elucidate the intricate relationship between sustainability and economic success.

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