

Doing Good, Doing Well: The Impact Of Green CSR On Manufacturing SME Sustainability In OMAN

Noura Said AL-Jahwari¹, Vathana Bathmanathan², Abubakar Ahmed³

¹Sohar university, Njahwari@su.edu.om, PM21233@student.uniten.edu.my

²Universiti Tenaga Nasional, vathana@uniten.edu.my

³Sohar university, AAbubakar@su.edu.om

Abstract

Purpose: This study examines whether Green Corporate Social Responsibility (GCSR) enhances the economic, social, and environmental sustainability of manufacturing SMEs in Oman.

Design/methodology/approach: A quantitative, cross-sectional survey was administered to 153 Omani manufacturing SMEs. Constructs were measured with validated multi-item Likert scales. Data were analyzed using PLS-SEM (SmartPLS 4) following a two-step procedure (measurement then structural models). Reliability and validity were assessed via Cronbach's alpha, composite reliability, AVE, HTMT, and Fornell-Larcker; common method bias was checked with full collinearity VIFs.

Findings: GCSR shows significant positive effects on all three sustainability dimensions: economic ($\beta = 0.739$, $p < 0.001$), social ($\beta = 0.590$, $p < 0.001$), and environmental ($\beta = 0.447$, $p < 0.001$). The model explains 54.6% of variance in economic sustainability ($R^2 = 0.546$), 34.8% in social ($R^2 = 0.348$), and 20.0% in environmental ($R^2 = 0.200$). Reliability indicators were acceptable ($CR > 0.80$); AVE met the 0.50 threshold for SBS_ECO and SBS_ENV but was marginal for GCSR and SBS_SOC. HTMT and Fornell-Larcker provided mixed evidence of discriminant validity; however, all full collinearity VIFs were < 3.3 .

Practical implications: Results support the business case for GCSR in SMEs, particularly its strong economic and meaningful social payoffs, while indicating that environmental outcomes may require complementary enablers (e.g., green finance, technical assistance, or regulatory support).

Originality/value: The study offers context-specific evidence from an emerging economy, extending stakeholder theory by showing that GCSR can materially advance triple-bottom-line performance in manufacturing SMEs.

Keywords: Green CSR; SME sustainability; manufacturing; Oman; PLS-SEM; stakeholder theory; triple bottom line.

1. INTRODUCTION

Climate change and environmental degradation have heightened the emphasis on sustainable business practices worldwide. In response, organizations are increasingly expected to address environmental concerns as part of their corporate strategies (Wu et al., 2018). This trend has given rise to the concept of green corporate social responsibility (GCSR), the integration of environmental considerations into a firm's social responsibility initiatives (Wu et al., 2018). GCSR represents corporate initiatives that benefit the environment beyond mere legal compliance (Wu et al., 2018). For example, companies might invest in reducing emissions, conserving resources, or developing eco-friendly products as part of their CSR commitments. Such "going green" efforts are not only ethically driven but are also strategic; research indicates that engaging in GCSR can enhance a firm's competitiveness by cutting waste and energy costs, improving brand reputation, and even boosting financial performance (Wu et al., 2018). In short, being socially responsible and environmentally conscious has become intertwined with long-term business success in today's global economy.

Small and medium-sized enterprises (SMEs) play a pivotal role in this sustainability transition. SMEs make up roughly 90% of businesses worldwide, and while each SME's environmental footprint is small, their collective impact is substantial (Adawi, 2023). Notably, SMEs account for about 13% of the energy used by businesses, and their cumulative contribution to industrial pollution is significant (Adawi, 2023). This implies that SMEs' sustainability practices (or lack thereof) can greatly influence environmental outcomes. The manufacturing sector, in particular, is associated with resource-intensive processes and waste generation, meaning manufacturing SMEs have a critical environmental impact. Embracing GCSR in manufacturing,

such as using cleaner production methods or recycling waste, can therefore be a key lever for reducing industrial pollution and achieving broader sustainability goals.

In the Sultanate of Oman, the push for sustainability and greener business practices has gained momentum in recent years. Oman has pledged to reach net-zero carbon emissions by 2050 (Paldaviciute, 2022), aligning with global climate objectives and signaling a national commitment to environmental responsibility. Achieving this target will require concerted efforts across all sectors of the economy, especially from the private sector. Oman's long-term development strategy, Vision 2040, underscores sustainable development and economic diversification, identifying manufacturing as a critical sector for future growth (Balushi, 2025). The manufacturing industry is viewed not only as a driver of economic diversification and job creation but also as an area where sustainability must be prioritized in the face of climate change and resource constraints (Balushi, 2025). Consequently, there is growing recognition in Oman that CSR, particularly its environmental dimension, is indispensable for businesses of all sizes. CSR has "gained significant importance in Oman" among large and smaller organizations as they seek to contribute to the country's economic, social, and environmental well-being (Balushi, 2025). In fact, CSR in Oman is increasingly seen as a strategic investment for the future, not simply a philanthropic effort (Balushi, 2025). Many Omani companies, ranging from oil and gas enterprises to banks, retailers, and manufacturers, now pursue CSR initiatives aligned with national goals of economic diversification, social welfare, and environmental sustainability (Balushi, 2025). These initiatives include programs for community development, support for entrepreneurship and SMEs, as well as environmental actions like renewable energy adoption, waste reduction, and water conservation (Balushi, 2025). Given challenges such as water scarcity, desertification, and climate change in Oman, integrating environmental sustainability into business operations is viewed as a must for long-term viability (Balushi, 2025).

Within this context, SMEs in the manufacturing sector emerge as crucial players. SMEs form a fundamental pillar of Oman's economy, comprising a large majority of businesses and contributing around 15–20% of the country's Gross Domestic Product while employing roughly 40% of the workforce (Alqassabi, 2020). They are central to Oman's diversification efforts under Vision 2040 (Alqassabi, 2020), and their sustainable growth is vital for economic progress. At the same time, manufacturing SMEs tend to have notable environmental footprints due to production processes, meaning their commitment to GCSR can significantly influence Oman's environmental performance. Indeed, a recent report on "Oman's Journey to Net Zero" emphasizes the critical role of SMEs in driving a low-carbon economy, highlighting that eco-innovation and eco-friendly practices by SMEs will be key to Oman's green growth (Adawi, 2023). An increasing number of Omani SMEs are aware of their carbon footprint and have begun transitioning their business models toward more sustainable practices (Adawi, 2023). These range from offering climate-friendly products and services to improving operational efficiency and aligning with national sustainability goals (Adawi, 2023).

Such proactive steps suggest that Omani manufacturing SMEs can become frontrunners in the nation's journey toward net-zero emissions (Adawi, 2023). However, despite these encouraging developments, many SMEs still face obstacles in adopting green practices. Challenges like limited financial resources, lack of technical know-how, and insufficient institutional support can hinder SMEs in implementing effective CSR and sustainability initiatives (Iqbal et al., 2025). Moreover, there remains a knowledge gap in understanding the extent to which Omani manufacturing SMEs are embracing GCSR and how it affects their business sustainability. This gap is underscored by calls in the literature for more research on manufacturing SMEs in the region, given their major role in unsustainable production and the lack of studies focusing on their sustainability practices (Iqbal et al., 2025).

In light of the above, this study examines GCSR and SME business sustainability in Oman's manufacturing sector. The aim is to introduce and clarify the key concepts, identify the core issues, and lay the groundwork for investigating how environmentally oriented CSR efforts might influence manufacturing SMEs' sustainability and long-term success in Oman. The following sections present a formal statement of the research problem, the objectives and questions guiding the study, and a review of relevant literature defining the two main variables of interest, GCSR and SME business sustainability, within the context of manufacturing and Oman.

2. Problem Statement

Manufacturing SMEs in Oman face a dual challenge of achieving economic sustainability while responding to rising environmental expectations. On one hand, these enterprises are under pressure to remain viable and competitive in a diversifying economy; on the other hand, they are increasingly expected to operate in an environmentally responsible manner. The necessity of this study stems from a convergence of practical and knowledge gaps. Although Oman's government and large companies have embraced sustainability initiatives, many SMEs struggle to adopt green practices due to resource constraints, limited awareness, and perceived costs (Iqbal et al., 2025). The failure rate of Omani SMEs is reportedly high; for instance, the number of registered SMEs dropped by 36.7% in one recent year (Iqbal et al., 2025), indicating underlying sustainability issues in the SME sector. Environmental responsibility might be de-prioritized by cash-strapped small firms focused on short-term survival. This is problematic because the cumulative impact of SMEs, especially in manufacturing, contributes significantly to pollution and resource use (Adawi., 2023). If SMEs do not integrate GCSR practices, Oman's broader environmental goals (such as the 2050 net-zero pledge) and the sustainable growth of its industrial sector could be jeopardized.

there is a lack of sufficient research on how GCSR initiatives relate to the sustainability of SMEs in developing economies like Oman. The existing literature on CSR has largely focused on large corporations or general CSR themes, with far less attention paid to "green" CSR in the SME context. Regionally, studies note a dearth of research on manufacturing SMEs and sustainability practices (Iqbal et al., 2025). It remains unclear to what extent Omani manufacturing SMEs engage in environmental CSR and how such engagement influences their business performance, resilience, and growth. In other words, we do not yet fully understand whether GCSR can serve as a lever to improve SME business sustainability in Oman's manufacturing sector. This gap is significant because, without this knowledge, policymakers and business leaders lack evidence-based guidance on encouraging sustainable industrial development at the SME level.

the problem this research addresses is the insufficient understanding of GCSR adoption among manufacturing SMEs in Oman and its impact on their business sustainability. The study is necessary to illuminate why and how these firms incorporate (or fail to incorporate) environmental responsibility in their strategies, and what effects such practices have on their long-term viability. Addressing this problem will support Oman's policy direction (under Vision 2040 and the net-zero commitment) by identifying ways to better integrate SMEs into the country's sustainable development agenda. It will also contribute to the academic discourse by filling a gap in CSR and sustainability research in the Middle East, specifically concerning manufacturing SMEs.

This study aims to investigate the influence of Green Corporate Social Responsibility (GCSR) on the sustainability performance of manufacturing Small and Medium Enterprises (SMEs) in Oman. Specifically, it examines the relationship between GCSR and three core dimensions of SME Business Sustainability: economic, social, and environmental. The following research objectives, questions, and hypotheses have been formulated to guide the study.

3. Research Objectives

- To assess the current practices of Green Corporate Social Responsibility (GCSR) among manufacturing SMEs in Oman.
- To examine the effect of GCSR on the economic sustainability of manufacturing SMEs in Oman.
- To examine the effect of GCSR on the social sustainability of manufacturing SMEs in Oman.
- To examine the effect of GCSR on the environmental sustainability of manufacturing SMEs in Oman.

4. Research Questions

- RQ1: To assess the current practices of Green Corporate Social Responsibility (GCSR) among manufacturing SMEs in Oman.
- RQ2: To examine the effect of Green CSR on the economic sustainability of manufacturing SMEs in Oman.

- RQ3: To examine the effect of Green CSR on the social sustainability of manufacturing SMEs in Oman.
- RQ4: To examine the effect of Green CSR on the environmental sustainability of manufacturing SMEs in Oman.

5. Research Hypotheses

- **H1:** Green CSR has a significant positive effect on the *economic sustainability* of manufacturing SMEs in Oman.
- **H2:** Green CSR has a significant positive effect on the *social sustainability* of manufacturing SMEs in Oman.
- **H3:** Green CSR has a significant positive effect on the *environmental sustainability* of manufacturing SMEs in Oman.

6. LITERATURE REVIEW

6.1 Green Corporate Social Responsibility (GCSR)

Corporate social responsibility (CSR) broadly refers to a company's voluntary actions and policies that contribute to societal goals beyond the pursuit of profits and legal requirements (Wu et al., 2018). CSR is multi-dimensional, encompassing economic, social, and environmental responsibilities toward various stakeholders (Wu et al., 2018). Within this framework, GCSR denotes the environmental pillar of CSR; it reflects a firm's initiatives that are beneficial to the environment, going above and beyond compliance with environmental laws (Wu et al., 2018). In other words, GCSR involves proactive efforts by companies to minimize their ecological footprint and promote environmental sustainability in their operations and communities. These efforts can include reducing waste and emissions, improving energy and resource efficiency, investing in renewable energy, adopting eco-friendly technologies, and engaging in conservation or reforestation projects. A useful definition comes from Wu et al. (2018), who describe GCSR as firms' waste-reduction practices aimed at maximizing the efficiency of resource use while minimizing activities that negatively affect future generations (Wu et al., 2018). This definition highlights two key aspects: efficiency in using inputs (energy, water, raw materials) and an ethical commitment not to harm the environment for future stakeholders.

GCSR has gained prominence as businesses worldwide respond to rising environmental awareness and stakeholder pressures (Wu et al., 2018). Stakeholder theory posits that firms are accountable not only to shareholders but also to various groups, customers, employees, communities, regulators, and others, who expect them to act responsibly (Wu et al., 2018). With stakeholders increasingly valuing ecological sustainability, companies find it necessary to integrate environmental concerns into their CSR agendas to maintain legitimacy and support (Wu et al., 2018). Importantly, engaging in GCSR is not merely altruistic; it can yield tangible strategic benefits. Scholars argue that GCSR can upgrade a firm's competitiveness and create business value (Wu et al., 2018). By committing to environmental initiatives, firms often reduce costs (through energy savings, waste reduction, and avoiding regulatory penalties) and enhance revenues (by attracting eco-conscious customers, differentiating their brand, and improving reputation) (Wu et al., 2018). For instance, reducing material waste or improving energy efficiency directly cuts operating costs, while demonstrating environmental stewardship can strengthen a company's brand loyalty and stakeholder trust (Wu et al., 2018). In some cases, superior environmental performance may open up new markets or investment opportunities, as businesses that align with sustainability trends become more attractive to investors and partners (Wu et al., 2018). These positive outcomes align with the idea that doing good environmentally can help companies do well financially.

The growing body of literature on GCSR also examines its broader impact on innovation and long-term performance. Environmentally responsible firms often need to innovate by developing cleaner technologies or novel sustainable products to meet their green commitments (Wu et al., 2018). This can act as a catalyst for overall innovation performance. Moreover, companies that excel in GCSR may gain preferential support from regulators and communities (such as subsidies, tax breaks, or goodwill), which further contributes to their success (Wu et al., 2018). However, it is worth noting that the effectiveness of GCSR can depend on context and how transparently firms communicate their efforts. In some cases, CSR engagement does not

automatically equate to strong environmental performance (Wu et al., 2018). Firms must genuinely invest in the environmental dimension rather than assume that generic CSR will cover it (Wu et al., 2018).

In the Omani context, awareness of GCSR is rising alongside national sustainability initiatives. Omani businesses are increasingly expected to incorporate environmental protection into their CSR strategies, reflecting the country's Vision 2040 emphasis on a sustainable economy (Balushi, 2025). CSR in Oman is seen as a framework covering environmental protection, community welfare, ethical practices, and more (Balushi, 2025). Notably, companies across sectors, including manufacturing, have begun implementing GCSR activities. For example, some firms are investing in renewable energy (solar and wind projects) at their facilities, running waste reduction and recycling programs, and adopting water conservation measures to address the nation's resource challenges (Balushi, 2025). Such efforts align with Oman's environmental priorities, given issues like water scarcity and climate change impacts in the region (Balushi, 2025). There is also a trend of larger corporations in Oman (e.g., in oil & gas, telecom, banking) supporting sustainability programs that benefit SMEs and local communities, such as providing funding, mentorship, and training for green entrepreneurship and SME development (Balushi, 2025). This indicates an ecosystem approach to CSR, where big firms help enable smaller ones to be more sustainable. Public discourse in Oman, as reflected in local media, reinforces that CSR, particularly GCSR, is "no longer just a matter of conscience; it is a strategic investment for the future of Oman", leading to better brand value and sustainable business outcomes in the long run (Balushi, 2025). In sum, GCSR is emerging as an essential practice for large and small Omani firms to demonstrate their commitment to environmental stewardship and support the country's transition toward a more diversified and sustainable economy.

6.2 SME Business Sustainability

The concept of business sustainability for SMEs refers to the ability of a small or medium enterprise to survive and thrive over the long term while balancing economic performance, social responsibility, and environmental stewardship. In practical terms, an SME's sustainability is often judged by its continued growth, profitability, and stability over time (economic sustainability), as well as its capacity to manage social and environmental obligations (often described as the "triple bottom line" of people, planet, and profit). Unlike large corporations, SMEs typically operate with fewer resources and may face more volatile market conditions, which makes achieving sustainability a distinct challenge.

From an economic perspective, key indicators of SME sustainability include revenue growth, stable or increasing annual sales, profitability, and job creation or retention (Alqassabi, 2020). An SME that consistently grows its sales and maintains healthy financial performance is considered more sustainable in business terms than one with erratic performance or frequent losses (Alqassabi, 2020). Employment generation is another indicator, as sustainable SMEs tend to contribute to steady employment in their communities. In fact, continuous business growth over a certain time period is one way to gauge the sustainability of an SME's development (Alqassabi, 2020). Achieving such growth often requires effective management, innovation, and adaptability to market changes.

However, SME sustainability is multifaceted and extends beyond just financial metrics. Stakeholder theory suggests that considering the needs and expectations of various stakeholders (customers, employees, suppliers, community, and environment) is crucial for a firm's long-term success (Alqassabi, 2020). For SMEs, this means that sustainable business practices can involve building good relationships with customers through quality and trust, investing in employee well-being and skills, and behaving ethically and responsibly in the community. Notably, many SMEs worldwide are integrating environmental and social practices into their business models, for example, by reducing energy usage, minimizing waste, or sourcing responsibly, as these practices can improve efficiency and brand image, thereby supporting financial success as well. In essence, SME's business sustainability increasingly encompasses resilience (ability to withstand economic downturns or external shocks), responsible governance, and adaptation to environmental and social challenges.

In the context of Oman's SMEs, sustainability has become a focal issue for policymakers and entrepreneurs alike. The Omani government recognizes SMEs as vital for economic diversification and job creation, incorporating their development into national plans like Vision 2020 and Vision 2040 (Alqassabi, 2020). Despite this support, Omani SMEs face persistent challenges that can impede their sustainability. Research and surveys have identified several major hurdles: bureaucratic hurdles and regulatory constraints, intense market competition, and limited access to finance are repeatedly cited as top challenges for SMEs in Oman

(Alqassabi, 2020). These factors can constrain an SME's growth and even threaten its survival. For instance, heavy administrative procedures or strict regulations may burden small businesses, aggressive competition (including from large firms or imports) can squeeze their market share, and difficulties in obtaining loans or investment limit their ability to expand or innovate (Alqassabi, 2020). Additionally, many Omani SMEs have limitations in managerial experience and technical expertise, which affect their strategic planning and operational efficiency (Alqassabi, 2020). The geographical isolation of some SMEs (those operating in interior regions away from major markets) and technological gaps (slow adoption of digital tools or e-commerce) further pose challenges to sustaining their business in a fast-evolving global market (Alqassabi, 2020).

One consequence of these challenges is a relatively high failure or attrition rate among SMEs in Oman (Alqassabi, 2020). Many new SMEs do not survive beyond a few years, which raises concerns about the sector's sustainability. For example, it was noted that the number of registered SMEs in Oman saw a sharp drop in one period, implying that a significant proportion ceased operations (Alqassabi, 2020). These trends underscore the need for improved support systems and capacity-building to ensure SMEs can endure and prosper. Encouragingly, studies have shown that external support can make a positive difference. Government support programs, such as financing schemes, advisory services, and infrastructure support, have been found to correlate positively with the sustainability of SMEs in Oman (Alqassabi, 2020). In one conceptual framework, Alqassabi (2020) demonstrated that when SMEs take advantage of public institutions' marketing, financial, and technical support, their chances of sustainable growth improve (Alqassabi, 2020). This highlights that an enabling environment, including accessible funding and business development services, is crucial to SME sustainability.

It is also increasingly evident that sustainable business practices (environmental and social initiatives) can bolster SME sustainability. Although resource constraints are real, SMEs often find that initiatives like improving energy efficiency, reducing waste, or obtaining eco-certifications lead to cost savings and better market opportunities in the long run (Iqbal et al., 2025). Drivers such as cost reduction and differentiation have been noted as motivations for SMEs to engage in sustainability initiatives (Iqbal et al., 2025). For instance, an SME that minimizes waste output can lower its raw material costs and simultaneously appeal to environmentally conscious clients, thus creating a competitive edge. Moreover, external pressures are mounting: SMEs in Oman and globally are increasingly influenced by customers, supply chain partners, and investors who prefer to do business with socially responsible and green firms (Iqbal et al., 2025). Larger corporations may require their SME suppliers to meet certain environmental standards (green procurement policies), and consumers are paying more attention to the ethical and environmental track record of the brands they patronize. As a result, adopting sustainable practices is becoming part of maintaining business viability for SMEs. In Oman, for example, there is growing awareness among SME owners that aligning with national sustainability priorities (like reducing carbon footprint or supporting community welfare) can enhance their reputation and stakeholder relations, which in turn supports their business objectives (Balushi, 2025).

In summary, SME business sustainability entails a holistic blend of financial health, stakeholder satisfaction, and adaptability to environmental and social demands. For Omani manufacturing SMEs, achieving sustainability means not only managing profits and growth but also responding to the country's call for sustainable development. These firms must overcome typical barriers (financial, regulatory, technical) while also integrating innovative practices that reduce environmental impact and contribute positively to society. The interplay between these factors sets the stage for examining how GCSR activities might serve as a catalyst for SME sustainability, potentially turning challenges into opportunities for long-term success.

7. Linking GCSR and SME Sustainability in Oman's Manufacturing Sector

Having defined the core concepts of GCSR and SME sustainability, it is important to explore their intersection, particularly within the manufacturing sector in Oman. Manufacturing SMEs stand at the crossroads of industrial development and environmental impact. By virtue of their production activities, these SMEs contribute to issues like resource consumption, energy use, and waste generation. Thus, their adoption of GCSR practices can have a direct bearing on both environmental outcomes and their own business continuity.

Literature suggests that there are mutually reinforcing benefits when SMEs integrate environmental responsibility into their business strategy. GCSR initiatives, such as improving the energy efficiency of manufacturing processes, treating and reducing industrial waste, or designing greener products, can lead to operational improvements that enhance an SME's efficiency and cost-effectiveness (Wu et al., 2018). For example, a manufacturing workshop that invests in energy-efficient machinery or optimizes its raw material usage not only lowers its environmental footprint but also reduces production costs, thereby improving profit margins. These efficiency gains support financial sustainability. Additionally, manufacturing SMEs that proactively address environmental concerns may enjoy stronger stakeholder support. They can attract customers who prefer eco-friendly products, gain trust from local communities concerned about pollution, and avoid conflicts with regulators by staying ahead of environmental compliance. This stakeholder goodwill can translate into a more stable market position and even allow premium pricing for sustainably-made products, thus contributing to business longevity (Wu et al., 2018).

In Oman, these dynamics are increasingly recognized. As noted earlier, Omani SMEs engaging in sustainable practices can unlock benefits like cost savings, operational efficiency, and enhanced brand recognition (Adawi, 2023). This is particularly relevant in manufacturing, where efficiency and innovation are keys to competitiveness. A Ministry official in Oman commented that by aligning operations with sustainability goals, local SMEs are positioning themselves as frontrunners in the journey to net-zero and reaping advantages in revenue and competitiveness (Adawi., 2023). Thus, green practices are not a financial burden in the long run; rather, they are investments into improved performance and market differentiation.

Empirical research in similar contexts supports the notion that CSR and sustainability efforts can enhance SME performance. For instance, studies have found that while implementing CSR (including environmental initiatives) may incur short-term costs, it often leads to long-term gains such as greater efficiency, reduced risks, and improved stakeholder loyalty (Alkandi, 2025). In emerging markets, it has been observed that CSR and sustainable practices contribute to building a positive corporate image and trust, which are critical assets for small businesses competing with larger firms (Balushi, 2025). Specifically regarding environmental CSR, its role in fostering innovation is noteworthy, adopting green solutions can push SMEs to innovate in processes and products, potentially leading to new business opportunities and resilience against market shifts (Wu et al., 2018).

Despite these benefits, the adoption of GCSR among manufacturing SMEs in Oman is not without hurdles. As highlighted in the problem statement, many SMEs encounter financial and knowledge constraints that make it challenging to invest in sustainability. Initial costs for new equipment or certifications, perceived complexity of implementing environmental management systems, and a lack of expertise in sustainability are common concerns. Moreover, some SME owners might not yet be convinced of the business case for GCSR, considering it secondary to immediate business needs. The literature points out that without adequate incentives and support (government policies, access to green financing, technical training), SMEs may be slow to change their traditional practices (Iqbal et al., 2025). In Oman, while there are initiatives (such as the Public Authority for SME Development and various funds) aimed at supporting small businesses, the awareness and utilization of these supports for sustainability might be limited (Alqassabi, 2020). Indeed, many SME owners in Oman have reported not being fully aware of available support programs or finding the procedures cumbersome (Alqassabi, 2020). This suggests that bridging the gap between policy intent and on-ground action is necessary.

Another consideration is the cultural and organizational mindset. Sustainability culture may still be nascent in some SME circles, where owners are accustomed to conventional ways of doing business. Changing mindsets to value long-term sustainability over short-term gains is a gradual process that may require demonstration of success stories and peer learning. In regions like Oman, studies have noted cultural barriers and skill gaps as obstacles to adopting sustainable practices (Iqbal et al., 2025). These are not insurmountable, as awareness grows and more local SMEs showcase the advantages of green innovation (for example, renewable energy startups or firms succeeding with eco-friendly products), a positive shift is likely.

Building on the literature reviewed, it becomes evident that GCSR is not only an environmental obligation but also a strategic driver for SMEs' survival and competitiveness, particularly in manufacturing sectors with high environmental impact. Prior studies show that integrating GCSR into business operations can generate economic benefits through cost reduction and efficiency gains, social benefits by strengthening community

and employee relations, and environmental benefits through reduced ecological footprints. In Oman, where SMEs face both sustainability challenges and opportunities under Vision 2040, the potential for GCSR to foster long-term business sustainability is especially relevant. Despite the growing awareness, empirical evidence from Omani manufacturing SMEs remains limited, leaving a research gap regarding the direct effects of GCSR on the economic, social, and environmental dimensions of SME sustainability. To address this gap, the following hypotheses are proposed:

- **H1:** Green CSR has a significant positive effect on the economic sustainability of manufacturing SMEs in Oman.
- **H2:** Green CSR has a significant positive effect on the social sustainability of manufacturing SMEs in Oman.
- **H3:** Green CSR has a significant positive effect on the environmental sustainability of manufacturing SMEs in Oman.

In conclusion, the literature indicates that GCSR and SME business sustainability are closely linked: proactive environmental responsibility can drive the durability and success of SMEs, particularly in manufacturing, where efficiency and innovation are paramount. For Oman's manufacturing SMEs, adopting GCSR aligns with national sustainability goals and can improve their own prospects by boosting efficiency, meeting stakeholder expectations, and differentiating themselves in the market. However, realizing these benefits depends on overcoming challenges such as resource constraints and knowledge gaps. This study's focus on Omani manufacturing SMEs will shed light on how these dynamics play out in practice, whether GCSR is being effectively leveraged for sustainable business performance, and what more can be done to support SMEs on this path. The insights from this research will contribute to the academic understanding of CSR in the SME context and inform practical strategies to enhance the sustainability of SMEs in Oman's manufacturing sector.

8. METHODOLOGY

8.1 Research Design

This study employed a quantitative, cross-sectional survey design to investigate the influence of Green Corporate Social Responsibility (GCSR) on the business sustainability of small and medium enterprises (SMEs) within Oman's manufacturing sector. Business sustainability was operationalized across three dimensions: economic, social, and environmental. Data were obtained through a structured questionnaire administered to 153 SMEs and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS software. PLS-SEM was selected because of its strength in estimating complex models with latent constructs, its predictive orientation, and its appropriateness for exploratory research conducted with relatively modest sample sizes.

The sample size achieved is considered statistically sufficient for reliable estimation and, combined with stratification across sub-sectors, enhances the representativeness of the findings.

8.2 Population and Sample

The population targeted in this research comprised manufacturing SMEs operating across Oman. These included firms engaged in industries such as food processing, plastics, metals, and textiles. SMEs were defined in accordance with Omani criteria (e.g., employee count and annual turnover thresholds). This focus was chosen because manufacturing SMEs play a pivotal role in Oman's economic diversification agenda, and understanding their engagement with GCSR and its sustainability implications provides both theoretical and practical relevance.

A total of 153 SMEs were surveyed. This number aligns with methodological guidelines for PLS-SEM, which is known to yield robust estimates with relatively small samples. A non-probability convenience sampling strategy was employed, reflecting both the study's exploratory nature and practical constraints in accessing firms (Nikolopoulou, 2022). SME owners and managers were approached via professional networks, industry associations, and referrals, and invited to participate. Each firm was represented by a single key informant, preferably the owner or a senior manager, who possessed sufficient knowledge of the firm's CSR practices and performance.

Although convenience sampling limits generalizability, the researcher sought to mitigate bias by including SMEs of different sizes and from diverse sub-sectors within manufacturing. Participation was voluntary, and all respondents satisfied the inclusion criteria of being decision-makers within Omani manufacturing SMEs.

8.3 Data Collection Method

Data were collected using a structured, self-administered questionnaire delivered primarily online through secure survey links emailed to participants. This approach enabled wide geographic coverage across Oman. The questionnaire commenced with an introduction outlining the study's purpose, the scope of questions, and the ethical considerations underpinning participation.

Informed consent was obtained electronically. Respondents were advised that their participation was voluntary, that they could withdraw at any time without consequence, and that their responses would remain strictly anonymous. No personally identifiable information (such as the names of firms or individuals) was recorded. All responses were aggregated for analysis.

To encourage candid responses, the survey was designed for completion in a private setting and in English, a language widely used in Omani business contexts. Questions were phrased clearly to minimize ambiguity. Out of the responses received, 153 were complete and valid, with incomplete or ineligible surveys excluded automatically by the online platform, which enforced completion of required fields.

Subsequently, the dataset was cleaned, coded, and checked for entry errors or missing values. No significant issues were identified. The research process adhered strictly to ethical standards, ensuring confidentiality, voluntary participation, and transparency. The study safeguarded ethical integrity while ensuring efficiency and reliability in data collection by employing an online, self-administered survey with clear protocols for consent and anonymity.

Table 1a: Sample Descriptive

Variable	Category	n	%
Industry	Manufacturing	52	34.0
	Services	69	45.1
	Trade/Wholesale & Retail	29	19.0
	Other	3	2.0
Firm size	Micro (1-9 employees)	60	39.2
	Small (10-49)	66	43.1
	Medium (50-249)	27	17.7
Firm age	< 3 years	24	15.7
	3-5 years	41	26.8
	6-10 years	50	32.7
	> 10 years	38	24.8
Region	Muscat	85	55.6
	Dhofar	22	14.4
	Other governorates	46	30.1
Respondent role	Owner/Founder	90	58.8
	Senior Manager	63	41.2
Primary market	Local (domestic)	109	71.2
	Export (any share)	44	28.8
N (total)	—	153	100

The sample of 153 firms was largely concentrated in the services sector (45.1%), followed by manufacturing (34.0%) and trade/retail (19.0%), with only a small share in other industries (2.0%). In terms of size, the majority were small (43.1%) and micro enterprises (39.2%), while medium-sized firms accounted for 17.7%. Regarding firm age, around one-third (32.7%) had been operating for 6–10 years, with others distributed across 3–5 years (26.8%), more than 10 years (24.8%), and less than 3 years (15.7%). Geographically, over half were located in Muscat (55.6%), followed by other governorates (30.1%) and Dhofar (14.4%). Most respondents were owners or founders (58.8%), while 41.2% were senior managers. Finally, the primary market focus was domestic (71.2%), with 28.8% of firms involved in exports.

8.4 Operationalization of Variables and Measurement Scales

All constructs in this study were measured using validated multi-item scales on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The constructs represent the independent and dependent variables of the research model, adapted from established prior studies.

8.4.1 Green Corporate Social Responsibility (GCSR).

GCSR was measured as the firm's environmental and social responsibility practices directed toward stakeholders and the natural environment. This construct captures how SMEs invest in environmental initiatives, engage in sustainable practices, and promote long-term ecological and social well-being. The items were adapted from prior empirical studies (Afiuc et al., 2021; Le et al., 2024; Hameed et al., 2022; Becerra-Vicario et al., 2023; Kamalanon et al., 2022; Enbaia et al., 2024; Rui & Lu, 2021), which have validated GCSR measures across multiple contexts.

8.4.2 SMEs' Business Sustainability (SBS).

SBS was conceptualized as a multidimensional construct consisting of three dimensions: Economic, Social, and Environmental sustainability. This operationalization reflects the triple bottom line framework of profit, people, and planet, adapted to SMEs in Oman.

- **Economic Sustainability (SBS_ECO)** emphasizes growth in market share, cost efficiency, and environmentally friendly business practices.
- **Social Sustainability (SBS_SOC)** refers to initiatives that improve employee welfare, community engagement, and social recognition.
- **Environmental Sustainability (SBS_ENV)** captures firms' ability to reduce ecological impact, minimize waste, and maintain clean operational standards.

The items were adapted from prior studies (Hameed et al., 2022; Becerra-Vicario et al., 2023; Le et al., 2024; Nguyen & Nguyen, 2020; Khan & Quaddus, 2015, 2016, 2017, 2018; Yadegaridehkordi, 2023; Kurniawati et al., 2022), which provide reliable and valid indicators for measuring SMEs' sustainability outcomes.

Consistent with SME research practice, we adopt perceptual (manager-reported) measures for sustainability performance, as audited performance data are often incomplete or unavailable for SMEs. This approach has been validated in prior empirical studies, demonstrating reliability and predictive validity.

Descriptive statistics (means, standard deviations) and zero-order correlations for all constructs are reported in Table 1. The detailed operational definitions and measurement items are presented below.

Operational Definition	Code	Item (Our enterprise ...)	Source(s)
Green Corporate Social Responsibility (GCSR) refers to an enterprise's initiatives and practices that proactively address environmental and social responsibilities, including ecological protection, transparency, and community engagement.	GCSR.1	Supports external stakeholders who promote environmental protection for community well-being.	Afiuc et al. (2021); Le et al. (2024); Hameed et al. (2022)
	GCSR.2	Invests in environmental initiatives that aim to create a better life for future generations.	Becerra-Vicario et al. (2023); Le et al. (2024); Hameed et al. (2022)
	GCSR.3	Undertakes GCSR initiatives that reduce ecological impact on the natural environment.	Hameed et al. (2022); Becerra-Vicario et al. (2023)
	GCSR.4	Allocates funds to raise awareness about environmental.	Afiuc et al. (2021)
	GCSR.5	Encourages employees to participate in volunteer activities that support social causes.	Hameed et al. (2022)
	GCSR.6	Demonstrates social responsibility by creating a positive social impact through value-driven practices.	Hameed et al. (2022); Becerra-Vicario et al. (2023)
	GCSR.7	Integrates stakeholder transparency into long-term business planning that supports environmental.	Kamalanon et al. (2022)
	GCSR.8	Practices environmental reporting as part of its corporate responsibility.	Hameed et al. (2022)
SMEs' Business Sustainability - Economic (SBS_ECO) refers to a firm's ability to maintain financial viability and growth while integrating environmentally friendly practices.	SBS_ECO_1	Collaborates with government representatives to support business growth.	Becerra-Vicario et al. (2023); Le et al. (2024)
	SBS_ECO_2	Improves cost efficiency through environmentally friendly purchasing in operational business practices.	Le et al. (2024); Yadegaridehkordi (2023); Kurniawati et al. (2022); Khan & Quaddus (2015)

	SBS_ECO_3	Strengthens customer relationships by promoting products with strong environmental performance.	Le et al. (2024); Yadegaridehkordi (2023); Khan & Quaddus (2016, 2017); Kurniawati et al. (2022)
	SBS_ECO_4	Has achieved growth in market share through environmentally friendly practices.	Khan & Quaddus (2018)
SMEs' Business Sustainability - Social (SBS_SOC) refers to a firm's responsibility toward employees and society, including community engagement, employment initiatives, and social recognition.	SBS_SOC_1	Supports initiatives that enhance the well-being of the local community.	Kurniawati et al. (2022); Khan & Quaddus (2015)
	SBS_SOC_2	Supports employment initiatives that improve the livelihoods of employees.	Khan & Quaddus (2015)
	SBS_SOC_3	Enhances social recognition by informing the community about its environmental contributions.	Le et al. (2024); Khan & Quaddus (2016); Nguyen & Nguyen (2020)
	SBS_SOC_4	Promotes work-life balance for employees.	Khan & Quaddus (2016)
	SBS_SOC_5	Encourages employees are highly environmentally committed.	Nguyen & Nguyen (2020)
SMEs' Business Sustainability - Environmental (SBS_ENV) refers to a firm's practices that minimize environmental impact and ensure ecological responsibility.	SBS_ENV_1	Produces high-quality products with reduced environmental impact.	Le et al. (2024); Nguyen & Nguyen (2020); Becerra-Vicario et al. (2023); Khan & Quaddus (2015)
	SBS_ENV_2	Minimizes environmental impact by efficiently using utilities (e.g., electricity, water).	Nguyen & Nguyen (2020); Le et al. (2024); Becerra-Vicario et al. (2023); Khan & Quaddus (2016)
	SBS_ENV_3	Reduces waste by efficiently streamlining operational activities.	Le et al. (2024); Nguyen & Nguyen (2020)
	SBS_ENV_4	Maintains cleanliness in daily operations to meet environmental health standards.	Nguyen & Nguyen (2020)

9. Common Method Bias and Validity Checks

To mitigate Common Method Bias (CMB), anonymity and clarity were ensured, and scale item separation was applied. Statistically, VIF values were below the 3.3 threshold (Kock, 2015), confirming CMB is not a concern. Reliability and validity were assessed via Cronbach's Alpha, Composite Reliability (CR), Average Variance Extracted (AVE), Fornell-Larcker (Fornell, C., & Larcker, D. F., 1981), and HTMT criteria.

Additionally, we ran full collinearity VIF diagnostics for all latent variables (values < 3.3) and included an ex-post non-response bias check by comparing early and late respondents on focal constructs (no significant differences). These results, together with the measurement model evidence (Tables 2 and 3a-3b), support the validity of our inferences.

10. Data Analysis Technique

PLS-SEM (SmartPLS 4) was employed due to its suitability for complex models and non-normal data (Hair et al., 2021). Analysis followed a two-step procedure of measurement and structural model. Measurement Model: Indicator loadings, AVE, CR, and HTMT were used to validate constructs. Structural Model: Path coefficients, R^2 , f^2 , Q^2 , and bootstrapping (5,000 samples) assessed direct, indirect, and mediating relationships. All inner VIF values remained below recommended thresholds (Hair et al., 2021; Kock, 2015), ensuring no multicollinearity.

11. RESULTS

This study employed a two-stage analytical approach using SmartPLS: (1) Measurement Model Assessment and (2) Structural Model Assessment, following best practices in PLS-SEM (Hair et al., 2021; Sarstedt et al., 2022).

11.1 Measurement Model Assessment

11.2 Indicator and Internal Consistency Reliability

The results in Table 3 demonstrate a reasonably strong measurement model, satisfying most criteria for construct reliability and convergent validity, with a few limitations. Cronbach's alpha values ranged from 0.661 to 0.831. Three constructs (GCSR = 0.823, SBS ENV = 0.831, SBS SOC = 0.714) exceeded the 0.70 threshold (Hair et al., 2019), confirming acceptable internal consistency, while SBS ECO (0.661) fell slightly below, indicating marginal reliability. Composite reliability scores (ρ_A = 0.747–0.845; CR = 0.804–0.882) were well above the recommended 0.70 level, confirming robust internal consistency reliability across all constructs.

For Average Variance Extracted (AVE), SBS ECO (0.530) and SBS ENV (0.603) surpassed the 0.50 threshold, providing evidence of convergent validity. However, GCSR (0.449) and SBS SOC (0.471) did not meet the cutoff, indicating that these constructs explain less than half of the variance in their respective indicators and may require refinement.

Overall, the measurement model demonstrates adequate psychometric properties. Reliability indicators (Cronbach's alpha and CR) are mostly satisfactory, and two of the four constructs show good convergent validity. While GCSR and SBS SOC remain slightly weak in AVE performance, the results are sufficient to proceed to the structural model assessment.

Table 2. Indicator and Internal Consistency Reliability

Constructs	Cronbach's alpha	Composite reliability (ρ_a)	Composite reliability (ρ_c)	Average variance extracted (AVE)
GCSR	0.823	0.845	0.865	0.449
SBS ECO	0.661	0.752	0.804	0.530
SBS ENV	0.831	0.838	0.882	0.603
SBS SOC	0.714	0.747	0.811	0.471

Source: Authors own work

11.3 Discriminant Validity

Discriminant validity was assessed using two approaches: the Heterotrait-Monotrait ratio (HTMT) and the Fornell-Larcker criterion. These methods ensure that constructs are conceptually distinct and not affected by multicollinearity.

As shown in Table 4a, several HTMT values exceeded the recommended 0.85 threshold (Henseler et al., 2015). The highest value was observed between SBS ENV and SBS SOC (1.003), followed by SBS ECO and SBS SOC (0.922), and GCSR and SBS ECO (0.915), indicating potential discriminant validity concerns among these constructs. In contrast, other HTMT values such as GCSR-SBS ENV (0.560), GCSR-SBS SOC (0.759), and SBS ECO-SBS ENV (0.510) were below the threshold, suggesting acceptable discriminant validity for those construct pairs.

Table 3a: Heterotrait-monotrait ratio (HTMT) – Matrix

Constructs	GCSR	SBS ECO	SBS ENV	SBS SOC
GCSR				
SBS ECO	0.915			
SBS ENV	0.560	0.510		
SBS SOC	0.759	0.922	1.003	

Source: Authors own work

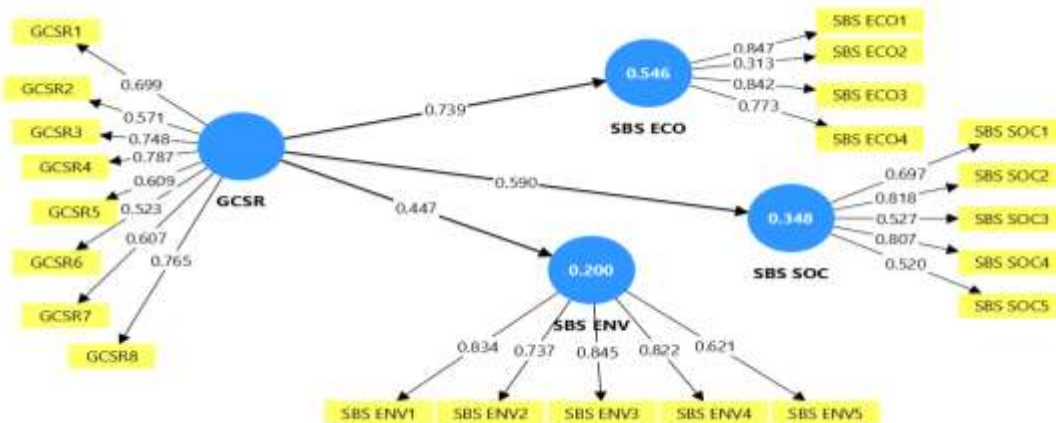
Table 3b applies the Fornell-Larcker criterion to assess discriminant validity. This method requires that the square root of a construct’s AVE (values on the diagonal) must be higher than its correlations with other constructs (off-diagonal). In this study, some constructs meet this requirement, while others do not. For example, SBS ENV has a diagonal value of 0.776, which is higher than its correlations with GCSR (0.447), SBS ECO (0.381), and SBS SOC (0.791), partially supporting discriminant validity. However, GCSR (0.670) and SBS SOC (0.686) are close to or lower than some of their inter-construct correlations, suggesting weaker discriminant validity.

Table 3b: Fornell-Larcker criterion

Constructs	GCSR	SBS ECO	SBS ENV	SBS SOC
GCSR	0.670			
SBS ECO	0.739	0.728		
SBS ENV	0.447	0.381	0.776	
SBS SOC	0.590	0.670	0.791	0.686

Source: Authors own work

Combined results from the HTMT and Fornell-Larcker tests provide partial support for discriminant validity. While some construct pairs remain empirically distinct, others (notably between GCSR, SBS ECO, and SBS SOC) show evidence of conceptual overlap. This indicates that measurement refinement may be necessary to fully establish discriminant validity. see the figure 1 : Structural Model Linking GCSR and SME Sustainability Dimensions



12. Structural Model Assessment

12.1 Path Coefficients

The path coefficients reflect the strength, direction, and statistical significance of the hypothesized relationships among constructs in the structural model. As shown in Table 6, all direct effects of Green Corporate Social Responsibility (GCSR) on SMEs' sustainability dimensions were found to be positive and statistically significant ($p < 0.001$).

Specifically, $GCSR \rightarrow SBS\ ECO$ demonstrated the strongest effect ($\beta = 0.739$, $t = 17.253$, $p = 0.000$), confirming that GCSR significantly enhances the economic sustainability of manufacturing SMEs in Oman.

This finding suggests that environmentally responsible practices, such as eco-efficient purchasing and waste reduction, directly contribute to improved market share and cost efficiency.

The effect of $GCSR \rightarrow SBS\ SOC$ was also significant and moderately strong ($\beta = 0.590$, $t = 8.010$, $p = 0.000$), indicating that GCSR initiatives positively influence the social sustainability dimension. This highlights how CSR-driven employee engagement, community support, and socially responsible practices improve the firm's social recognition and stakeholder relations.

Finally, $GCSR \rightarrow SBS\ ENV$ showed a significant positive effect ($\beta = 0.447$, $t = 4.484$, $p = 0.000$). Although weaker compared to the economic and social dimensions, this relationship confirms that GCSR initiatives contribute to reducing ecological footprints and improving SMEs' environmental performance.

Overall, the results provide strong empirical support for H1, H2, and H3, validating that GCSR positively influences the economic, social, and environmental sustainability of SMEs in Oman's manufacturing sector.

Table 4: Results of hypotheses testing.

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
GCSR \rightarrow SBS ECO	0.739	0.749	0.043	17.253	0.000
GCSR \rightarrow SBS ENV	0.447	0.458	0.100	4.484	0.000
GCSR \rightarrow SBS SOC	0.590	0.605	0.074	8.010	0.000

Source: Authors own work

The indicator loadings reflect the strength, direction, and significance of the relationships between observed items and their latent constructs. As presented in Table 5, the majority of items load strongly on their respective constructs, with most values exceeding the recommended threshold of 0.70 (Hair et al., 2019).

For the Green Corporate Social Responsibility (GCSR) construct, all indicators were statistically significant ($p < 0.001$). The strongest loading was observed for GCSR8 ($\beta = 0.765$, $p = 0.000$), followed by GCSR4 ($\beta = 0.787$, $p = 0.000$) and GCSR3 ($\beta = 0.748$, $p = 0.000$), confirming their robustness. Moderate but acceptable loadings were recorded for GCSR1 ($\beta = 0.699$, $p = 0.000$), GCSR5 ($\beta = 0.609$, $p = 0.000$), and GCSR7 ($\beta = 0.607$, $p = 0.000$), while GCSR6 ($\beta = 0.523$, $p = 0.000$) was slightly below the preferred cutoff, though still significant, indicating that the item contributes meaningfully to the construct.

Within SMEs' Economic Sustainability (SBS ECO), three items showed strong and highly significant loadings: ECO1 ($\beta = 0.847$, $p = 0.000$), ECO3 ($\beta = 0.842$, $p = 0.000$), and ECO4 ($\beta = 0.773$, $p = 0.000$). However, ECO2 ($\beta = 0.313$, $p = 0.038$) fell well below the recommended 0.70 threshold, suggesting weak reliability and potential measurement concerns for this indicator.

For Environmental Sustainability (SBS ENV), most items demonstrated satisfactory loadings. ENV3 ($\beta = 0.845$, $p = 0.000$), ENV1 ($\beta = 0.834$, $p = 0.000$), and ENV4 ($\beta = 0.822$, $p = 0.000$) performed strongly, while ENV2 ($\beta = 0.737$, $p = 0.000$) was also acceptable. ENV5 ($\beta = 0.621$, $p = 0.000$), although significant, fell slightly short of the recommended cutoff, indicating marginal reliability.

In the case of Social Sustainability (SBS SOC), the highest loading was observed for SOC2 ($\beta = 0.818$, $p = 0.000$) and SOC4 ($\beta = 0.807$, $p = 0.000$), both demonstrating strong indicator reliability. SOC1 ($\beta = 0.697$, $p = 0.000$) was just below the threshold but still acceptable. By contrast, SOC3 ($\beta = 0.527$, $p = 0.000$) and

SOC5 ($\beta = 0.520$, $p = 0.000$) were weaker, falling short of the recommended level, suggesting these items may require refinement in future studies.

Overall, these results indicate that the measurement model demonstrates acceptable reliability and indicator significance, with most items loading strongly onto their constructs. While a small number of indicators (GCSR6, SBS ECO2, SBS ENV5, SBS SOC3, and SBS SOC5) performed below the 0.70 threshold, their statistical significance and theoretical importance justify their retention for further structural model analysis.

Table 5: outer loadings

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
GCSR1 < GCSR	0.699	0.689	0.063	11.090	0.000
GCSR2 < GCSR	0.571	0.561	0.087	6.572	0.000
GCSR3 < GCSR	0.748	0.752	0.045	16.467	0.000
GCSR4 < GCSR	0.787	0.790	0.037	21.103	0.000
GCSR5 < GCSR	0.609	0.604	0.083	7.336	0.000
GCSR6 < GCSR	0.523	0.508	0.110	4.761	0.000
GCSR7 < GCSR	0.607	0.590	0.114	5.301	0.000
GCSR8 < GCSR	0.765	0.774	0.027	27.834	0.000
SBS ECO1 < SBS ECO	0.847	0.851	0.022	38.823	0.000
SBS ECO2 < SBS ECO	0.313	0.297	0.151	2.073	0.038
SBS ECO3 < SBS ECO	0.842	0.846	0.038	22.075	0.000
SBS ECO4 < SBS ECO	0.773	0.764	0.052	15.007	0.000
SBS ENV1 < SBS ENV	0.834	0.830	0.063	13.322	0.000
SBS ENV2 < SBS ENV	0.737	0.728	0.090	8.202	0.000
SBS ENV3 < SBS ENV	0.845	0.833	0.059	14.228	0.000
SBS ENV4 < SBS ENV	0.822	0.827	0.034	24.381	0.000
SBS ENV5 < SBS ENV	0.621	0.616	0.091	6.813	0.000
SBS SOC1 < SBS SOC	0.697	0.699	0.067	10.368	0.000
SBS SOC2 < SBS SOC	0.818	0.822	0.029	28.250	0.000
SBS SOC3 < SBS SOC	0.527	0.500	0.140	3.754	0.000

SBS SOC4 < SBS SOC	0.807	0.809	0.051	15.869	0.000
SBS SOC5 < SBS SOC	0.520	0.497	0.135	3.849	0.000

Source: Authors own work

12.2 Coefficient of Determination (R²),

The coefficient of determination (R²) was assessed to evaluate the explanatory power of the structural model. R² values represent the proportion of variance in the dependent constructs explained by their predictors, with thresholds of 0.25 (weak), 0.50 (moderate), and 0.75 (substantial) suggested in the PLS-SEM literature (Hair et al., 2021).

As presented in Table 6, the model explains:

- 54.6% of the variance in Economic Sustainability (SBS ECO) (R² = 0.546, adjusted R² = 0.543). This indicates a moderate-to-strong explanatory power, suggesting that GCSR substantially contributes to explaining economic performance outcomes such as market share growth and cost efficiency.
- 20.0% of the variance in Environmental Sustainability (SBS ENV) (R² = 0.200, adjusted R² = 0.195). This falls within the weak explanatory range, showing that while GCSR has a positive and significant effect on environmental outcomes, additional factors beyond the model are likely influencing SMEs' environmental sustainability.
- 34.8% of the variance in Social Sustainability (SBS SOC) (R² = 0.348, adjusted R² = 0.344). This represents a moderate explanatory power, confirming that GCSR provides meaningful explanation of SMEs' ability to engage stakeholders, support employees, and enhance community well-being.

Overall, these results suggest that the model has moderate explanatory power for economic and social sustainability, while environmental sustainability is less explained by GCSR alone, implying that future studies should explore additional predictors (e.g., regulatory enforcement, technological innovation, or green capabilities).

Table 6: Coefficient of Determination (R²)

	R-square	R-square adjusted
SBS ECO	0.546	0.543
SBS ENV	0.200	0.195
SBS SOC	0.348	0.344

Source: Authors own work

13. DISCUSSION OF FINDINGS

This study examined whether Green Corporate Social Responsibility (GCSR) enhances the business sustainability of Omani manufacturing SMEs across economic, social, and environmental dimensions. The structural model results show that all three hypothesized paths are positive and statistically significant:

- GCSR → Economic sustainability (SBS ECO): $\beta = 0.739$, $t = 17.253$, $p = 0.000$
- GCSR → Social sustainability (SBS SOC): $\beta = 0.590$, $t = 8.010$, $p = 0.000$
- GCSR → Environmental sustainability (SBS ENV): $\beta = 0.447$, $t = 4.484$, $p = 0.000$

These findings support H1, H2, and H3 and align with the literature that positions GCSR as both a moral imperative and a strategic lever (e.g., cost savings, efficiency, legitimacy, and reputation). They are also consistent with Oman's policy direction (Vision 2040; net-zero by 2050), which expects private-sector environmental stewardship to translate into sustainable growth.

13.1 What the magnitudes imply

The largest effect is economic ($\beta = 0.739$). In a manufacturing context—where input efficiency, waste minimization, and compliance-driven process upgrades matter—GCSR appears to translate most directly into economic outcomes (e.g., cost efficiency and market share). This is echoed by your R² for SBS ECO = 0.546 (adj. 0.543), indicating moderate-to-strong explanatory power: GCSR alone accounts for more than half of the variance in economic sustainability.

The social pathway is also strong ($\beta = 0.590$; R^2 for SBS SOC = 0.348, adj. 0.344). This suggests that CSR-driven practices—like employee involvement, community engagement, and transparent reporting—feed into stakeholder trust and social recognition, which are salient for SME legitimacy and retention of skilled labor in Oman.

The environmental effect, though significant, is smaller ($\beta = 0.447$; R^2 for SBS ENV = 0.200, adj. 0.195). This pattern is realistic in emerging contexts: environmental performance often depends on additional external and capability-related drivers (e.g., technology access, regulatory enforcement, green finance, supplier demands, and technical know-how). In short, GCSR helps, but other forces likely co-determine environmental outcomes for SMEs.

13.2 Measurement considerations

Your measurement model is acceptable overall (Cronbach’s alpha: 0.661–0.831; ρ_A : 0.747–0.845; CR: 0.804–0.882), but convergent validity is weak for GCSR (AVE = 0.449) and SBS SOC (AVE = 0.471). Item-level signals match this: SBS ECO2 (0.313), SBS SOC3 (0.527), SBS SOC5 (0.520), GCSR6 (0.523), and SBS ENV5 (0.621) are the main contributors to low AVE. Discriminant validity is partial: HTMT shows GCSR–SBS ECO (0.915), SBS ECO–SBS SOC (0.922), and SBS ENV–SBS SOC (1.003) above the 0.85 guideline; Fornell–Larcker is mixed (e.g., SBS ENV diagonal = 0.776 > off-diagonals, but GCSR and SBS SOC are borderline). Importantly, outer/inner VIFs are acceptable, indicating no problematic multicollinearity and supporting the stability of the estimates.

Taken together, the substantive effects are robust, but future refinement of the GCSR and SBS_SOC measures will strengthen construct distinctiveness and convergent validity.

13.3 Positioning within the Omani context

The pattern of results fits the national narrative: Omani SMEs are increasingly aware of sustainability and respond to stakeholder pressure, cost realities, and legitimacy needs. The strong economic and social payoffs observed here provide a business case for manufacturing SMEs to pursue GCSR—an important point in settings where resource constraints can make “green” investments feel risky. The more modest environmental R^2 underscores that policy instruments (e.g., targeted subsidies, low-interest green loans, supplier standards, and technical assistance) will be pivotal complements to firm-level CSR to unlock deeper environmental gains. see the figure 2

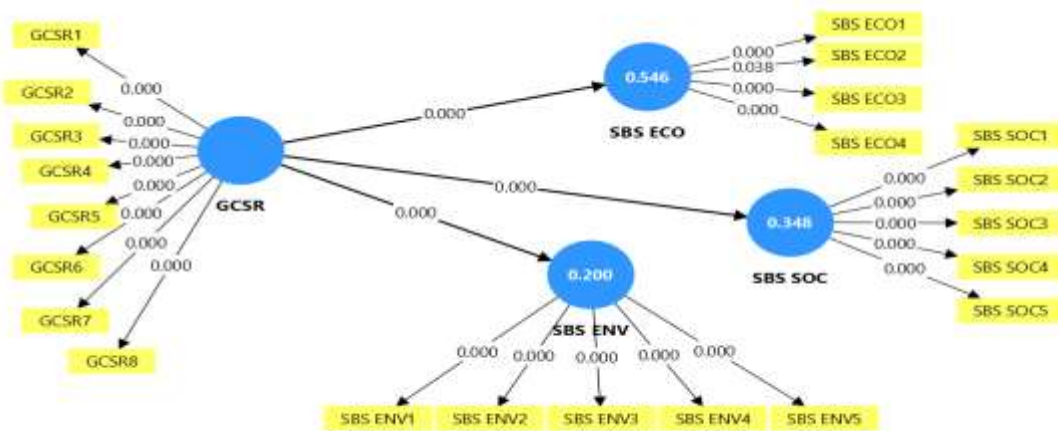


Figure 2: Structural Model Showing Significant Paths Between GCSR and SME Sustainability

14. CONCLUSIONS, IMPLICATIONS, AND DIRECTIONS FOR FUTURE RESEARCH

14.1 Conclusions

This study provides strong empirical evidence that Green Corporate Social Responsibility (GCSR) significantly enhances the sustainability of SMEs in Oman’s manufacturing sector. The findings confirm hypotheses H1–H3, demonstrating that GCSR positively influences business sustainability across its economic, social, and environmental dimensions.

Among these outcomes, the economic benefits emerged as the most pronounced, followed by social and then environmental outcomes. This ordering reflects the practical realities of resource-constrained SME settings,

where financial performance often receives greater emphasis before social or environmental commitments are fully developed.

The structural model further illustrates this hierarchy of impact by explaining a substantial proportion of variance in economic sustainability ($R^2 = 0.546$) and a moderate proportion in social sustainability ($R^2 = 0.348$). By contrast, the model accounted for a relatively small proportion of variance in environmental sustainability ($R^2 = 0.200$), suggesting that environmental outcomes may depend on additional factors or drivers beyond GCSR practices alone.

Finally, the measurement model was found to be generally serviceable, though it highlighted opportunities for refinement in terms of convergent and discriminant validity. Importantly, the results showed no evidence of multicollinearity, underscoring the robustness of the analytical framework and providing a sound basis for the study's theoretical and practical conclusions.

14.2 Practical implications

For SME owners and managers, the findings highlight the importance of operationalizing GCSR in ways that generate tangible business value. Prioritizing process efficiencies such as reducing energy and water use, minimizing waste, and adopting eco-procurement practices can deliver immediate economic payoffs. These actions reduce operating costs and position firms competitively in increasingly sustainability-conscious markets. At the same time, leveraging social channels is essential. By formalizing employee participation, initiating community engagement programs, and enhancing transparency through regular reporting, SMEs can strengthen stakeholder trust and reinforce their social sustainability. With regard to environmental outcomes, owners and managers are encouraged to target upgrades strategically. In resource-constrained contexts, incremental, low-cost, and high-return measures, such as routine equipment maintenance, leak detection, and optimization of lighting or drive systems, should precede more capital-intensive investments in cleaner technologies, which can be pursued in a phased manner as resources allow.

For policymakers and ecosystem actors, the results emphasize the need to create an enabling environment that aligns incentives with SME sustainability. Expanding access to green finance through low-interest loans, tax credits, and rebates for energy-efficient equipment or cleaner production technologies would reduce financial barriers to adoption. Equally important is capability building: providing SMEs with technical advisory services, practical toolkits, and environmental audits can help translate GCSR commitments into measurable performance improvements. Policymakers can also create market pull by embedding green criteria in public procurement frameworks and supply chains of large anchor firms, ensuring that SMEs are commercially rewarded for adopting sustainable practices. Finally, light-touch reporting frameworks, such as simplified ESG or GCSR disclosure templates, should be promoted to improve transparency without overburdening SMEs. Together, these measures create a balanced ecosystem in which GCSR becomes a moral imperative and a strategic pathway for SME sustainability.

14.3 Theoretical implications

The findings of this study provide important contributions to theory by reinforcing the relevance of stakeholder theory and the business-case perspective of CSR within an emerging-market SME context. The results demonstrate that engaging in GCSR practices is a socially responsible course of action and generates measurable business benefits, particularly in economic performance. This alignment of “doing good” with “doing well” underscores the applicability of established CSR theories in resource-constrained SME environments, such as those found in Oman's manufacturing sector.

At the same time, the asymmetric R^2 profile revealed by the model suggests important boundary conditions for theory. While economic and social sustainability outcomes were explained to a considerable degree by GCSR, environmental outcomes showed weaker explanatory power. This indicates that environmental sustainability may depend more on firm-level capabilities and supportive institutional frameworks than on GCSR alone. Consequently, the findings point to the need for more nuanced, multi-level theoretical models that integrate firm-level practices with policy and market-level drivers. Such an approach would advance understanding of how GCSR interacts with broader systemic factors to shape SME sustainability in emerging economies.

14.4 Limitations

This study has several limitations that should be acknowledged when interpreting the findings. First, using a cross-sectional design restricts the ability to draw causal inferences. While the results demonstrate strong

associations between GCSR and SME sustainability outcomes, it remains possible that reverse causality is at play. For instance, more successful firms may have greater resources to allocate toward GCSR activities. Longitudinal or experimental designs would be valuable for establishing the directionality of these relationships more firmly.

Second, the reliance on convenience sampling with a sample size of 153 SMEs constrains the generalizability of the findings. Although the study targeted manufacturing SMEs across a range of sub-sectors, heterogeneity remains, and the sample may not fully capture the diversity of the broader Omani SME population. This limitation suggests that replication with larger and more representative samples is necessary to validate and extend the conclusions.

Third, the study employed perceptual measures, often the most practical and defensible approach when researching SMEs. However, such self-reported data are susceptible to standard method variance despite applying procedural remedies. Future studies could benefit from incorporating objective or multi-source data to triangulate findings and minimize bias.

Finally, particular measurement challenges emerged. Specifically, the relatively low Average Variance Extracted (AVE) values for the GCSR and SBS_SOC constructs and instances of HTMT exceedances suggest some degree of construct overlap. These issues highlight areas for refinement in the measurement model and point to the need for more precise operationalization of constructs in future research.

14.5 Directions for future research

Future research could extend this study in several important ways. From a design and data perspective, longitudinal or panel studies would be particularly valuable for establishing temporal precedence and examining how sustainability performance evolves over time. Multi-respondent or dyadic data, such as supplier-buyer perspectives, could also help mitigate the risks of single-source bias. Additionally, combining perceptual measures with objective indicators, such as energy intensity, waste diversion rates, or environmental certifications, would strengthen the validity of findings and provide a more comprehensive assessment of SME sustainability.

Refinements to the measurement model also warrant attention. Certain items (e.g., SBS ECO2, SBS SOC3, SBS SOC5, GCSR6, SBS ENV5) may require reassessment, replacement, or rewording to improve construct validity, particularly about AVE and HTMT thresholds. Future studies might also explore formative specifications for constructs such as GCSR or environmental outcomes, where multiple distinct practices could be more appropriately modeled as composite indices. Furthermore, testing potential mediators, such as green process and product innovation, operational efficiency, or organizational reputation, could shed light on how GCSR translates into sustainability outcomes. Similarly, examining moderating factors such as regulatory pressure, customer or supplier demands for greener practices, firm size and age, digitalization, and access to finance would help clarify the boundary conditions of the observed relationships.

Finally, further contextual extensions would deepen the relevance of this research. Comparative studies between manufacturing and non-manufacturing SMEs, or between urban and interior regions, could illuminate important contingencies shaped by sectoral and geographic variation. Policy intervention studies also represent a promising avenue, particularly those designed to evaluate the effectiveness of targeted supports such as green voucher programs. Such research could quantify which forms of intervention are most effective in enhancing environmental sustainability outcomes, particularly in cases where the explanatory power of GCSR alone appears limited.

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