

The role of sustainable business model innovation (SBMI) towards sustainable performance of SMEs

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Introduction

Define the goals of the work and the methods used in the Master's thesis.

I. Theoretical Part

- Conduct a literature review on SBM, SBMI practice for SMEs and SBMI being used in sustainability performance and its impacts.

II. Practical part

- Analyze the development of SBMI.
- Analyze the relationship between sustainable business model innovation (SBMI) and sustainable performance indicators.
- Extract practical implications from data analysis of SMEs.
- Propose recommendations to SMEs for the measurement of sustainable performance based on the analysis.

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ABSTRAKT

Tato studie zkoumá roli inovace udržitelného obchodního modelu (SBMI) při zlepšování udržitelného výkonu – environmentálního, finančního a sociálního – malých a středních výrobních podniků v Etiopii. SBMI je ověřen jako vícerozměrná nadřazená konstrukce, která se skládá z udržitelné hodnotové nabídky (SVP), udržitelného vytváření a doručování hodnoty (SVC) a udržitelného zachycení hodnoty (SRC), a to pomocí modelování strukturálních rovnic metodou částečných nejmenších čtverců (PLS-SEM). Data byla shromážděna prostřednictvím samostatně vyplňovaného dotazníku od 157 malých a středních podniků napříč různými výrobními odvětvími. Výsledky ukazují, že SBMI má významný a pozitivní vliv na všechny tři dimenze udržitelného výkonu. Přestože SBMI vykazuje silný vliv ve všech dimenzích, jeho dopad na finanční výkon byl nejslabší – což zdůrazňuje potřebu praktik, které účinněji generují finanční výnosy. Výsledky potvrzují přizpůsobitelnost měřicí škály SBMI, vyvinuté Bashirem a kol. (2022), v kontextu etiopských výrobních SME a přinášejí praktické implikace. Doporučení zdůrazňují podporu inkluzivního vedení a standardizaci měřicího rámce SBMI za účelem podpory strategického růstu a dlouhodobé konkurenceschopnosti.

Klíčová slova: Inovace udržitelného obchodního modelu, malé a střední podniky, udržitelný výkon, Etiopie, PLS-SEM

ABSTRACT

This study examines the role of Sustainable Business Model Innovation (SBMI) in improving the sustainable performance—environmental, financial, and social—of Ethiopia's small and medium-sized manufacturing firms. SBMI is validated as a higher-order construct consisting of Sustainable Value Proposition (SVP), Sustainable Value Creation and Delivery (SVC), and Sustainable Value Capture (SRC), using Partial Least Squares Structural Equation Modelling (PLS-SEM). Data were collected through a self-administered questionnaire from 157 SMEs across various manufacturing sub-sectors. The findings reveal that SBMI has a significant and positive impact on all three dimensions of sustainable performance.

However, while SBMI exerts a strong influence across all dimensions, its impact on financial performance was the weakest, highlighting the need for practices that more effectively generate financial returns. The results confirm the adaptability of the SBMI measurement scale developed by Bashir et al. (2022) within the context of Ethiopian manufacturing SMEs and offer practical implications. The recommendations emphasize promoting inclusive leadership and standardizing the SBMI measurement framework to support strategic growth and long-term competitiveness.

Keywords: Sustainable Business Model Innovation, SMEs, Sustainable Performance, Ethiopia, PLS-SEM

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INTRODUCTION

The growing severity of sustainability issues, such as extreme weather events, economic downturns, pollution, inflation, natural resource shortages, biodiversity loss, and climate change caused by population growth (World Economic Forum (2024); Ganivet (2020)), and the increasing societal concern about sustainability make the topic headlines across industries (Karuppiyah et al. (2023)). Nowadays large number of firms adopt sustainable development and deferent programs that support sustainability in their policies and initiatives. Triose, C.et al.(2024) Like any firm Small and medium-sized enterprises (SMEs), which are the backbone of many economies, have had to adapt their business models (BM) due to internal and external factors and barriers. (Jabeen, F.et al.2023; Triose, C.et al.2024; Bargoni, A.et al.2024). Based on these external and internal incentives, business model innovation (BMI) occurs when firms change one or more components of their business model, leading to the creation and capture of value Bakhit Al Daraai and Madbouly (2024). Externally, facilitating conditions, social influence, market changes and technological innovation; internally, effort expectancy, hedonic motivation, speed and performance expectancy influenced SMEs to incorporate sustainability in their business model innovation (BMI); means changing the process of creating, delivering and capturing value in to more sustainable way Utaminingsih et al. (2023). Small and medium size enterprises (SMEs) are the primary engines in global socioeconomic development, they contribute significant amount of job creation, economic growth, technological innovation and poverty alleviation. Their influence is much bigger in developing economies reaching up to 70% job opportunities and 50-60% of value added Kraus et al. (2020). The adoption of sustainable business model innovation (SBMI) into the SMEs significantly benefits the economy by improving competitiveness, fostering innovation and promoting sustainability Bashir et al. (2022). Despite the growing interest in SBMI, until 2022 there was no comprehensive validated measurement scale to measure it. But the newly developed scale by Bashir et al., (2022) allows researchers and practitioners to accurately assess and compare sustainable business practices. However, the scale measures SBMIs three dimensions; it's not been tested yet by another researcher in another country and context. Moreover the paper measures SME's relative performance and competitive advantage but not sustainable performance firms. Consequently, this master's thesis aims to fill this

existing research gap. This paper is organized as follows: the first section serves as an introduction, followed by a discussion of the objectives and methods used. Next, we review the relevant literature on Sustainable Business Management (SBM) and Sustainable Business Model Innovation (SBMI) practices, focusing on their impact on small and medium-sized enterprises (SMEs) and sustainable performance. The research methodology, an analysis of the development of SBMI, and the scale for measuring the sustainable performance of SMEs are included in the analytical section. Finally, recommendations for SMEs are presented in the concluding part of the thesis.

OBJECTIVES AND METHODS OF THESIS DEVELOPMENT

The main objective of the master's thesis is to study the role of sustainable business model innovation (SBMI) towards the sustainable (social, environmental, and financial) performance of manufacturing SMEs in Ethiopia. The main objective will be achieved through the following specific objectives:

1. To investigate the impact of SBMI on the sustainable financial performance of SMEs.
2. To investigate the effect of SBMI on the sustainable social performance of SMEs.
3. To investigate the impact of SBMI on the sustainable environmental performance of SMEs.
4. To evaluate the contribution of sustainable value proposition (SVP) to SBMI.
5. To assess the contribution of sustainable value capture (SRC) to SBMI.
6. To assess the contribution of sustainable value creation and delivery (SVC) to SBMI.

The paper employed a quantitative approach to achieve the above-stated general and specific objectives.

I THEORETICAL PART

1 SUSTAINABLE BUSINESS MODEL INNOVATION

1.1 Business Model

Over the past six decades, business models have been a fundamental priority in literature (Wirtz et al., 2023). These models serve as a structure that enables value proposition, value creation, and delivery, along with the interaction between the components within the organization Geissdoerfer et al. (2018). Shakeel et al. (2020) outlined different approaches in which Americans give priority to classification and innovation links while Europeans focus on design methods and causal modeling. The literature displays different views on the concept; however, many researchers agree that it fundamentally explains “the way the firm operates” Wirtz et al. (2016).

1.2 Business Model Innovation

Making important changes to the company’s business model or developing an entirely new business model within a newly established business is called Business model innovation Bashir et al. (2022). However, the research on the topic is still in progress, and there is no clear consensus on what BMI means Foss and Saebi (2017) There are two main research streams on how businesses change their models. The first one involves totally changing the BM and developing a new one, which is called dynamic transformation. The second way involves making a small change to the existing business model. Despite the ambiguity, firms are obliged to seek BMI in changing the technological landscape. After an extensive literature review, Geissdoerfer et al. (2018) define BMI as planning and executing a new business model. It involves developing, diversifying, acquiring, or transforming business models and focusing on elements like value proposition, value creation, value capture, and value networks to optimize resilience, market advantage, and stakeholder benefit.

1.3 Sustainable Business Model

According to Marczewska and Kostrzewski (2020), SBM has gained considerable recognition from academics and practitioners since the beginning of this century. Due to mounting

apprehensions about sustainability Tseng et al. (2016), a growing number of companies are shifting their models from conventional to sustainable models Marczewska and Kostrzewski (2020). Geissdoerfer et al. (2016) underlined the importance of a business model for sustainability to consider the social and environmental values besides the economic value; by defining the model as a clear outline of the components, the association among these components, and the interrelations with stakeholders that organizational unit implements to create, deliver, capture, and exchange sustainable value for and in partnership with a different set of stakeholders. The comprehensive perspective also mentioned by Bocken et al. (2015) on how the organization proposes, generates, and acquires value in conducting business. Literature commonly illustrates SBM as a refined version of the traditional business model, including specific features and targets added to it. The models for sustainability either integrate the concepts, principles, or goals that are directed toward three pillars of sustainability (social, environmental, and economic) or merge sustainability-driven factors into the designing of their value proposition, formulation, and implementation of value creation and delivery activities and value capture strategies Geissdoerfer et al. (2018). After reviewing the literature on sustainable business models from different databases Geissdoerfer et al. (2018) put the working definition of a sustainable business model “Sustainable business models as business models that incorporate pro-active multi-stakeholder management, the creation of monetary and non-monetary value for a broad range of stakeholders and hold a long-term perspective.” Bashir et al. (2022); Bocken et al. (2015); Schaltegger et al. (2016) mentioned that a sustainable business model encompasses three elements including value proposition, value creation and delivery, and value capture. The value proposition involves launching a product or service into the market. Value creation includes different activities, resources, and capacities necessary to produce goods and services by the organization. Value capture relates to the system of costs, profit collection, and distribution of revenue arising from the offering of these provisions. Incorporating sustainability practices into the business model of the company needs a deep perspective, going beyond the lines of the organization. Therefore, it is very important to deeply understand the features of SBM to get a comprehensive view. It is very difficult to address sustainable business challenges using a traditional business model Goni et al. (2021). Goni et al. (2021) discuss nine core attributes of SBM including sustainability, circular economy, value chain, information technology, core values, value creation, organizational values, performance management, and stakeholder engagement, that must be

harmonized into a complete business strategy. The ability to rapidly and efficiently change into another model is the essential origin of long-term competitive advantage and a key strategy for improving organizations' sustainable performance. Implementing an innovative business model can give an organization a critical lead over its competitors, allowing it to adjust to new customer demands and changing market dynamics Geissdoerfer et al. (2018) ALO (2021) also highlighted that, while some of the selected SBM struggle to balance sustainability dimensions, they conclude the impact of adopting sustainable business models in achieving sustainable performance organizations is undeniable.

1.4 Concept of Sustainable Business Model Innovation (SBMI)

Sustainable Business Model Innovation is stimulated by vital demand to overcome ecological decline and social inequalities requiring transformation in organizational practice. The concept of business model innovation refers to developing or restructuring the business model to incorporate sustainability in dealing with social, financial, and environmental impacts, ensuring companies can maintain economically while also benefiting their external world Roshan and Balodi (2024) stated that SBMI consists of a transition from the current business model to a different one within the existing organization, moreover, within the scheme of mergers and acquisitions. Additionally, new startups can develop new SBM which is different from their industry. A significant number of reviews have been made on this topic, like Geissdoerfer et al. (2018); Shakeel et al. (2020); Sinkovics et al. (2021), which highlight the key themes of sustainability integration, value creation, and capture, adaptation, and transformation, stakeholders' management, and overcoming internal and external barriers as given in the Table 1.1. Based on the above key themes SBMI incorporates sustainability into a business model by adopting, overcoming internal and external barriers, and stakeholders' management to reduce negative and amplify positive effects. SBMI can involve evolutionary change or novel models, as in new ventures, mergers or acquisitions, to align with sustainable development principles for competitiveness, resilience, and positive societal and environmental benefits. The abovementioned key themes differ sustainable business model from a conventional business model. Unlike SBMI traditional models only focus on the short-term perspective, which makes it unable to resolve sustainable challenges of the organization. That's why the traditional needs modification to incorporate sustainability

Table 1.1 Key themes on the selected definition of SBMI

Key themes	Definition
Integration of sustainability	SBMI includes sustainability in the company's business model, including value creation, delivery, and capture, as well as targets to deal with the environment, social, and economic impact Bocken et al. (2014); Geissdoerfer et al. (2016)
Value creation and capture	Changing sustainability challenges into market opportunities and creating monetary and non-monetary value for a wide range of stakeholders Schaltegger et al. (2016)).
Adaptation and transformation	SBMI demands to continuously update their business models and create new models for new startups or through acquisition and merger Loorbach and Wuijsman (2013); Roshan and Balodi (2024))
Proactive stakeholder management	SBMI encompasses stakeholders' relationships to align sustainability goals with company objectives. And also shows the relevance of stakeholders in the innovation process to create shared value Geissdoerfer et al. (2016)
Barriers and Challenges	SBMI frequently requires resolving internal and external barriers, including resource constraints, and market forces Bocken et al. (2014)

Source: Author own

concepts, principles, and goals into the model. SBM could be viewed as the transformation of traditional business strategy. Geissdoerfer et al. (2018) outline four types of SBMI, which show paths organizations can apply to fuse sustainability into their business models:

1. **Sustainable Start-Ups:** The establishment of new organizations built upon SBM from the foundation.
2. **Sustainable Business Model Transformation:** The changing of the core business model according to sustainability principles.
3. **SBM Diversification:** Establishing additional SBM alongside the current model, without fundamental change to it.
4. **SBM Acquisition:** Involves the identification, acquisition, and incorporation of SBM as an additional initiative within the organization.

After an extensive review, Shakeel et al., (2020) elucidated that the three key components of SBMI can be structured around the concept of sustainable value innovation, which are:

1. **Sustainable Value Proposition Innovation (SVPI):** Focuses on how an organization can enhance its dedication to its customers and society by identifying new opportunities and fostering enduring relationships.

2. **Sustainable Value Creation & Delivery Innovation (SVC&DI):** Relates to the firm's potential to organize its value chain network efficiently. This involves coordinating resources, capabilities, activities, and partnerships in alignment with customers, competitors, and collaborators.
3. **Sustainable Value Capture Innovation (SVCI):** Underscores a firm's strategy to capturing environmental, social, and economic value. This is achieved through innovative designs of sustainable revenue models and cost structures. The summary components of SBMI are illustrated in Figure 1.1.

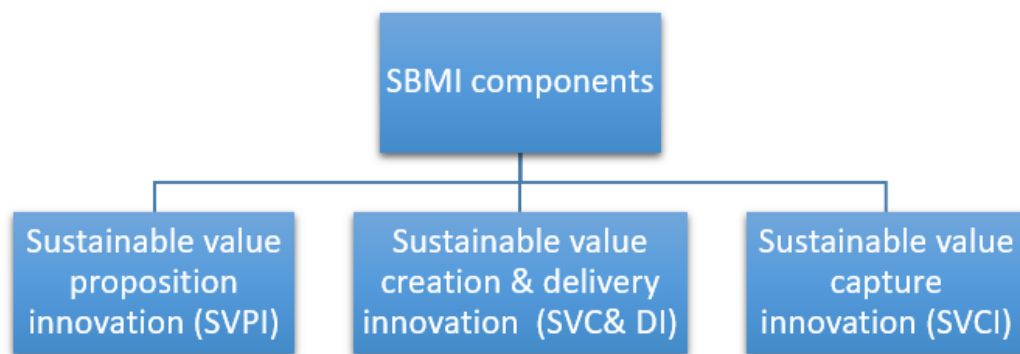


Figure 1.1 Sustainable business model innovation framework from (Shakeel et al., (2020)

1.4.1 Drivers and Barriers to SBMI Adoption in SMEs

In recent years, many SMEs have incorporated sustainability and innovation into their business models Troise et al. (2024). Business operation and innovation management are highly influenced by sustainable business model innovation (SBMI). Most established firms encounter barriers to successfully adopting and implementing SBMI despite its various benefits for contemporary business. The integration of sustainability practices by SMEs is a multidimensional task, with a multiplicity of internal and external considerations influencing their decision-making and capacities Bakos et al. (2020). Researchers mentioned internal and external drivers. As mentioned the implementation of technologies like 4.0, IoT, cloud computing, digital transformation, skilled human power, and support from management as main enablers internally. Whereas government incentives, stakeholder collaboration market demand for sustainable products, trust, financial support, and cost-benefit awareness an

external drivers. In another study conducted by Troise et al. (2024) using inductive qualitative research design, internal and external drivers that can advance the adoption of SBM of SMEs are investigated. Willingness to adopt new ideas, change the firm's value of sustainability, resource maximization, and incorporate technological advancements, encounter changing market dynamics, stakeholder impact is the findings of the paper. Using the survey method, Purwandani and Michaud (2021) studied key drivers for adopting eco-friendly business practices in Ohio, USA. internal commitment and a chance to build a better public image were pointed out as key factors by SMEs.

Sampene et al. (2023) underlined the importance of promoting a learning environment, effectively using information, efficiently utilizing resources for innovation, incorporating innovation within business operations, and using skilled manpower as accelerators of SBMI adoption. HAN (2024) also studied the factors that influence SBMI adoption in the agriculture sector. Identified the manager's initiative for sustainability goals and sustainable value creation from an ecosystem. The compound effect of Internal and external factors is crucial to incorporating successful SBMI. Sampene et al. (2023) SMEs must be concerned with leadership commitment, digital tools, and resource management for the successful implementation of SBMI. The broader adoption of SBMI can also be limited by different barriers. Some of them are classified as institutional, strategic, and operational (Sampene et al. (2023); BOC (2020) some of them are identified as external and internal barriers purwandani2021drivers. Financial constraints, focusing on short-term profit rather than sustainability, weak enforcement of regulations, and leadership gaps are hindering factors Vanpetch and Sattayathamrongthian (2024); Sampene et al. (2023); Purwandani and Michaud (2021); BOC (2020)

Different researchers list the major bottlenecks in SMEs' adoption of SBMI as lack of capital, leadership gaps, and regulatory constraints. To tackle these problems and succeed in adopting SBMI, firms need context-based business strategies in their business models.

1.4.2 SMEs in Ethiopia

In 1997, the Ethiopian government started working on a comprehensive SMEs strategy and later established the Federal Micro and Small-Scale Enterprise Development Agency (FeMSEDA) and regional branches (ReMSEDA). The government revised the strategy at different times, expecting to go beyond creating job opportunities rather than facilitating the industrialized economy (Ghebreyesus et al., 2018). The definition and classification of SMEs are established on the size of capital, type of sector, and employment. Unlike any other international organization, like the World Bank and the European Union, the Ethiopian classification doesn't include total annual sales Wajebo (2022). Like any other developing

Table 1.2 Classification of Enterprises by Sector, Manpower, and Capital

Type of Enterprises	Sector	Man power	Size of capital (ETB)
Micro Enterprise	Industry	≤ 5	$< 100,000$
	Service	≤ 5	$< 50,000$
Small Enterprise	Industry	$6 \leq 30$	100,001 – 1.5 million
	Service	$6 \leq 30$	50,001 – 500,000
Medium Enterprise	Manufacturing Industry	$31 \leq 100$	1.5 – 20 million

Source: Wajebo, 2022.

country, Ethiopia is also influenced by SMEs' impact on the employment market and sustainable GDP growth Abdissa et al. (2022). According to Ababiya (2018) mentioned that the government report says that in 2020, 1.5 million enterprises nationwide employed 4.5 million laborers and earned 40.7 billion Ethiopian birr in monthly revenue. Ethiopian Economics Association (2015) underlined that the construction, service, trade, and manufacturing sector of SMEs in Ethiopia cover 36.2%, 20.8%, 15.2%, and 14.7% of employment, respectively. Besides employment, SMEs contribute to the country's long-term development goal through poverty reduction and the enhancement of quality of life Endris and Kassegn (2022). Using innovative ideas in their business model in Ethiopia is in the early stages of development Salfore et al. (2023). The government is supporting enterprises through public-private sector partnerships to encourage the implementation of innovation of sustainable business models, especially in the agriculture sector. Not only the application of sustainable business models but also the performance measurement of sustainability is Nascent stage. Ayele and Singh,

in their studies which focus on financial institutions in Ethiopia, propose that incorporating the environmental and social elements can boost the organizational performance. In another study, Alemayehu and vom Brocke (2011) investigated the performance measurement system of Ethiopian Airlines and suggested that by adding environmental, social, and financial key performance indicators (KPI), the airline can enhance its performance. Most of the research on sustainable business models and performance measurement has been theoretical and primarily focused on large companies. This paper will significantly influence the adoption of sustainability business model innovation (SBMI) and improve the measurement of sustainable performance of small and medium-sized enterprises (SMEs) by adopting a validated measurement scale in Ethiopia. It will provide valuable insights for policymakers and practitioners.

2 SUSTAINABLE PERFORMANCE

Sustainable performance represents a balanced approach to achieving long-term social, environmental, and economic profitability of a company's operation Appiah-Nimo and Chovanová (2020); Indriastuti and Riansyah (2024); HAD (2021).

2.1 Concept of Sustainable Performance (SP)

According to Chardine-Baumann and Botta-Genoulaz (2014), the concept of sustainable performance comes after sustainable development. They defined SP as integrating the three elements: environmental, economic, and social achievements. Büyüközkan & Karabulut (2018) defined SP in their review done in sustainable performance evaluation that it is the net effect (negative or positive) of an organization's sustainability three dimensions relative to the standard. Damtoft, van Liempd, and Lueg (2025), Hadi & Baskaran (2021), Syed, Song & Junaid, (2024) also highlighted that SP is how firms significantly contribute to sustainable development by equalizing environmental, social, and economic aspects, and organizational goals, and sustainability objectives with long-term competitiveness should also be maintained. Abdul-Rashid et al. (2022) examined how sustainable manufacturing practices impact the sustainable performance of ISO 4001-certified manufacturers in Malaysia. They realized that sustainable product design, manufacturing process, and sustainable performance have strong linkages. They underlined the alignment of Sustainability throughout the organizational operation is supported by the TBL framework, highlighting its divers' benefit. Sudusinghe & Seuring (2022) reviewed 82 journal articles to investigate how intercompany networks can impact the sustainable performance of supply chains in the process of adopting a circular economy. They reported renovating collaboration practice in circular supply chains, giving less focus on social sustainability, economic and environmental sustainability giving priority to mutual benefit. The paper explained that sustainability performance is a result of the combination of three dimensions of sustainability. The integration of the Triple Bottom Line (TBL), sustainable competitiveness (long-term orientation), and operational alignment are some of the major themes mentioned in the literature of sustainable performance. Next, in this chapter, I will describe the social, environmental, and financial

sustainability performances, respectively. Sustainable economic performance: According to Tunisa, Yanti, & Puspitasari (2024), financial sustainability illustrates firms' financial success while promoting sustainable business growth. Rodrigues, Pigosso & McAloone (2016) also highlighted that this dimension of sustainability performance focuses on long-term market advantage, promotes value creation for both the organization and its stakeholders. Economic Performance includes:

- Return and value
- Cost reduction
- Relationship with stakeholders
- Resource management

Sustainable Social Performance Wang and Bian (2022); FER (2022) outlined companies' social performance as their capacity to attain social goals and maintain ethical business practices. Firms influence people's lives and build strong relationships with employees, customers, and all stakeholders, ensuring their well-being (Tunisa et al., 2024). Wang and Bian (2022) classified the components of social sustainability as internal (employee-focused) and external (community-focused)

Internal Practices:

- *Health and safety* – Making the work environment risk-free to ensure employee well-being FER (2022)
- *Human rights* – Fostering fairness and equity, such as gender equality FER (2022).

External Practices:

- *Community participation* – Programs that benefit local communities, such as donations or educational initiatives FER (2022).
- *Corporate social responsibility* – Promoting the company's image and strengthening relationships with the local community.

Sustainable Environmental Performance COO (2017); Adebayo (2022) stated that environmental sustainability focuses on enhancing human well-being by preserving natural resources—which are sources of raw materials for basic human needs—and managing waste generated by human activity. A firm's environmental performance depends on how well it balances human needs with planetary health, protects resources, manages waste, improves community livelihoods, and ensures a sustainable future.

2.2 Sustainable Models and Sustainable Performance

Business models for sustainability incorporate a comprehensive perspective on how the firm operates concerning its different stakeholders, including broader societal and environmental contexts. According to Bocken (2023), this model emphasizes stakeholders' engagement, leading to improved corporate social responsibility and environmental management practice. The alignment of stakeholders' interests has a positive impact on the company's sustainability performance. Pinto (2019) and Eccles et al. (2014) also underlined that for attaining sustainable organizational performance, stakeholders' synchronization is a cornerstone. Collaborative approaches, long-term strategic planning with stakeholders, and harmonizing performance metrics, firms cultivate trust and support, which are crucial for sustainable progress. Rahman, Wen, and Amjad (2024; Bocken, 2023; Marczevska and Kostrzewski, 2020) explained the positive and substantial impact of business models on the sustainability of manufacturing firms. Rahman, Wen, and Amjad (2024) state that the assimilation of sustainability into their activities can enhance the sustainable performance of manufacturing companies. The study found that in achieving sustainable performance, advanced technologies and alternative financing have vital roles. Sustainable organizational performance is considerably affected by sustainable business model innovation (SBMI) by creating a consistent structure with green technology innovation (GTI). The study also found that for achieving improved sustainable development within the firm, keeping the equilibrium between SBMI and GTI is very important. (Zhou et al., 2023). Alonso-Martinez, De Marchi, and Di Maria (2021) investigated how different SBM archetypes relate to sustainability performance (SP) across the three dimensions. There is no single SBM model that reliably delivers a balanced or integrated sustainable performance across TBL dimensions. High sustainable performance depends on the complex and detailed practice of and goals of each model. From various liter-

ature, the impact of SBMs on the sustainable performance of firms can be organized into different themes (Table 3), such as holistic approaches (triple bottom line approach). Rahman, Wen, and Amjad (2024), stakeholders approach. (Zhou et al.,2023), and innovation-driven sustainability (Zhou et al., 2023). The papers also mentioned the importance of positive drivers mediating the relationship between SBMs and sustainable performance. (Le et al., 2024). The existing literature on the impact of Sustainable Business Models (SBMs) on sustainable performance is summarized in Table 2.1. The existing literature offers an extensive

Table 2.1 Authors About the Impact of SBM on Sustainable Performance

Core Idea	Description	Author(s)
Integrated Sustainability Framework	SBMs incorporate TBL into their strategies and enable the organization to create value for the holistic model.	Rahman et al. (2024); Marczevska and Kostrzewski (2020)
Stakeholders' Engagement	For long-term sustainability and improved accountability, the engagement of different stakeholders is crucial.	Bocken (2023)
Innovation-led Approaches	Combines technological innovation and business model innovation (SBMI) to drive sustainability.	Rahman et al. (2024); Zhou et al. (2023)
Intervening Factor	Enablers that mediate the link between SBM and sustainability performance are technology (Industry 4.0, green innovation), finance, and firm culture.	Rahman et al. (2024); Marczevska & Kostrzewski (2020); Le et al. (2024)
Performance Results and Competitive Edge	Enhance sustainable performance across: • Financial: cost savings, green markets • Environmental: waste reduction • Social: community well-being	Rahman et al. (2024); Zhou et al. (2023); Marczevska & Kostrzewski (2020); Nosratabadi et al. (2019)

Source: Author own

understanding of the mechanism by which business models for sustainability improve the sustainable performance of the firm. Nevertheless, there are theoretical and geographical limitations remaining. Theoretically, most frameworks underrated the social goal and gave

more emphasis to economic and environmental goals. Contextually, most frameworks are taken from research conducted in developed countries. It has not fully understood the diverse aspects of SBM in developing countries. Regarding the practical applicability of the proposed models, most of them are abstract and lack actionable tools for small and medium-sized enterprises (SMEs). (Le et al., 2024; Zhou et al., 2023).

3 SUSTAINABLE PERFORMANCE ON SMES

3.1 Concept of Sustainable Performance (SP)

The existing literature explained that sustainable performance is an integration of environmental, social, and financial performance (Oduro, 2024; Omar et al., 2024; Al Koliby et al., 2024; Obeidat et al., 2023; Saqib and Zhang, 2021; Haldorai et al., 2025; Büyüközkan and Karabulut, 2018; Saulick et al., 2023; Chardine-Baumann and Botta-Genoulaz, 2014). According to Chardine-Baumann and Botta-Genoulaz (2014), the word sustainable performance was introduced after the emergence of sustainable development. It explained the integration of economic, social, and environmental outcomes in measuring a practice's effectiveness. This reflects a unified concept design to combine different performance dimensions into a structured approach. This integration of the TBL approach is explained in 3.1.

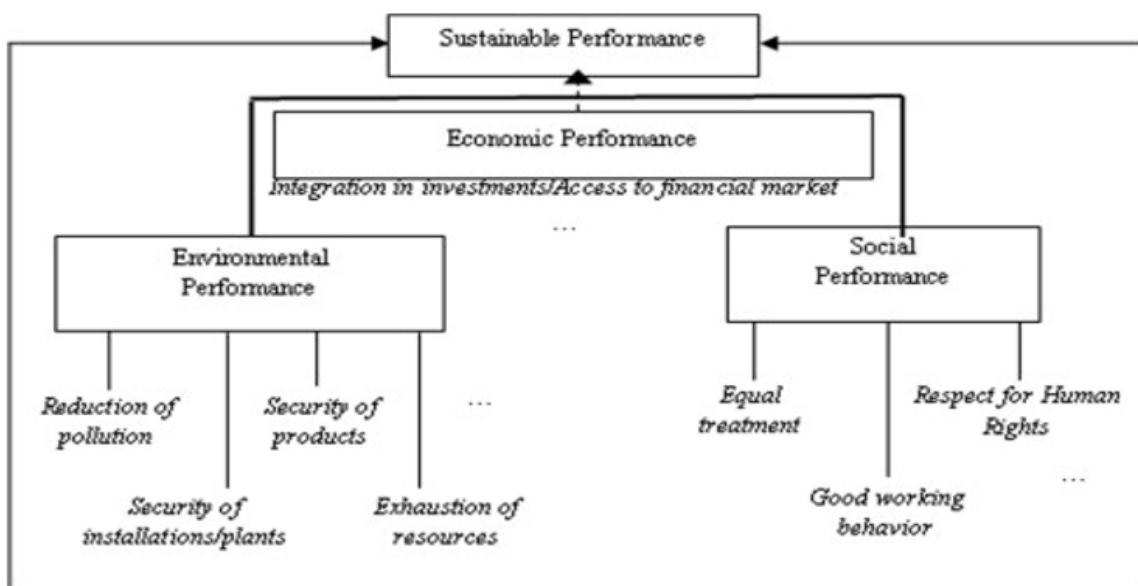


Figure 3.1 sustainable performance (Chardine-Baumann and Botta-Genoulaz (2014))

Omar et al. (2024) explained sustainable performance (SP) as a balanced approach between enterprise preventive effort and financial benefit, and their approach reduces environmental and social footprints while ensuring stakeholders' interests. It is a strategy for working and evaluating sustainable development. It includes measures, programs, and social and environmental policies while maintaining profitability. (Al Koliby et al., 2024). In their literature review on sustainability performance evaluation, Büyüközkan and Karabulut (2018) defined SP as the overall sum of the three dimensions (economic, social, and financial), positive or

negative outcome, measured against a defined baseline. On the contrary, Agyabeng-Mensah et al. (2021) described SP as a degree of positive progress caused by firms' actions and policies. Most recent literature agrees that sustainable performance harmonizes environmental, financial, and social performance. Each component explains across the triple bottom line approach.

- Financial performance: In this dimension, SP is characterized by cutting costs (cost of waste discharge), effective resource utilization, and revenue increment through a sustainable approach CHA (2014).
- Social performance: it involves ethical relationships with stakeholders, an improved brand image, and an effort to improve societal well-being, improved occupational health, and employee safety Baah et al. (2021).
- Environmental performance: minimizing environmental harm through emissions reduction, reducing the use of hazardous materials, and reducing energy consumption. (Oduro, 2024; Agyabeng-Mensah et al., 2021; Chardine-Baumann and Botta-Genoulaz (2014)

3.1.1 Sustainable Financial Performance (SFP)

According to the literature, sustainable financial performance (SFP) implies a company's capability to attain economic security and return on investment (ROI) while incorporating social and environmental concerns into a company's financial strategy. It highlights that firms should focus on a holistic sustainability approach alongside profitability Valdez-Juárez et al. (2024); Momtaz and Parra (2024); Valdez-Juárez et al. (2024); Tegethoff et al. (2025). Momtaz and Parra (2024) analyzed SMEs' financial performance and sustainability impact from 2012 to 2022 in Spain. The study emphasized the significance of adopting sustainability and aligning it with SMEs' approaches for long-term economic resilience. Increasing Sustainable Financial Performance is influenced by technological (different tools) and non-technological innovation (business process optimization). Valdez-Juárez et al. (2024) suggested that integrating technology, innovation, and sustainability will accelerate the growth of SMEs. Khan et al. (2022) investigated the effect of green innovation and finance on the SFP of Pakistan

SMEs. Therefore, they defined SFP as achieving financial success while applying sustainable practices. Tegethoff et al. (2025) focused on assessing the impact of eco-innovation on the financial benefits of SMEs. SFP is explained as achieving financial growth while implementing innovative sustainability practices. In another literature, Rodriguez-Espindola et al. (2022) examined the advantages of circular economy principles on financial performance of SMEs. Similarly, this study also put sustainable financial performance as maintaining economic stability meanwhile incorporating eco-innovation and sustainability considerations. Most of the above-mentioned literature shares common themes on sustainable financial performance. Some of the themes are the integration of sustainability practices and profitability, the impact of innovation and technology, the role of green practices, and the importance of ESG factors. Most of the above-mentioned literature shares common themes on sustainable financial performance. Some of the themes include the integration of sustainability practices and profitability, the impact of innovation and technology, the role of green practices, and the importance of ESG factors.

- **Integration of Sustainability Practices:**

All studies mainly underline the importance of combining sustainability goals with a firm's financial goals to attain long-term financial success. The harmony between financial achievement and maintaining sustainability goals defines sustainable financial performance.

- **Impact of Innovation and Technology:**

The literature states that digital transformation and innovative practices are frequently mentioned as key enablers of sustainable financial performance. These drivers help SMEs to cut costs, boost performance, and unlock emerging markets.

- **Role of Green Practices:**

Environmentally friendly practices and green innovation are frequently highlighted in the literature. These factors consistently benefit SMEs through cost reduction, productivity enhancement, and improved market opportunities.

- **Importance of ESG Factors:**

ESG (Environmental, Social, and Governance) factors are cited in the literature as

essential elements of sustainable financial performance. They ensure regulatory compliance, enhance reputation, and build stakeholder trust.

3.1.2 Sustainable Environmental Performance (SEP)

Sustainable environmental performance (SEP) indicates managing and maximizing positive ecological impact via the combination of environmentally friendly practices, such as effective resource utilization, and maintaining environmental protocols with financial profitability. Waste reduction, reducing the carbon footprint, and promoting sustainable innovative technologies are included; as a result, it can contribute to long-term environmental sustainability Martínez-Martínez et al. (2023); Melo et al. (2023). Melo et al. (2023) explored SMEs' evaluation of performance under digital transformation and sustainability. SEP is explained in the study as the company's capability, particularly SMEs' incorporation of sustainable practices in their operation (reducing pollution, implementing green initiatives, minimizing material consumption), with other sustainability pillars. In another study, Baah et al. (2021) explore the stakeholders' pressure on implementing green production in manufacturing SMEs in developing countries. They defined sustainable environmental performance as an organization's ability to implement green production practices that can increase the positive ecological impact. Sustainable environmental performance involves enhancing the effective utilization of resources and minimizing ecological damage while generating financial benefits Park and Behera (2014) They also mentioned combining the TBL concept and harmonizing the three dimensions (environmental, social, and economic) to measure industrial parks' sustainability. Hermawan et al. (2024) tie sustainable environmental performance with sustainable manufacturing, showing that generating economic value without ignoring ecological health for the coming generations. The paper also underlined the importance of complying with environmental regulations and adopting ecological innovation in improving sustainable environmental performance. The observable result of the company's effort in implementing the organization's environmental strategies is sustainable environmental performance. It also denotes that the achievement of SFP depends on aligning the firm's production operation with broader sustainability goals. Meanwhile, the influence of stakeholders and innovation is significant. The above literature mentioned that the prevalent themes are sustainable practice, TBL approach, stakeholder engagement, resource efficiency, compliance

and regulations, technology, corporate alignment, and performance measurement. Across all studies, eco-friendly practices are associated with sustainable environmental performance. Even though SEP is related to the environment, maintaining the balance between the three dimensions of sustainability is very significant in the papers. Engagement of stakeholders such as customers, employees, shareholders, the community, and the regulatory bodies is the enabler for implementing sustainability in the company. Environmental regulations and protocols are considered pivotal frameworks in the papers for enhancing the performance of ecological sustainability. Eco-friendly innovations and Technological advancements help SMEs to synchronize the manufacturing process with the sustainability goals. Therefore, sustainable environmental performance is a quantifiable result of a firm's engagement in managing the positive environmental impact while keeping the balance between the triple bottom line.

3.1.3 Sustainable Social Performance (SSP)

Sustainable social performance (SSP) has been elucidated in different studies as an organizational performance of managing societal responsibilities with respect to sustainability goals. Fostering equitable labor practice, community engagement, and resolving inequality and inclusivity are included. The ultimate goal of positive societal impact while considering the other dimensions of sustainability Amini and Bienstock (2014); Wang and Bian (2022)

Wang and Bian (2022) explored firms social sustainability impact on financial and social performance. They highlighted SSP as firms' capability of generating two dimensions of social outcomes: employee-oriented outcomes (EOO) and community-oriented positive results through strong sustainability practice. The paper also linked the SSP with quantifiable results. In another study, Guo and Wu (2022) explain SSP as the facet of supply chain management encompasses how well a company handles the safety of its employees and other supply chain participants. This includes looking at health and safety incidents, product safety issues, and overall working conditions.

II PRACTICAL PART

4 RESEARCH METHODOLOGY

4.1 Research Objective

The study examines the role of sustainable business model innovation (SBMI) in achieving the sustainable performance of manufacturing small and medium-scale enterprises in Ethiopia. It examines whether SVP, SVC, and SRC contribute meaningfully to the formation of SBMI. The general and supportive objectives of the study are strategically designed to test the newly developed SBMI scale by Bashir et al. (2022) to measure the sustainable performance of SMEs and to test the measurement in a different context.

4.2 Developing Research Model and Hypothesis

A proposed model was developed to achieve the research objective based on the previous kinds of literature and literature reviews made in this research (Figure 4.1). The selected items Sustainable Value Proposition Innovation, Sustainable Value Creation and Delivery Innovation, and Sustainable Value Capture Innovation are adopted from Bashir et al. (2022).

The other item selected to measure sustainable performance is Sustainable Environmental Performance. Sustainable Financial and Social Performance are adopted from YAD (2023), Paulraj (2011).

The following set of hypotheses is generated:

H1: Sustainable Business Model Innovation positively influences Sustainable Financial Performance.

H2: Sustainable Business Model Innovation positively influences Sustainable Social Performance.

H3: Sustainable Business Model Innovation positively influences Sustainable Environmental Performance.

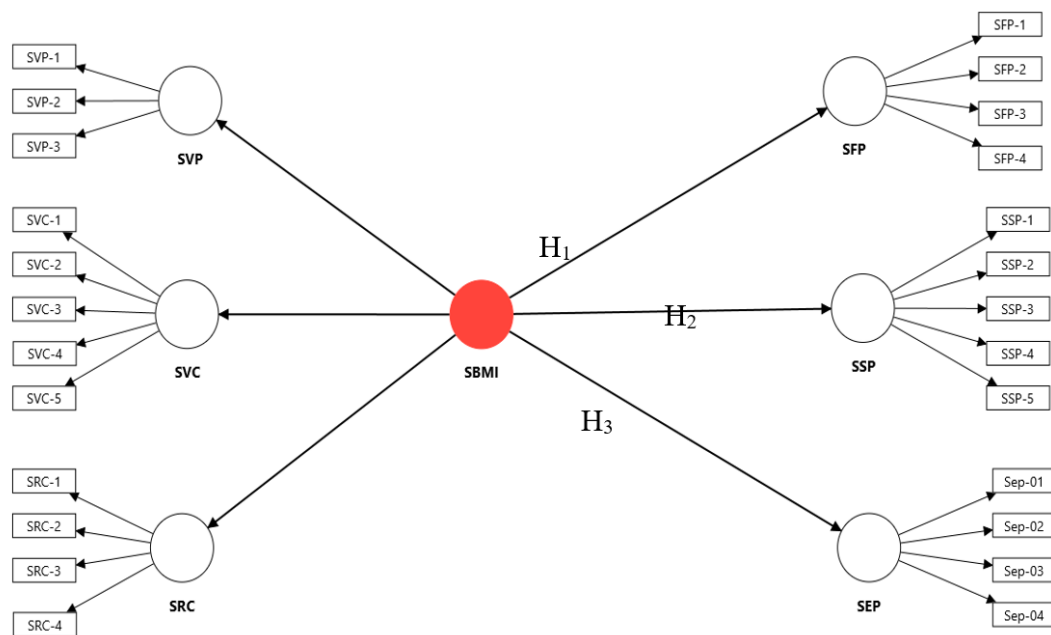


Figure 4.1 Conceptual research model

4.3 Research Type and Approach

This study aimed to assess the structural linkage of SBMI and the three dimensions of sustainable performance in the Ethiopian SME manufacturing sector. A quantitative research model is adopted to measure relationships between constructs.

4.4 Instrument

Based on the literature mentioned in the following paragraph, a Self-administered questionnaire (Appendix 1) is developed and distributed through online platforms. This survey was conducted in English and consists of three parts. The first section mainly described the overall objective of collecting the survey. Additionally, the all-encompassing demographic questions about respondents and their SMEs, such as the type of industry and the number of staff they have, are included. In this section, important information about the respondents is gathered. The second part of the survey tested the previously identified dimensions to measure sustainable business model innovation. The construct and measurement items are adopted from Bashir et al. (2022). In this section, overall, 12 items are adopted.

In the last section of the survey, the sustainable performance of SMEs is assessed using three

constructs and 13 items adopted YAD (2023); Laosirihongthong et al. (2013); Paulraj (2011). This scale covered the whole dimension of sustainable performance, such as environmental, social, and financial. All items are measured using the Likert scale: 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree. The selected items and constructs for Section 2, which measure sustainable business model innovation, and Section 3, for the items chosen for measuring sustainable performance, are mentioned in Tables 4.1 and 4.2, respectively.

Table 4.1 Construct Items for the Measurement of Sustainable Business Model Innovation

Dimension	Items
Sustainable Value Proposition Innovation	SVP1: Our focus has shifted toward sustainable value proposition innovation for customers who seek sustainability. SVP2: Our products and service offerings have become sustainable over the years. SVP3: We positioned ourselves to be ‘sustainable’.
Sustainable Value Creation and Delivery Innovation	SVC1: We make regular efforts to make our core competencies and resources more sustainable. SVC2: We make regular efforts to convert internal value-creation activities to be more sustainable. SVC3: We make regular efforts to partner with firms that focus on sustainability. SVC4: We make regular efforts to make our distribution channels sustainable. SVC5: We make regular efforts to evaluate new competencies that need to be developed to adapt to changing sustainable market requirements.
Sustainable Value Capture Innovation	SRC1: We regularly try to replace short-term sources of revenue with sustainable (long-term) recurring revenue models (e.g., leasing). SRC2: Our profit margins have increased by offering sustainable products. SRC3: We make regular efforts to reduce manufacturing costs by incorporating sustainable practices. SRC4: Differentiated, sustainable products help us charge higher premiums.

Table 4.2 Construct Items for the Measurement of Sustainable Business Performance

Dimension	Items
Sustainable Environmental Performance (SEP)	SEP-1: Our firm has improved compliance with environmental standards. SEP-2: Our firm has reduced energy consumption. SEP-3: Our firm has reduced the consumption of hazardous materials. SEP-4: Our firm has reduced CO ₂ emissions.
Sustainable Financial Performance (SFP)	SFP-1: Our firm has decreased the fee for waste discharge. SFP-2: Our firm has decreased the cost of materials purchased. SFP-3: Our firm has decreased the cost of energy consumption. SFP-4: Our firm has made improvements in return on investment.
Sustainable Social Performance (SSP)	SSP-1: Our firm has improved or enhanced the overall stakeholder welfare. SSP-2: Our firm has improved the community's health and safety. SSP-3: Our firm has reduced environmental impacts and risks to the public. SSP-4: Our firm has improved the awareness and protection of the claims and rights of the community served. SSP-5: Improvement in occupational health and safety of employees.

4.5 Population and Sampling

The target population of this study is manufacturing SMEs in Ethiopia, which covers electrical, food and beverage, plastic, textile, machinery, and other sub-sectors that manufacture traditional equipment. The sampling technique is purposive sampling, which gives equal opportunity across the sector (West, 2016). The survey was distributed mainly using Telegram and WhatsApp social media platforms, and from 170 respondents, who are top managers or middle managers, 160 responses were collected. Three incomplete responses were deleted, and 157 were used for data analysis.

4.6 Measurement Model and Techniques

After the survey, data were examined via Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS 4.0. PLS-SEM employment is recommended for complex models Hair et al. (2019). The reflective-reflective Hierarchical Component Model (HCM) is used for this study, where SBMI is Higher higher-order construct (HOC) formed by three lower-order constructs (LOC): SVP, SVC, and SRC. Higher-order constructs play a significant role in structural equation modeling Ouro et al. (2023). The results of the study were analyzed and linked with the current literature. And finally, following the discussion of the result, recommendations were proposed for manufacturing SME owners and policymakers in Ethiopia.

5 RESULTS

The SMART PLS-4 software was used to analyze SEM for the analysis and result section. The analysis includes an assessment of the measurement and structural model.

5.1 Respondents' Demographic

The results of the respondents' demographic backgrounds are summarized in Table 5.1.

Table 5.1 Demographic Background (N=157)

Category	Sub-Category	Frequency	Percentage
Gender	Female	41	26.1%
	Male	116	73.8%
Position	Middle manager	32	20.4%
	Top manager	125	79.6%
Education level	Degree	64	40.8%
	Diploma	12	7.6%
	High school	56	35.7%
	Master	21	13.4%
	PhD	4	2.5%
Number of employees	<5 staff	41	26.1%
	6-30 staff	96	61.1%
	31-100 staff	20	12.7%
Industry	Electrical	28	17.8%
	Food and beverage	58	36.9%
	Machinery	29	18.5%
	Other	10	6.4%
	Plastic	3	1.9%
Age of the industry	1-10 years	81	51.6%
	11-20 years	59	37.6%
	21-30 years	15	9.6%

Category	Sub-Category	Frequency	Percentage
	31-above	2	1.2%
Ownership	Government sector	5	3.2%
	Mixed ownership	20	12.7%
	Private sector	132	84.1%

Source: Author own.

The study collected data from 157 SMEs in Ethiopia from 170 distributed surveys on the Internet. The sample result is impressive, having 92.4 validity, which can give enough awareness about the demographic background such as sex, position, industry type, and other important demographic factors of respondents. The backgrounds mentioned support the study and show the variety and significance of the respondents to the research focus. The survey covered various manufacturing sectors (machinery, electrical, textile, food and beverage, plastic, and other fields), leadership, and ownership structure. From the results of the collected samples, the manufacturing SMEs in Ethiopia are youthful industries 51.6% are aged 1-10 years (Gebreyesus, 2008), and 84 % are privately owned enterprises.

Gender distribution: out of the total respondents, 73.8 % are males, and 26.1% are females. The male-dominated leadership illustrates the gender imbalance in Ethiopian SMEs. Singh and Belwal (2008), Bekele and Worku (2008), and Tadesse, Gecho, and Leza (2020) examine factors that influenced Women's participation in SMEs in Ethiopia. Illustrated gender disparities in the SME sector. Bekele and Worku (2008) mentioned that women-headed enterprises have the lowest survival rates compared to men. Gender has a positive influence in promoting sustainability. Females care more about social and environmental sustainability than their male counterparts. (Ozordi et al., 2020; Outsios and Farooqi, 2017).

Position: out of the total number of respondents, 79.6 % are top managers, which guarantees deep insights into a sustainable business model and sustainable performance in the survey. SMEs' Top managers are the leading influencers in implementing sustainable practices; sometimes, they are groundbreakers in social and environmental practices. (Kutzschbach, Tanikulova, and Lueg, 2021). The rest of the 20.4 % of respondents are middle managers.

Posch and Speckbacher (2017) studied the role of middle managers in implementing sustainability strategies. They found that middle management has a significant role in changing the company's sustainability strategy into the ground. According to the survey, the top position in the Ethiopian SME manufacturing sector is male-dominated; 62% and 18% are female top managers. Of the middle managers, 8% are female, and 12% are male as given in Chart in Figure 5.1. As stated by Ozordi et al. (2020) and Outsios and Farooqi, (2017). Females have a more holistic view than males. The Ethiopian government should focus on solving potential problems hindering women from taking top managerial positions.

Educational level: Regarding the academic level, most of the respondents are degree-

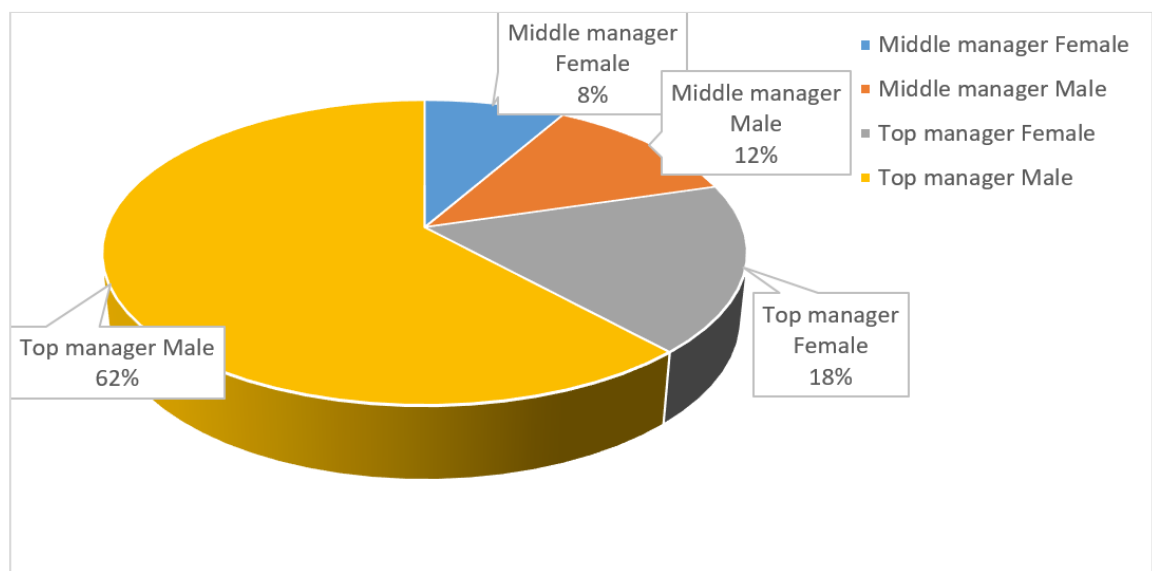


Figure 5.1 Gender and position distribution

holders, with 40%. High school graduates are 25%, master's 13%, and PhD 2.5%. It's good that most leaders are degree-holders; they likely know business and sustainability frameworks. In creating an innovative way for business models, higher education managers are more insightful. Those managers have the ability to understand the complexity of some specific business model applications.

Number of employees: From the survey collected, 61% have 6-30 staff, 26% have up to 5 staff, and 12.7 % have 31-100 staff. The small and medium-sized enterprises with 6-30 staff and 31-100 staff, respectively, have more resources to implement sustainability into the company. (Pinuer et al., 2022).

Type of Industry and ownership: From the survey, 84% are privately owned SMEs as given

Chart in Figure 5.2, which clearly shows the private sector's dominance in the industry. In influencing the SMEs' business strategy and fostering innovation, private ownership plays an essential role. (Deng, Hofman, and Newman, 2013). The remaining 12.7 % are mixed

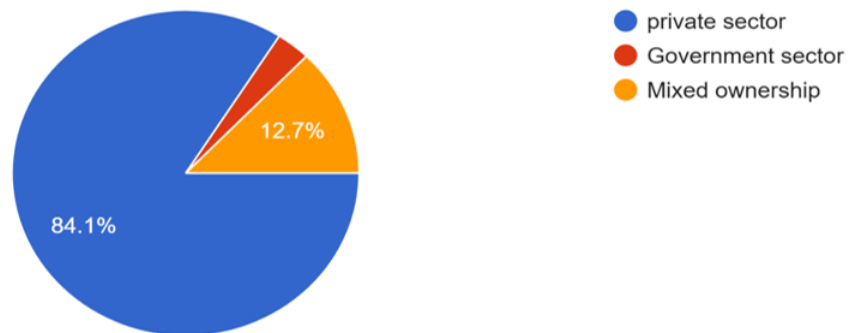


Figure 5.2 Ownership distribution

ownership, and 3.2 % are government-owned enterprises, which is the smallest involvement in the electrical, textile, and machinery sectors as given chart in Figure 5.3. The largest share

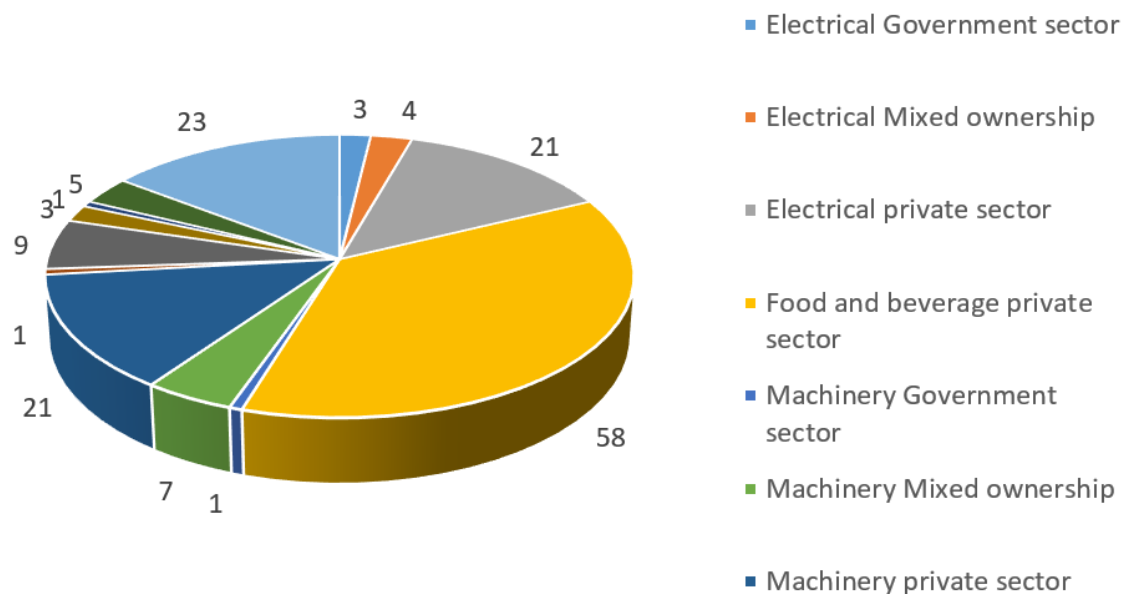


Figure 5.3 Ownership and industry distribution

related to industry involvement, with 36.9% (58), is the food and beverage industry, which is totally controlled by the private sector. The machinery industry accounts for 18.5% of the respondents (twenty-one private, seven mixed, and one government-owned SMEs). 17.8% of respondents are engaged in the electrical sector (twenty-one private private sector, four

mixed, and three government-owned SMEs), and others account for 6.4% of respondents. Age of industry: from the surveyed SMEs, 51.6% are young, which ranges from 1-10 years in the market. The middle-aged enterprises, which range from 11-20 years, that survived the first phase are 37.6%, and the old enterprises, which fall within the range of 21-30 years, are 9.6%, and those that fall under the above 30 years are 1.2 % according to Figure 5.4.

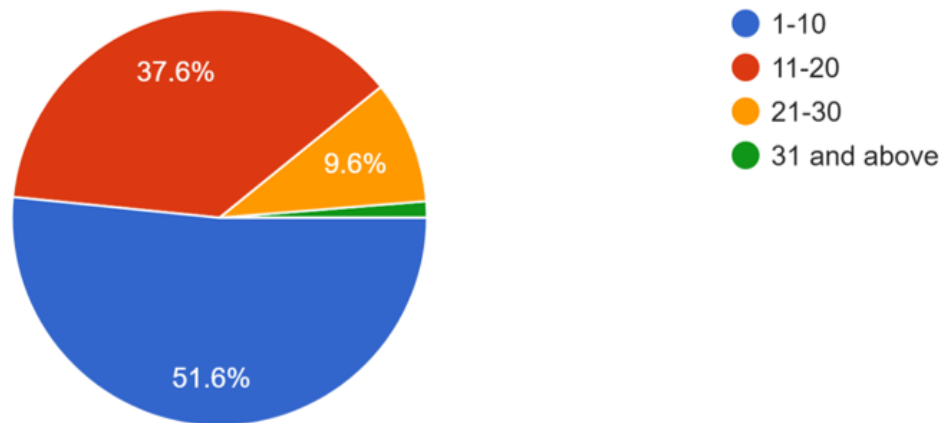


Figure 5.4 Age of the industry

5.2 Measurement Model

In this study, the quality of constructs is assessed based on the evaluation of the assessment model. The quality criteria assessment starts with the factor loading evaluation, followed by establishing the reliability and validity of the construct.

5.2.1 Factor Loading

Table 5.2 Factor Loadings

	SEP	SFP	SRC	SSP	SVC	SVP
SEP-1	0.767					
SEP-2	0.823					
SEP-3	0.865					
SEP-4	0.843					
SFP-1		0.837				
SFP-2		0.760				
SFP-3		0.854				
SFP-4		0.830				
SRC-1			0.804			
SRC-2			0.820			
SRC-3			0.854			
SRC-4			0.790			
SSP-1				0.740		
SSP-2				0.893		
SSP-3				0.880		
SSP-4				0.843		
SSP-5				0.829		
SVC-1					0.742	
SVC-2					0.827	
SVC-3					0.843	
SVC-4					0.806	
SVC-5					0.838	
SVP-1						0.840
SVP-2						0.828
SVP-3						0.812

Source: Researcher's own. Pett et al. (2003), p 299, define that Factor loadings illustrate the strength of the relationship between observed variables and the latent construct, and the typical acceptable range is between -1 and 1. All the factor loading results in the study (Table 5.2) are above the recommended result, which is 0.5 (Yim, 2019). Exceeding the recommended threshold shows all items, for example, SEP-1 up to SEP-4, reliably measure their respective construct SEP.

5.2.2 Indicator Multicollinearity

According to Hair et al. (2019), the variance inflation factor (VIF) is the degree of correlation among the indicators, and the acceptable range is below 5. As illustrated in multicollinearity Table 5.3, all the results are below 3, which is the ideal range for the VIF (Hair et al., 2019). Since most results are in the perfect range (below 3), it indicates low multicollinearity between the indicators.

Table 5.3 Multicollinearity Statistics (VIF) for Indicators

Indicator	VIF
SEP-1	1.515
SEP-2	1.924
SEP-3	2.369
SEP-4	2.127
SFP-1	1.962
SFP-2	1.631
SFP-3	2.022
SFP-4	1.812
SRC-1	1.774
SRC-2	1.827
SRC-3	2.019
SRC-4	1.651
SSP-1	1.756
SSP-2	3.403

Indicator	VIF
SSP-3	3.261
SSP-4	2.537
SSP-5	2.539
SVC-1	1.586
SVC-2	2.065
SVC-3	2.343
SVC-4	1.964
SVC-5	2.225
SVP-1	1.773
SVP-2	1.718
SVP-3	1.400

Source: Author own.

5.2.3 Reliability Analysis

Reliability tests mainly include Cronbach's alpha and composite reliability. These tests ensure that indicators measuring constructs yield consistent results across different sample sizes and time periods. According to various literature sources, the acceptable range for both tests is between 0.70 and 0.95 (Hair et al., 2019). Table 5.4 presents the results of Cronbach's alpha (ranging from 0.769 to 0.893), while composite reliability lies between 0.866 and 0.922. Therefore, both reliability indicators are within the acceptable range, confirming the stability and consistency of the measurement model used in this study.

5.2.4 Construct Validity

Statistically, using PLS-SEM, construct validity is established when there is convergent validity and discriminant validity.

Convergent Validity: According to Hair et al. (2019), p. 9, "Convergent validity is the

Table 5.4 Construct Reliability and Validity

Construct	Cronbach's Alpha	Composite Reliability (ρ_c)
SEP	0.843	0.895
SFP	0.839	0.892
SRC	0.834	0.889
SSP	0.893	0.922
SVC	0.870	0.906
SVP	0.769	0.866

Source: Author's own.

extent to which the construct converges to explain the variance of its items. The metric used for evaluating a construct's convergent validity is the average variance extracted (AVE) for all items on each construct. An acceptable AVE is 0.50 or higher, indicating that the construct explains at least 50 per cent of the variance of its items." Table 5.5 shows that all constructs exceed the required threshold, indicating valid and reliable constructs.

Table 5.5 Constructs Convergent Validity (AVE)

Construct	AVE
SEP	0.681
SFP	0.674
SRC	0.668
SSP	0.704
SVC	0.660
SVP	0.683

Source: Author's estimation from SmartPLS 4.0.

Discriminant Validity: Discriminant validity assesses whether a construct is empirically distinct from other constructs in the model. This validity is measured by the Fornell-Larcker criterion. The criterion expresses that the constructs AVE should be greater than the squared correlation between each construct and other constructs in the model. (Hair et al. 2019; Fornell& Larcker, 1981). In this study, the square root of AVE (in bold and italics) for constructs was higher than their correlation with different constructs (Table 5.6), which shows satisfactory discriminant validity. **Cross Loadings:** Cross-loadings assess whether each item loads higher on its assigned construct than others. Table 5.7 shows that all items meet this criterion, confirming discriminant validity.

Heterotrait-Monotrait Ratio (HTMT) HTMT measures the degree of correlation between

Table 5.6 Fornell and Larcker Criterion

Construct	SEP	SFP	SRC	SSP	SVC	SVP
SEP	0.825					
SFP	0.782	0.821				
SRC	0.556	0.566	0.817			
SSP	0.640	0.730	0.565	0.839		
SVC	0.542	0.543	0.759	0.549	0.812	
SVP	0.462	0.430	0.497	0.433	0.718	0.826

Source: Author's estimation

from SmartPLS 4.0.

constructs. The ratio for discriminant validity is less than 0.90, and in some studies, it is 0.85. If it is above the threshold, the construct may not be distinct. (Hair et al. (2019); Henseler et al. (2015)). The HTMT result in Table 5.8 shows that most ratios are below the required level except SFP-SEP (0.933). Although the ratio between SEP and SFP is above the threshold of 0.90, the cross-loading results in Table 5.8 revealed that each item loads higher to its respective construct than others, which justifies their separation.

5.2.5 Validating Higher Order Construct

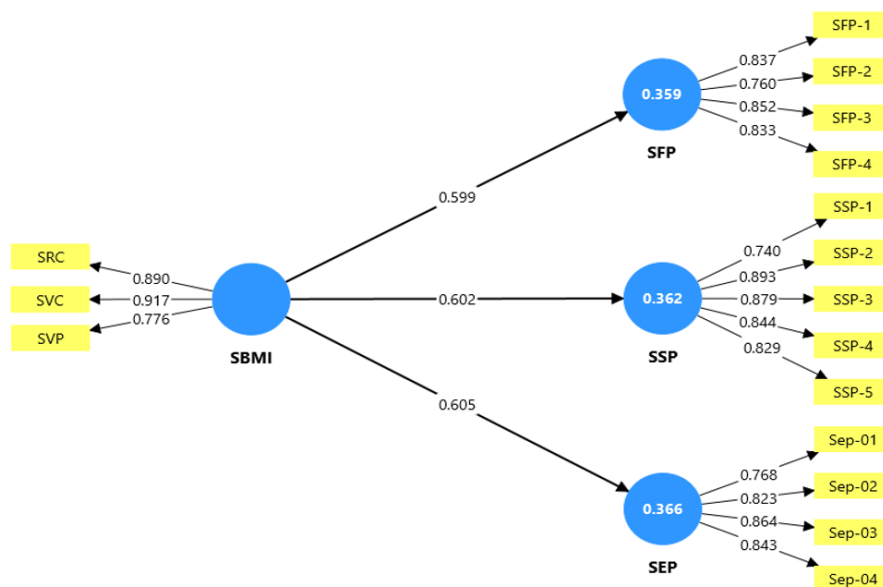


Figure 5.5 HOC results

As a part of the measurement model assessment, higher-order constructs are also validated. Each of these constructs was assessed for reliability and convergent validity. According to the results of higher-order reliability and validity, both are established. Table 5.9 shows that

Table 5.7 Cross Loadings

Item	SEP	SFP	SRC	SSP	SVC	SVP
SEP-1	0.767	0.563	0.422	0.530	0.435	0.482
SEP-2	0.823	0.562	0.436	0.446	0.406	0.366
SEP-3	0.865	0.680	0.502	0.532	0.470	0.338
SEP-4	0.843	0.769	0.472	0.597	0.475	0.338
SFP-1	0.723	0.837	0.463	0.596	0.442	0.368
SFP-2	0.645	0.760	0.379	0.577	0.340	0.289
SFP-3	0.651	0.854	0.528	0.609	0.461	0.360
SFP-4	0.565	0.830	0.472	0.619	0.521	0.387
SRC-1	0.409	0.415	0.804	0.475	0.661	0.429
SRC-2	0.440	0.505	0.820	0.425	0.607	0.430
SRC-3	0.495	0.468	0.854	0.517	0.623	0.402
SRC-4	0.470	0.460	0.790	0.430	0.594	0.366
SSP-1	0.566	0.706	0.435	0.740	0.423	0.380
SSP-2	0.557	0.618	0.554	0.893	0.528	0.358
SSP-3	0.570	0.655	0.469	0.880	0.455	0.318
SSP-4	0.515	0.536	0.453	0.843	0.460	0.427
SSP-5	0.473	0.552	0.448	0.829	0.427	0.335
SVC-1	0.438	0.449	0.530	0.407	0.742	0.513
SVC-2	0.434	0.427	0.540	0.504	0.827	0.535
SVC-3	0.416	0.396	0.654	0.441	0.843	0.453
SVC-4	0.450	0.461	0.611	0.366	0.806	0.480
SVC-5	0.460	0.470	0.738	0.501	0.838	0.418
SVP-1	0.364	0.336	0.353	0.341	0.463	0.840
SVP-2	0.361	0.347	0.448	0.323	0.460	0.828
SVP-3	0.416	0.380	0.428	0.403	0.532	0.812

reliability and convergent validity for all the constructs are established as the value is greater than 0.70 (0.828) and the AVE is greater than 0.50 (0.745). Based on the results, SBMI is statistically reliable and valid as a higher-order construct built of SVC, SVP, and SRC. The discriminant validity of the higher-order construct with the lower-order is also assessed. All the results in Table 5.10 confirm discriminant validity. Therefore, SBMI keeps its uniqueness; it impacts sustainable performance but does not merge with the three dimensions. The HTMT result in Table 5.11 shows that all the results are in the acceptable range except for one value, SEP-SFP (0.933). Even though this specific value is not in the acceptable range, the discriminant validity is generally confirmed. In this study, the Fornell-Larcker Criterion was also used to cross-validate.

Table 5.8 HTMT Results

Construct	SEP	SFP	SRC	SSP	SVC	SVP
SEP						
SFP	0.933					
SRC	0.661	0.670				
SSP	0.736	0.847	0.652			
SVC	0.632	0.627	0.891	0.618		
SVP	0.570	0.529	0.619	0.519	0.718	

Source: Author's estimation from SmartPLS 4.0.

Table 5.9 Higher-order construct reliability and convergent validity

Construct	Cronbach's Alpha	(ρ_a)	Composite Reliability (ρ_c)	Variance Extracted
SBMI	0.828	0.844	0.897	0.745

Source: Authors' estimation from SmartPLS 4.0

Table 5.10 Fornell-Larcker Criterion Higher-order discriminant validity

Construct	SBMI	SEP	SFP	SSP
SBMI	0.863			
SEP	0.605	0.825		
SFP	0.599	0.782	0.821	
SSP	0.602	0.640	0.730	0.839

Table 5.11 HTMT - Higher order discriminant validity

Construct	SBMI	SEP	SFP	SSP
SBMI				
SEP	0.721			
SFP	0.707	0.933		
SSP	0.695	0.736	0.847	

Table 5.12 Hypothesis test

Hypothesis	Original Sample (O)	Mean (M)	STDEV	T Statistics (O/STDEV)	P Values
SBMI $\rightarrow$ SEP	0.605	0.608	0.049	12.254	0
SBMI $\rightarrow$ SFP	0.599	0.602	0.049	12.166	0
SBMI $\rightarrow$ SSP	0.602	0.605	0.054	11.209	0

6 DISCUSSION

Small and medium-scale enterprises have been the focus of the Ethiopian Economic Strategy since 1997 in the Ethiopian calendar (2004 G.C), by formulating a micro and small-scale enterprise development strategy. In the following year, 2005, the government organized the Federal Micro and Small Enterprise Development Agency (recently renamed the Ethiopian Enterprise Development), which is solely responsible for manufacturing SMEs. (Gebreselassie, 2020). Responsible Government bodies' intervention and regulatory compliance (Yonis et al., 2018), cost saving, and increasing market demand for eco-friendly products push them to adopt sustainable business model innovation.

Sustainable business model innovation has been broadly discussed among scholars and draws interest from business practitioners. (Shakeel et al., 2020). The absence of a validated measurement scale hindered business practitioners from assessing SBMI systematically. Bashir et al. (2022) developed a comprehensive tool to measure SBMI. The scale is constructed around three main components: sustainable value proposition innovation, sustainable value creation, delivery, and sustainable value capture. Testing the core dimensions of SBMI is very significant for standardizing the measurement scale and examining the role of SBMI in sustainable (social, financial, and environmental) performance

The research result confirmed that sustainable value proposition innovation (SVPI), sustainable value creation, delivery (SVCI), and sustainable value capture (SRCI) significantly contribute to the formation of sustainable business model innovation (SBMI). Each core component plays an effective role in shaping the construct.

Sustainable value proposition innovation (SVPI) represents how the firm creates a product that meets sustainability needs. Acceptable discriminant value and high factor loadings on items (SVP-1, SVP-2, and SVP-3) show that the listed items can be used to assess the construct. The Composite reliability and Cronbach's alpha result shows high internal consistency, validating SVPI as an essential component of SBMI. SMEs that intentionally harmonize their offerings with sustainability goals build a robust SBMI foundation.

Sustainable value creation and delivery innovation (SVCI) signifies how a firm incorporates

sustainability values into its internal processes and partnerships. The research result reveals that SVCI has consistently high loadings. All statistical results assured that SVC is a strong component of SBMI. Sustainable value capture innovation (SRCI) focuses on how SMEs' revenue models and cost mechanisms are organized to capture value from sustainable innovation. Again, a powerful consistency value ensures that SRCI is well-defined and an essential component of SBMI. PLS-SEM empirical evidence of this study confirms that the three components, SVC, SVP, and SRC, are statistically reliable and conceptually valid sub-constructs. The findings of this study match with Bashir et al. (2022), who conceptualized SBMI as a multidimensional construct made up of SVC, SVP, and SRC. This thesis focused on the positive impact of SBMI on sustainable financial performance (H1), sustainable social performance (H2), and sustainable environmental performance (H3). The result of Hypothesis 1 shows that a substantial and statistically significant effect of SBMI on sustainable financial performance ($\beta = 0.599$ and $p=0.001$). Therefore, H1 was supported. SMEs that adopt an innovative business model for sustainability frequently perceive better economic performance. The above findings align with (Zhou et al., 2023; Pham et al., 2021; Ameer & Othman, 2012; Yang and Jang, 2020) that firms that adopt sustainable practices have higher financial performance. Sustainable business model innovation (SBMI) significantly contributes to social outcomes (H2). The substantial value of $\beta = 0.602$ and $p=0.001$ shows that SBMI really impacted stakeholders and community wellbeing, employee safety, and fair labor practices. Alonso-Martinez et al. (2021) underline that some specific SBM directly influences the sustainable social performance of the firm. The third Hypothesis, which is the impact of SBMI on sustainable social performance (H3), results ($\beta = 0.605$ and $p=0.001$), confirms that SBMI impacts this dimension more than the others. This model significantly increases the environmental performance of the manufacturing SME in Ethiopia. SBMI motivates SMEs to practice eco-friendly production processes, reduce carbon emissions. The result coincides with that of Girma et al. (2025), which explains that SBMI enhances corporate environmental performance.

7 RECOMMENDATION FOR MANUFACTURING SMES IN ETHIOPIA

Based on the above-mentioned statistical results, this study proposed a few recommendations for manufacturing SMEs in Ethiopia:

- **Improve gender imbalance in leadership:** Most respondents are male. This shows there is a high gender disparity in the sector. The government should promote gender diversity through different programs. According to the literature, women are more dedicated to social and environmental sustainability.
- **Improving the life span of SMEs:** More than half of SMEs are young (1-10 years). Policymakers should focus on supporting firms to stay in the market longer to influence the economy in the desired way.
- **Revise the product design:** The data analysis shows there is some inconsistency in defining sustainable products among the manufacturing SMEs. They should improve product definition and brand story around sustainability.
- **Improve sustainable financial performance:** SBMI impacts the sustainable financial performance of SMEs, but it's among the least impacted dimensions of sustainable performance. This shows that many manufacturing SMEs are not capitalizing on SBMI for economic benefit, such as saving costs and ROI. Firms should focus on strengthening the connection between SBMI and financial performance. SMEs should change their view of perceiving sustainability as a “cost” into leveraging it as a long-term investment.
- **Increase concern for SBMI:** Since SBMI impacts the sustainable (environmental, financial, and social) performance of SMEs, top managers and responsible parties should focus on improving the model.
- **Adopt the measurement scale:** As the study revealed, the three components of SBMI (SVP, SVC, and SRC) can be used as a measurement. SMEs should adopt the scale in their context and practically measure the performance of their business model.

8 LIMITATIONS

The study results should be considered along with the following limitations:

- The geographic and economic context is the first limitation. The samples are taken from the manufacturing sector SMEs in Ethiopia; therefore, it is still challenging to generalize the findings. Future studies should consider covering more sectors and other geographical contexts.
- Even though the study has a valid sample size, the survey relied on online platforms like Telegram and WhatsApp, which may have excluded SMEs without digital access.

CONCLUSION

This paper examined the role of sustainable model innovation (SBMI) in enhancing the sustainable financial, environmental, and social performance of manufacturing SMEs in Ethiopia. A partial Least Squares Structural Equation (PLS-SEM) was employed for data processing, and the result confirmed that SBMI substantially affects the sustainable performance of SMEs. In addition, it is empirically verified that the multi-level construct of SBMI comprises Sustainable value proposition innovation (SVPI), Sustainable value creation, Delivery (SVCI), and Sustainable value capture (SRCI) as confirmed by Bashir et al (2022). Among them, SVC demonstrated a significant influence on SBMI, while SVP had less impact, pointing out vital areas for managerial attention. Based on the result, the study proposed recommendations for manufacturing SMEs in Ethiopia: enhance the product sustainability definition by improving how to integrate sustainability into the product design and brand positioning. Improve economic benefit from SBMI, strengthen SBMI adoption, and utilize the SBMI measurement scale by adopting the three components (SVP, SVC, and SRC) framework to measure and monitor the model's performance. Using these recommendations, SMEs in Ethiopia will improve their sustainable performance.

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LIST OF ABBREVIATIONS

SMEs	Small and medium-sized enterprises
BM	Business Model
BMI	Business Model Innovation
SBMI	Sustainable Business Model Innovation
SVP	Sustainable Value Proposition
SRC	Sustainable Value Capture
SVC	Sustainable Value Creation and Delivery
GTI	Green Technology Innovation
SP	Sustainable Performance
TBL	Triple Bottom Line
SFP	Sustainable Financial Performance
SEP	Sustainable Environmental Performance
SSP	Sustainable Social Performance
EOO	Employee-Oriented Outcomes
PLSSEM	Partial Least Squares Structural Equation Modelling
LOC	Lower-Order Constructs
HOC	Higher-Order Construct
VIF	Variance Inflation Factor
AVE	Average Variance Extracted
HTMT	Heterotrait-Monotrait Ratio

LIST OF APPENDICES

APPENDIX A I: SURVEY QUESTIONNAIRE

APPENDIX A I: SURVEY QUESTIONNAIRE

Dear respondent,

Thank you for contributing to my study. My name is Bereket Getachew Tessema, and I am a student at Tomas Bata University in Zlín, Czechia. I am collecting data for my Master's degree thesis. This research aims to evaluate the role of Sustainable Business Model Innovation (SBMI) on the sustainable performance of SMEs. The findings will clarify how SBMI enhances sustainable performance and provide practical recommendations for its implementation.

The questionnaire consists of three sections:

1. Scope of the study and demographic data
2. Items assessing Sustainable Business Model Innovation
3. Items assessing sustainable performance

Your participation is voluntary, and your responses will remain anonymous.

Sincerely,

Bereket Getachew Tessema

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Zlín, Czechia

DEMOGRAPHIC INFORMATION

1. What is your position? *

- ☐ Top manager ☐ Middle manager

2. What is your gender? *

- ☐ Male ☐ Female

3. What is your highest level of education? *

- ☐ High School ☐ Diploma ☐ Degree ☐ Masters ☐ PhD

4. What is the number of your firm's employees? *

- ☐ <5 ☐ 6–30 ☐ 31–100

5. What is the type of your industry? *

- ☐ Electrical ☐ Machinery ☐ Textile ☐ Food and Beverage
☐ Plastic ☐ Other

6. What is the age of the industry? *

- ☐ 1–10 ☐ 11–20 ☐ 21–30 ☐ 31 and above

7. What is the ownership of the enterprise? *

- ☐ Private sector ☐ Government sector ☐ Mixed ownership

ITEMS ASSESSING CONSTRUCTS

Instructions: Please rate the following statements on a 5-point Likert scale:

1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

Sustainable Value Proposition Innovation

- SVP-1: Our focus has shifted towards customers who seek sustainability.
- SVP-2: Our products and service offerings have become sustainable over the years.
- SVP-3: We repositioned ourselves to be 'sustainable'.

Sustainable Value Creation and Delivery Innovation

- SVC-1: We make regular efforts to make our core competencies and resources more sustainable.
- SVC-2: We make regular efforts to convert internal value creation activities to be more sustainable.
- SVC-3: We make regular efforts to partner with firms that focus on sustainability.
- SVC-4: We make regular efforts to make our distribution channels sustainable.
- SVC-5: We make regular efforts to evaluate new competencies that need to be developed to adapt to changing sustainable market requirements.

Sustainable Value Capture Innovation

- SRC-1: We regularly try to replace short-term sources of revenues with sustainable (long-term) recurring revenue models (e.g., leasing).
- SRC-2: Our profit margins have increased by offering sustainable products.
- SRC-3: We make regular efforts to reduce manufacturing costs by incorporating sustainable practices.
- SRC-4: Differentiated sustainable products help us charge higher premiums.

Sustainable Environmental Performance

- SEP-1: Our firm has improved compliance with environmental standards.
- SEP-2: Our firm has reduced energy consumption.
- SEP-3: Our firm has reduced the consumption of hazardous materials.
- SEP-4: Our firm has reduced CO₂ emissions.

Sustainable Financial Performance

- SFP-1: Our firm has decreased the fee for waste discharge.
- SFP-2: Our firm has decreased the cost for materials purchased.
- SFP-3: Our firm has decreased the cost for energy consumption.
- SFP-4: Our firm has made improvement in return on investment.

Sustainable Social Performance

- SSP-1: Our firm has improved or enhanced the overall stakeholder welfare.
- SSP-2: Our firm has improved the community's health and safety.
- SSP-3: Our firm has reduced environmental impacts and risks to the public.
- SSP-4: Our firm has improved the awareness and protection of the claims and rights of the community served.
- SSP-5: Improvement in occupational health and safety of employees.