A Sustainable Business Model Innovation Framework towards Enhancing the Global Competitiveness of Ethiopian Manufacturing Firms in the Leather Sector

A Dissertation Submitted for the Partial Fulfilment of PhD Degree in Mechanical Engineering, Industrial Engineering Specialization, in the School of Mechanical and Industrial Engineering, College of Technology and Built Environment, Addis Ababa University, Ethiopia.

By: Mulatu Tilahun Gelaw

Main Supervisor: Prof. Eshetie Berhan

Co-Advisor: Dr. Gezahegn Tesfaye (Assistant Professor)

January, 2026

Addis Ababa, Ethiopia

ADDIS ABABA UNIVERSITY

COLLEGE OF TECHNOLOGY AND BUILT ENVIRONMENT

SCHOOL OF MECHANICAL AND INDUSTRIAL ENGINEERING

ADDIS ABABA, ETHIOPIA

A Sustainable Business Model Innovation Framework towards Enhancing the Global Competitiveness of Ethiopian Manufacturing Firms in the Leather Sector

By: Mulatu Tilahun Gelaw

Approved by the Board of Examiners:

Dr. Abdulkadir Aman (Associate Prof.)	_____	_____
Chairman	**Sign.**	**Date**
Prof. Eshetie Berhan	_____	_____
Main Supervisor	**Sign.**	**Date**
Dr. Gezahegn Tesfaye (Assistant Prof.)	_____	_____
Co- Advisor	**Sign.**	**Date**
Dr. Birhanu Beshah (Associate Prof.)	_____	_____
Internal Examiner	**Sign.**	**Date**
Prof. Elvis Korku Avenyo	_____	_____
External Examiner	**Sign.**	**Date**

Declaration

I hereby declare that the work which is being presented in this PhD dissertation entitled "A Sustainable Business Model Innovation Framework towards Enhancing the Global Competitiveness of Ethiopian Manufacturing Firms in the Leather Sector" is original work of my own, has not been presented for a degree of any other university and all the source of materials used for this dissertation have been duly acknowledged.

Mulatu Tilahun Gelaw	_____	_____
PhD Candidate	Signature	Date

This is to certify that the above declaration made by the candidate is correct to the best of my knowledge.

Prof. Eshetie Berhan	_____	_____
Main Supervisor	Signature	Date
Dr. Gezahegn Tesfaye (Assistant Professor)	_____	_____
Co- Advisor	Signature	Date

Authors:

Mulatu Tilahun Gelaw, a Ph.D. candidate at Addis Ababa University, College of Technology and Built Environment, School of Mechanical and Industrial Engineering, Addis Ababa, Ethiopia.

E-mail: mtbt2017@gmail.com

Prof. Eshetie Berhan, Full professor at Addis Ababa University (AAU), College of Technology and Built Environment, School of Mechanical and Industrial Engineering, Ethiopia.

E-mail: berhaneshetie@gmail.com

Dr. Gezahegn Tesfaye, Assistant professor at Addis Ababa University (AAU), College of Technology and Built Environment, School of Mechanical and Industrial Engineering, Ethiopia.

E-mail: gezahegnt2000@gmail.com

Acknowledgement

First and foremost, I wish to express my profound gratitude to Almighty God for the multitude of blessings I have received.

I extend my heartfelt appreciation to my Main-supervisor, Prof. Eshetie Berhan, Full Professor of Industrial Engineering, and my Co-Advisor, Dr. Gezahegn Tesfaye, Assistant Professor of Industrial Engineering, at the College of Technology and Built Environment, Addis Ababa University. I express my sincere gratitude for the autonomy given to me, which enables the exploration of diverse opportunities and challenges. I also appreciate the guidance provided during moments of uncertainty and the timely assistance rendered when necessary. You did not merely supervise, you inspired. This journey was not mine alone. It was built on your patience, your trust in my curiosity, and your persistent commitment to excellence. Your invaluable support and guidance have played a crucial role in my academic journey.

I also extend my sincere gratitude to the professors of the Industrial Engineering Chair: Prof. Daniel Kitaw, Dr. Berhanu Beshah, Dr. Kassu Jilcha, Dr, Amha Mulugeta, Dr. Ermias Tesfaye for their collective dedication and impactful contributions, which have significantly enriched my learning experience and played a crucial role in reaching this important milestone.

I am especially grateful to my wife, Zenebech Kasahun (Zeni), and my children; Yohanes Mulatu and Wanofi Mulatu, for their unwavering love and encouragement which have been vital to my accomplishments.

I would like to take a moment to express my heartfelt gratitude to all my colleagues, family, and everyone who has supported me on my journey. Your contributions have been invaluable, and I truly appreciate the role each of you has played in my success. Thank you for being a part of this journey with me.

Last but not least, I extend my deepest gratitude to the institutions and organizations whose unwavering support made this academic journey possible, including Addis Ababa University; Mizan-Tepi University; Nuremburg Campus of Technology, Germany; AfricaLics; and SIDA. Your commitment to advancing education and sustainable development has been instrumental in enabling my research and professional growth.

Dedication

I express my deepest gratitude to my father, Tilahun Gelaw, a man of modest resources but strong determination. Although his formal education concluded with basic adult training, he showed great commitment to the values of curiosity, honesty, and the power of learning. He believed that education can go beyond life's limitations, and he worked hard to pass that belief on to his children.

Through his quiet strength, he taught me the importance of hard work, thoughtful thinking, and willingness to learn and grow. He gave us what he could not have himself, so that we could reach the opportunities he dreamed of. His hands, shaped by years of labor, held firmly to the idea that knowledge can change lives. Every lesson he gave, whether through advice or quiet role model, guided me on the path to this achievement.

This success is not mine alone. It reflects his deep belief in me, even when I doubted myself. For the many sacrifices he made, the dreams he handed to me, and the hopeful spirit he lived by, I am truly grateful. I dedicate this work to him, not only as a father, but as a teacher, a role model, and the quiet builder of everything I have become.

This PhD dissertation is dedicated to my father:

Tilahun Gelaw

Abstract

Adopting Sustainable Business Model Innovation (SBMI) capabilities empowers businesses to compete at a higher level, driving economic growth, enhancing social well-being, and promoting environmental responsibility. By embracing SBMI, Ethiopian manufacturing firms in the leather sector (EMF-in-LS) can continually evolve, challenge conventional methods, explore new revenue streams, and stay ahead of the curve in dynamic market environments. However, EMF-in-LS often struggle with global competitiveness and face challenges in sustainable business model innovation. This is primarily due to many pressing challenges including lack of capabilities and awareness concerning sustainable business model innovation, as manufacturing firm owners and managers are more focused on day-to-day operations and immediate profits. To address these challenges, it is crucial to raise awareness among EMF-in-LS about the importance of SBMI and develop SBMI framework that can enhance their SBMI capabilities. The main purpose of this dissertation is to develop a comprehensive sustainable business model innovation (SBMI) framework for EMF-in-LS, focusing on the sector's comparative advantages and systemic challenges and untapped opportunities in global competitiveness and sustainability.

The research was conducted in Addis Ababa, Ethiopia, chosen for its concentration of leather manufacturing firms and accessibility to key stakeholders. A mixed-methods approach was used to capture comprehensive insights, targeting all the 225 registered, export-oriented Ethiopian leather manufacturing firms, including 34 tanneries, 37 footwear manufacturers, and 154 leather article producers. This crucial sector was selected as it drives employment, exports, and growth in Ethiopia. Purposive sampling was employed to collect both primary and secondary data, which was analyzed using appropriate tools and techniques which have been thoroughly discussed inside this PhD dissertation.

This dissertation presents a validated Sustainable Business Model Innovation (SBMI) framework tailored for Ethiopian manufacturing firms in the leather sector (EMF-in-LS), developed through three empirical studies, each addressing a set of specific objectives of this PhD research.

To address the first objective and inform the development of the Sustainable Business Model Innovation (SBMI) framework, the Empirical study I of this PhD study examines Ethiopia's leather export performance and comparative advantages using Food and Agriculture Organization

(FAO)stat and International Trade Center (ITC) trade data. By applying the Revealed Comparative Advantage (RCA) index and Constant Market Share (CMS) analysis, the study reveals a decline in Ethiopia's comparative advantage in raw hides and skins (RHS) alongside steady growth in leather articles and fluctuating footwear exports revealing systemic competitiveness challenges that demand strategic intervention. Complementing this quantitative assessment, a comprehensive methodology integrating thematic literature analysis, sector analysis using the Porter's Diamond Model, semi-structured interviews, and a business model evaluation of a typical firm in EMF-in-LS identifies critical challenges and opportunities shaping the sector's future.

Additionally, to complete the first objective and deepen insights into the Sustainable Business Model Innovation (SBMI) framework, empirical study I of this PhD Study explores the contribution of Total Productive Maintenance (TPM) to operational excellence within Ethiopian Manufacturing Firms in the Leather Sector (EMF-in-LS). The study identifies Focused Improvement (FI), Quality Maintenance (QM), and Education & Training (EduT) as pivotal enablers of Overall Equipment Effectiveness (OEE). Based on descriptive statistics and Partial Least Squares Structural Equation Modeling (PLS-SEM), the results show that TPM implementation remains at a nascent stage, falling short of the internationally recognized OEE benchmark of 85%. The findings offer empirical validation of the interconnectedness between TPM practices, OEE, and operational performance, providing actionable insights that informed the development of the SBMI framework tailored to EMF-in-LS.

To fulfill the second objective and extend insights for shaping the Sustainable Business Model Innovation (SBMI) framework, Empirical Study II of this PhD dissertation investigates Ethiopian consumers' online purchasing behavior through Partial Least Squares Structural Equation Modeling (PLS-SEM). The study identifies Perceived Ease of Use, Subjective Norms, Perceived Usefulness, Website Design, and Trust as significant determinants of purchase intention, thereby elucidating critical drivers of digital engagement. Grounded in the Technology Acceptance Model (TAM), the Theory of Planned Behavior (TPB), and supporting literature, the analysis enriches contextual understanding of consumer behavior within emerging markets.

For Ethiopian Manufacturing Firms in the Leather Sector (EMF-in-LS), these findings underscore the strategic relevance of intuitive website interfaces, transparent product information, and

credible customer reviews. Moreover, the influence of social norms and sustained platform value emerges as pivotal for fostering trust and enhancing customer retention. Collectively, these insights provide actionable implications that strengthen the design and relevance of the SBMI framework tailored to EMF-in-LS.

To address the third objective and strengthen the foundation of the Sustainable Business Model Innovation (SBMI) framework, Empirical Study III of this PhD dissertation comprises two interconnected inquiries. The first entails a rigorous thematic analysis of existing literature, which identifies ten critical success factors (CSFs) and eleven barriers to SBMI, each categorized under four overarching themes. This synthesis provides a comprehensive empirical mapping of the enablers and challenges, offering a structured lens to examine prior SBMI implementations and inform future applications.

The second dimension of Empirical Study III empirically investigates the relationship between key business model innovation (BMI) drivers and firm performance (FP). The study reveals that dynamic capabilities (DC), digital capabilities (DigC), and the business environment (BE) significantly foster BMI. Moreover, DC, BE, and BMI exhibit positive impacts on FP, whereas strategic agility (SA) presents a counterintuitive negative association, signaling the need for deeper inquiry. Innovation Capability (IC) and DigC display marginal effects, suggesting potential areas for strategic enhancement.

By integrating insights from dynamic capability theory and the resource-based view (RBV), the study underscores the necessity of cultivating both dynamic and digital capabilities to navigate evolving market conditions, regulatory landscapes, and technological disruptions. Ultimately, SBMI emerges as a strategic imperative for Ethiopian Manufacturing Firms in the Leather Sector (EMF-in-LS), advancing resilience, global competitiveness, and long-term sustainability.

Finally, this dissertation synthesizes the insights drawn from the three interrelated empirical studies to propose a novel and comprehensive Sustainable Business Model Innovation (SBMI) framework, tailored to enhance the SBMI capabilities of Ethiopian Manufacturing Firms in the Leather Sector (EMF-in-LS).

Validated through rigorous empirical evidence, subject matter experts and practitioner evaluations, the proposed framework significantly advances the conceptual and practical

understanding of SBMI within emerging market contexts. It delivers actionable guidance to EMF-in-LS striving to transform their business models for greater sustainability, equips policymakers with evidence-based directions for regulatory support, and facilitates collaboration among industry stakeholders toward achieving sustainable industrial development aligned with the United Nations Sustainable Development Goals (SDGs).

Grounded in dynamic capability, RBV, TAM, and TPB, the proposed SBMI framework emerges as a transformative model for EMF-in-LS enhancing strategic resilience, fostering sustainable business model innovation, and informing policy alignment with national competitiveness goals. Its uniqueness lies in the integration of multi-theoretical perspectives with contextual empirical insights, delivering a flexible, stakeholder-inclusive, and scalability-oriented tool tailored for emerging market firms specific in EMF-in-LS operating within sustainability-sensitive industry.

Keywords: *Business Model (BM), Business Model Innovation (BMI), Comparative advantage, Dynamic Capabilities (DC), Emerging markets, Ethiopian Manufacturing firms in the leather sector (EMF-in-LS), Global Competitiveness, Sustainable Business Model Innovation (SBMI).*

Table of Contents

Content Page

List of Figures

Figure **Page**

List of Tables

Table **Page**

Abbreviations and Acronyms

BMI	Business Model Innovation
CMS	Constant Market Share
CSF	Critical Success Factors
DC	Dynamic Capabilities
ELIA	Ethiopian Leather Industries Association
EMF-in-LS	Ethiopian Manufacturing Firms in the Leather Sector
FAO	Food and Agricultural Organization
FL	Finished Leather
ITC	International Trade Center
LIDI	Leather Industries Development Institute
OEE	Overall Equipment Effectiveness
PLS-SEM	Partial Least Squares Structural Equation Modelling
R&D	Research and Development
RBV	Resource Based View
RCA	Revealed Comparative Advantage
RHS	Raw Hides and Skin
SBMI	Sustainable Business Model Innovation
SDGs	Sustainable Development Goals
SLR	Systematic Literature review
TAM	Technology Acceptance Model

TPB	Theory of Planned Behavior
TPM	Total Productive Maintenance
TRA	Theory of Reasoned Action
UN	United Nations
UNIDO	United Nations Industry Development Organizatio

Chapter 1

Introduction

1.1 Background and Justifications of the study

Innovation is key in a global marketplace, driving the development of new ideas, solutions, and business models (Makalesi *et al.*, 2023; Sudolska and Łapińska, 2020). Innovative firms consistently track their competitors and leverage diverse organizational competencies to develop novel business models shaping the competitive landscape (Adetumi Adewumi *et al.*, 2024).

The idea of business models became increasingly prominent during the 1990s, especially with the emergence of the Internet (He and Ortiz, 2021). A business model serves as a strategic framework that explains how a company creates, delivers, and captures value to sustain its operations (Geissdoerfer et al., 2018; Osterwalder, 2010; Richardson, 2008; Teece, 2018). It includes the essential elements that drive revenue and ensure business sustainability, such as identifying target markets, defining unique value propositions, setting up distribution channels, building customer relationships, determining revenue streams, carrying out key operations, managing resources effectively, forming strategic alliances, and evaluating cost structures (Osterwalder, 2010; Zheng *et al.*, 2022).

Business Model Innovation (BMI) involves rethinking a company's core components to enable sustainable value creation, competitive advantage, and growth (Geissdoerfer et al., 2018; Randhawa et al., 2021). It pushes conventional models to evolve, ensuring they stay relevant and provide distinctive value (Bell, 2022). Firms often develop and adapt their business models consciously or unconsciously from inception (Elmehdi *et al.*, 2024; Ramdani *et al.*, 2019; Spieth *et al.*, 2023).

Shifts in consumer behavior, globalization, digital transformation, and technological advancements are fostering the emergence of new business models (Sjödin *et al.*, 2020). Many firms periodically change their business models to meet changing business circumstances and market needs (Elmehdi et al., 2025; Zare and Persaud, 2024).

The process of creating and implementing new business models that not only provide economic benefit but also solve social and environmental concerns is known as sustainable business model innovation (SBMI) (Bashir et al., 2022; Bocken et al., 2019; Geissdoerfer et al., 2018). SBMI involves the incorporation of sustainability principles into the fundamental operations, strategies, and value proposition of a company, highlighting the importance of ongoing adaptation and evolution (He and Ortiz, 2021).

The idea of sustainability has evolved in recent years to address urgent global challenges such as climate change, resource depletion, and increasing social inequalities (Faus Onbargi, 2022). In contrast to conventional business models and industrial approaches that often focused on immediate profits, sustainable business models prioritize long-term viability, environmental responsibility, and ethical considerations (Pengchao *et al.*, 2023).

Sustainability strengthens brand loyalty, enables premium pricing, and enhances financial accessibility (Mohammad Obaidullah *et al.*, 2025). Governments support sustainable efforts through subsidies and tax incentives, easing financial burdens and promoting long-term implementation (Molina-Castillo *et al.*, 2021).

Through the creation of long-term value for all stakeholders and alignment with the triple bottom line of economic, environmental, and social dimensions, sustainable business model innovation seeks to balance economic growth with environmental preservation and social well-being (Dhir et al., 2023; Pan et al., 2023). SBMI extends beyond innovations confined to specific domains like technology, processes, or products, instead, it focuses on revolutionizing the foundational structure of an organization, requiring a comprehensive approach to business model innovation (Brenner and Drdla, 2023).

Through the adoption of SBMI, companies can achieve a competitive edge, improve their brand image, attract environmentally and socially conscious customers, enhance operational efficiency, optimize cost-effectiveness, and mitigate risks related to climate change and resource scarcity (Pan et al., 2023; Rosati et al., 2023). Moreover, SBMI actively contributes to the attainment of the Sustainable Development Goals (SDGs) set by the United Nations, playing a pivotal role in tackling urgent global challenges (Rosati *et al.*, 2023).

In today's dynamic market environment, firms are realizing the importance of engaging in sustainable business model innovation (SBMI) as a crucial endeavor to uphold their competitiveness (Salfore *et al.*, 2023). This process significantly influences a company's competitiveness and long-term sustainability (Ammirato *et al.*, 2022) which can lead to growing interest among practitioners and researchers in sustainable business model innovation (Pucihar et al., 2019).

SBMI is seen as a key way for companies to stay competitive and adapt to a fast-changing business world (Ammirato *et al.*, 2022; Xue *et al.*, 2019). Unlike minor product or service enhancements, SBMI transforms business operations by prioritizing not only profitability but also environmental sustainability and social responsibility (Coffay and Bocken, 2023; Franco et al., 2023). With rising competition and technological progress, experts and business leaders are increasingly focusing on SBMI to develop adaptable and sustainable strategies (Dymitrowski and Mielcarek, 2023). To succeed in the long run, companies need to match their business models to changing market needs and environmental challenges, using creative solutions to turn sustainability issues into opportunities (Li *et al.*, 2024). By balancing profit goals with social and environmental needs, SBMI helps businesses build strength and create value in a world that values overall responsibility toward people and the planet (Schlüter *et al.*, 2023; Utaminingsih *et al.*, 2023).

Leather, derived from animal hides and skins, has served humanity as a vital material for everyday essentials since ancient times (Silva, 2021). Renowned for its hydrothermal stability, exceptional mechanical strength, and resistance to chemical and biological degradation, leather remains indispensable across multiple industries (Maina et al., 2019). Beyond its functional attributes, leather and its byproducts constitute some of the most widely traded commodities worldwide, sustaining millions of livelihoods in livestock rearing, tanning, and manufacturing (Omoloso *et al.*, 2021). The persistent rise in demand particularly within the fashion, automotive, and furniture sectors highlights the industry’s sustained economic significance (Maina *et al.*, 2019; Verma, 2020). Global production and consumption are largely concentrated in countries such as China, India, Italy, and the United States, whose advanced manufacturing infrastructures and expansive consumer markets secure their dominance in the leather trade (FMI, 2024; Navarro *et al.*, 2020).

The global leather sector is a key contributor to the world economy, driving employment, trade, and industrial development (J. *et al.*, 2020). Market projections indicate that the leather goods industry is set to reach a value of $764.81 billion by 2033 (FMI, 2024). This growth is attributed to rising disposable incomes, evolving consumer preferences, and advancements in production technologies (Custom Market Insight, 2024).

Ethiopia is now a major player in the global leather market, with a manufacturing sector that includes tanning, footwear manufacturing, and the creation of other leather goods. The country benefits from a large livestock population, which serves as a key source of raw materials for its growing leather sector.

The Ethiopian leather sector holds immense promise in enhancing export revenues, fostering job creation, empowering women economically, and contributing to the nation's overall progress (Berkesa et al., 2024)(Tsega et al., 2022). With a labor-intensive value chain spanning raw hide processing to the manufacturing of leather goods, the industry presents significant opportunities for youth employment (China et al., 2022) (Grumiller, 2021).

The Ethiopian leather industry represents one of the country’s most strategically significant sectors, contributing to industrial development, export earnings, and employment opportunities across its extensive value chain (Berkesa et al., 2024)(Tsega et al., 2022). This value chain spans pre-slaughter activities such as animal husbandry and cattle trade, peri-slaughter operations dominated by slaughterhouses, the marketing of raw hides and skins (RHS), tanning processes, leather manufacturing, and the distribution of finished goods

As Ethiopia positions itself as a key player in the global leather market, aligning industry practices with sustainable development goals, such as the United Nations Sustainable Development Goals (SDGs), is crucial for enhancing competitiveness and attracting international partnerships (Tarnovskaya, 2023).

The Ethiopian government's vision to create 300,000 jobs by 2030 in the leather sector and establish the country as a major global leather supplier underscores the nation's commitment to industry growth (EIC, 2024). With strategic initiatives promoting finished leather production, a skilled workforce, competitive wages, and favorable trade agreements, Ethiopia emerges as a

prime destination for investors seeking to capitalize on the burgeoning leather industry (EIC, 2024).

Current developments in the leather industry reveal a growing preference for sustainable and ethically produced leather (Pavani et al., 2024) (Tewari et al., 2024) (Dissanayake et al., 2017)(FMI, 2024). Consumers increasingly consider the environmental footprint of leather production, fostering a shift towards eco-friendly tanning methods and alternative materials (FMI, 2024). Furthermore, the luxury leather goods market witness growth propelled by rising incomes and the desire of premium brands (Custom Market Insight, 2024) . In light of increasing global environmental concerns, the sustainable leather industry emphasizes cleaner processing methods to foster a greener environment (Alemu et al., 2024) (Mahdi Haroun & Manal Mohammed Ahmed, 2023)(Liang et al., 2024). While the leather industry plays a pivotal role in the global economy, challenges such as raw material scarcity, ethical considerations, competition from substitutes, and environmental regulations pose obstacles to its expansion (Muthukrishnan, 2021) (Navarro et al., 2020).

The ongoing discourse on sustainability within the leather industry underscores the importance of addressing environmental issues to ensure long-term viability (Muthukrishnan, 2021) (Navarro et al., 2020). By focusing on sustainable practices, the Ethiopian leather sector can enhance its global competitiveness, increase exports, and drive economic growth, paving the way for a prosperous and sustainable future (Legesse & Hussien, 2024)(Muthukrishnan, 2021b) (Berkesa et al., 2024).

Sustainable business model innovation holds the key to transforming the Ethiopian leather sector, attracting foreign investment, promoting economic development, and fostering social cohesion through job creation, particularly for marginalized groups (Yana Mbena, 2022)(Nguyễn & Phan, 2023) (Jeong & Yoo, 2022). Initiatives like eco-friendly industrial parks are poised to stimulate economic activity and bolster employment opportunities, positioning Ethiopia as a dynamic player in the global leather market (UNIDO, 2023).

Advances in technology, shifting consumer preferences, and regulatory frameworks have urged businesses and societies to integrate sustainable business models that balance profitability with environmental and social well-being (Anitha, 2024). The rise of circular economies, green technologies, and corporate social responsibility (CSR) reflects how sustainability is no longer an

optional practice but a fundamental principle shaping modern industries and economies (Zervoudi *et al.*, 2025). As global markets increasingly prioritize ethical production and environmental consciousness, sustainability has become a determinant factor in business success and competitive advantage (Lee and Fu, 2024).

Embracing Sustainable Business Model Innovation (SBMI) capabilities empowers the leather sector to compete at a higher level, driving economic growth, enhancing social well-being, and promoting environmental responsibility (Girma *et al.*, 2025). SBMI significantly boosts economic productivity, fosters community development, and ensures sustainable resource management (Ferlito and Faraci, 2022; Pan *et al.*, 2023). Recognizing and harnessing the power of SBMI is essential for businesses aiming to thrive in the globalized world.

Adopting SBMI frameworks can lead manufacturing firm to enhanced global market access by meeting international sustainability standards, improved operational efficiency, waste reduction, and greater resilience against market disruptions by diversifying value propositions and adopting digital business models (Jagani *et al.*, 2024).

The leather manufacturing industry is highly labor-intensive, requiring a significant amount of human work and manual effort throughout the production process (Brun and Ciccullo, 2022) which is potential of creating significant number of job opportunities for developing nations like Ethiopia.

Ethiopia has a long-standing history in leather production, dating back to the early 20th century (ECA, 2024). With one of the largest livestock populations in Africa, the country possesses a significant comparative advantage in raw material sourcing (Ethiopian Monitor, 2024). The Ethiopian leather industry, with its vast potential for industrial and economic development, plays a crucial role in driving employment, boosting export revenues, and contributing to GDP growth (Wudu et al., 2024).

The value chain for the Ethiopian leather industry has numerous steps, including preslaughter, peri slaughter, marketing of RHS, tanning, leather manufacturing, and selling leather goods. Animal husbandry and cattle commerce make up the stage before slaughter. Slaughterhouses are the major participants in the peri-slaughter period. Small- and large-scale domestic commerce are important in RHS's marketing. To transform the raw hides and skins into high-quality leather, tanneries employ a variety of tanning techniques. The completed leather from the leather-production step is

used by manufacturers to create a variety of leather goods, such as footwear, accessories, belts, gloves, and upholstery. When a leather product is at the marketing phase, it may be exported to foreign markets or dispersed to various regions of the nation. A value chain is strong when all of its participants work together to maximize value creation throughout the chain; conversely, a value chain's weaker nodes prevent it from being economically optimized (MOI, 2016).

Sustainable Business Model Innovation (SBMI) acts as a blueprint for manufacturing firms, guiding their operations and ensuring they remain competitive and meet changing customer demands (Ferlito and Faraci, 2022). To achieve excellence and high performance, Ethiopian manufacturing firms in the leather sector (EMF-in-LS) should strategically develop distinctive and hard-to-replicate sustainable business models through SBMI capabilities, providing a competitive edge and strengthening their global market position.

To compete globally, (EMF-in-LS) must adopt sustainable business models and implement international best practices, which can improve efficiency, reduce costs, and enhance their brand reputation (Berkesa *et al.*, 2024) . By adopting SBMI practices, EMF-in-LS can continuously innovate, rethink traditional approaches, discover new revenue opportunities, and maintain a leading edge in evolving market landscapes.

Although the topic is highly significant, the literature lacks a thorough and detailed description of the sustainable business model innovation process, as research on SBMI has been relatively unexplored due to its later emergence compared to BMI research (Pan *et al.*, 2023) . Various prior studies including (Kwasi Sampene *et al.*, 2023)(Brenner and Drdla, 2023) (Geissdoerfer et al., 2018) identified the lack of comprehensive framework for sustainable business model innovation (SBMI) implementation and underscore the need for a structured approach to SBMI.

Although sustainable business model innovation (SBMI) holds theoretical promise, its practical implementation remains limited (Minatogawa *et al.*, 2022). Existing studies are fragmented and offer limited empirical evidence linking SBMI to performance outcomes. Moreover, research on the determinants of its adoption is sparse (Ammirato *et al.*, 2022; Bhatti *et al.*, 2021). To advance the field, (Clauss *et al.*, 2021) emphasize the need for large-scale empirical research and causal analysis to strengthen methodological rigor and enhance generalizability.

Many prior studies primarily focus on digital and e-commerce applications leaving significant gap in the manufacturing sector (Minatogawa *et al.*, 2022; Pan *et al.*, 2023).The existing limited studies within the manufacturing sector SBMI research has predominantly focused on case studies from developed economies, offering limited insights into how firms in developing countries adopt and adapt these innovations (Huang and Ichikohji, 2023). This gap is particularly evident in the global leather industry, where existing studies are outdated, fragmented, and insufficient. There is a pressing need for updated, context-specific investigations that address the unique challenges of SBMI implementation in leather production encompassing tanneries, footwear, and leather goods especially in developing countries contexts such as Ethiopia.

This PhD study aims to fill this gap focusing on developing a sustainable business model innovation (SBMI) framework tailored to Ethiopian Manufacturing firms in the leather Sector (EMF-in-LS).

1.2 Statement of the Problem

The evolving concept of sustainability is still insufficiently embedded in strategies tackling climate change, resource depletion, and social inequality, demanding more integrated and resilient frameworks (Buonocore *et al.*, 2024; Verhoef *et al.*, 2021). Firms in emerging economies face growing pressure to adopt socially and environmentally sustainable practices as rapid digitalization, shifting consumer expectations, and intensified market competition position Sustainable Business Model Innovation (SBMI) as a strategic imperative for competitiveness (Chen *et al.*, 2023; Santiago, 2021).

Despite its economic significance, the leather industry faces considerable environmental and ethical challenges (Chen *et al.*, 2023; Monira and Mostafa, 2023). The sector's reliance on intensive chemical processes, including hazardous substances like chromium, contributes to pollution and excessive waste generation, posing serious ecological risks (Famielec, 2020; Ghaly *et al.*, 2022; Prasad *et al.*, 2021; Silva, 2021). In response, growing consumer awareness and regulatory efforts are driving a shift toward sustainable leather production, emphasizing eco-friendly leather processing methods (Pavani *et al.*, 2024; Tewari *et al.*, 2024).

Conventional chrome tanning methods in Ethiopia discharge harmful chemicals into ecosystems, polluting water supplies and threatening local communities (Faye and Sibali, 2025). Additionally,

the lack of recycling programs and circular economy practices contributes to resource waste and financial inefficiencies.

Socially, poor working condition including unsafe work environments, low wages, and inadequate worker protections further diminishes the industry's sustainability reputation (Arshad, 2024). These challenges not only contradict global sustainability standards but also discourage ethically-conscious consumers and investors, undermining Ethiopia's competitiveness in markets where adherence to environmental and social governance (ESG) principles is critical.

Despite Ethiopia's vast livestock resources offering strong potential for economic growth, the leather manufacturing sector faces operational inefficiencies that limit its ability to shift from raw material exports to value-added production. Currently, over 80% of Ethiopia's leather output comprises raw or semi-processed hides (Arshad, 2024), reflecting a reliance on low-value addition activities. Outdated technology, unskilled workforce, and poor operational excellence result in suboptimal resource utilization, poor product quality, and failure to meet international standards.

Ethiopian leather manufacturers struggle with frequent equipment failures, inefficient maintenance, and outdated machinery, leading to high defect rates, excessive material waste, and reduced productivity. According to (Yohannes *et al.*, 2023), 78.71% of large and medium manufacturing industries in Ethiopia operate below full capacity, further weakening competitiveness. Additionally, poor maintenance philosophy lowers Overall Equipment Effectiveness (OEE), worsening inefficiencies and sustainability gaps.

The outdated tanning practices waste over 80% of materials (Jaffari *et al.*, 2024), while low overall equipment effectiveness (OEE) upholds systemic inefficiencies. These factors not only limit competitiveness but also amplify environmental pollution and social disparities, underscoring the need for sustainable business model innovation (SBMI) prioritizing sustainability principles and value-added production.

Ethiopian leather manufacturing firms face challenges in expanding their international market presence due to underdeveloped e-commerce platforms, hindered by weak payment systems, inefficient logistics, and low consumer adoption (Chala Dandessa, 2023) alongside inadequate branding and limited digital marketing strategies (EBR, 2025).

These operational challenges hinder profitability and limit access to international markets, where strict sustainability and quality standards dictate competitive advantage (D'Adamo *et al.*, 2024). The lack of investment in innovative technologies and digital tools further aggravates these limitations, preventing firms from expanding their market reach and improving competitiveness.

Weak partnerships between suppliers, manufacturers, designers, and retailers hinder collaborative innovation and the sharing of knowledge. Reluctance to adopt changes, reliance on short term profits, combined with limited managerial skills and insufficient training, further slows the adoption of sustainable business models (Abdul Basit et al., 2024; Wudu et al., 2024).

Manufacturing firms often prioritize short-term financial gains over long-term sustainability, making it difficult to justify sustainable investments and recognize the competitive advantage of sustainability-driven innovation (Ahmad *et al.*, 2023; Najafi-Tavani *et al.*, 2023). Ethiopian leather manufacturing firms in the leather sector (EMF-in-LS) lack managerial expertise and awareness of SBMI's strategic value.

Without addressing these challenges, EMF-in-LS risk falling behind in global markets that increasingly prioritize sustainability. Addressing these challenges requires a tailored SBMI framework that integrates sustainable manufacturing solutions, innovation-driven strategies, operational excellence, and online international market presence enabling EMF-in-LS to meet international sustainability expectations while improving long-term business viability.

However, Ethiopian manufacturing firms in the leather sector (EMF-in-LS) lack research-based, context specific sustainable business model innovation (SBMI) frameworks suited to its specific institutional, cultural, and resource conditions to guide them in developing sustainable business models that can enhance their global competitiveness in today's dynamic business environment. These challenges underscore the urgent need for an overarching SBMI framework tailored to build SBMI capabilities of EMF-in-LS ultimately enhancing the global competitiveness of Ethiopian manufacturing firms in the leather sector.

Developing a comprehensive SBMI framework tailored to the EMF-in-LS context can address these challenges by providing a structured approach to innovation, sustainability, operational excellence, and competitiveness. By aligning with Ethiopia's industrialization goals and the United

Nations Sustainable Development Goals (SDGs), this research seeks to enhance the sector's global competitiveness while promoting environmentally responsible and socially inclusive growth.

Therefore, this dissertation emphasizes the creation of a comprehensive SBMI framework to bridge the identified research gaps and guide firms in adopting sustainable business practices leveraging modern competitive strategies and comparative advantages of the country, and improving their overall performance in the global leather market.

1.3 Research Questions

In line with the problem statement, this dissertation seeks to address the following key research questions:

1. What comparative advantages, systemic challenges, untapped opportunities, and operational excellence initiatives shape the sustainable global competitiveness of EMF-in-LS?
2. What factors shape Ethiopian consumers' purchase intentions on emerging digital business model platforms, and how can these platforms support sustainable market growth for EMF-in-LS?
3. What are the critical success factors and barriers in the pathways of Sustainable Business Model Innovation (SBMI), and how do these elements influence firm performance?
4. How can a Sustainable Business Model Innovation (SBMI) framework be developed and validated to enhance the sustainable global competitiveness of EMF-in-LS?

1.4 Objectives of the Research

1.4.1 General Objective

The general objective of this PhD dissertation is to develop a generic Sustainable Business Model Innovation (SBMI) framework that builds SBMI capabilities of EMF-in-LS ultimately enhancing their sustainable competitiveness in the global leather market.

1.4.2 Specific Objectives

Aligned with the main objective and research questions, the specific objectives of this study designed to address the research questions and support the overarching goal of this PhD study are:

1. To assess what comparative advantages, systemic challenges, untapped opportunities, and operational excellence initiatives influence the sustainable global competitiveness of EMF-in-LS.
2. To identify the key factors influencing Ethiopian consumers' purchase intentions on digital business model platforms, and to explore how these platforms can be leveraged to foster sustainable market growth for EMF-in-LS.
3. To examine the critical success factors and barriers in the pathways of Sustainable Business Model Innovation (SBMI), and to evaluate the impact of BMI on firm performance.
4. To develop and validate a SBMI framework that builds SBMI capabilities of EMF-in-LS ultimately enhancing their sustainable global competitiveness.

1.5 Significance of the Study

This study has broad significance across theoretical, empirical, and practical dimensions. Theoretically, it enriches the limited study in the body of knowledge on Sustainable Business Model Innovation (SBMI) by addressing gaps in the context of developing economies, specific in Ethiopian manufacturing firms in the leather sector (EMF-in-LS) offering new perspectives for academic research and expanding the global understanding of SBMI transitions.

Empirically, this study holds significant importance in the domain of SBMI within the context of EMF-in-LS. By developing a tailored Sustainable Business Model Innovation (SBMI) framework, this research aims to enhance SBMI capabilities and global competitiveness of EMF-in-LS.

Practically, the SBMI framework developed through this research provides a practical tool that EMF-in-LS can readily adopt to innovate their sustainable business models. This, in turn, will boost their global competitiveness and ensure long-term sustainability.

The insights gained from this study will offer valuable guidance to policymakers, legislators, senior business executives, and industry stakeholders. This will enable decision makers to make well-informed decisions regarding SBMI strategies in the face of intense global competition.

Additionally, the study promotes sustainable growth in Ethiopian leather manufacturing sector, aligning the sector with international standards.

1.6 Scope of the Study

This research focuses on registered EMF-in-LS that are engaged in export-oriented production. While acknowledging the diversity of Ethiopia's industrial landscape, the study concentrates on SBMI strategies.

1.7 Structure of the Dissertation

This PhD dissertation is organized into 8 chapters. Chapter 1 introduces the research background, problem statement, objectives, and questions. Chapter 2 reviews relevant literature and establishes the theoretical framework. Chapter 3 outlines the methodology, including study design, data collection, and analysis techniques. Chapter 4 evaluates EMF-in-LS's comparative advantages, export performance, systemic challenges, untapped opportunities, and Ethiopian manufacturing firms' efforts and challenges in achieving operational excellence via Total Productive Maintenance (TPM). Chapter 5 explores factors influencing Ethiopian consumers' online purchase behavior. Chapter 6 identifies critical success factors and barriers to SBMI, investigates BMI drivers and their impact on firm performance. Chapter 7 presents the generic SBMI framework and its components. Chapter 8 summarizes key findings, discusses implications, and proposes recommendations for future research.

Chapter-2

Related Theories and Literature

2.1 Introduction

This chapter establishes the theoretical and empirical foundation for analyzing sustainable business model innovation (SBMI) and global competitiveness within EMF-in-LS. It synthesizes key economic, strategic, and behavioral theories to contextualize the study within broader scholarly discourse.

By critically analyzing existing studies on global competitiveness, business models, business model innovation, and sustainable business model innovation; alongside foundational theories such as Comparative Advantage Theory, Resource-Based View (RBV), Dynamic Capabilities Theory, Technology Acceptance Model (TAM), Theories of Reasoned Action and Planned Behavior, and Stakeholder Theory; this chapter systematically identifies gaps in the literature. It positions the research to explore underexamined intersections of sustainability, innovation, and competitiveness, contributing to a more comprehensive understanding of their interdependencies in the evolving business landscape.

The integration of these theories and literature informs the development of a structured research framework, guiding the investigation of how Ethiopian manufacturing firms in the leather sector (EMF-in-LS) can leverage their unique resources, adapt to global market demands, and align with sustainable practices through sustainable business model innovation to achieve long-term success.

2.2 Theory of comparative advantage

The theory of comparative advantage, often attributed to economist David Ricardo in 1817, is a fundamental economic concept that explains how individuals, governments, and enterprises can gain collective advantages through trade and exchange (Roukanas, 2023; X. Zhao, 2023). It refers to an economy's capacity to produce a specific good or service more efficiently, at a lower opportunity cost, compared to its competitors (Algieri et al., 2022).

The core principle of comparative advantage is that countries should specialize in producing goods for which they have a lower opportunity cost, and then engage in trade to acquire other goods (Somale, 2021). This specialization allows for more efficient resource allocation and maximizes the benefits of global trade.

In the context of sustainable business model innovation (SBMI), the theory of comparative advantage offers valuable insights. Ethiopian manufacturing firms in the leather sector can leverage their comparative advantages to develop and implement sustainable innovative business models. A company situated in a resource-rich region can strategically create sustainable business models that capitalize on its available resources, offering innovative solutions to customer needs and positioning the firm as a leader in the sector (Arshad, 2024).

The theory of comparative advantage also emphasizes the benefits of specialization, collaboration, and global market access. Firms can work together to exchange knowledge, resources, and expertise, fostering innovation and the development of sustainable business models that cater to international demands (Somale, 2021; peopleinneed, 2024).

The Ethiopian leather industry is a clear example of how the theory of comparative advantage can be put into practice. Ethiopia's large livestock population, the Ethiopian uniquely high-quality highland sheep skin, low labor costs, and favorable geographic location contribute to its considerable comparative advantages in the global leather market (AlubelAbtew, 2015; Arshad, 2024). By integrating sustainability practices, such as eco-friendly tanning, and focusing on high-quality, value-added leather products, Ethiopian manufacturing firms in the leather sector can enhance their global competitiveness and access premium markets that value sustainability and ethical production (Arshad, 2024; peopleinneed, 2024).

The fundamental idea related to this theory is that Ethiopia’s leather sector gains trade advantages by specializing in goods with lower opportunity costs. Ethiopian manufacturing firms in the leather sector (EMF-in-LS) that align SBMI with Ethiopia’s comparative advantages will achieve higher global market penetration.

This study employed the theory of comparative advantage as a framework, to provide actionable framework into how Ethiopian manufacturing firms in the leather sector can innovate their business model sustainably and enhance their global competitiveness.

2.2.1 Revealed Comparative Advantage (RCA)

Revealed Comparative Advantage (RCA) is a concept in international economics that measures a country's advantage or disadvantage in a specific class of goods or services, based on the idea that trade patterns are determined by the differences in productivity among nations (Majidli, 2020).

(Balassa, 1965) introduced the concept of Revealed Comparative Advantage (RCA) metrics, which provide a straightforward method for calculating them using trade data. According to (Balassa, 1965), by analyzing the trade performance of individual countries, it becomes possible to identify their comparative advantage even when data on factor costs are not available. RCA indices utilize the trade patterns to assess the industries in which an economy excels by comparing the target country's trade profile with the global average (Startienė and Remeikienė, 2014).

According to the Ricardian trade theory the pattern of trading is determined by comparative advantage. A nation will probably export goods in which it has a comparative advantage while importing those in which it has a disadvantage (Ahmad *et al.*, 2021). The theory goes that differences in non-price components and relative costs are represented in the commodity pattern of exports, and as a result, one might anticipate that comparative advantage will have an impact on the structure of exports. The net exports within a particular commodity group increase with the size of the revealed comparative advantage.

Information on comparative export advantages versus other competing nations is provided by the RCA index (RCAI) (Balassa, 1965; Danna-Buitrago and Stellian, 2022; Purwono *et al.*, 2022). Revealed Comparative Advantage (RCA) is a method for assessing competitiveness by comparing the ratio of a specific commodity's share in a country's exports to its global share, where the numerator represents the country's ratio and the denominator represents the global proportion (Othman *et al.*, 2022; Purwono *et al.*, 2022; Were and Odongo, 2023; Zuhdi *et al.*, 2021).

Specializing in the production of goods based on their comparative advantage allows countries to obtain trade advantages, while the RCA index aids in identifying the specific products that hold trade potential for a country (Ahmed *et al.*, 2023; Stellian and Danna-Buitrago, 2022).

A country has a revealed comparative advantage (RCA) in a certain class of goods or services if its RCA value is greater than one, which means that it exports more of that class relative to its total exports than the world average; the RCA value ranges from zero to infinity and is based on trade

flows (Ramadhani and Santoso, 2019). The index is impacted by anything that alters the pattern of commerce, such as trade barriers, which is one of RCAI's limitations (Akhtar *et al.*, 2008).

Mathematical definition:

$$\mathbf{RCA=(\frac{X_{ij}}{Xi})/(\frac{X_{wj}}{Xw})}$$

Where:

i= 1……n, the number of countries (in this study: Ethiopia, Nigeria, Chad, Kenya, China, Brazil, India, and Pakistan selected based on their livestock population).

j= 1-----k, the number of products (in this study: RHS & FL, Articles of leather, and footwear)

X_{ij}= Export of product j by country i

X_i=$\sum_{i=1}^{k} X_{ij}$

X_{wj}=$\sum_{i=1}^{n} X_{ij}$

X_w= $\sum_{i=1}^{n} X_i$

X_i=country i export of all products

X_{wj}=World export of product j

X_w=World export of all products

Revealed Comparative Advantage (RCA) indices compare the trade profile of a country with the global average to identify the industries in which the country has a comparative advantage. To benefit from the global trading system, nations need to know their comparative advantages, which are measured by RCA and its various extensions (Ahmad *et al.*, 2021).

Several studies have used the Revealed Comparative Advantage (RCA) index, introduced by (Balassa, 1965) to analyze the trade performance and competitiveness of different countries and industries. For instance, (Mahajan *et al.*, 2015) examined the Indian pharmaceutical industry after the patent act modification; (Thelia Sari and Rochelle Divinagracia, 2021) assessed the Indonesian cinnamon market in the global and US markets; (Kostoska and Hristoski, 2018) studied the

Macedonian industry specialization and structure; (Ahmad *et al.*, 2021) investigated the export competitiveness of Pakistan's key fruits and vegetables; and (Abbas and Waheed, 2017) explored the international trade competitiveness of Pakistan in 14 major agricultural and manufacturing industries. These studies show that the RCA index is a well-tested tool to measure the comparative advantage of a country in relation to other selected countries.

The core concept here is that Balassa's RCA index quantifies Ethiopia's competitiveness in leather exports relative to competitors. RCA >1 for Ethiopian leather products correlates with sustainable export growth.

Therefore, this PhD study employs Balassa's RCA index to measure the comparative advantages of the (EMF-in-LS) using international trade center (ITC) data and to make appropriate conclusions and recommendations on whether the country should invest its limited resources in this sector or not.

2.3 Resource-Based View (RBV) Theory

The Resource-Based View (RBV) Theory, first introduced by Edith Penrose, posits that a company's competitive advantage stems from its unique resources, capabilities, and strategic positioning, encompassing both tangible and intangible assets (Agrawal *et al.*, 2024). Effective utilization and deployment of corporate resources, including financial and intellectual assets, enables organizations to enhance their performance and seize emerging market opportunities (Heriyanto & Weli, 2023). At the core of RBV is the emphasis on the importance of distinct resources and capabilities in shaping competitive advantage (Salvato and Vassolo, 2018).

A cornerstone of RBV is the VRIN framework, which evaluates the strategic potential of resources based on their Valuable, Rare, Inimitable, and Non-substitutable characteristics (Salvato and Vassolo, 2018). These VRIN attributes play a crucial role in determining the long-term success and competitive dominance of a resource (Bertram, 2016; Heriyanto and Weli, 2023). Resources that possess VRIN qualities are more likely to generate sustained competitive advantage for the firm.

The core concept with this theory is that Competitive advantage stems from Valuable, Rare, Inimitable, Non-substitutable resources. EMF-in-LS with VRIN-aligned SBMI strategies will outperform their competitors in premium markets.

Therefore, the RBV theory has been incorporated into the framework of this study, guiding the analysis of how organizations harness and configure their unique resources and capabilities to drive sustainable business model innovation (SBMI) and competitive differentiation.

2.4 Theory of Dynamic Capabilities

The theory of dynamic capabilities (DCs), introduced by (Teece *et al.*, 1997a), provides a framework for understanding how organizations adapt to rapidly changing environments. Defined as an organization's ability to integrate, reconfigure, and transform its internal and external resources and competencies, DCs address a critical gap in the resource-based view (RBV) theory. While RBV theory emphasizes the strategic value of rare, inimitable resources (VRIN) for sustained competitive advantage, DC theory focuses on adaptability, explaining how firms survive and thrive in volatile markets by continuously evolving their capabilities (Zhou et al., 2019;Cavusgil & Deligonul, 2024).

(Teece *et al.*, 2008) later refined DC theory by identifying three micro-foundations: Sensing: Detecting opportunities and threats through market intelligence, customer insights, and technological trends. Seizing: Mobilizing resources to capitalize on opportunities, such as investing in R&D or entering new markets. Transforming: Continuously renewing organizational structures, processes, and assets to maintain agility.

These dimensions underscore that competitive advantage stems not merely from possessing resources but from the ability to dynamically reconfigure them in response to disruptions (Teece et al., 2008).

In contrast to RBV's focus on long-term stability, DC theory prioritizes survival in discontinuous environments. Senior leaders play a pivotal role in steering firms through radical shifts such as regulatory changes or sustainability demands by balancing innovation with core competencies (Cozzolino and Verona, 2024). For instance, manufacturing firms leverage DCs to align with sustainability trends, proactively adopting green technologies and sustainable business models (Schiavon *et al.*, 2022).

DCs are particularly vital in sustainable business model innovation. A case in point is Ethiopian manufacturing firms in the leather sector (EMF-in-LS), which face global market volatility. By sensing shifts in consumer preferences, seizing opportunities through incorporating sustainability

in the core of the business model, partnerships, and technology upgrades, and transforming business operations for flexibility, these firms can enhance global competitiveness. This iterative process rooted in learning, experimentation, and collaboration highlights how DCs enable firms to turn constraints into strategic advantages.

DCs are inherently complex to imitate, as their effectiveness lies in interdependencies across organizational processes (Zhou et al., 2019). A change in one capability such as SBMI often necessitates systemic adjustments elsewhere, creating barriers for competitors. Moreover, DCs thrive in cultures that prioritize adaptability, fostering resilience through knowledge sharing and cross-functional teams (Bernal-Torres *et al.*, 2023).

The core concept here is that firms adapt to volatility via sensing market trends, seizing opportunities, and transforming operations. Dynamic capabilities enable sustainable business model innovation (SBMI) and enhance global competitiveness (Bocken and Geradts, 2020).

For Ethiopian manufacturing firms in the leather sector, mastering dynamic capabilities is not optional but essential for navigating the complexities of modern markets. This study employs DC theory as a lens to explore how manufacturing firms develop sustainable innovative business models.

2.5 Technology Acceptance Model (TAM) Theory

The Technology Acceptance Model (TAM) is a theory in information systems that explains how individuals adopt and start using technology (Kelly and Palaniappan, 2023). TAM attempts to assist academics and practitioners in determining why a certain technology or system may be acceptable or unsuitable and in taking the necessary actions by offering explanations in addition to predictions (Musa *et al.*, 2024). TAM has been shown empirically to be a useful model for understanding end-user adoption of technology and for studying the uptake of new and developing technology by users with a variety of characteristics in various industries (Li *et al.*, 2023; Mata *et al.*, 2024).

Real system usage is the point at which people interact with technology. People utilize technology because of their behavioral intentions. The attitude, which is the broad perception of the technology, influences the behavioral intention. According to the concept, when consumers are faced with new technology, a variety of variables impact their decision about how and when to use

it, most notably Perceived Usefulness (PU) and Perceived Ease-of-Use (PEOU)(Davis, 1989). External elements such as social influence have a significant role in determining attitude (Gunawan *et al.*, 2023). People will have the attitude and intention to use technology once these items are in place (Davis, 1989).

Even though TAM is widely used, it has faced substantial criticism, leading the original creators to revise and reinterpret it several times (Malatji *et al.*, 2020). Critics of TAM argue that it has limited practical value because it does not provide useful guidelines, has low capacity to explain or predict outcomes, is overly simplistic, and lacks real-world applicability (Shachak *et al.*, 2019).

Despite its limitations many researchers employed TAM to predict user acceptance of technology (Ursavaş, 2022). TAM helps to evaluate barriers to digital adoption for instance e-commerce platforms among Ethiopian manufacturing firms in the leather sector and consumers.

TAM has been used to frame this PhD dissertation to identify factors affecting Ethiopian consumers' purchase intentions from digital business model platforms.

2.6 Theories of Reasoned Action and Planned Behavior

The Theory of Reasoned Action (TRA) (Ajzen and Fishbein, 1980) and its extension, the Theory of Planned Behavior (TPB) (Ajzen, 1991), provide a framework for understanding how behavioral intentions drive actions. TRA posits that behavioral intention, the strongest predictor of actual behavior, is shaped by two factors: attitude toward the behavior (ATT) and subjective norms (SN) TPB expands this model by introducing a third determinant: perceived behavioral control (PBC), which reflects an individual's confidence in their ability to execute the behavior, considering internal and external barriers. According to the TPB, these components (ATT, SN, and PBC) collectively influence intention, which in turn predicts behavior.

The core assumption here is that Theory of Planned Behavior (TPB) predicts consumer intent to purchase sustainable leather goods online.

This dissertation leverages TPB to investigate determinants of online purchasing behavior among selected Ethiopian consumers.

2.7 Stakeholders Theory

Stakeholders' theory is a framework for understanding and managing the various parties that have an interest or stake in a business (Pies and Valentinov, 2024; Valentinov and Chia, 2022). This theory, developed by R. Edward Freeman in the 1980s, suggests that a company's success is best achieved by addressing the needs and concerns of all its stakeholders, not just shareholders (Valentinov and Chia, 2022). Stakeholders encompass various groups that have an interest in the company's activities including employees, customers, suppliers, investors, communities, regulators (Pfajfar *et al.*, 2022).

Employees are important stakeholders who work for the company and depend on it for their income. Customers, who buy and use the company's products or services, also play a crucial role. Suppliers are businesses that provide the company with essential raw materials or services. Investors, who can be individuals or organizations, provide money in exchange for potential financial gains. Communities, which include local populations where the company operates, may be affected by the company's actions. Lastly, regulators, which are government agencies, create and enforce rules that impact the company's activities. Hence based on Stakeholders theory, an innovative sustainable business model should be in line with addressing the interests of all these stakeholders not only shareholders.

Creating value for all stakeholders leads to long-term success, which can be achieved by sustainable business model. Incorporating sustainable practices such as waste management, ecofriendly tanning, and lean manufacturing can address environmental concerns and improve operational efficiency. Identifying key stakeholders including: employees, customers, suppliers, investors, communities, and regulators, and understanding their needs and expectations, engaging with stakeholders through regular communication and involvement in decision-making, firms can align interests, implement sustainable practices, and foster trust and collaboration.

Regular evaluation of the business model's performance in terms of stakeholder satisfaction and sustainability metrics can provide insights for improvement. By using stakeholder theory, this study explores how EMF-in-LS can innovate their business models to meet the needs of all stakeholders and enhance their global competitiveness and sustainability.

The core assumption related to this theory is that balancing interests of employees, suppliers, communities, and regulators drives sustainable value creation and enhance global competitiveness. Stakeholder-inclusive SBMI models, developed through active engagement in the innovation process, enhance customer loyalty, regulatory compliance, trust, and long-term viability.

This PhD dissertation takes into consideration the stakeholder theory to develop sustainable business model innovation framework tailored to the EMF-in-LS.

2.8 Global Competitiveness

The International Trade Center (ITC) defines global competitiveness as the ability of a business or industry to deliver products that combine superior quality, competitive pricing, cutting-edge innovation, and an unwavering commitment to sustainability. Beyond profit generation, globally competitive industries drive societal value by fostering high wages, bolstering public revenue, and advancing productivity in response to dynamic global challenges and opportunities (Lee and Karpova, 2018; World Economic Forum *et al.*, 2020).

For developing economies, enhancing competitiveness is particularly transformative, as it directly correlates with increased participation in international trade. Export competitiveness is a key success element for developing nations (Gebrewahid & Wald, 2017).

The Ethiopian manufacturing sector, particularly the leather industry, faces persistent challenges in maintaining business sustainability within global markets. These barriers hinder the sector's ability to meet the International Trade Centre (ITC) competitiveness criteria, restricting its export potential and overall economic contributions. However, Ethiopia's leather industry possesses significant untapped opportunities, including an abundant raw material base, cost-effective labor, and a strategically advantageous geographic location. By integrating sustainable and innovative business practices, the sector has the potential to enhance its global competitiveness, strengthen its market positioning, and drive long-term economic growth.

This dissertation explores how Sustainable Business Model Innovation (SBMI) can strengthen the global competitiveness of Ethiopian manufacturing firms in the leather sector (EMF-in-LS). By integrating sustainability into core business strategies, firms can effectively address economic, social, and environmental challenges while meeting evolving market demands. This approach aligns with global trade expectations, Ethiopia's national industrial policies, and the United

Nations Sustainable Development Goals (SDGs), ensuring both economic viability, social and environmental responsibility. The research aims to develop comprehensive SBMI frameworks that empower EMF-in-LS to enhance their sustainability-driven business model innovation capabilities, shifting from resource-dependent practices to value-added, innovative, and globally competitive operations.

2.8.1 Constant Market Share (CMS)

Constant Market Share (CMS) analysis is a method to examine a country's export growth and performance by breaking it down into components that relate to its market share at different levels (Tarihoran *et al.*, 2023). CMS analysis can reveal how a country's trade performance is influenced by its export profile, which consists of the products, regions, and competitiveness factors that affect its trade growth relative to the world average, and how preferential trading arrangements can modify these influences (Bonanno, 2016).

CMS analysis has been widely used in practical and academic studies of export growth and performance (Batista, 2008; Fagerberg and Sollie, 1987; Liu *et al.*, 2020; Milana, 1988). The original CMS decomposition method, developed by Leamer and Stern and later cited by (Liu et al., 2020), utilizes trade value as its core metric and is recognized for its simplicity in application. (Gilbert, 2017; Richardson, 1971) further refined the Leamer and Stern CMS decomposition, making it more accessible and adaptable. This refined approach has been incorporated into this PhD dissertation, contributing to a more nuanced evaluation of export dynamics.

$X_r^1 - X_r^0 = g^* X_r^0$ (World export growth effect)

$+ \sum_i (g_i - g) X_{ir}^0$ (Commodity effect)

$+ \sum_i \sum_p (g_{irp} - g_{ir}) X_{irp}^0$ (Regional market effect)

$+ \sum_i \sum_p (g_{ir} - g_i) X_{irp}^0$ (Competitiveness effect)

Where:

X_r^1 = export of country "r" at time 1.

X_r^o = export of country "r" at time 0.

X_{ir}^{0}= Exports of commodity "i" by country "r" at time 0.

X_{ir}^{1}=Exports of commodity" i" by country "r" at time 1.

g= $(X_w^1 - X_w^0)/X_w^0$ is the growth rate of world exports

g_i = $(X_{iw}^1 - X_{iw}^0)/X_{iw}^0$ is the growth rate of world exports of commodity i,

g_{ir} = $(X_{ir}^1 - X_{ir}^0)/X_{ir}^0$ is the growth rate of world exports of commodity i from country r.

g_{irp} = $(X^1_{irp}-X^0_{irp})/X^0_{irp}$ is the growth rate of exports of commodity "i" from region "r" to partner "p".

The first term in the above equation is *the world growth effect*, the part of the growth attributed to the overall rise in world exports. The second term on the right is called *the commodity effect*. It represents how much export growth can be attributed to an export profile that is comprised of goods that are relatively slow/fast growing as compared to the world average. This term will be positive if the goods that are exported by country "r" are growing faster than the world average across goods.

The third term is *Regional Market Effect* which is the part of growth attributed to the regional composition of the countries' exports (positive if exports are concentrated in markets which are experiencing relatively rapid growth). The last term is *the competitiveness effect*, representing the residual. The residual effect, which captures the difference between the actual export growth and the growth that would have occurred had the export shares remained constant. The effect of competitiveness is solely related to market share (Fontoura and Serôdio, 2017). A positive value is interpreted as an increase in competitiveness.

Constant Market Share (CMS) Analysis helps to decompose export growth into global demand, commodity mix, and competitiveness effects. This analysis technique has been employed in the this PhD study.

2.8.2 Competitive advantage analysis using the Porter's Diamond Theory of National Advantage

Porter's Diamond Model, developed by Michael Porter, is a framework used to understand why certain nations or regions excel in specific industries and achieve competitive advantages in the

global market (Dawut and Tian, 2021; Osman and Sheng, 2023; Tsai et al., 2021; Vlados, 2019). Also known as the Porter Diamond Theory of National Advantage, this model identifies four key interrelated factors that contribute to an industry's success (Dawut and Tian, 2021; Jia et al., 2022; Osman and Sheng, 2023) including: factor conditions; demand conditions; related and supporting industries; firm strategy, structure, and rivalry. The model also considers two additional factors: the role of the government and chance (See Figure 2.1).

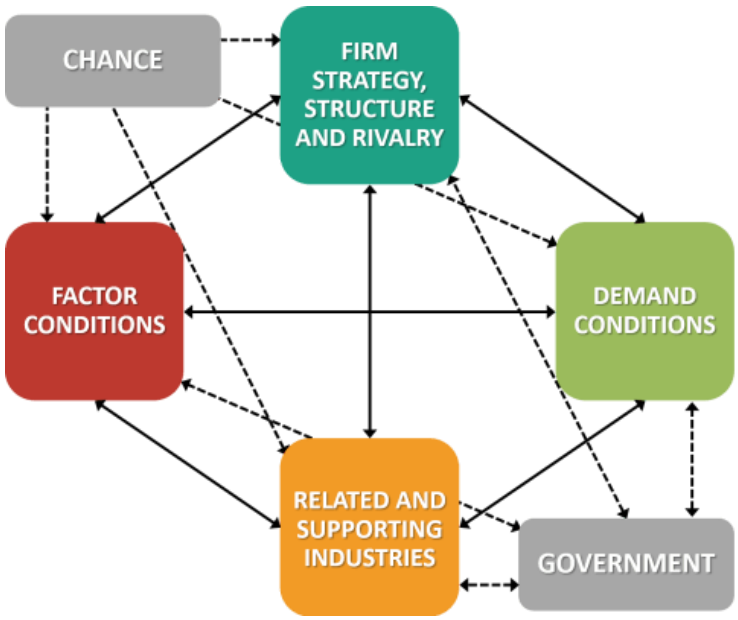


Figure 2. 1: Porter's diamond model

Source: Adapted from (Porter, 2011)

Porter's diamond model highlights key factors influencing competitiveness. Factor Conditions include natural resources, skilled labor, and technology. While Ethiopia benefits from abundant hides and skins, challenges like outdated technology and limited skilled labor persist. Demand Conditions show how strong domestic demand fosters innovation, but Ethiopia's domestic leather market remains small. Related and Supporting Industries, such as tanneries and chemical suppliers, can strengthen the sector, especially with global partnerships. Firm Strategy, Structure, and Rivalry indicate that competition drives efficiency, making branding and export strategies crucial.

Additionally, Government and Chance factors influence business success; supportive policies and global shifts create both opportunities and challenges for Ethiopian leather-sector manufacturers.

Porter's Diamond Model is the most well-known theory for explaining how a country's industries and businesses gain competitive advantages (Zhang and London, 2013). Porter's diamond model integrates many important variables into a single model, including the factor conditions that traditional theorists use to explain national competitiveness (Cho et al., 2009; Osman and Sheng, 2023).

Several empirical studies have used Porter's diamond model to analyze different countries and industries, such as: the Ghanaian Construction Industry (GCI) by (Osman and Liu, 2022); the Pakistani garments industry by (Safeer *et al.*, 2019); the Indian micro, small, and medium-sized businesses (MSMEs) by (Kharub and Sharma, 2017) ;the industry 4.0 development in Turkey by (Erboz, 2020); the universities in Indonesia by (Sukardi *et al.*, 2019).

The core assumption here is that Porter's Diamond Model helps to analyze Ethiopia's factor conditions, demand dynamics, supporting industries, and firm rivalry in the context of EMF-in-LS.

Therefore, Porter's diamond model is a suitable tool to analyze the factors influencing the global competitiveness of the Ethiopian leather industry as a sector and has been adapted in this PhD dissertation.

2.8.3 Business model analysis using business model canvas tool

The Business Model Canvas (BMC) created by (Osterwalder Pigneur, Yves,, Clark, Tim., 2010), is a template for developing and documenting new and existing business models. BMC shows how a company works and provides a visual representation of its value proposition, infrastructure, client base, and financials (Montenegro *et al.*, 2021; Tilahun *et al.*, 2023). The BMC can be used for strategic analysis, as it allows to examine the strengths, weaknesses, opportunities, and threats of a business model (Basuki, 2023). The BMC can also help to identify the factors that affect the competitiveness of a company, such as its collaborators, activities, resources, and costs. The BMC is analytical, adaptable, and comprehensive tool that can be used to study businesses across all industries (Slávik and Bednár, 2014).

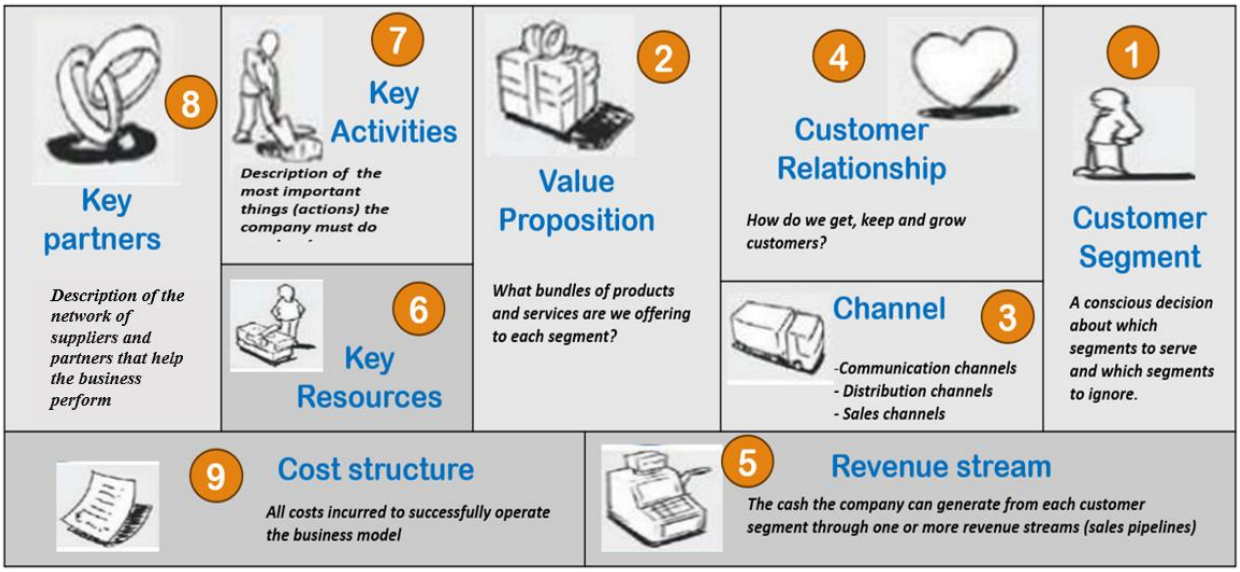


Figure 2. 2: Business model canvas

Source: Adapted from (Osterwalder Pigneur, Yves,, Clark, Tim., 2010).

According to (Osterwalder Pigneur, Yves,, Clark, Tim., 2010), the Business Model Canvas (BMC) is a template that consists of nine building blocks that describe how a business creates, delivers, and captures value. These blocks are:

1. ***Customer Segments:*** the different groups of customers that a business targets and serves.
2. ***Value Propositions:*** the products and services that a business offers to meet the needs and wants of its customers. The value proposition is what makes a business stand out from its competitors.
3. ***Channels:*** the ways that a business communicates and delivers its value proposition to its customers. Channels are important for creating a good customer experience.
4. ***Customer Relationships:*** the types of interactions that a business has with its customers. A business should be clear about the kind of relationship it wants to have with each customer segment. Customer relationships can be driven by goals such as customer acquisition or retention.
5. ***Revenue Streams:*** the sources of income that a business generates from each customer segment.
6. ***Key Resources:*** the assets that a business needs to deliver its value proposition to its customers. Key resources can be physical, human, intellectual, or financial.

7. ***Key Activities:*** the main actions that a business performs to create and deliver its value proposition to its customers. Key activities can be material sourcing, production, distribution, sales, maintenance, problem-solving, or platform management, customer acquisition.
8. ***Key Partnerships:*** the network of suppliers and partners that help a business perform its key activities and access its key resources. Key partnerships can be strategic alliances, joint ventures, or buyer-supplier relationships.
9. ***Cost Structure:*** the major costs that a business incurs to operate its business model. Cost structure can be fixed or variable, and it can be influenced by the key resources, key activities, and key partnerships

Business model canvas tool helps to diagnose gaps in current business models and identifies untapped opportunities. The business model canvas tool has been leveraged in this PhD dissertation to assess the challenges and prospects of a typical firm in the Ethiopian leather sector to drive lessons to the EMF-in-LS.

2.9 Innovation and Global Competitiveness

The application of ideas that result in the introduction of new products or services, business models or an improvement in the way those goods or services are provided, is characterized as innovation (Taylor, 2017). Throughout history, humanity has attached great importance to innovation, as innovators create innovative business models, new items, processes, services, technologies, and artworks, and that eventually become available to markets, governments, and society (Edwards-Schachter, 2018). Survival and improved quality of life have hinged on continuous innovation, with major waves of revolution; agricultural, industrial, and information, now convergence all centered on creating new and greater value (Lee &Trimi, 2018; Rajapathirana& Hui, 2018).

Innovation aims to construct a better future, benefiting individuals, communities, industries, societies, and the entire planet, with all firms sharing the common trait of striving for innovation to prepare for the future (Lee &Trimi, 2018; Rajapathirana& Hui, 2018). Innovation, distinct from invention, often involves practical implementation to significantly impact markets or society (Lee and Trimi, 2018b; OECD, 2004).

Innovation is a useful condition for, global competitiveness (Agazu and Kero, 2024). Along with other elements like human capital and infrastructure, innovation is critical to increasing productivity in the local economy ("Innovation and Global Competitiveness", 2017).

In today's global landscape, both developed and developing countries employ diverse strategies to enhance their international trade (Sardana, 2016; Sener and Delican, 2019). Each innovation gives rise to a new business environment, and nations aiming to improve their competitiveness should prioritize innovation across all industries, aiming to outperform competitors by reducing costs.

Competitiveness and innovation performance are two interrelated economic factors that interact in a variety of economic and social contexts. Products and services become more competitive not just in their local market, but also in the global market, as a consequence of innovation. In today's corporate climate, technology and innovation activities have become the primary sources of economic development and competitiveness, both locally and globally (Shabbir, 2015)(Sofrankova *et al.*, 2017).

Global competitiveness is an alternative economic performance measure that provides for the tracking of all important factors influencing not only a country's economic performance but also a variety of social dimensions and social maturity (Fallis, 2019).

2.10 Business Model

The concept of business models gained traction in the 1990s alongside the rise of the Internet (He and Ortiz, 2021), serving as a strategic framework that outlines how a company creates, distributes, and captures value to sustain its operations (Geissdoerfer et al., 2018; Osterwalder, 2010; Teece, 2018). It outlines essential approaches that support revenue creation and business continuity (Zheng *et al.*, 2022), such as identifying target markets, defining unique value propositions, establishing distribution channels, building customer relationships, determining revenue streams, outlining key activities, allocating resources, forming partnerships, and analyzing cost structures (Osterwalder, 2010).

A well-crafted business model aligns operational resources with customer needs and profitability objectives (Teece & Linden, 2017), guiding companies to differentiate themselves, deliver products or services, and drive revenue. Business models evolve over time in response to market

dynamics and technological advancements (Codini *et al.*, 2023), necessitating continuous innovation to stay competitive, explore new opportunities, and meet evolving customer demands (Teece, 2018).

2.11 Business Model Innovation (BMI)

Business Model Innovation (BMI) involves transforming a company's core elements to create new sustainable pathways for value creation, competitive advantage, and growth (Geissdoerfer et al., 2018; Randhawa et al., 2021). It is a crucial strategy for businesses, challenging traditional approaches to value creation, distribution, and capture to maintain competitiveness and offer unique value propositions (Bell, 2022). Firms consciously or /and subconsciously build, define, and innovate their business models from the start of their operations (Slávik and Bednár, 2014).

According to (Osterwalder Pigneur, Yves,, Clark, Tim., 2010), a business model is a rationale of an organization to create, deliver and capture value. A business model is a conceptual structure that supports the viability of a firm, including its mission, goals, and ongoing attempts to attain them (Galvez *et al.*, 2013).

The term "business model" refers to a wide range of informal and formal descriptions used to represent core aspects of an organization or business, such as purpose, business process, target customers, offerings, strategies, infrastructure, organizational structures, sourcing, trading practices, and operational processes (Dahle *et al.*, 2019; Dasilva, 2021; Zott and Amit, 2010).

A business model is a high-level blueprint for running a profitable firm in a certain market (Osterwalder, 2014). Successful firms have business models that allow them to meet the demands of their customers at a competitive and sustainable cost. Many firms periodically change their business models to meet changing business circumstances and market needs. A business model, no matter how well developed, does not last in the market indefinitely. It should be updated on a regular basis to reflect changing customer demands, market needs, and rivals.

BMI goes beyond incremental changes, seeking to overhaul a company's entire operational structure, potentially altering target markets, value propositions, revenue streams, cost structures, key activities, resources, and partnerships (Berends *et al.*, 2016). Factors such as new technologies, shifts in consumer behavior, emerging markets, and changes in the competitive landscape can drive BMI initiatives (Dymitrowski and Mielcarek, 2023).

By engaging in innovative business model development, companies can differentiate themselves, adapt to market shifts, and better meet customer needs, enhancing efficiency, profitability, and market exploration opportunities (Peñarroya-Farell & Miralles, 2021).

Product and service innovation are essential, but business model innovation, particularly during disruptive times, can give a longer-term competitive advantage (Agazu and Kero, 2024). BMI has emerged as an essential skill for firms seeking to achieve breakthrough growth, revitalize a fading core, or avoid industry disruption or decline (Hacklin et al., 2018; "Innovation and Global Competitiveness," 2017; Lee &Trimi, 2018; Shaul et al., 2014). Business model development and change is also known as business model innovation, and it is a component of business strategy (Geissdoerfer *et al.*, 2017).

For new industry entrants and incumbents, existing business models often prove inadequate to leverage emerging technologies, requiring the development of innovative approaches (Vanhaverbeke, 2017). In some cases, the business model itself can be the source of innovation, rather than just the product or service, making it a powerful strategy for growth and sustainable competitive advantage (Kuo, 2020).

BMI is the art of gaining a competitive edge and creating value by altering both an organization's value proposition to customers and its underlying operating model at the same time and in a mutually supportive manner (Bereznoy, 2019). At the value proposition level, changes to the target segment, product or service offering, and revenue model can all be addressed (Zott& Amit, 2010). Changes in customer behavior, globalization, and technical improvements are all creating opportunities for business model innovation (Sjödin *et al.*, 2020).

2.12 Sustainable Business Model Innovation (SBMI)

Sustainable development is an idea that strives to fulfill the current needs while ensuring that future generations can also meet their needs which includes three key areas: economic growth, social progress, and environmental care (Shayan *et al.*, 2022).

Business sustainability revolves around three key pillars: environmental, social, and economic sustainability (Pérez Estébanez and Sevillano Martín, 2025). Environmental sustainability aims to minimize ecological impact through carbon reduction, waste management, and responsible

resource use; social sustainability emphasizes ethical business practices, fair labor, and community well-being; economic sustainability ensures profitability without jeopardizing future generations' ability to thrive (Schmidpeter, 2025).

The process of creating and implementing new business models that not only provide economic benefit but also solve social and environmental concerns is known as SBMI (Bocken et al., 2019; Geissdoerfer et al., 2018) .

By creating long-term value for stakeholders and aligning with economic, environmental, and social dimensions, SBMI enhances brand image, attracts eco-conscious customers, improves efficiency, reduces costs, and mitigates climate and resource risks (Dhir et al., 2023; Pan et al., 2023). This approach outperforms traditional innovations by restructuring organizational foundations, requiring a holistic approach to SBMI.

Through SBMI, companies can gain a competitive edge, contribute to Sustainable Development Goals (SDGs), and address pressing global challenges (Rosati *et al.*, 2023). Understanding key success factors and obstacles in SBMI empowers organizations to navigate challenges effectively and drive positive environmental, social, and economic outcomes (Bocken and Geradts, 2020; Cano et al., 2023).

2.13 Research Gaps

Based on an extensive review of systematically selected 182 articles, a comprehensive analysis of sustainable business model innovation (SBMI) literature has been conducted. The study identifies critical research gaps, offering valuable insights into unexplored areas in the field. The key gaps identified include:

2.13.1 Sustainable Business Model Innovation (SBMI) framework in Developing Economies

Many firms struggle with managerial limitations, resource constraints, and resistance to change, creating barriers to adopting sustainable business models (Najafi-Tavani *et al.*, 2023). Ethiopian manufacturing firms in the leather sector (EMF-in-LS) are not specific to these challenges. Overcoming these challenges requires a tailored SBMI framework suited to the Ethiopian context.

Despite its importance, SBMI remains underexplored, particularly in developing economies like Ethiopia. Existing studies (Chabowski et al., 2023; Evans et al., 2017; Ferlito and Faraci, 2022; Schaller and Vatananan-Thesenvitz, 2019; Schaltegger et al., 2012; Sinkovics et al., 2021) fail to address the unique challenges and opportunities faced by Ethiopian manufacturing firms in the leather sector.

Geissdoerfer's Sustainable Business Model Innovation (SBMI) process model (Geissdoerfer, 2019), offers structured and empirically grounded guidance for sustainability-oriented transformation. However, it requires contextual adaptation to reflect the capacities, cultures, and resources of specific institutions.

Osterwalder's Business Model Canvas (Osterwalder Pigneur, Yves,, Clark, Tim., 2010), while widely adopted for its intuitive structure and visual clarity, falls short in embedding sustainability principles and lacks provisions for dynamic innovation or iterative development

The Triple Layered Business Model Canvas proposed by (Joyce and Paquin, 2016) introduces valuable environmental and social dimensions by extending the original canvas with lifecycle and stakeholder perspectives. Yet, its complexity demands substantial stakeholder engagement and detailed data inputs. It primarily supports the mapping of existing models, resulting in a static representation that offers limited support for iterative learning, feedback loops, or strategic alignment with organizational competitiveness.

Teece's Dynamic Capabilities Framework (Teece et al., 1997) provides a robust lens for analyzing firm agility, resource orchestration, and strategic adaptation in volatile environments. However, it does not explicitly address sustainability orientation or the generation of social value.

Finally, the Sustainable Business Model Archetypes proposed by (Bocken *et al.*, 2014) offer useful design principles focused on sustainability, such as promoting resource sufficiency, responsible management, and circular practices. However, the framework is mainly theoretical and lacks clear steps for practical application, which limits its use in structured implementation

To address these gaps, this study proposes a novel SBMI framework explicitly tailored to the Ethiopian context which aims to support EMF-in-LS to make a systemic shift to sustainable

business model innovation. By integrating localized empirical data with theoretical advancements, the research seeks to provide actionable strategies for EMF-in-LS to mitigate their unique challenges while capitalizing on emerging opportunities in sustainable production and circular economy practices. The resulting framework seeks to address two key purposes: first, to expand scholarly discussions about Sustainable Business Model Innovation (SBMI) in underserved contexts, and second to equip policymakers, industry leaders, and scholars with evidence-based tools to foster sectoral resilience, enhance global competitiveness, and align Ethiopia's leather industry with the United Nations Sustainable Development Goals (SDGs).

2.13.2 Critical Success Factors (CSF) and Barriers of SBMI

In the dynamic landscape of sustainability-driven transformation, Sustainable Business Model Innovation (SBMI) has emerged as a pivotal mechanism for aligning economic viability with environmental and social imperatives. Despite the importance of understanding critical success factors (CSFs) and barriers in SBMI, comprehensive and up-to-date literature remain scarce.

While existing studies (Benz, 2022; Donner et al., 2021; Long et al., 2018; Vinayan et al., 2012) have made valuable contributions, they often address CSFs and barriers in isolation or within narrow contexts, leaving substantial gaps in understanding the systemic interplay between enabling and constraining forces. This fragmentation has led to persistent uncertainties in both academic discourse and practical implementation (Benz, 2022b; Geissdoerfer *et al.*, 2023).

Addressing this knowledge gap is not merely an academic exercise; it is a strategic imperative for guiding firms, policymakers, and researchers toward more resilient and scalable sustainability transitions.

This PhD dissertation seeks to bridge this gap by systematically identifying and synthesizing the CSFs and barriers of SBMI, thereby contributing to the development of a generic SBMI framework tailored to EMF-in-LS.

2.13.3 Operational excellence through TPM Implementation in EMF-in-LS

Production, a key activity in business model of manufacturing firms, is pivotal for EMF-in-LS, with Overall Equipment Effectiveness (OEE) serving as a key performance indicator. Machine availability, performance, and quality are critical for scaling production and meeting customer expectations.

To boost their competitive stance, many businesses have embraced proactive solutions like Total Productive Maintenance (TPM), which plays a key role in enhancing global competitiveness through comprehensive maintenance strategies (Al-refaie *et al.*, 2022; Wolska *et al.*, 2023). Effective maintenance management is essential for producing high-quality products cost-effectively, enabling global competitiveness (BouAbid *et al.*, 2024; Patil *et al.*, 2022).

While TPM is known for enhancing productivity and efficiency, its application and the resulting impact on OEE remain uncertain in the previous studies. Existing studies (Brown et al., 2002; Gupta et al., 2016; K. Sharma et al., 2012; R. K. Sharma et al., 2006; Singh et al., 2013; Tsang & Chan, 2000) have primarily focused on TPM implementation without evaluating the existing status of TPM initiatives in manufacturing firms.

Existing research offers limited analysis of TPM implementation, its linkages with Overall Equipment Effectiveness (OEE), and priority areas for improvement. Studies on barriers and success factors in EMF-in-LS are especially scarce. This study addresses these gaps by examining current TPM practices and challenges, providing essential insights for designing a context-specific SBMI framework for EMF-in-LS.

2.13.4 Comparative Advantages, Challenges, and untapped opportunities of EMF-in-LS

In today's rapidly evolving global business landscape, manufacturing firms must continually assess their comparative advantages, challenges, and untapped opportunities to remain competitive. For Ethiopian Manufacturing Firms in the Leather Sector (EMF-in-LS), leveraging existing advantages and addressing critical challenges are fundamental in shaping a Sustainable Business Model.

Despite the leather sector's strategic significance in Ethiopia's industrial development, there is a notable lack of recent research focusing on EMF-in-LS. Existing studies often overlook the unique dynamics of leather-sector firms in developing economies, creating a gap in the body of knowledge.

As businesses navigate an increasingly competitive international market, understanding industry-specific comparative advantages, challenges, and untapped opportunities is essential. Such an evaluation provides a foundation for designing an effective SBMI framework that capitalizes on opportunities while mitigating challenges.

This study seeks to bridge the gap by conducting an in-depth analysis of EMF-in-LS's comparative advantages, challenges, and untapped opportunities within the global leather market and gains insights that can complement to the tailored sustainable business model innovation (SBMI) framework for EMF-in-LS aiming at leveraging the comparative advantages and opportunities and mitigating the challenges.

2.13.5 Ethiopian Consumers' Purchase Behavior within Emerging Digital Business Model platforms

To effectively tap into Ethiopia's online market, firms must gain a deep understanding of local consumers' interests and purchasing behavior. Identifying the key factors that drive purchase decisions on online business model platforms is essential for innovating digital channels that effectively engage Ethiopian consumers. These insights also contribute to the development of a robust SBMI framework for EMF-in-LS, the overarching goal of this PhD study.

While existing research (Ahmad Wani and Wajid Ali, 2016; Peña-García *et al.*, 2020) has primarily explored factors influencing online repurchase intentions in industrialized nations, studies on consumer behavior in developing economies, especially Ethiopia, remain scarce. This gap leaves significant uncertainties regarding the critical determinants of online purchase intention in Ethiopia. Given the limited published research on the variables shaping Ethiopian consumers' behavior in online platforms, this study seeks to bridge this conceptual gap by identifying the key drivers of online purchase intention. The findings will offer valuable insights for shaping an SBMI framework tailored to EMF-in-LS.

2.13.6 Drivers of Business Model Innovation (BMI) and Firm Performance (FP)

As research on business models and their impact on firm performance continues to evolve, there is a growing need to explore the organizational enablers driving the development of BMIs (Clauss *et al.*, 2021; Shahwan *et al.*, 2024). A deeper understanding of these enablers, along with the effects of BMI on firm performance, is essential for shaping an SBMI framework tailored to EMF-in-LS.

However, the absence of comprehensive conceptual and empirical models examining the link between BMI and firm performance hinders both theoretical progress and practical applications in strategic management and entrepreneurship (White *et al.*, 2022). To bridge this gap, more causal studies and large-scale empirical analyses are necessary to enhance generalizability and methodological rigor (Clauss *et al.*, 2021). This PhD study aims to contribute to this area by generating valuable insights that support the development of an SBMI framework for EMF-in-LS, aligning with the overarching objective of the research.

2.14 Conceptual Framework of the Dissertation

This section synthesizes foundational theories and critical insights from the existing body of literature to construct a conceptual framework (see Figure 2.3) that systematically guides the methodological and analytical dimensions of this doctoral research.

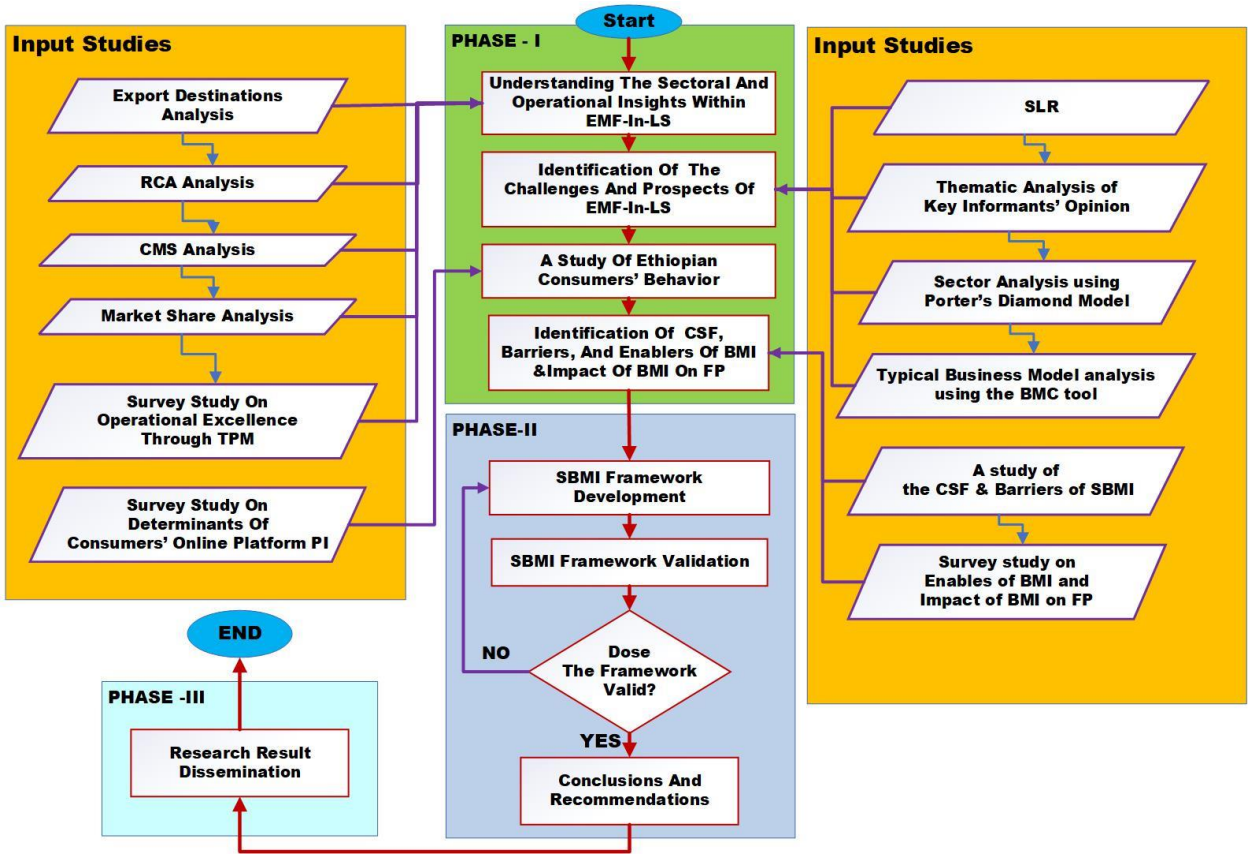


Figure 2. 3:: Research conceptual frame work

(Source: The author)

Note: CMS=Constant Market Share, EMF-in-LS=Ethiopian Manufacturing Firms in the Leather Sector, PI=Purchase Intention, RCA=Revealed Comparative Advantage, SBMI=Sustainable Business Model Innovation, SLR=Systematic Literature Revie

2.15 Summary of Chapter Two

This chapter synthesizes key theories and existing literature that inform the development of a Sustainable Business Model Innovation (SBMI) framework. It integrates perspectives from the Resource-Based View, Dynamic Capabilities Theory, Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), and Stakeholder Theory, alongside frameworks on global competitiveness and business model innovation. The chapter identifies conceptual gaps, particularly in the context of developing economies specific in Ethiopia..

Drawing on Ricardian comparative advantage, the study highlights Ethiopia's potential in the leather sector by leveraging its unique highland sheepskin, abundant livestock, affordable labor,

and favorable climate. The chapter discusses the importance of using Balassa's Revealed Comparative Advantage (RCA) index, to evaluate Ethiopia's positioning in the global leather export market relative to key competitors.

The Resource-Based View (RBV) theory emphasizes that firms achieve sustained competitive advantage through unique VRIN (valuable, rare, inimitable, non-substitutable) resources. EMF-in-LS are urged to capitalize on tangible assets (RHS abundance, Ethiopian highland sheep skin) and intangible capabilities (Ethiopian artisanal craftsmanship, SBMI capability) to differentiate their offerings and align with global demand for ethically produced goods.

Extending RBV, the dynamic capabilities theory highlights adaptability in dynamic markets. EMF-in-LS must sense emerging trends, seize opportunities, and transform operations to align with global sustainability imperatives. Iterative learning and cross-sector collaboration are underscored as critical for resilience.

The technology acceptance model (TAM) explains technology adoption through perceived usefulness and ease of use that shape consumer behavior. Applied to Ethiopia's digital transition, it reveals how e-commerce platforms could expand market reach.

The theories of reasoned action and planned behavior link ATT, SN, and PBC to intention-driven actions. They frame the study's analysis of Ethiopian consumers' intention toward online purchasing and cultural preferences for in-person transactions, which SBMI strategies must address.

Stakeholder theory advocates balancing the interests of employees, suppliers, communities, and regulators. For Ethiopian SBMI, this translates to aligning eco-friendly practices with inclusive engagement, including ensuring fair wages, community development, and regulatory compliance to foster trust and long-term viability.

This study uses three tools to examine EMF-in-LS's competitiveness: Constant Market Share (CMS) Analysis, Porter's Diamond Theory of National competitiveness, and the Business Model Canvas (BMC) tool. CMS breaks down export growth, Porter's Diamond Model looks at the factors affecting the sector's competitiveness, and the BMC tool shows how firms create, deliver, and capture value. Together, these tools help identify the challenges and prospects of EMF-in-LS for improvement.

Innovation serves as a crucial foundation for maintaining a competitive edge, with Sustainable Business Model Innovation (SBMI) restructuring value creation processes. SBMI integrates economic, social, and environmental goals, enabling EMF-in-LS to meet United Nations' Sustainable Development Goals (SDGs) while tapping into ethically conscious markets.

This chapter conducts a thorough analysis of prior studies to identify critical research gaps that justify the need for this PhD study and inform future research directions. It highlights the role of Sustainable Business Model Innovation (SBMI) as a driving force in Ethiopia's shift from raw material dependency to high-value production.

The review shows that there is a lack of well-integrated and locally relevant SBMI frameworks for firms in emerging economies specific in EMF-in-LS. It identifies important concepts and relationships that will help guide the research approach and shape the SBMI framework for Ethiopian leather manufacturing firms. Finally, this chapter ends with developing a conceptual research framework that guided this PhD study.

After reviewing the key theories and identifying gaps in the existing research in this chapter, the next chapter explains how the study is designed to collect and analyze data in order to build a reliable and context-based SBMI framework.

Chapter- 3

Research Methodology

3.1 Introduction

This section presents a detailed overview of the research methodology adopted in this dissertation. It explores key components, including the study area, research design, target population, sampling techniques, and sample size determination. Additionally, it provides an in-depth examination of the types and sources of data, along with the methods employed for data collection, analysis, and the tools utilized for both quantitative and qualitative research. Furthermore, it outlines the reliability and validity assessments conducted to ensure the accuracy of findings, as well as the ethical considerations during data collection.

3.2 Research Philosophy

This study adopts a pragmatist research philosophy, which supports the integration of qualitative and quantitative methods to address complex, real-world problems. Pragmatism emphasizes the practical application of research outcomes, aligning with the study's objective to develop a validated SBMI framework for Ethiopian manufacturing firms in the leather sector.

3.3 Study area

The research carried out in Addis Ababa, Ethiopia, which has been carefully selected as an optimal study area for several important reasons. Firstly, Addis Ababa, being the capital city of Ethiopia, features a significant concentration of manufacturing firms operating within the leather industry. This favorable circumstance ensures that the research can directly engage with key players and stakeholders, thereby facilitating the acquisition of valuable insights into the subject matter.

Furthermore, Addis Ababa serves as a vibrant urban center, acting as a central hub for various administrative offices and institutions throughout the country. The abundance of relevant offices and institutions in this area creates an advantageous environment for the researcher, granting seamless access to critical data, resources, and specialized expertise. By conducting the study in

Addis Ababa, the researcher effectively taped into the vast wealth of knowledge and information readily available in this central location.

Moreover, the selection of Addis Ababa as the study area is well-justified, as it combines the presence of manufacturing firms within the Ethiopian leather industry with the accessibility of crucial offices and institutions. This strategic decision significantly enhances the researcher's prospects of obtaining relevant data and enables to delve deeper into the research topic with the invaluable support of local expertise and resources.

3.4 Research design

This study employs a mixed-methods research design, integrating both quantitative and qualitative approaches to comprehensively address the complexities of sustainable business model innovation (SBMI) within Ethiopian manufacturing firms in the leather sector (EMF-in-LS). The rationale for this integration lies in the complementary strengths of each method: quantitative data provide statistical generalizability, while qualitative insights uncover contextual details, enabling a holistic analysis of SBMI drivers, challenges, and outcomes.

In the quantitative research phase, numerical data was utilized to construct knowledge through principles such as cause-and-effect reasoning, hypothesis formulation and testing, and theory validation. Factor analysis was employed to identify key variables, and their interrelationships were systematically examined to uncover underlying interactions.

In addition to the quantitative methods, this research also incorporated a qualitative research approach to provide a more comprehensive understanding of the sustainable business model innovation process. The qualitative part enabled the researcher to examine the details and contextual elements affecting SBMI in Ethiopian leather manufacturing firms.

Through in-depth interviews with key industry stakeholders, including business owners, managers, and experts; systematic literature review; and onsite observations the researcher was able to gather rich, detailed insights that complemented the numerical data collected.

By combining quantitative and qualitative methods, this mixed-methods research design provided a thorough and detailed examination of SBMI within Ethiopian manufacturing firms in the leather sector.

3.5 Population of the study

The population of this study is all the Registered, Export Oriented, Ethiopian manufacturing firms in the leather sector. The total number of manufacturing firms in the leather industry are 225 which includes 34 tanneries, 37 footwear manufacturing firms and 154 leather articles producers. The decision to focus this research on manufacturing firms in the Ethiopian leather industry was intentional and well-justified. The leather industry holds immense economic significance for Ethiopia, contributing substantially to employment, exports, and the country's overall economic growth.

Additionally, Ethiopia has huge opportunities to benefit from this sector attributed to its large livestock population. By centering this study on this strategically important sector, the research directly aligns with a crucial pillar of the Ethiopian economy.

Furthermore, sustainable business model innovation (SBMI) is widely recognized as a key driver of competitiveness, growth, and long-term sustainability for businesses which prioritize long-term value creation, balancing economic growth with social and environmental gains, and driving competitive advantages (Latan, 2024). Given the dynamic global landscape, evolving business sustainability demands, and rapid technological advancements, Ethiopian manufacturing firms operating in the leather sector must urgently adapt their business models to remain resilient and capitalize on emerging opportunities.

This research, therefore, addresses a timely and pressing need within the Ethiopian context. By exploring the complexities of SBMI in the leather manufacturing sector, the study promises to yield insights that can guide firms in navigating the transition towards more sustainable and innovative business models. Ultimately, this focus aligns the research with areas of critical importance for the Ethiopian economy, positioning it to make a meaningful impact on the competitiveness and growth of the country's leather manufacturing industry.

3.6 Sampling technique

The sampling technique employed in this PhD dissertation is purposive sampling. The three clusters of the target population within the Ethiopian manufacturing firms in the leather sector, including: Tanneries (34 firms), Footwear Manufacturers (37 firms), and Leather Articles Producers (154 firms) was taken in to consideration to have an appropriate mix of samples from

these existing clusters. Subsequently, appropriate samples were selected from each clusters using purposive convenient sampling techniques based on the requirements of each study of this PhD dissertation.

3.7 Data types and sources of data

For this study, the researcher utilized both secondary and primary data types. Primary data was acquired through surveys, interviews, and direct observations. As for secondary data, it was sourced from international databases such as FAO stat and the International Trade Center (ITC), along with government publications, historical and statistical papers, business documents, journals, and technical trade magazines

3.8 Data collection, analysis, and tools

The data required for this study has been collected and analyzed using appropriate data collection tools and techniques. The detail of the data collection and analysis techniques and the tools employed for each study are shown below (See Table 3.1).

Table 3. 1: Overview of this PhD Dissertation's Sub-studies, Data Sources, Data Collection Methods, Data Analysis Techniques, and Tools Utilized

Research question/ Specific objective	**Study title**	**Research Design**	**Type of data**	**Data Source**	**Data collection tools**	**Data analysis Technique**	**Data Analysis tools**
1	Empirical Study I: Sectoral and Operational Insights within Ethiopian Manufacturing firms in the Leather Sector	Mixed	Primary and Secondary	• ITC, FAO stat, • The selected manufacturing firms' key informants. • Published literature.	• Access to online data base • Literature review • Observation, • Semi structured interview • Questionnaire	• RCA and CMS analysis. • Export data analysis, • Industry analysis using Porter's Diamon Model, • Business model analysis • Thematic analysis • PLS-SEM	• Microsoft Excel. • Porter's Diamond Model • Business Model Canvas Tool • Smart PLS, • SPSS
2	Empirical Study II: Understanding determinants of Ethiopian Consumers' Purchase Behavior within Emerging Digital	Quantitative	Primary	The selected Ethiopian online digital business model platform consumers	Questionnaire	PLS-SEM	- Smart PLS version 3.2.9 software - SPSS version 25 software, - Microsoft Excel

	Business Model platforms.						
3	Empirical Study III: Pathways to Sustainable Business Model Innovation; Insights into Success Factors, Barriers, and Firm Performance	Mixed	Primary and Secondary	- Scopus and Google Scholar - The selected Key informants from EMF-in-LS	Questionnaire	- Bibliometric and content analysis - PLS-SEM	- Microsoft excel, VOS viewer software - Smart PLS version 3.2.9 software, - GPower software - Microsoft Excel - SPSS version 25.
4	Sustainable Business Model Innovation Framework Development and Validation	Qualitative	Primary	- Insights from the three empirical studies - Selected peers, practitioners, and experts	- Semi-Structured interviews - Focused group discussion	Thematic analysis	MS-excel

3.9 Ethical considerations

When requesting data from organizations, a comprehensive application seeking permission for the research was submitted. This application outlined the research's significance, methodologies, participants, and research status, ensuring a complete understanding by the authorities.

Throughout the study, the researcher diligently addressed ethical considerations. The questionnaire included essential details such as the principal investigator's information, study details, justification, objectives, and methods.

The questionnaire explicitly stated participants' rights to either participate or decline involvement. The researcher prioritized the protection of key informants' identities by refraining from collecting personal data and placing a strong emphasis on maintaining confidentiality.

All study data, including electronic files, interview recordings, and transcripts, were securely stored. Robust security measures were implemented to safeguard data confidentiality and integrity. Furthermore, a reasonable timeframe was established for data retention, followed by appropriate destruction of all information.

By implementing these measures, the researcher upheld the highest ethical standards, ensuring participant privacy, data security, and adherence to research compliance.

3.10 Research workflow

The overall research workflow is shown below in Figure 3.1

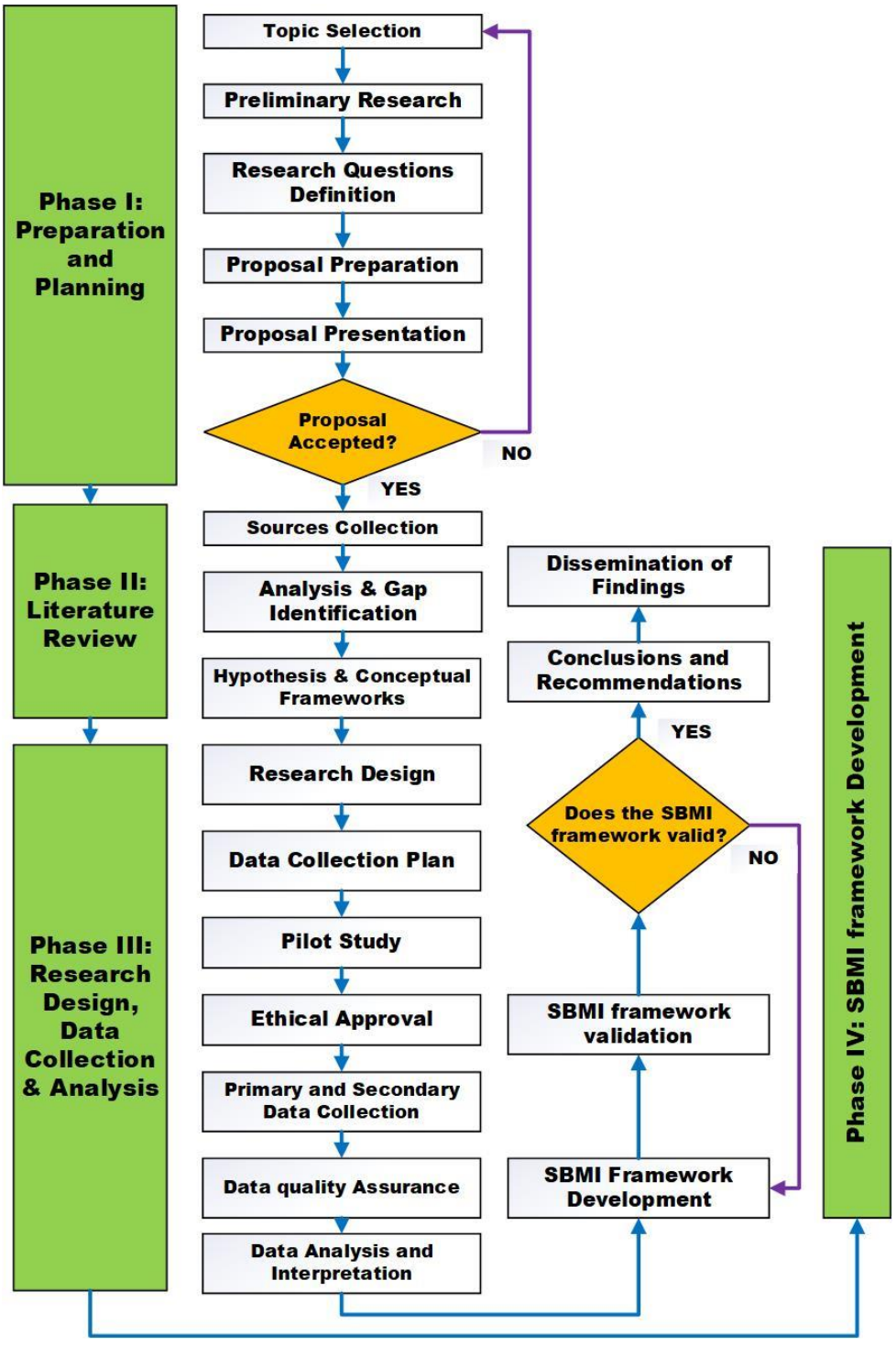


Figure 3. 1: Research workflow

Source: The author

3.11 Summary of Chapter Three

This chapter explains the research approach used to conduct this PhD study. It presents the overall research design, the data collection, and analysis methods. A mixed-methods strategy, combining both qualitative and quantitative techniques, is used to ensure a well-rounded understanding of the research problem.

Additionally, the chapter describes how participants and firms were selected, what types of data were collected, and the tools used to analyze the information. These include thematic analysis, Revealed Comparative Advantage (RCA), Constant Market Share (CMS) analysis, and Partial Least Squares Structural Equation Modeling (PLS-SEM). Ethical standards and the steps followed in the research process are also discussed to ensure the quality and trustworthiness of the study.

With the research design clearly explained, the study now turns to its first empirical focus, analyzing Ethiopia's position in the global leather market. This sets the foundation for identifying where and how SBMI efforts should be directed to enhance competitiveness.

Chapter 4

Empirical Study I: Sectoral and Operational Insights within Ethiopian Manufacturing firms in the Leather Sector

4.1 Introduction

Having established a clear methodological roadmap in chapter 3, this chapter begins the empirical analysis by positioning Ethiopian manufacturing firms in the leather sector (EMF-in-LS) within the global competitiveness landscape.

According to the International Trade Center (ITC), competitiveness refers to a firm's ability to succeed against rivals by operating efficiently, managing costs, delivering quality products, and adapting to market changes which also includes how well a business innovates, invests in its workforce and technology, and communicates with its stakeholders. A competitive business outperforms others, becoming the preferred choice for customers and investors (Osman & Sheng, 2023). To succeed, leather manufacturing firms must adopt strategies that meet customer needs, adapt to market trends, and ensure long-term profitability (Hermundsdottir and Aspelund, 2021).

In today's dynamic global business environment, systematic assessment of manufacturing firms' performance, comparative advantages, systemic challenges, and unexploited opportunities within their existing business model is critical to understand areas for improvement and sustaining competitiveness. Despite this imperative, recent empirical studies focusing on the leather industries of developing economies, particularly Ethiopia's manufacturing firms in the leather sector (EMF-in-LS), remain scarce, resulting in a critical gap in the existing literature.

To bridge this gap, this study presents a comprehensive analysis of Ethiopian manufacturing firms in the leather sector (EMF-in-LS), focusing on export performance, comparative advantages, challenges, untapped opportunities, and operational excellence through TPM initiatives. Importantly, the insights generated in this chapter provide the foundational sectoral and operational evidence necessary for embedding Sustainable Business Model Innovation (SBMI) into the broader competitiveness framework, thereby linking firm-level realities with the conceptual development of SBMI.

It is guided by Research question 1:

> *What comparative advantages, systemic challenges, untapped opportunities, and operational excellence initiatives shape the sustainable global competitiveness of EMF-in-LS?*

This study directly addresses Research Question 1 in alignment with Objective 1 of the PhD research, while also synthesizing insights to support the development of the SBMI framework, the core focus of this PhD research.

4.2 Livestock Production

Table 4. 1: The Top 10 world's livestock producers based on cattle, sheep, and goats in 2021

Area	Year	Livestock (Millions of Head)			Total (Millions of Head)	Rank
		Cattle	Sheep	Goats		
India	2021	193	74	149	416	1
China	2021	61	186	133	380	2
Brazil	2021	225	21	11	257	3
Pakistan	2021	51	32	80	163	4
Ethiopia	2021	66	39	47	152	5
Nigeria	2021	21	49	76	146	6
Chad	2021	33	42	44	119	7
Sudan	2021	32	41	32	105	8
USA	2021	94	5		102	9
Australia	2021	24	68		96	10

Source: Author's calculation based on FAO stat (2023).

Table 4.1 shows that Ethiopia ranked 5th in the world in livestock production in 2021, based on the total number of cattle, sheep, and goats. The top four countries in the same year were India, China, Brazil, and Pakistan, in that order.

Table 4. 2: The top 10 African livestock producers based on cattle, sheep and goat population in 2021

Area	Year	Livestock (Millions)			Total	Rank
		Cattle	Sheep	Goats		
Ethiopia	2021	66	39	47	152	1
Nigeria	2021	21	49	76	146	2
Chad	2021	33	42	44	119	3
Sudan	2021	32	41	32	105	4
Kenya	2021	23	25	33	80	5
Mali	2021	13	21	29	63	6
Tanzania	2021	31	7	21	59	7
Niger	2021	17	14	20	51	8
South Sudan	2021	14	14	14	42	9
South Africa	2021	12	21	5	39	10

Source: Author's calculation based on FAO stat (2023).

Table 4.2 shows that Ethiopia had the largest livestock size in Africa in 2021, based on the total number of cattle, sheep, and goats. The next four countries in the ranking were Nigeria, Chad, Sudan, and Kenya, respectively.

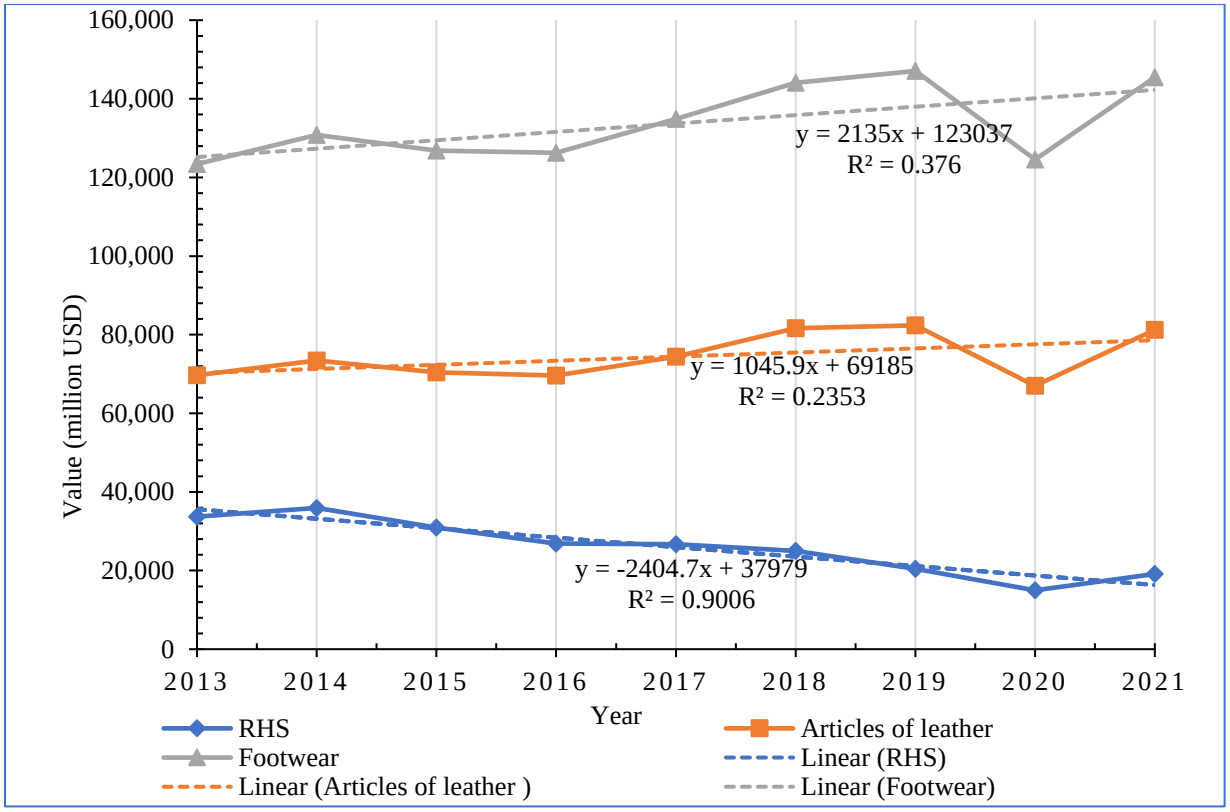
4.3 Growth trend of the global demand to leather and leather products

Figure 4.1 and Table 4.3 show that the world's import value of RHS & FL is declining, while the import value of articles of leather and footwear is increasing. The linear trend equations for each commodity group indicate the direction and strength of the trend over time. The coefficients of the equations show the slope of the trend line, which is positive for articles of leather and footwear, and negative for RHS & FL. The R-squared values show how much of the variation in the import value is explained by time. The higher the R-squared value, the better the fit of the trend line. The results suggest that the world's demand for value-added products, such as articles of leather and footwear, is growing, while the demand for RHS & FL is shrinking.

Table 4. 3: Growth of World's import value of RHS & FL, Articles of leather, and Footwear (Millions USD)

Items	In 2013	In 2014	In 2015	In 2016	In 2017	In 2018	In 2019	In 2020	In 2021
RHS & FL	33,730	35,939	30,908	26,879	26,676	24,979	20,403	14,973	19,112
Articles of leather	69,690	73,430	70,402	69,604	74,394	81,628	82,367	67,001	81,211
Footwear	123,399	130,779	126,808	126,289	134,914	144,069	147,072	124,577	145,498

Figure 4. 1: World's Leather and leather products import trend



Source: Author's calculation based on ITC, UNCOMTRADE data (2023)

4.4 Export performance of EMF-in-LS

Table 4.4 and Figure 4.2 show the trends of Ethiopia's leather exports from 2012 to 2021. Footwear and articles of leather exports have increased over time, while raw hides and skins (RHS) and finished leather (FL) have decreased. The linear trend equations and the R-squared values for each category are:

- Footwear: $y = 4.7813x + 59.698$, $R^2 = 0.5737$
- Articles of leather: $y = 0.8653x + 2.4119$, $R^2 = 0.8346$
- RHS & FL: $y = - 7.281x + 109.41$, $R^2 = 0.797$

The positive coefficients indicate an upward trend, while the negative coefficient indicates a downward trend. The R-squared values show how much of the variation in export values is explained by time. A higher R-squared value means a better fit of the linear model. The two possible reasons for the decline in RHS & FL export are the decline in the worlds' demand for these commodities and the Ethiopian government's trade policy, which imposed a 150% tax on RHS export in 2008 and semi-processed leather export in 2012. This policy was meant to encourage value addition in the (EMF-in-LS).

Table 4. 4: Ethiopia's leather and leather products Exported values (Millions USD)

Commodity	In 2012	In 2013	In 2014	In 2015	In 2016	In 2017	In 2018	In 2019	In 2020	In 2021
RHS & FL	84.5	101.1	89.5	87.4	67.6	74.8	72.9	59.6	27.8	28.7
Articles of Leather	2.9	3.1	4.9	5.8	7.5	7.7	10.4	10.7	9.5	9.0
Footwear	51.5	63.1	66.8	88.5	98.7	112.9	94.6	93.3	92.0	98.4

Source: Authors' calculation based on ITC, UN COMTRADE (2023) data

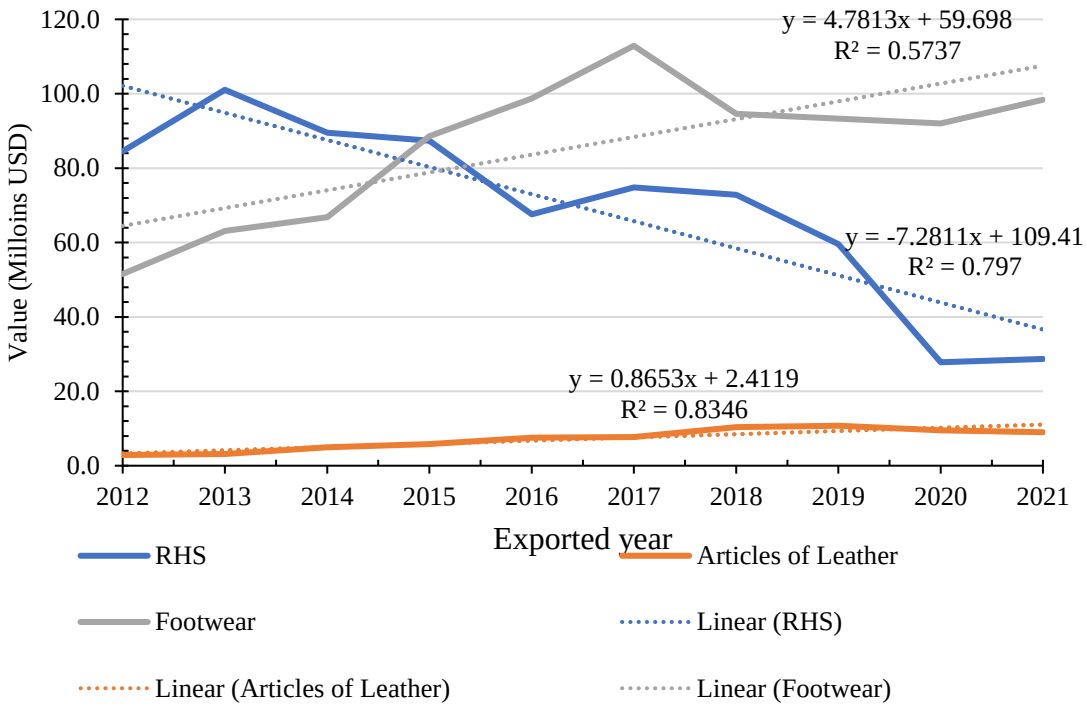


Figure 4. 2: Ethiopia's Export trend in the global leather market

Source: Authors' calculation based on ITC, UN COMTRADE (2023) data

4.4.1 Ethiopia's market share in the world's leather and leather products market

The RHS & FL export market share of Ethiopia is too small as compared to the large market share of Italy, USA, Brazil, China, Spain, and Germany (See Table 4.5 and Figure 4.3).

Table 4. 5: RHS & FL export market share

Exporters	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Italy	15.5	15.4	15.2	16.5	17.0	18.4	19.6	20.2	19.1	20.3
USA	10.5	10.5	10.6	10.4	10.4	9.2	8.7	8.7	9.9	9.8
Brazil	7.0	8.1	7.5	7.7	7.3	6.0	5.9	6.8	7.5	6.8
China	1.3	1.5	2.2	2.4	2.4	2.6	3.6	4.5	5.3	5.5
Spain	2.9	2.7	2.5	2.7	2.8	3.1	3.3	3.6	3.5	3.8
Germany	4.0	4.2	4.1	4.2	4.2	4.4	4.1	4.3	4.0	3.7
Ethiopia	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1

Source: Authors' calculation based on ITC, UN COMTRADE (2023) data

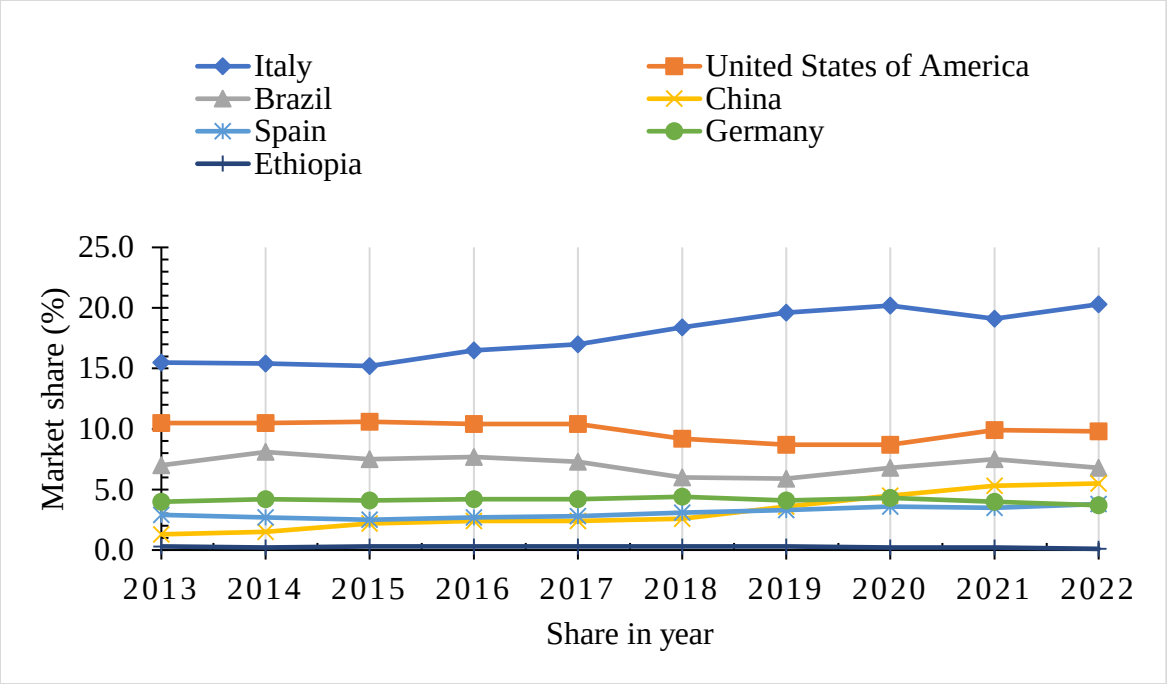


Figure 4. 3: Market share of Ethiopia in world's RHS & FL export

The Articles of leather export market share of Ethiopia is too small as compared to the large market share of China, Italy, France, and Viet Nam (See Figure 4.4 and Table 4.6).

Table 4. 6: Ethiopia's Articles of leather export market share

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
China	41.3	39.9	41.8	38.7	37.7	35.8	33.6	31.9	34.6	37.3
Italy	11.4	12	10.7	11.1	11.9	12.6	14.2	13.5	13.7	12.9
France	9.1	9	8.4	9.3	9.7	10.5	10.9	12.8	13.4	12.4
Viet Nam	2.4	3.1	3.6	4.1	4	3.8	3.9	4	3	5.1
India	3.4	3.3	3.3	3.2	3.1	3	2.9	2.6	2.7	3.3
Germany	2.9	3.1	2.8	3.1	3.3	3.4	3.1	3.5	3.2	2.9
Hong Kong	8.6	7.8	7.2	6.5	6.2	5.5	5	5	4.1	2.9
Ethiopia	0.004	0.006	0.008	0.010	0.010	0.013	0.012	0.013	0.010	0.006

Source: Authors' calculation based on ITC, UN COMTRADE (2023) data

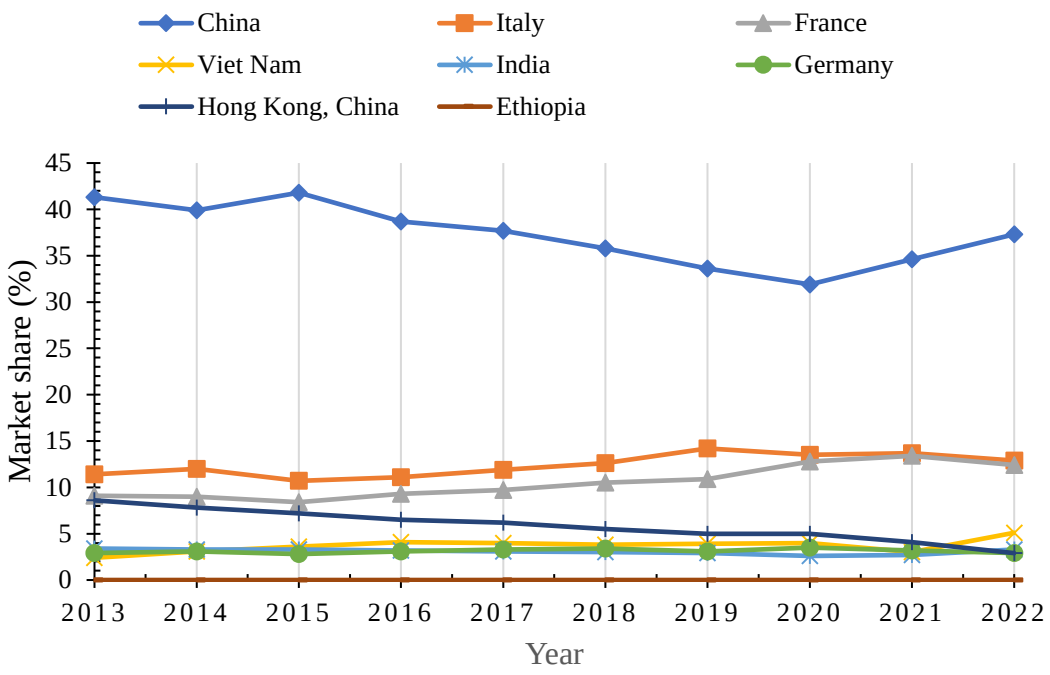


Figure 4. 4: Ethiopia's market share in the export of articles of leather (%)

As indicated in Figure 4.5 and Table 4.7, the footwear export market share of Ethiopia is too small as compared to the large market share of China, Vietnam, Italy, and Germany

Table 4. 7: Ethiopia's footwear export market share

Exporters	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
China	39.6	39.7	40.3	36.6	34.9	32.4	32.1	29.9	33.6	33
Viet Nam	6.8	7.6	9.3	10.3	11	11.6	12.8	13.5	11.9	18
Italy	9.2	8.7	7.9	8.2	8.2	8.5	8.4	8.4	8.5	8.1
Germany	4	4.1	3.8	4.5	5.4	5.9	6	6.5	6.2	5.4
Ethiopia	0.022	0.022	0.025	0.028	0.033	0.034	0.021	0.006	0.003	0.002

Source: Authors' calculation based on ITC, UN COMTRADE (2023) data

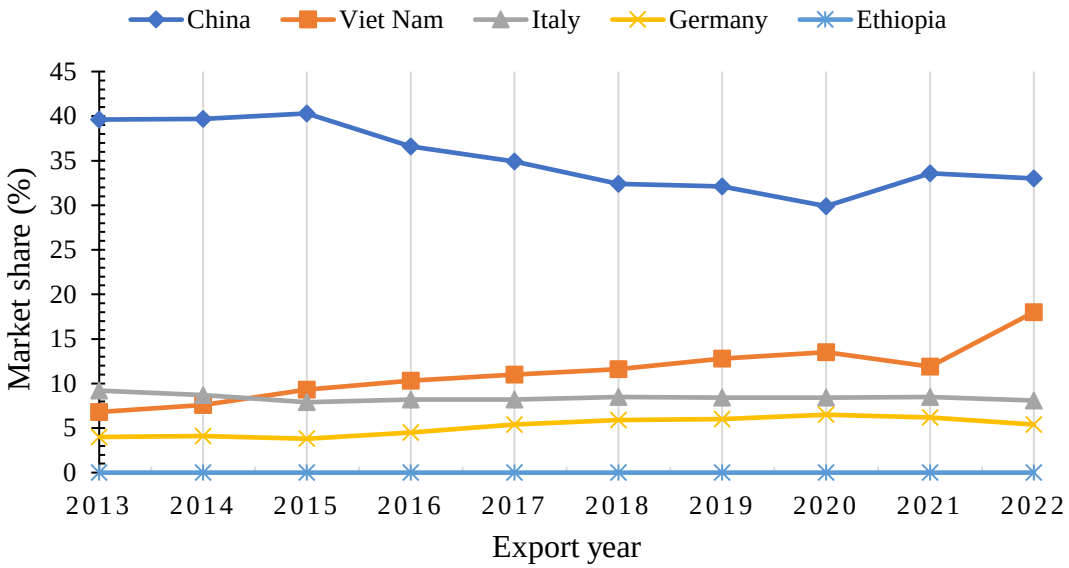


Figure 4. 5: Ethiopia's market share in the footwear export market

4.4.2 Revealed Comparative Advantage (RCA) comparison of Ethiopia with Selected countries within the leather sector

This section compares Ethiopia's Revealed Comparative Advantage (RCA) with that of the top seven countries; Nigeria, Chad, Kenya, China, Brazil, India, and Pakistan; which have large livestock populations in the world. The comparison is based on their export performance in raw hides and skins (RHS), finished leather (FL), leather articles, and footwear commodities.

Ethiopia's RCA in RHS & FL export is the highest among other exporters, as shown in Table 4.8 and Figure 4.6. However, it has a downward trend over time, as indicated by the negative coefficient of the linear equation: $y = -0.7643x+21.468$

The R-squared value of 0.3109 implies that time accounts for 31.09% of the RCA variation. Ethiopia has a comparative advantage in RHS & FL export, since its RCA is above 1 throughout 2013-2022. Pakistan is the second highest, followed by others except China and Chad, whose RCA values are below 1.

Table 4. 8: RCA of Ethiopia in RHS & FL export market as compared to selected exporters

Exporter	RCA									
	In 2013	In 2014	In 2015	In 2016	In 2017	In 2018	In 2019	In 2020	In 2021	In 2022
Ethiopia	20.62	15.56	17.68	15.66	17.61	21.95	21.39	13.35	11.00	10.18
Nigeria	5.39	2.98	1.78	0.83	1.12	1.42	1.35	2.28	2.29	
Chad	0.09	0.08	0.21	0.20	0.30	0.52	0.43	0.17	0.17	0.14
Kenya	9.08	7.46	5.96	5.01	5.83	5.89	5.01	4.06	3.21	
China	0.11	0.12	0.16	0.18	0.18	0.21	0.27	0.30	0.35	0.35
Brazil	5.71	6.90	6.47	6.65	5.88	4.84	4.94	5.66	5.91	4.71
India	2.12	2.22	2.27	2.11	2.01	1.94	1.65	1.65	1.34	
Pakistan	11.15	11.46	10.50	10.30	10.34	10.10	9.23	8.29	7.62	

Source: Authors' calculation based on ITC, UN COMTRADE (2023) data

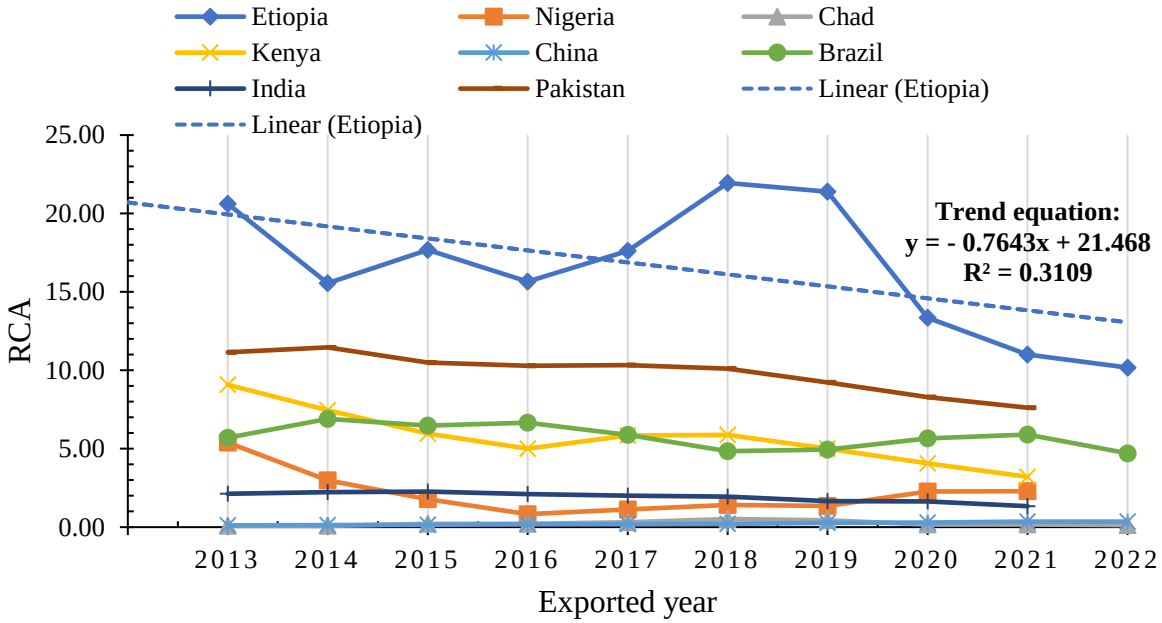


Figure 4. 6: RCA of the selected countries in RHS &FL

Table 4.9 and Figure 4.7 show the RCA values of different countries in the articles of leather export market from 2013 to 2022.

Pakistan has the highest RCA value (>1) in the articles of leather export market throughout the period from 2013 to 2021, followed by China and India, which also have RCA values (>1) that show their constant comparative advantage in this market. On the other hand, Ethiopia, Nigeria, Chad, Kenya, and Brazil have RCA values (<1) that show their comparative disadvantage in exporting articles of leather. However, the RCA linear trend of Ethiopia's articles of leather export shows a slight increase over time, indicating that Ethiopia is improving its competitiveness in this market. The linear trend equation is:

$y=0.0421x+0.36,$

Where y is the RCA value and x is the year.

The positive coefficient (0.0421) shows that Ethiopia's RCA value is slightly rising by 0.0421 times every year. The R squared value (0.3403) shows that 34.03% of the variation in Ethiopia's RCA value is explained by time.

Table 4. 9: RCA of Ethiopia in Articles of leather export market as compared to the selected exporters

Exporter	Exported Year/RCA									
	In 2013	In 2014	In 2015	In 2016	In 2017	In 2018	In 2019	In 2020	In 2021	In 2022
Ethiopia	0.31	0.41	0.48	0.63	0.61	0.91	0.86	0.93	0.73	0.47
Nigeria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Chad	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Kenya	0.09	0.09	0.07	0.07	0.08	0.07	0.08	0.06	0.07	
China	3.52	3.21	3.01	2.90	2.91	2.77	2.52	2.16	2.28	2.40
Brazil	0.06	0.07	0.08	0.09	0.07	0.04	0.04	0.03	0.03	0.03
India	1.89	1.99	2.03	1.97	1.85	1.80	1.66	1.66	1.49	
Pakistan	7.51	7.44	6.86	6.89	6.56	6.50	5.70	6.46	6.00	

Source: Authors' calculation based on ITC, UN COMTRADE (2023) data

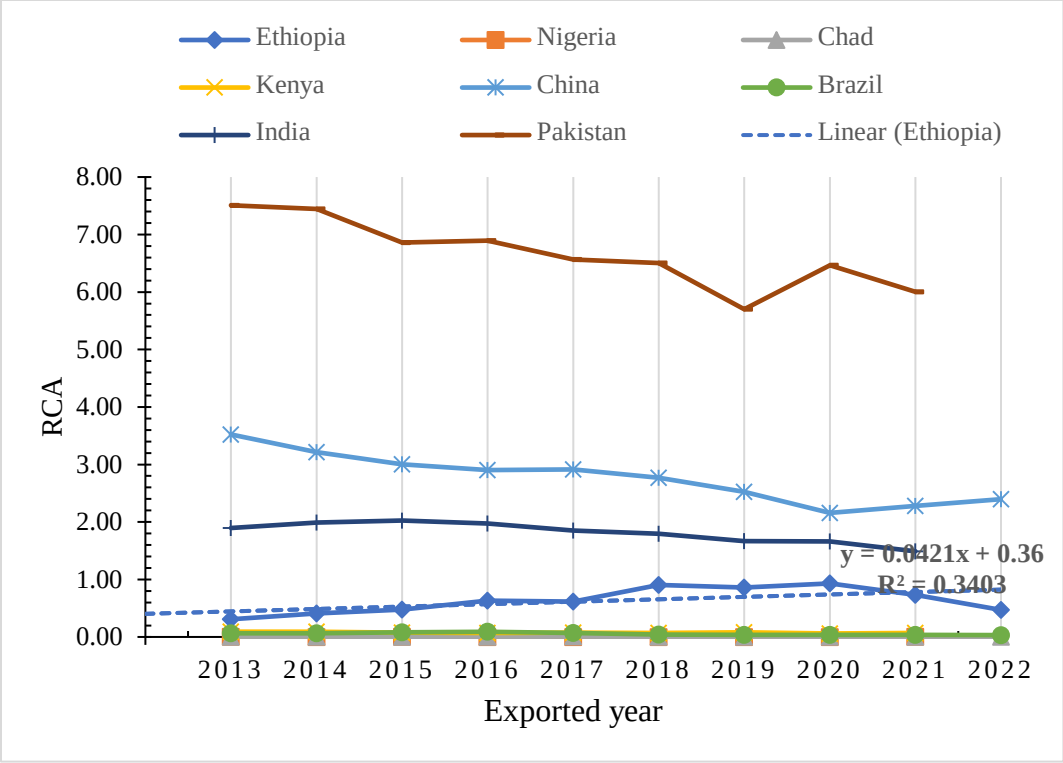


Figure 4. 7: RCA of the selected countries in the Articles of leather export market

Table 4.10 and Figure 4.8 show the RCA values of different countries in the footwear export market from 2013 to 2022. China has the highest RCA value (>1) in the footwear export market throughout the period, followed by Ethiopia in the second position from 2013 to 2018. However, Ethiopia's RCA value begins to drop from 2018 onwards, possibly due to the impact of COVID-19 and the civil war in Ethiopia in the period. India ranks third from 2013 to 2019, but surpasses Ethiopia in 2020 and 2021. There is no data for India in 2022. Pakistan, Brazil, and Kenya have RCA values (<1) that show their comparative disadvantage in this market. Kenya's RCA value was >1 only in 2013.

Unfortunately, the RCA linear trend of Ethiopia in the footwear export market is downward. The linear trend equation is:

$y = -0.16x + 2.3445,$

Where “y” is the RCA value and “x” is the year.

The negative coefficient (-0.16) shows that Ethiopia’s RCA value is decreasing by 0.16 times every year. The R squared value (0.3857) shows that 38.57% of the variation in Ethiopia’s RCA value is explained by time.

Table 4. 10: RCA of Ethiopia in the footwear market as compared to the selected exporters

Country	Exported Year/RCA									
	In 2013	In 2014	In 2015	In 2016	In 2017	In 2018	In 2019	In 2020	In 2021	In 2022
Ethiopia	1.57	1.39	1.53	1.73	2.01	2.49	1.50	0.43	0.19	0.20
Nigeria	0.31	0.08	0.07	0.01	0.01	0.01	0.00	0.00	0.00	
Chad	0.06	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Kenya	1.20	0.91	0.80	0.74	0.70	0.76	0.82	0.91	0.74	
China	3.38	3.20	2.90	2.75	2.70	2.51	2.41	2.02	2.22	2.43
Brazil	0.80	0.75	0.72	0.77	0.74	0.63	0.61	0.48	0.54	0.62
India	1.14	1.26	1.29	1.28	1.19	1.17	1.10	0.95	0.85	
Pakistan	0.64	0.71	0.65	0.64	0.58	0.66	0.72	0.76	0.70	

Source: Authors’ calculation based on ITC, UN COMTRADE (2023) data

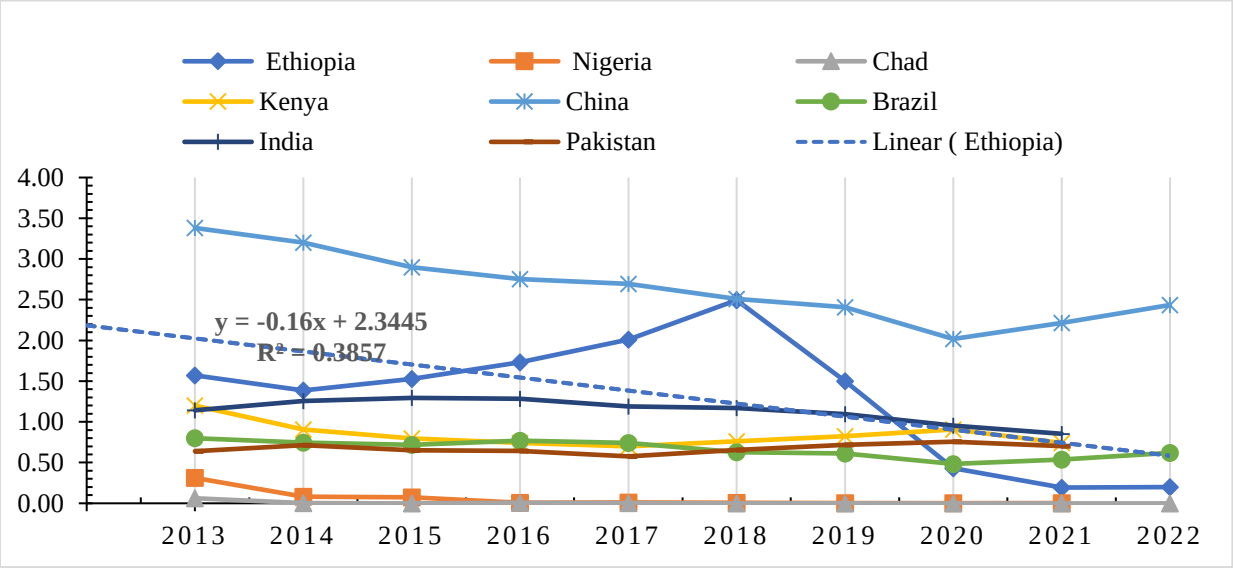


Figure 4. 8: RCA of the selected footwear exporters

4.4.3 Constant Market Share (CMS) Analysis

The previous section used RCA analysis to show whether Ethiopia has a comparative advantage in a commodity export market or not.

However, RCA analysis does not reveal the source of the export growth. In this section, we will use the original CMS model to decompose the total growth change into four effects: *world export effect, commodity effect, regional market effect,* and *competitiveness effect.*

Table 4. 11: World Export Growth effect calculation

World Export of	Exported value in 2013	Exported value in 2022	g_i	G	X_r^0	$g*Xr^0$ (World Export growth effect)
RHS & FL	35,670,075	17,903,862	**-0.4981**			
Articles of Leather	74,336,385	103,716,264	**0.39523**			
Footwear	128,175,496	187,806,264	**0.46523**			
Total	238,181,956	309,426,390		**0.29912**	**238,181,956**	**71,244,434**

Source: Author's calculation based on ITC, UN COMTRADE (2023) data

Table 4. 12: Commodity Effect

Product Exported	g_i	G	g_i-g	X_{ir}^0	$(g_i-g)*X_{ir}^0$
RHS & FL	-0.498	0.301	-0.799	101,063	-80,723
Articles of Leather	0.395		0.094	3,143	296
Footwear	0.465		0.164	27,687	4,548
Total (Commodity Effect)					**-75,879**

Source: Author's calculation based on ITC, UN COMTRADE (2023) data

Table 4. 13: Regional market effect calculation

Product Exported	Major Importers	g_{irp}	g_{ir}	$g_{irp - gir}$	X_{irp}^0	$(g_{irp - gir})*X_{irp}^0$
RHS & FL	China	-0.59	-0.76	0.17	24,044	4,065
	Hong Kong	-0.99		-0.23	21,288	-4,931
	Italy	-0.92		-0.17	18,500	-3,057
	UK	-0.33		0.43	3,434	1,479
	Thailand	-0.99		-0.23	10,627	-2,410
	Other markets	-0.24		0.52	15,603	8,116
Sub-Total						*3,262*

Articles of Leather	USA	2.20	1.08	1.12	2,335	2,611
	Germany	-0.97		-2.05	868	-1,778
	China	122.33		121.25	3	364
	Japan	1.41		0.33	119	40
	Sweden	0.33		-0.75	226	-170
	Uk	0.35		-0.73	66	-48
	Other markets	1.63		0.55	150	82
Sub-Total						*1,101*
Footwear	USA	-0.83	-0.84	0.01	20,519	238
	China	-0.90		-0.06	240	-15
	Kenya	97.00		97.84	1	98
	Canada	1.28		2.13	436	928
	Italy	5.46		6.30	400	2,520
	Other markets	-0.49		0.35	3,265	1,139
Sub-Total						*4,908*
Grand Total (Regional market effect)						**9,270**

Source: Author's calculation based on ITC, UN COMTRADE (2023) data

Table 4. 14:: Competitiveness Effect calculation

Product Exported	Importer	g_i	g_{ir}	g_{ir}-g_i	X_{irp}^0	$(g_{ir - gi})*X_{irp}^0$
RHS & FL	China	-0.498	-0.760		24,044	-6,288
	Hong Kong				21,288	-5,567
	Italy				18,500	-4,838
	UK				3,434	-898
	Thailand				10,627	-2,779
	Other markets			-0.262	15,603	-4,081
Sub-Total						***-24,452***
Articles of Leather	USA	0.395	1.078		2,335	1,594
	Germany				868	593
	China				3	2
	Japan				119	81
	Sweden				226	154
	Uk				66	45
	Oth er markets			0.683	150	102
Sub-Total						**2,571**
Footwear	USA	0.465	-0.843	-1.308	20,519	-26,847
	China				240	-314

	Kenya				1	-1
	Canada				436	-570
	Italy				400	-523
	Other markets				3,265	-4,272
Sub-Total						-32,528
Grand Total (Competitiveness effect)						**-54,408**

Source: Author's calculation based on ITC, UN COMTRADE (2023) data

$$X_r^1 - X_r^0 = g * X_r^0 \quad \text{(World export growth effect)}$$

$$+ \sum_i (g_{i-} g) X_{ir}^0 \quad \text{(Commodity effect)}$$

$$+ \sum_i \sum_p (g_{irp} - g_{ir}) X_{irp}^0 \quad \text{(Regional market effect)}$$

$$+ \sum_i \sum_p (g_{ir} - g_i) X_{irp}^0 \quad \text{(Competitiveness effect)}$$

Substituting the calculated values from the Tables 4.11- 4.14 in the above export change formula:

Export change = $X_r^1 - X_r^0$ = **71,244,434 - 75,879 + 9,270 - 54,408 = 71,123,417 (thousands USD)**

The result shows that Ethiopia's export change in the leather sector from 2013 to 2022 is positive, and most of its positive change is due to the global export growth. However, most of the value drop is due to the commodity effect, which is the decrease of RHS & FL export. This may be attributed to the falling global demand for these commodities and the 150% export tax on RHS and semi-processed leather imposed by the Ethiopian government in 2008 and 2012, respectively, to encourage the export of more value-added goods. The other commodities (articles of leather and footwear) show an increasing effect. The competitiveness effect is also negative, and most of the competitiveness loss is due to footwear export, followed by RHS & FL export. Articles of leather has a positive competitiveness effect. The (EMF-in-LS) gained from the regional market effect.

4.4.4 Export destination analysis

Table 4. 15: Ethiopia's Export Performance in Global and African Markets: Captured and Uncaptured Opportunities.

Exported Product	Top 10 Global importing Markets			Export Destinations outside top 10 Global Markets	Top 10 African Importing Markets			Export Destinations outside top 10 African Markets
	Rank	Importer	Remark		Rank	Importer	Remark	
RHS & FL	1	China	✓	Thailand	1	Tunisia	X	Zimbabwe
	2	Italy	✓	India	2	Morocco	X	Djibouti
	3	Viet Nam	✓	UK	3	Nigeria	✓	Togo
	4	Mexico	X	Sweden	4	South Africa	✓	Rwanda
	5	Hong Kong	✓	Romania	5	Lesotho	X	Congo
	6	France	X		6	Madagascar	X	Uganda
	7	USA	X		7	Mauritius	X	
	8	Germany	X		8	Ghana	✓	
	9	Thailand	X		9	Namibia	X	
	10	Indonesia	✓		10	Kenya	✓	
Articles of leather	1	USA	✓	Sweden	1	South Africa	✓	Kenya
	2	China	✓	Canada	2	Ghana	✓	Somalia
	3	Japan	✓		3	Morocco	X	Zambia
	4	France	✓		4	Algeria	X	Rwanda
	5	Germany	✓		5	Guinee	X	Zimbabwe
	6	Korea	X		6	Sudan	X	Uganda
	7	Hong Kong	X		7	Egypt	X	Nigeria
	8	Italy	✓		8	Tunisia	X	Djibouti
	9	UK	✓		9	Libya	X	
	10	Netherlands	✓		10	Botswana	X	
Foot wear	1	USA	✓	Kenya	1	South Africa	✓	Kenya
	2	Germany	✓	Canada	2	Ghana	X	Rwanda
	3	France	X	Sudan	3	Morocco	X	Uganda
	4	Italy	✓	Hong Kong	4	Algeria	X	Zambia
	5	China	✓	UAE	5	Tunisia	X	Angola
	6	Netherlands	✓		6	Djibouti	✓	Senegal
	7	UK	X		7	Sudan	✓	Somalia
	8	Japan	X		8	Guinea	X	
	9	Belgium	X		9	Libya	X	
	10	Spain	X		10	Ethiopia	NA	

Source: Authors' calculation based on ITC, UN COMTRADE (2023) data

Note: ✓ = Captured markets, x=Uncaptured markets

NA=Not Applicable, USA= United States of America, UK=United Kingdom, UAE=United Arab Emirates

Table 4.15 illustrates Ethiopia's presence in both captured and uncaptured markets among the top 10 importers worldwide and within African markets. While Ethiopia has successfully exported its RHS & FL products to China, Italy, Viet Nam, Hong Kong, and Indonesia, it has yet to tap into the markets of Mexico, France, USA, Germany, and Thailand, despite their prominence in RHS & FL imports. Surprisingly, Ethiopia has managed to export its RHS & FL products to Thailand, India, UK, Sweden, and Romania, even though these countries are not among the top-10 RHS & FL importers.

However, Ethiopia's RHS & FL exports have not made significant inroads into many of the top-10 RHS & FL importing African markets. Although Ethiopia has exported to Nigeria, South Africa, Ghana, and Kenya, it has not ventured into markets such as Tunisia, Morocco, Lesotho, Madagascar, Mauritius, and Namibia, which are among the leading RHS & FL importers. Nevertheless, Ethiopia has found success in exporting its RHS & FL products to countries like Zimbabwe, Djibouti, Togo, Rwanda, Congo, and Uganda, despite their lower rankings as RHS & FL importers.

Regarding articles of leather, Ethiopia has established export links with major import markets such as the USA, China, Japan, France, Germany, Italy, UK, and Netherlands. However, it has yet to tap into the markets of Korea and Hong Kong, both of which are significant importers of articles of leather. Instead, Ethiopia has managed to export its leather products to Sweden and Canada, even though they are not among the top -10 importers. Ethiopia's exports in this sector are primarily focused on South Africa and Ghana, and it has not been able to capture markets in Morocco, Algeria, Guinea, Sudan, Egypt, Tunisia, Libya, and Botswana, despite their prominence as articles of leather importers. Additionally, Ethiopia has exported its articles of leather products to Kenya, Somalia, Zambia, Rwanda, Zimbabwe, Uganda, Nigeria, and Djibouti, despite their lower rankings as importers.

In the footwear sector, Ethiopia has captured only five out of the top- 10 global markets, exporting its products to the USA, Germany, Italy, China, and the Netherlands. Surprisingly, Ethiopia has not captured the footwear markets of France, UK, Japan, Belgium, and Spain, despite their top-10

status as footwear importers. Furthermore, Ethiopia has exported its footwear products to Kenya, Canada, Sudan, Hong Kong, and the UAE, despite these markets not being among the top-10 importers. However, Ethiopia has not been able to capture the top-10 African footwear importers' market, as it has only exported to South Africa and Sudan. It has yet to export any footwear products to Ghana, Morocco, Algeria, Tunisia, Djibouti, Guinea, and Libya, despite their significance in the footwear importing market. Ethiopia has exported its footwear to Kenya, Rwanda, Uganda, Zambia, Angola, Senegal, and Somalia, which are not among the top listed African footwear importer markets.

Overall, while various factors can influence export performance, tapping into large importing markets is crucial for enhancing Ethiopia's leather and leather products exports. Ethiopian exporting firms should explore opportunities in uncaptured markets globally, as well as within Africa, to maximize their export potential.

4.5 Challenges and prospects of the EMF-in-LS based on previous empirical studies

Table 4. 16: Challenges of the Ethiopian leather industry based on the previous empirical studies

S/N	Challenges of the Ethiopian leather Industry	(Addis *et al.*, 2018)	(Dvivedi and Beshah, 2017)	(Ayele, 2019)	(Tsega *et al.*, 2023)	(Adem, 2019)	(Awulachew, 2021)	(Tekletsadik, 2023)	(Tsega *et al.*, 2022)	(Grumiller, 2021)	(Getahun Abebe, 2020)	(Grumiller and Raza, 2019)	(Feleke *et al.*, 2016)	(B. *et al.*, 2018)	(Gebrewahid & Wald, 2017	(Negussie and Jayaprakash, 2019)	(Hardy and Hauge, 2019)	(Abate *et al.*, 2021)	(Filketu and Negash, 2023)	(Kahsay *et al.*, 2015)	(Amde, 2017)	Frequency
1	Outdated Technology & Frequent machine Failure.		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	16
2	Lack of online presence & market Linkage	✓	✓		✓	✓	✓	✓		✓	✓						✓	✓	✓		✓	12
3	Lack of skilled labor	✓	✓	✓		✓		✓		✓	✓		✓	✓	✓							10
4	Environmental Pollution and health risk	✓		✓		✓	✓				✓				✓		✓		✓		✓	9
5	High production cost and low productivity	✓	✓	✓		✓		✓					✓			✓						7
6	Poor quality of raw hides and skins						✓				✓	✓				✓	✓	✓				6
7	Inadequate infrastructure and utilities			✓		✓				✓			✓	✓						✓		6
8	Limited access to finance					✓		✓				✓			✓						✓	5
9	Trade barriers and tight standards		✓			✓							✓					✓		✓		5
10	Lack of price incentives for good quality			✓						✓		✓			✓							4
11	Low value addition		✓								✓			✓							✓	4
12	Fierce global Competition		✓					✓												✓		3

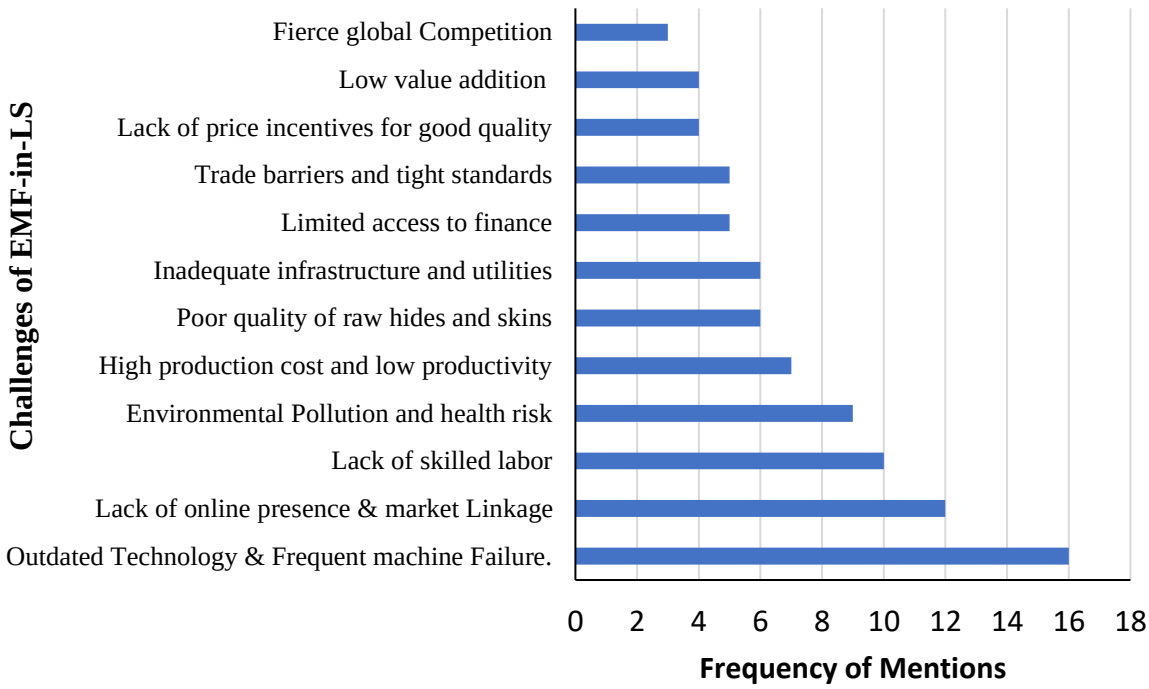


Figure 4. 9: Challenges of the Ethiopian Leather Industry based on the previous empirical studies

As shown in Table 4.16 and Figure 4.9, based on previous empirical studies, the major challenges of EMF-in-LS include: Outdated Technology & Frequent machine Failure, Lack of online presence & market Linkage, Lack of skilled labor, Environmental Pollution and health risk, High production cost and low productivity, Poor quality of raw hides and skins, Inadequate infrastructure and utilities, Limited access to finance, Trade barriers and tight standards, Lack of price incentives for good quality, Low value addition , Fierce global Competition in order of importance.

Table 4. 17: The prospects of the Ethiopian leather industry based on the previous empirical studies

S/N	Opportunities of the Ethiopian leather industry	(Addis *et al.*, 2018)	(Dvivedi and	(Ayele, 2019)	(Tsega *et al.*, 2023)	(Adem, 2019)	(Awulachew,	(Tekletsadik, 2023)	(Tsega *et al.*, 2022)	(Grumiller, 2021)	(Getahun Abebe,	(Grumiller and	(Feleke *et al.*,	(B. *et al.*, 2018)	(Gebrewahid & Wald, 2017)	(Negussie and	(Hardy and Hauge,	(Abate *et al.*, 2021)	(Filketu and	(Kahsay *et al.*, 2015)	(Amde, 2017)	Frequency
1	Abundant and cheap raw material supply from the large livestock population in the country	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	18
2	Government Support and incentives for development of the leather sector; Technical Assistance from UNIDO, ELIA, LIDI; Industry parks	✓	✓	✓		✓			✓		✓			✓	✓		✓		✓		✓	11
3	Growing domestic, regional and international market demand for leather products, especially footwear			✓	✓	✓			✓	✓	✓			✓	✓		✓			✓		10

4	Comparative advantages like low labor cost, Ethiopian highland sheep skin, low energy cost, favorable climate, proximity to emerging markets		✓	✓	✓				✓					✓			✓	✓		✓		8
5	Potential for value addition and diversification	✓				✓	✓	✓				✓	✓								✓	7
6	Adoption of cleaner production						✓			✓								✓			✓	4
7	Preferential Market Access (America, China, Regional markets)							✓							✓		✓					3

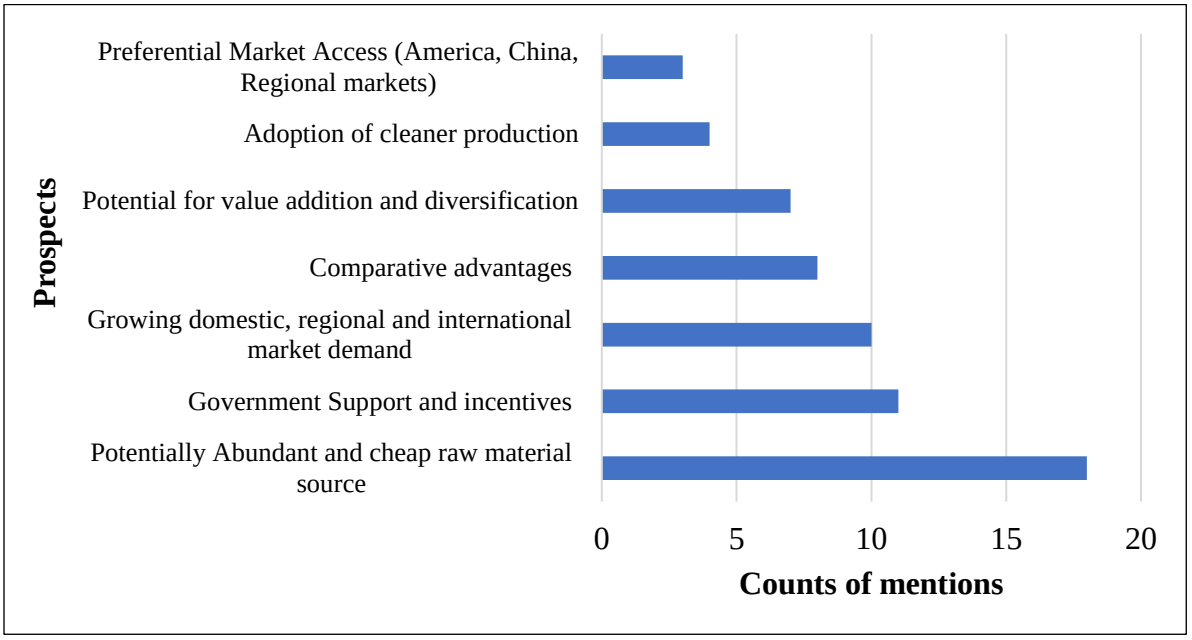


Figure 4. 10: The prospects of the Ethiopian leather industry based on the previous empirical studies.

As illustrated in Table 4.17 and Figure 4.10, previous empirical studies highlight the key opportunities for EMF-in-LS. These include: an abundant and affordable raw material source; government support and incentives; increasing demand in domestic, regional, and international markets; comparative advantages such as a large livestock population, Ethiopian highland sheep skin, low-cost labor, favorable climate, and market proximity; potential for value addition and diversification; adoption of cleaner production methods; and preferential market access (the United States, China, and regional markets). These prospects are ranked in order of significance.

4.6 Challenges and opportunities of the EMF-in-LS based on Porter's Diamond model mapping

Ethiopian manufacturing firms in the leather sector (EMF-in-LS) face both challenges and opportunities when assessed through Porter's Diamond Model, which examines national competitive advantage. The source of the data that have been employed for this assessment were literature, semi-structured interviews with key informants in EMF-in-LS, and direct observation. The results are presented in Table 4.18.

Table 4. 18: Analysis results of Challenges and prospects of the Ethiopian leather industry using Porter's Diamond model

S/N	Porter's Variables	Factors affecting global competitiveness of the Ethiopian leather industry.	
		Challenges	Opportunities
1	Factor Conditions	• Outdated machineries • Lack of Modern technology • Lack of skilled labor • Poor quality of raw materials • Lack of chemicals • Lack of access to finance and shortage of foreign currency. • Lack of infrastructure and utilities.	• Large livestock population • A large and cheap labor force • Favorable climate conditions for livestock breeding. • Ethiopian highland sheep breeding
2	Demand Condition	• Low demand for local products due to poor perception hindering firms' innovation and value addition. • Demand shift to 2nd hand and synthetic and fabric items by the youth. • Intense competition from low-cost producers such as China and India.	• The growing local, regional, and global demand for value added leather products. • Ethiopia's growing population offering a potential source of trainable young labor to address the sector's skill gap. • The new railway infrastructure which can boost export logistics. • The Grand Renaissance Dam, nearing completion, can double the country's electric power supply.
3	Related supporting industries	• Lack of competent factories for chemicals, soles, zippers, spare parts, and other accessories. • Absence of integrated supply chain. • Absence of supportive financial institutions caused shortage of finance. • The poor Ethiopian livestock husbandry practice deteriorates the quality of the raw hides and skins.	• Opening the banking industry to the international market can ease financial issues, promote fair competition, and reduce the financial shortage. • The establishment of the Ethiopian Leather industries development institute (LIDI), and the Ethiopian leather industries association (ELIA) can support the leather sector. • The governments initiative in taking the leather industry as one of its priority sectors.

		• The meat industry's infancy leads to raw hide and skin scarcity.	• The Leather parks being built • The emerging digital platforms can improve access to market.
4	Firm Strategy, structure, and rivalry	• A few large firms dominate the sector, reducing local competition and innovation. • Non competent SMEs. • Supply chain structural issues leading to low-quality raw materials. • Efficiency and competitiveness challenges for dominant firms and SMEs.	• Government policies for SMEs can boost industry competition and efficiency. • The recently formed Ethiopian Enterprises Development organization can help firms' structure, strategy, and rivalry.
5	Chance	• Fluctuations in global demand due to consumers' preferences. • Disruptive innovations. • Low-cost producers like China and India pose a serious threat to Ethiopia's leather sector. Cheaper commodities due to economies of scale is one of the causes driving this competition. • Climate change and environmental concerns can affect the industry.	• Changes in global demand for leather products, particularly as consumers become more environmentally conscious and seek leather products produced environmentally friendly. • Technological innovations, especially automation and digitization, can transform industry production and supply chains. • Global trade policy changes may affect industry market access and competitiveness.
6	Government	• Inconsistent policies and regulations • Limited access to finance. • Weak institutional capacity. • Failure of trade agreements such as the African Growth and Opportunity Act (AGOA), which grants duty-free access to the US market.	• The Government's initiative in prioritizing the leather sector. • The establishment of Leather industry development institute to support the sector. • Tax exemption to the imported machineries, inputs and spare parts

Table 4.18 presents a detailed assessment of the Ethiopian leather industry's challenges and prospects using Porter's Diamond Model. The analysis draws on prior studies, semi-structured interviews with key informants from EMF-in-LS and industrial visits. Findings highlight critical constraints across multiple dimensions of competitiveness, including limited access to modern technology, outdated machinery, inadequate supply of essential chemicals, substandard raw

materials, shortage of skilled labor, restricted access to finance and foreign exchange, and deficient infrastructure and utility services.

Further constraints include weak livestock management practices affecting hide and skin quality, an underdeveloped meat sector, market concentration by a few dominant firms, underperformance of SMEs, fragmented supply chains, and institutional inefficiencies.

Addressing these systemic challenges and leveraging the opportunities requires coordinated action among stakeholders, particularly the government. Policy coherence, financial inclusion, infrastructure development, and institutional strengthening are key governmental roles.

4.7 Challenges and prospects of the EMF-in-LS based on the semi-structured interviews

To validate findings from previous research, identify additional factors, and assess the current state of Ethiopian manufacturing firms in the leather sector (EMF-in-LS), semi-structured interviews were conducted with key informants from EMF-in-LS. These qualitative insights provide a comprehensive understanding of the sector's competitive dynamics. The challenges and opportunities identified through thematic analysis of the interview data are presented in Tables 4.19 and 4.20.

Table 4. 19: Challenges of the Ethiopian leather Industry based on the thematic analysis of the Semi-Structured interviews.

S/no.	Challenges	Key informants and their Mentions																						Counts
		KI-1	KI-2	KI-3	KI-4	KI-5	KI-6	KI-7	KI-8	KI-9	KI-10	KI-11	KI-12	KI-13	KI-14	KI-15	KI-16	KI-17	KI-18	KI-19	KI-20	KI-21	KI-22	
1	Frequent machine Failure and Outdated Technology.		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	20
2	Lack of online presence & market Linkage.	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	20
3	Poor quality of raw hides and skins	✓	✓		✓	✓		✓	✓	✓	✓		✓	✓		✓	✓			✓	✓	✓	✓	16
4	Absence of supporting firms (chemical, sole, spare parts, and other accessory factories).	✓		✓	✓	✓		✓	✓	✓			✓	✓	✓	✓	✓		✓			✓	✓	15
5	Limited access to finance.		✓		✓		✓	✓	✓				✓			✓		✓	✓	✓				14
6	Inadequate infrastructure and utilities.	✓	✓	✓				✓	✓				✓	✓	✓				✓	✓				10
7	Trade barriers and tight standards.		✓					✓	✓		✓			✓					✓	✓		✓		8
8	Fierce global Competition		✓					✓	✓		✓			✓					✓	✓		✓		8
9	Lack of skilled labor.		✓					✓	✓		✓			✓			✓			✓	✓			8
10	Lack of price incentives for good quality	✓	✓	✓							✓					✓		✓			✓			7

11	High production cost and low productivity.	✓	✓	✓													✓	✓	✓				6
12	Environmental Pollution and health risk.		✓					✓	✓					✓		✓	✓						6
13	Low value addition	✓		✓									✓						✓	✓				5
14	Limited investment in R&D, innovation and product differentiation		✓					✓									✓		✓					4
15	The demand shift of the young generation to synthetic, textile, and 2nd hand commodities.	✓				✓							✓								✓			4

Note: KI=key informant

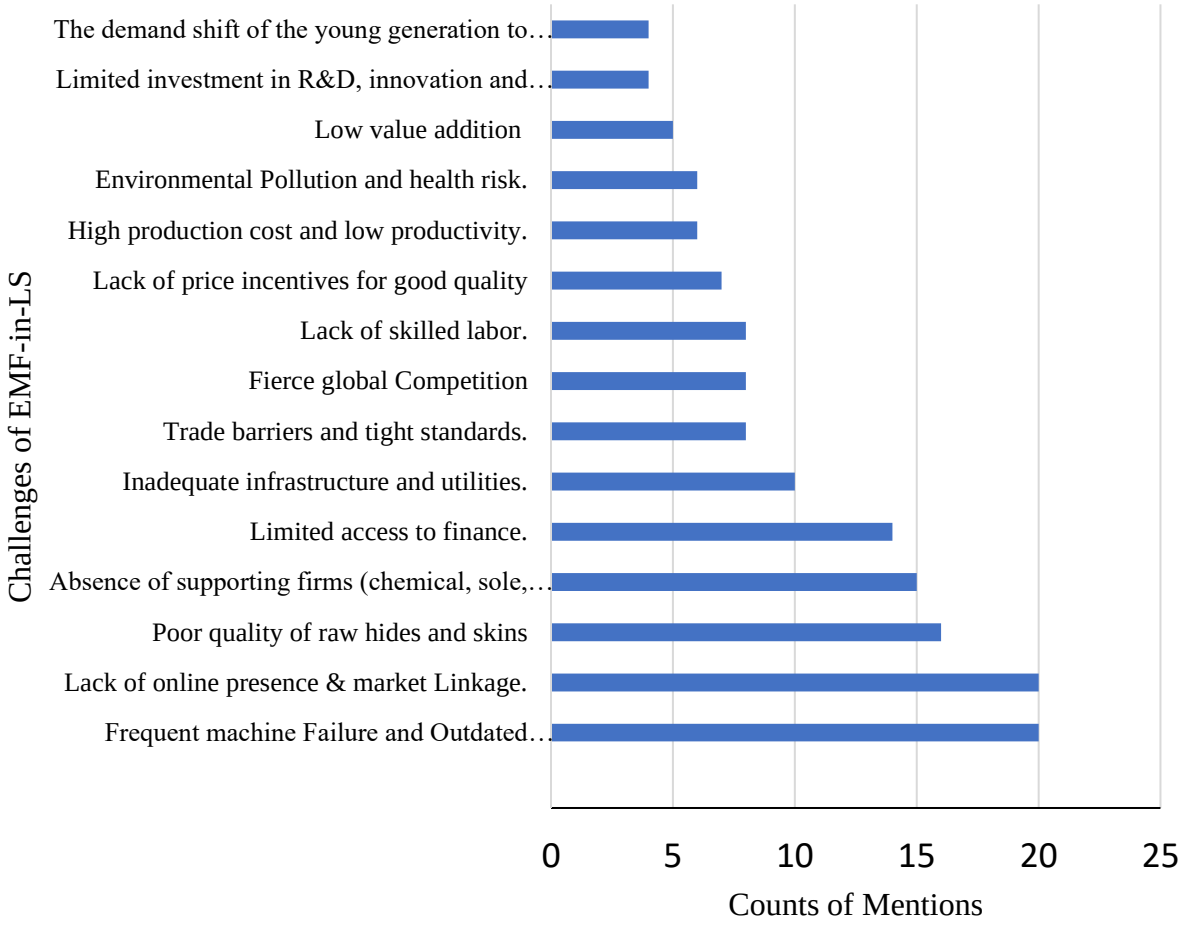


Figure 4. 11: Challenges of the Ethiopian leather Industry based on the thematic analysis of the Semi-Structure interview.

Table 4.19 and Figure 4.11 provide a comprehensive overview of the major challenges faced by the Ethiopian leather industry, as revealed through the responses of the key informants. These challenges include: Frequent machine Failure and Outdated Technology; Lack of online presence & market Linkage; Poor quality of raw hides and skins; Absence of supporting firms (chemical, sole, spare parts, and other accessory factories); Limited access to finance; Inadequate infrastructure and utilities; Trade barriers and tight standards; Fierce global Competition; Lack of skilled labor; Lack of price incentives for good quality; High production cost and low productivity; Environmental Pollution and health risk; Low value addition; Limited investment in R&D, innovation and product differentiation; The demand shift of the young generation to synthetic, textile, and 2nd hand commodities in order of importance.

The key informants largely agreed with the findings of previous empirical studies; however, they additionally highlighted several variables that were not extensively addressed in the earlier research. These variables include: the absence of supporting firms such as chemical, sole, spare parts, and other accessory factories; limited investment in R&D; lack of innovation and product differentiation; and the shifting demand of the younger generation towards synthetic, textile, and second-hand commodities. These insights from the key informants contribute valuable perspectives to the existing body of knowledge regarding the challenges faced by the Ethiopian leather industry.

Table 4. 20: Prospects of the Ethiopian leather industry based on thematic analysis of the semi-structured interview.

S/no.	Prospects	Key informants and their Mentions																						Counts
		KI-1	KI-2	KI-3	KI-4	KI-5	KI-6	KI-7	KI-8	KI-9	KI-10	KI-11	KI-12	KI-13	KI-14	KI-15	KI-16	KI-17	KI-18	KI-19	KI-20	KI-21	KI-22	
1	Abundant raw material source from the large livestock population in the country	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	20
2	Government Support and incentives for development of the leather sector; Technical Assistance from UNIDO, ELIA, LIDI; Industry parks	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	19
3	Comparative advantages like low labor cost, Ethiopian highland sheep skin, low energy cost, favorable climate, proximity to emerging markets		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		✓	✓	17
4	The emerging digital platforms for e-commerce		✓		✓	✓	✓	✓	✓	✓			✓	✓		✓	✓	✓	✓	✓	✓			15
5	Adoption of cleaner production	✓	✓	✓	✓	✓	✓						✓	✓	✓	✓	✓	✓						12
5	Potential for value addition and diversification	✓	✓	✓						✓	✓		✓	✓	✓						✓	✓		10
7	Growing domestic, regional and international market demand for leather products, especially footwear	✓	✓	✓			✓						✓	✓	✓			✓						8
8	Preferential Market Access (America, China, Regional markets)	✓	✓	✓									✓	✓	✓									6

Note: KI=key informant, FDI=foreign direct investment, LIDI=Leather development Institute, ELIA= Ethiopian Leather industries Association, UNIDO= United Nations Industrial Development Organization

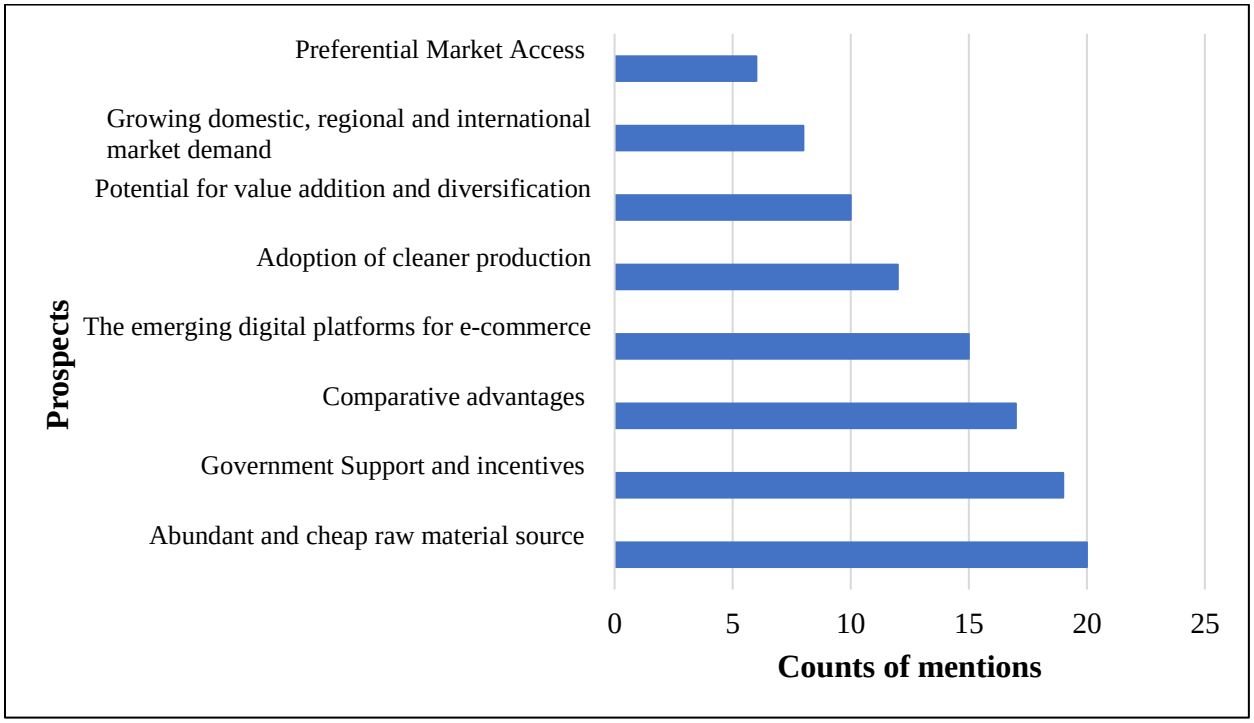


Figure 4. 12: The prospects of the Ethiopian leather industry based on the thematic analysis of the key informants' semi-structured interview.

Table 4.20 and Figure 4.12 present the major prospects identified by the key informants in the Ethiopian leather sector, which can be leveraged to address the challenges faced by the sector. The key informants largely supported the findings of previous empirical studies, affirming their validity. Additionally, they highlighted emerging digital platforms for e-commerce as an additional opportunity for the industry, particularly in terms of enhancing market linkage and information dissemination.

These prospects, as identified by the key informants, offer significant potential for the Ethiopian leather industry to capitalize on and overcome the existing challenges and boost the global competitiveness of the Ethiopian leather industry. By effectively harnessing these opportunities, the industry can enhance its competitiveness and expand its market presence at both local and global levels.

4.8. The challenges and prospects of a typical Ethiopian leather manufacturing firm's business model mapped using the business model canvas tool.

In the subsequent sections of this study, the business model of a typical manufacturing firm in the Ethiopian leather sector is analyzed using the well-known Business Model Canvas tool. The data required to map the business model of the selected manufacturing firm was collected through an in-depth semi-structured interviews with the high-level management team of the organization, including marketing, design, production, and general managers, as well as an assessment of the firm's reports.

This organization was chosen because it is engaged in various sub-sectors in the leather industry, including raw hides and skin (RHS) collection, tanning, footwear manufacturing, leather and articles of leather production, and export businesses. According to the reports of the company, the selected firm for this study is a prominent leather manufacturing company based in Addis Ababa, Ethiopia. It has provided approximately 1,200 employment opportunities, with 47% of these positions held by women, including 861 first- and second-degree graduates and 122 semiprofessionals.

The vision of the firm is to become a world-class and branded quality name in finished leather and leather products. The mission of the industry is the production and marketing of environmentally sustainable finished leather and leather products for export and local markets to satisfy customers.

This organization operates two tanneries, one leather goods and garment factory, and a shoe factory. Tannery 1 produces finished sheep dress and sport gloving leather, finished sheep garment leather, finished cow hide for shoe uppers, sole leather, and finished cow hides for articles. Tannery 2 produces finished sheep and goat suede uppers, finished sheep service gloves, chrome-free finished goat suede uppers, and finished sheep uppers. The leather products factory manufactures leather garments, leather executive cases, leather handbags, leather luggage, leather belts, and leather wallets. The shoe factory produces casual men's and women's shoes, classic men's and women's shoes, sport shoes, and ladies' boots.

According to the report of this company, the organization aggressively delivers and exports its finished leather products to various international leather markets. The major market areas and

export destinations include the USA from North America, Germany, France, and Italy from Europe, and China, Japan, South Korea, Indonesia, Thailand, and India from Asia. All export products are prepared based on customers' orders.

This analysis aims to map the existing business model (See Table 4.21), to identify the challenges (See Table 4.22), and prospects (See Table 4.23) faced by the firm in the global leather market under its current business model. Furthermore, the study proposes a TO-BE business model tailored to the firm (See Table 4.24), offering valuable lessons for other companies in the leather sector.

Table 4. 21: The Current (AS-IS) Business Model of the typical EMF-in-LS in the leather sector as mapped by the business model canvas tool.

<table>
<tr>
<td rowspan="2">8. Key partners

• Abattoirs
• RHS suppliers
• Chemical suppliers
• Accessory, Spare parts Suppliers
• ELIA
• LIDI
• MOI
• MOE
• International buyers
• Local customers
• Government</td>
<td>7. Key activities

• raw material sourcing
• tanning
• Design
• manufacturing
• Quality control
• marketing and sales</td>
<td rowspan="2">2. Value proposition

• Finished leather
• Footwear
• Articles of leather
• Gloves</td>
<td>4. Customer relationships

• Customer support
• Pre sales assistance</td>
<td rowspan="2">1. Customer Segment

• USA
• Germany
• France
• Italy
• China
• Japan
• South Korea
• Thailand
• India</td>
</tr>
<tr>
<td>6. Key Resources

• Manufacturing facility
• Raw materials
• Skilled workers
• Machineries
• Distribution network
• Technology</td>
<td>3. Channels
• Export channels
• Retail shops
• Whole sale stores
• Distributors and agents</td>
</tr>
</table>

9. Cost structure	*5. Revenue streams*
• Raw materials cost • Labor cost • Manufacturing overheads • Marketing and distribution costs	• Finished leather sales • Footwear sales • Articles of leather sales

Source: The Author

Table 4. 22: Challenges of a typical firm in EMF-in-LS in its existing (AS-IS) business model as mapped by the business model canvas tool

<table>
<tr>
<td rowspan="2">8. Key partners
• Week suppliers' partnership
• Limited international collaboration
• Limited opportunity for strategic partnership
• Inadequate government support</td>
<td>7. Key activities
• The use of outdated machineries
• Lack of innovation
• Inadequate technology adoption
• Inadequate R&D
• Inadequate training
• Lack of product differentiation activities</td>
<td rowspan="2">2. Value proposition
• Poor perception of quality of Ethiopian products
• Limited product diversity
• Lack of brand recognition
• Sustainability challenge
• Lack of innovative products</td>
<td>4. Customer relationships
• Language and cultural barriers
• Inconsistent customer experience
• Lack of customer feedback loops
• Inadequate sales support</td>
<td rowspan="2">1. Customer Segment
• Overall reliance on specific customers
• Limited market awareness
• Inability to cater niches
• Limited market diversification
• Limited brand recognition
• Limited domestic market awareness
• Limited market research</td>
</tr>
<tr>
<td>6. Key Resources
• Outdated machineries
• Poor quality of raw materials
• Inconsistent supply of raw materials
• Insufficient access to finance
• Lack of capital
• Lack of chemicals, spare parts, and accessories</td>
<td>3. Channels
• Undeveloped E-commerce
• Lack of robust digital platform
• Limited online presence
• Inadequate distribution network</td>
</tr>
</table>

9. Cost structure • Limited cost optimization • Limited financial resource • Limited budget for branding and promotion • Unable to achieve economy of scale	***5. Revenue streams*** • Inability to scale and dependence on low margin sales. • Insufficient export earning • Insufficient export diversification • Pricing challenges from low priced competitors

Source: The Author

Table 4. 23: The prospects of a typical firm in EMF-in-LS in its existing (AS-IS) business model as mapped by the business model canvas tool.

<table>
<tr>
<td rowspan="2">8. Key partners
• Government support & initiatives
• International trade agreements</td>
<td>7. Key activities
• Traditional craftmanship and expertise</td>
<td rowspan="2">2. Value proposition
• Natural and unique characteristics of Ethiopian handicraft
• Favorable geographic location
• Cultural value</td>
<td>4. Customer relationships
• Cultural tourism opportunities</td>
<td rowspan="2">1. Customer Segment
• The growing middle class in the local market
• Growing demand for value added products
• Customers demanding for luxury products
• Customers looking for Eco products.</td>
</tr>
<tr>
<td>6. Key Resources
• Large livestock population
• Cheap labor
• Unique Ethiopian highland sheep skin</td>
<td>3. Channels
• Growing digital platform
• Digital connectivity
• Geographical proximity</td>
</tr>
<tr>
<td colspan="2">9. Cost structure
• The cheap labor and abundant livestock population</td>
<td colspan="3">5. Revenue streams
• Global demand for high quality products
• The increasing domestic and global consumption of value-added products</td>
</tr>
</table>

Source: The Author

Table 4. 24: The: proposed (TO-BE) Business model of the typical firm in the Ethiopian leather sector using business model canvas tool

<table>
<tr>
<td rowspan="2">8. Key partners

• Collaboration
• Government support and initiatives
• Joint venture with technology providers
• Franchising
• Attract FDI
• LIDI
• ELIA</td>
<td>7. Key activities

• Chrome free tanning
• Fair labor practice
• Innovation
• Adoption of advanced technology
• Digitalization
• Design & Development
• Invest in R & D
• Quality assurance and certification
• Continuous skill development
• Practice of organic dyes
• Infrastructure development</td>
<td rowspan="2">2. Value proposition

• Sustainable production
• Emphasize on quality
• Focus on customer satisfaction
• Premium quality & craftmanship
• Leverage Ethiopia’s cultural heritage
• Innovative design
• Premium quality assurance
• Customization and personalization</td>
<td>4. Customer relationships

• Personalization and customization
• Enhance after sales service
• Enhance pre sales assistant
• Build brand loyalty
• Build customer centric initiatives</td>
<td rowspan="2">1. Customer Segments

• Niche markets
• Capitalize on the expanding domestic demand
• Luxury demand
• Tap emerging markets: Asia, Africa & South America
• Work on domestic market
• Consider regional market</td>
</tr>
<tr>
<td>6. Key Resources

• Sustainable sourcing
• Modern machinery
• Skilled labor
• Improved infrastructure and logistic
• Latest technology</td>
<td>3. Channels
• E-commerce expansion
• Retail expansion
• Retail collaboration
• Digital marketing
• Flag ship stores & Show rooms in international countries</td>
</tr>
<tr>
<td colspan="3">9. Cost structure
• Operational efficiency
• Lean manufacturing
• Access to finance & investment
• Economics of scale
• Secure funding from sustainability initiatives</td>
<td colspan="3">5. Revenue streams
• Product diversification
• Licensing and brand partnership
• Premium production lines
• Licensing and franchising
• Online sales
• Direct sales</td>
</tr>
</table>

Source: The Author

The nine building blocks of the proposed (TO-BE) business model for the selected typical Ethiopian manufacturing firm are summarized as follows:

Block 1: Customer Segments:

- Focus on niche markets and capitalize on luxury segments.
- Target environmentally conscious customers
- Explore emerging markets in Africa, Asia, and South America.
- Strengthen the domestic market while considering regional expansion.

Block 2: Value Proposition:

- Highlight sustainable production practices and prioritize customer satisfaction.
- Leverage Ethiopia's cultural heritage and innovative design.
- Emphasize premium quality and craftsmanship.
- Provide premium quality assurance and offer customization and personalization options.

Block 3: Channels:

- Expand the e-commerce presence and invest in digital marketing strategies.
- Establish flagship stores and showrooms in international countries.
- Explore opportunities for retail expansion and collaborations with retailers.

Block 4: Customer Relationships:

- Offer personalization and customization options to enhance the customer experience.
- Enhance after-sales service and provide pre-sales assistance.
- Build brand loyalty through customer-centric initiatives, sustainable production

Block 5: Revenue Streams:

- Diversify product offerings and develop premium production lines.
- Explore licensing and brand partnership opportunities.
- Consider licensing and franchising options.
- Focus on direct sales channels.
- Customized premium product sales

- Online platform sales
- Licensing and brand partnership
- Premium production lines
- Licensing and franchising
- Direct sales

Block 6: Key Resources:

- Ensure sustainable sourcing of materials.
- Acquire modern machinery and leverage the latest technology.
- Invest in skilled labor and provide continuous skill development programs.
- Improve infrastructure and logistics.

Block 7: Key Activities:

- Implement chrome-free tanning and use organic dyes.
- Adopt advanced technology and embrace digitalization.
- Foster innovation in design and development.
- Invest in R&D for continuous product improvement.
- Focus on quality assurance and obtain relevant certifications.
- Develop infrastructure and adhere to fair labor practices.

Block 8: Key Partners:

- Seek funding from sustainability initiatives.
- Seek collaborations with relevant stakeholders in the industry.
- Secure government support and initiatives.
- Consider joint ventures with technology providers.
- Explore franchising opportunities.
- Attract foreign direct investment (FDI) for growth and expansion.

Block 9: Cost Structure:

- Improve operational efficiency and implement lean manufacturing practices.
- Ensure access to finance and investment opportunities.
- Leverage economies of scale.
- Seek secure funding sources to support sustainable business operations.

The TO-BE business model aims to position the firm as a provider of premium quality products that prioritize sustainability, innovation, and customer satisfaction. By expanding into new markets, building strong customer relationships, optimizing key resources and activities, and fostering partnerships, the firm can establish a strong competitive advantage and achieve long-term success. Collaboration with partners and government support will facilitate growth and access to funding, while cost-effective operations will contribute to overall profitability.

4.9 An assessment of TPM-enabled operational excellence within EMF-in-LS

4.9.1 Introduction

Building upon the sector-level competitiveness gaps discussed in the previous sections, this section narrows the focus to firm-level capabilities, specifically the role of Total Productive Maintenance (TPM) in driving operational excellence. By examining how TPM is implemented and its performance outcomes within Ethiopian leather manufacturers, this section identifies internal operational levers crucial for sustainable business model innovation.

As discussed in the preceding sections, Ethiopian manufacturing firms in the leather sector (EMF-in-LS) exhibit low production efficiency and incur substantial maintenance costs due to recurrent machinery failures. This is a persistent issue in the Ethiopian leather industry, where manufacturers struggle with frequent equipment breakdowns, inefficient maintenance practices, and outdated machinery (Yohannes *et al.*, 2023)(Arshad, 2024) (Wudu et al., 2024).These challenges lead to high defect rates, excessive material waste, and reduced overall productivity, hindering the sector's competitiveness and growth potential.

A critical factor for these firms in addressing this challenge is Equipment Overall Effectiveness (OEE), a measure that helps manufacturing companies assess how well their machinery operates. OEE focuses on three essential aspects: machine availability, performance efficiency, and product quality. These factors directly influence a company’s ability to increase production and meet customer demands. To maintain high OEE, businesses must prioritize effective maintenance philosophy. Properly managed maintenance ensures equipment runs smoothly, reduces costs, and maintains consistent product quality.

Total productive maintenance (TPM) is a maintenance philosophy targeting zero breakdowns, zero defect and zero accident through the involvement of all employees, it helps the manufacturing

firms to solve the stated maintenance related problems. In addition to this; enlisting critical success factors and barriers of TPM implementation and identification of the weak and strong Pillars of TPM will help companies to allot their limited resource to vital areas only.

Total productive maintenance (TPM) is a source of potential improvement for Ethiopian manufacturing firms in the leather sector (EMF-in-LS). The relationship between people and machines is more productive when total productive maintenance (TPM) is practiced (Kalpande and Toke, 2023). Being competitive in a market requires a high level of productivity and quality, and TPM is crucial to accomplishing these goals (Chaurey *et al.*, 2023). TPM is becoming a critical strategic tool for businesses, and its significance is no longer limited to the manufacturing industry.

This study constructs a structural model to evaluate the interactions between the eight TPM pillars and OEE to assess the success of TPM pillar implementation, examine the linkages between them, and study their implications on overall equipment effectiveness (OEE).

The findings give decision-makers a clear picture of the links between TPM pillars, highlight the most (and least) impactful pillars on OEE, and point them in the right direction for improving EMF-in-LS's operational performance.

To the best of the researcher's knowledge, prior studies (Brown *et al.*, 2002; Gupta *et al.*, 2016; Sharma *et al.*, 2012, 2006; Singh *et al.*, 2013; Tsang and Chan, 2000) have primarily focused on the implementation of Total Productive Maintenance (TPM) without thoroughly examining the current status of TPM initiatives within manufacturing industries. Limited efforts have been made to assess the overall scope of TPM implementation, analyze the interrelationships between TPM pillars and Overall Equipment Effectiveness (OEE), identify the most effectively implemented TPM pillars, and determine those requiring further attention.

Moreover, recent studies have yet to explore the barriers and critical success factors influencing TPM implementation that can directly enhance OEE and contribute to broader operational excellence within EMF-in-LS. Consequently, this research aims to bridge the existing gap and gain helpful insights for the development of a Sustainable Business Model Innovation (SBMI) framework tailored to EMF-in-LS.

4.9.2 Hypotheses and Model Development

In this section, a detailed and comprehensive presentation of the hypotheses and the conceptual research model that guided this study is thoroughly presented.

4.9.2.1 TPM and Overall Equipment Effectiveness (OEE)

Manufacturing productivity is assessed through Overall Equipment Effectiveness (OEE), which measures equipment utilization based on availability, performance, and quality (Prakash *et al.*, 2019). OEE serves as both an independent metric and a key indicator of TPM success, driving industrial efficiency and operational excellence (Al-refaie *et al.*, 2022). TPM enhances OEE through eight structured pillars, fostering effective equipment management. This study examines TPM practices in EMF-in-LS, highlighting their impact on productivity and global competitiveness.

4.9.2.2 Pillars of TPM

As per Japan Institute of Plant Maintenance (JIPM), TPM has eight pillars including Autonomous Maintenance, Focused improvement, planned maintenance, Quality maintenance, Early Equipment maintenance, Education and Training, Office TPM, and (Safety, Health & Environment) (See Figure 4.13).

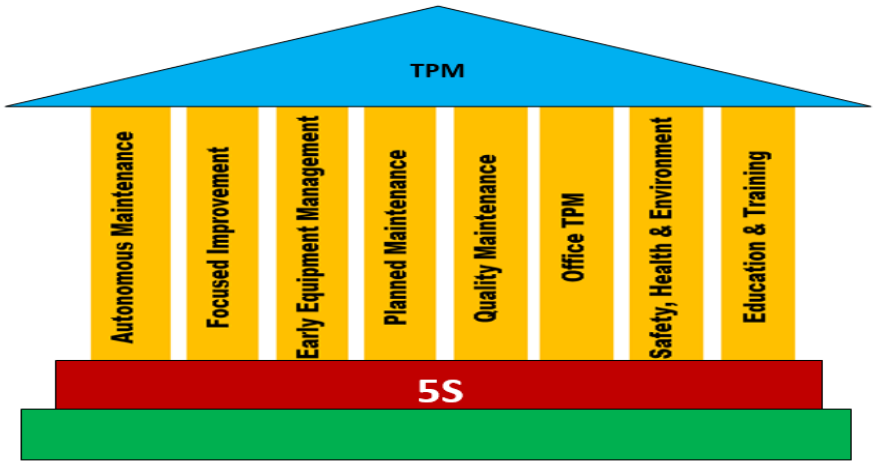


Figure 4. 13: JIPM'S Pillars of TPM

Source: Adapted from (Chaurey *et al.*, 2023)

a. Autonomous Maintenance (AM) Pillar

Autonomous maintenance is essential, as it empowers operators to handle basic maintenance tasks, leveraging their machine knowledge (Chaurey *et al.*, 2023). This approach reduces failures and enables quick defect response. Training equips operators for routine upkeep, ensuring smooth operations (Hassan, 2020; Ngaich and Malviya, 2015; Trutkowski, 2016). By fostering proactive maintenance, TPM minimizes downtime and enhances OEE. Thus, hypothesis 1 is formulated as:

H1: The implementation of the autonomous maintenance pillar positively impacts OEE in EMF-in-LS.

b. Focused Improvement (FI) Pillar

Focused Improvement, a key TPM pillar, enhances system efficiency through collective team efforts. It boosts equipment capacity, reduces waste, eliminates defects, and improves safety by addressing risk factors. Cross-functional teams identify and resolve recurring issues, strengthening operational effectiveness (Hassan, 2020; Labiyi, 2019; McKone *et al.*, 2001; Prabowo *et al.*, 2018). Thus, hypothesis 2 is formulated as:

H2: The implementation of the Focused Improvement pillar positively impacts OEE in EMF-in-LS.

c. Erly Equipment Management (EEM) Pillar

Early Equipment Management (EEM) streamlines machine design and manufacturing, addressing operational and maintenance challenges (Wolska *et al.*, 2023). It accelerates product development and mass production while reducing setup time and enhancing OEE (Ahuja and Khamba, 2008; Hassan, 2020; Mamo, 2019). By integrating maintenance and reliability into equipment design, EEM ensures optimal performance. Thus, hypothesis 3 is formulated as:

H3: The implementation of the Early Equipment Management pillar positively impacts OEE in EMF-in-LS.

d. Planned maintenance (PM) Pillar

Planned Maintenance enhances equipment effectiveness by shifting from reactive to proactive maintenance (Chaurey *et al.*, 2023). It improves dependability, maintainability, and performance while reducing breakdowns, defects, and unplanned downtime (Adesta *et al.*, 2018; Firdos Jahan and Quazi, 2014; Hassan, 2020). By optimizing MTTR (Mean Time to Repair), and MTBF (Mean

Time Between Failure), PM ensures higher reliability and efficiency. Thus, hypothesis 4 is formulated as:

H4: The implementation of the Planned Maintenance pillar positively impacts OEE in EMF-in-LS.

e. Quality Maintenance (QM) Pillar

Quality Maintenance (QM) ensures defect prevention in manufacturing, aiming for zero breakdowns and flawless output. Monitoring machine performance helps prevent failures, while maintaining optimal conditions minimizes quality costs, waste, and rework (Adesta *et al.*, 2018; Firdos Jahan and Quazi, 2014; Hassan, 2020; Ngaich and Malviya, 2015). By upholding high standards, QM enhances OEE by reducing defects and rework. Thus, hypothesis 5 is formulated as:

H5: The implementation of the Quality Maintenance pillar positively impacts OEE in EMF-in-LS.

f. Office TPM (OTPM) Pillar

The primary focus of this pillar lies in applying TPM methodologies to administrative functions. Its core objectives revolve around attaining zero function losses, optimizing office operations, and integrating service support mechanisms for industrial workflows. Noteworthy benefits of this pillar encompass enhanced workspace efficiency, reduced redundancy in tasks, and heightened inventory levels throughout the supply chain. Moreover, it can lead to lowered administrative and overhead expenses. Through streamlined logistics, it fosters a notable decline in office equipment failures, customer grievances, emergency dispatch costs, and unplanned purchases (Adesta *et al.*, 2018; Hassan, 2020; Prabowo *et al.*, 2018). Thus, drawing on supporting literature, hypothesis 6 has been formulated as follows.

H6: Implementation of Office TPM pillar positively and significantly affects the OEE in EMF-in-LS.

g. Safety, Health, and Environment (SHE)

Maintaining a safe and healthy working environment is the focus of this pillar. This pillar's goal is to have no accidents, no health problems, and no fires. As a result, workers must be able to carry out their duties in a safe workplace free of health hazards. This pillar's implementation avoids possible health and safety issues. This pillar guarantees that all employees operate in a safe and accident-free workplace. It enhances the motivation of employees. Employee attitudes about work

alter substantially in a safe atmosphere, resulting in increased productivity, quality, and delivery performance (Agung & Siahaan, 2020).

SHE prioritizes a safe and healthy work environment, reducing accidents and ensuring that equipment operates within safe parameters. This contributes to the overall effectiveness and efficiency of equipment. Thus, drawing on supporting literature, hypothesis 7 has been formulated as follows.

H7: Implementation of Safety, Health, and Environment (SHE) pillar positively and significantly affects OEE of EMF-in-LS.

h. Education and Training (EduT)

The most crucial aspect of accomplishing the TPM goal is training. All operators, supervisors, and managers are affected. Operators learn how to maintain the machine and spot any faults. The operator learns proactive and preventive machine maintenance practices. Training and education guarantee that employees are properly trained to do their jobs, managers identify the skill, which aids in the effective implementation of TPM by the organization's goals and objectives. The appropriate kind of practice and training raises skill levels, and constant repetition produces flawless performance (Chaurey *et al.*, 2023).

All personnel's abilities and performance improve as a result of education and training. Human potential wastes a lot of money in a company if it isn't developed. We may have multi-skilled employees through training and education, allowing the operator and supervisor to perform more efficiently, effectively, and autonomously (Elisabet, 2019; Firdos Jahan & Quazi, 2014; Prabowo et al., 2018).

TPM includes comprehensive training programs for operators and maintenance staff. Well-trained personnel are better equipped to identify potential problems early and take corrective actions, thus maintaining high equipment effectiveness.

Thus, drawing on supporting literature, the following hypotheses have been formulated.

H8a: Implementation of EduT pillar positively and significantly affects AM pillar of EMF-in-LS.

H8b: Implementation of EduT pillar positively and significantly affects FI pillar of EMF-in-LS.

H8c: Implementation of EduT pillar positively and significantly affects EEM pillar of EMF-in-LS.

H8d: Implementation of EduT pillar positively and significantly affects OEE of EMF-in-LS.

H8e: Implementation of EduT pillar positively and significantly affects PM pillar of EMF-in-LS.

H8f: Implementation of EduT pillar positively and significantly affects QM pillar of EMF-in-LS.

H8g: Implementation of the EduT pillar positively and significantly affects the OTPM pillar of EMF-in-LS.

H8h: Implementation of EduT pillar positively and significantly affects SHE pillar of EMF-in-LS.

4.9.3 Conceptual research model

This study presents a conceptual research model illustrating how TPM pillar implementation enhances Overall Equipment Effectiveness (OEE), signaling robust TPM adoption. Based on previous literature, the model suggests education and training impact OEE both directly and indirectly. It identifies EduT as an independent variable and OEE as a dependent variable. Constructs such as Autonomous Maintenance (AM), Focused Improvement (FI), Early Equipment Management (EEM), Planned Maintenance (PM), Quality Maintenance (QM), Office TPM (OTPM), and Safety, Health & Environment (SHE) function as both dependent (influenced by Education and Training) and independent variables (impacting OEE). The model's directional relationships are depicted in the conceptual model (Figure 4.14).

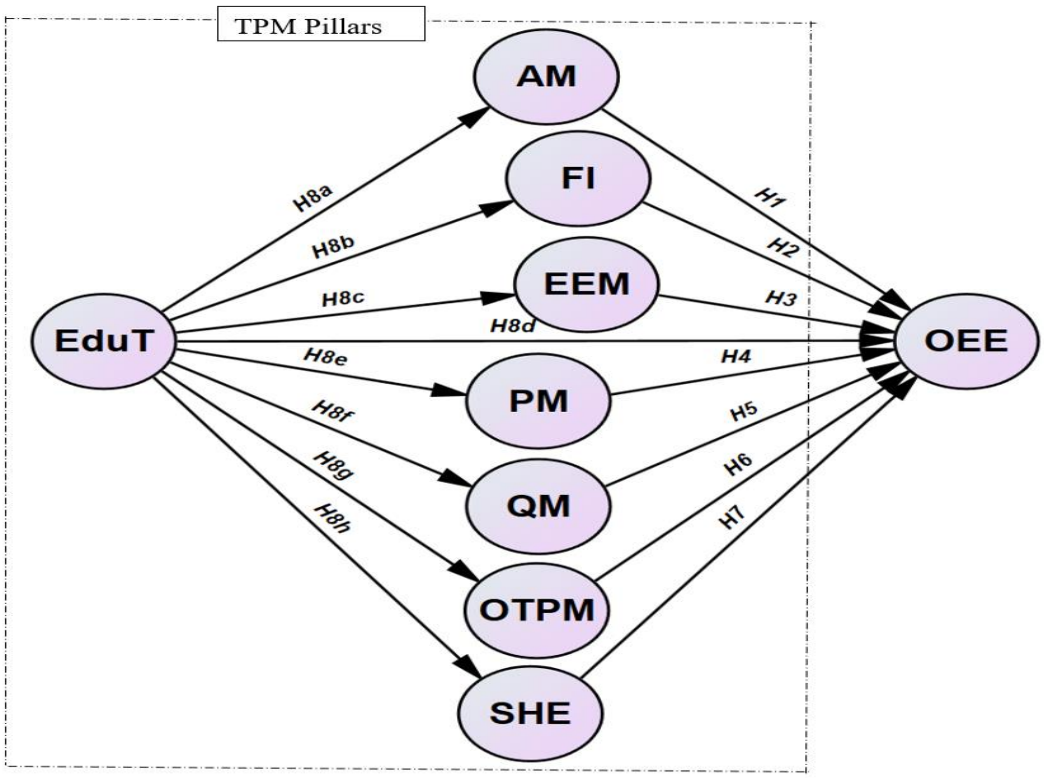


Figure 4. 14: Research conceptual model

Source: Created by the author

4.9.4 Descriptive statistics results

4.9.4.1 Profile of respondents and the case companies

The descriptive data which includes Gender, Age, Educational level, work experience, position of the respondents, company type, and the company size are shown in Table 4.25.

Table 4. 25: Profile of respondents and the case companies

Profile		Responses	
		Number	%
Gender	Male	98	96.08
	Female	4	3.92
Age	41-45	29	28.43
	36-40	25	24.51
	31-35	24	23.53
	>45	14	13.73
	26-30	10	9.80
Education status	First Degree	67	65.69

	Masters	35	34.31
Work experience	>15 years	33	32.35
	6 to 10	27	26.47
	11 to 15	27	26.47
	2 to 5	15	14.71
Position	Technical Manager	18	17.65
	Maintenance technician	23	17.65
	General Manager	18	17.65
	Production Manager	18	17.65
	Operators	25	29.41
Company Size	Large	102	100.00
Company Type	Manufacturing	102	100.00

Source: Created by the author

As shown in Table 4.25, the majority of respondents (96.08%) were males, while only (3.92%) were females, indicating that the proportion of females in this study is too low. The bulk of respondents, (65.69%) had first-level degrees, while (34.31%) had master's degrees. The majority of respondents (32.35%) have worked in the case companies for more than 15 years, followed by 26.47% who have worked there for 6 to 10 years, 26.47% who have worked there for 11 to 15 years, and 14.71% who have worked there for 2 to 5 years. It was done on purpose to include technical managers, maintenance technicians, general managers, production managers, and operators among the positions of the respondents as these respondents may have more reliable information about TPM. The sizes of all the selected manufacturing organizations were large.

a. Response given to the question "What type of maintenance policy best describes your company's maintenance practice?"

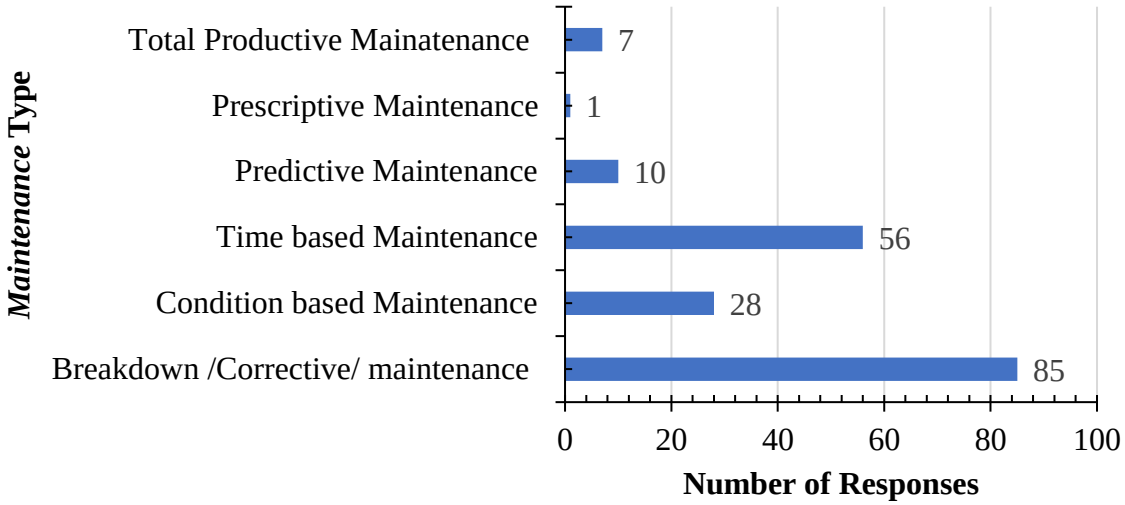


Figure 4. 15:The types of maintenance best practiced in the selected manufacturing firms

Source: Created by the author

As shown in Figure 4.15, a large number of respondents (85) indicated that Breakdown Maintenance is the most commonly employed maintenance strategy in their company, followed by Time Based Maintenance (56), Condition Based Maintenance (28), Predictive Maintenance (10), Total Productive Maintenance (7), and Prescriptive maintenance (1).

The data strongly suggests that Breakdown Maintenance is the dominant strategy among the case companies surveyed. This reactive approach; used by the highest number of respondents (85); far outpaces more proactive or predictive strategies, such as Time-Based (56), Condition-Based (28), Total Productive Maintenance (7), or Prescriptive Maintenance (1).

The overwhelming reliance on Breakdown Maintenance indicates that preventive and predictive strategies are underutilized, potentially pointing to limited technological infrastructure and gaps in strategic maintenance planning. The pattern has implications for equipment downtime and operational inefficiency.

Responses given to the Question "Have you implemented Total Productive Maintenance in your company? "

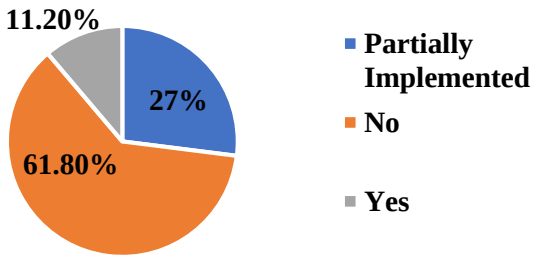


Figure 4. 16: Answers to the question, "Do you believe Total Productive Maintenance is used in your company?" Source: Created by the author

According to Figure 4.16, the majority of respondents (61.8%) believed that TPM was not adopted in their company, 27% believed that it was only partially implemented, and only 11.2% said that TPM had actually been implemented in their organization.

The data clearly shows that Total Productive Maintenance (TPM) is largely absent across the surveyed organizations. With 61.8% of respondents affirming non-adoption and only 11.2% confirming full implementation, it can be concluded that TPM is not a widely embraced strategy among the case companies. This limited uptake of TPM signal lack of awareness or training in TPM principles, possible misalignment between TPM goals and current performance priorities, Constraints in cross-functional collaboration needed to implement TPM effectively within the current business model of the organizations surveyed.

b. Responses to the question "If TPM (Total Productive Maintenance) is not implemented in your organization yet, what were the barriers of TPM implementation in your company?"

Table 4. 26: Critical Barriers of TPM implementation

Category	Critical Barriers of TPM Implementation	Responses		Rank
		Frequency	%	
1. Behavioral	Lack of top management commitment	54	41.86	1
	Employee Resistance	30	23.26	2
	Lack of Clear Vision	19	14.73	3

	Poor Coordination between maintenance and Production	18	13.95	4
	Lack of focus to maintenance activities	8	6.20	5
	Total	129	100.00	
2. Strategic	Poor structure to support TPM initiatives	43	27.56	1
	Ineffective long-term planning	34	21.79	2
	Non-clarity of organizational objectives	34	21.79	3
	Failure to allow sufficient time for evolution	25	16.03	4
	Non clarity of organization policy on TPM	20	12.82	5
	Total	156	100.00	
3. Technical	Lack of training and development	57	24.68	1
	Lack of understanding of TPM concepts and principles	51	22.08	2
	Lack of technical knowledge	49	21.21	3
	Lack of educated workforce	44	19.05	4
	Absence of computerized maintenance management system (CMMS	30	12.99	5
	Total	231	100.00	
4. Human and Cultural	Lack of coordination	45	0.23	1
	Lack of motivation	44	0.23	2
	Inability to change organizational culture	44	0.23	2
	Unwillingness of human resources to adopt TPM	36	0.19	3
	Less empowerment	25	0.13	4
	Total	194	100.00	
5. Operational	Lack of follow up of progress of TPM initiatives	52	30.23	1
	Lack of standard operating procedure	41	23.84	2
	Poor workplace environment	31	18.02	3
	Inadequate use of tools, techniques and methodologies	28	16.28	4
	Absence of preventive maintenance schedule	20	11.63	5
	Total	172	100.00	
6. Financial	Lack of sufficient budget for TPM	50	53.19	1
	Return on investment from TPM is not immediate	27	28.72	2
	TPM is too expensive to implement	17	18.09	3
	Total	94	100.00	

Source: Created by the author

As shown in Table 4.26, the findings underscore that Total Productive Maintenance (TPM) implementation is significantly hindered by multidimensional challenges, predominantly in behavioral, strategic, technical, human and cultural, operational, and financial, supporting the findings of (Chaurey *et al.*, 2023; Khamba, 2008; Panneerselvam, 2012; Tyagi *et al.*, 2009). In addition to this, Critical barriers are ranked under these categories based on the opinions of the respondents which includes: Lack of top management commitment, Poor structure to support TPM initiatives, Lack of training and development, Lack of coordination, Lack of follow up of progress of TPM initiatives, and Lack of sufficient budget for TPM. The most critical barriers; like lack of top management commitment, insufficient training, and poor structural support; reflect organizational and strategic misalignment.

d. Comments in response to the query "If TPM is implemented in your organization, what were the critical Success factors that helped you?"

Table 4. 27: Critical success factors of TPM implementation

S/N	Critical Success factors	Responses		Rank
		Frequency	%	
1	Long-term commitment and support to TPM by senior managers	25	16.56	1
2	Overall employee involvements in TPM implementation Activities	17	11.26	2
3	The Launched 6S(5S+Safety) movement and carried out complete implementation	16	10.60	3
4	Established thoughtful preventive maintenance policies	15	9.93	4
5	The properly Promoted and established team culture	14	9.27	5
6	High involvement willingness of the operators to the maintenance works	13	8.61	6
7	Continuous educational trainings, and cooperate with the carrying out of TPM	10	6.62	7
8	Good maintenance data record or maintenance status	9	5.96	8
9	Full empowerment to the employees	8	5.30	9
10	Acquired consensus of all employees within the company about TPM	8	5.30	10
11	The obtained full understanding on the basic conditions that equipment should possess	8	5.30	11
12	Upgraded maintenance management technologies	8	5.30	12

	Total	151	100	

Source: Created by the author

Table 4.27 shows the ranked critical success factors of TPM implementation. The ranked data highlights that senior management commitment, employee involvement, and full adoption of the 6S (5S + Safety) movement are the most critical success factors for effective Total Productive Maintenance (TPM) implementation. The result supports the finding of (Khamba, 2008; Panneerselvam, 2012; Tyagi *et al.*, 2009).

The key insights from this data shows that TPM thrives where senior managers provide sustained commitment and backing. Moreover, holistic employee engagement ensures that TPM activities are integrated across functional units rather than siloed.

Correlation analysis results

Table 4. 28: Correlations between Pillars of TPM and OEE

	AM	EduT	SHE	OEE	PM	EEM	QM	OTPM	FI
AM									
EduT	.698**								
SHE	.652**	.609**							
OEE	.549**	.583**	.692**						
PM	.440**	.598**	.664**	.606**					
EEM	.507**	.618**	.457**	.572**	.594**				
QM	.569**	.606**	.748**	.741**	.696**	.686**			
OTPM	.363**	.561**	.603**	.564**	.576**	.553**	.661**		
FI	.575**	.670**	.594**	.715**	.670**	.825**	.731**	.620**	

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Created by the author

The association between the TPM pillars and OEE is significant at the 0.01 level for each correlation value (see Table 4.28). The significance level at 0.01 confirms that the correlation

between TPM pillars and OEE is not due to chance, highlighting a robust and reliable relationship. This suggests that OEE will increase as TPM pillar deployment increases and vice versa. Additionally, there is a strong and positive association between the TPM pillars.

4.9.5 Evaluation of measurement model

The first step in PLS-SEM analysis is to evaluate the measurement model. The purpose is to determine how well the items load on the hypothetical-defined construct. The assessment of outer model involves: the examining of reliabilities of the individual items, reliability of each latent variables, internal consistency, convergent validity and discriminant validity (Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, 2017).

Composite reliability, individual indicator reliability, and average variance extracted (AVE) are all used to evaluate the measurement model's internal consistency and convergent validity. Additionally, the Fornell–Larcker criterion and cross-loadings are used to assess discriminant validity.

4.9.5.1 Indicator reliability

According to a common rule of thumb for indicator reliability, a latent variable should explain a significant part, usually at least 50%, of each indicator's variance (Joseph F. Hair et al., 2013). Therefore, the outer loading of an indicator should be more than 0.708, because that value squared $(0.708)^2$ equals 0.50. Except for EduT3 (0.699) all the indicators for the constructs in this work were well above the minimum acceptable level for outer loadings (See Table 4.5).

Table 4. 29: Construct Reliability, Validity, and collinearity Test results

Latent Variable	Indicators	Loadings	Collinearity Statistics (VIF)	Construct Reliability Cronbach's Alpha (α)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Autonomous Maintenance (AM)	AM1	**0.850**	**1.634**	**0.779**	**0.871**	**0.693**
	AM2	**0.850**	**1. 646**			
	AM3	**0.828**	**1. 560**			
Focused Improvement (FI)	FI1	**0.820**	**2.264**	**0.863**	**0.901**	**0.646**
	FI2	**0.836**	**2.450**			
	FI3	**0.778**	**1.923**			
	FI4	**0.8313**	**2.405**			
	FI5	**0.770**	**2.036**			
	EEM1	**0.860**	**2.344**			

Early Equipment Management (EEM)	EEM2	**0.874**	**2.508**	**0.865**	**0.908**	**0.712**
	EEM3	**0.782**	**1. 650**			
	EEM4	**0.857**	**2.155**			
Planned Maintenance (PM)	PM1	**0.747**	**1. 607**	**0.850**	**0.892**	**0.625**
	PM2	**0.838**	**2.454**			
	PM3	**0.851**	**2. 669**			
	PM4	**0.729**	**1.373**			
	PM5	**0.779**	**2.033**			
Quality Maintenance (QM)	QM1	**0.872**	**2. 699**	**0.899**	**0.929**	**0.767**
	QM2	**0.880**	**2.727**			
	QM3	**0.884**	**2.599**			
	QM4	**0.866**	**2.302**			
Office TPM (OTPM)	OTPM1	**0.866**	**2.753**	**0.893**	**0.921**	**0.700**
	OTPM2	**0.790**	**2.132**			
	OTPM3	**0.854**	**2.738**			
	OTPM4	**0.821**	**2.141**			
	OTPM5	**0.852**	**2.787**			
Safety, Health, and Environment (SHE)	SHE1	**0.813**	**1.787**	**0.843**	**0.895**	**0.681**
	SHE2	**0.778**	**1. 639**			
	SHE3	**0.864**	**2.331**			
	SHE4	**0.843**	**2.200**			
Education and Training (EduT)	EduT1	**0.821**	**1.862**	**0.730**	**0.850**	**0.656**
	EduT2	**0.897**	**2.161**			
	EduT3	**0.699**	**1.266**			
Overall Equipment Effectiveness (OEE)	OEE1	**0.908**	**2.827**	**0.900**	**0.938**	**0.834**
	OEE2	**0.951**	4.480			
	OEE3	**0.880**	**2.755**			

Source: Created by the author

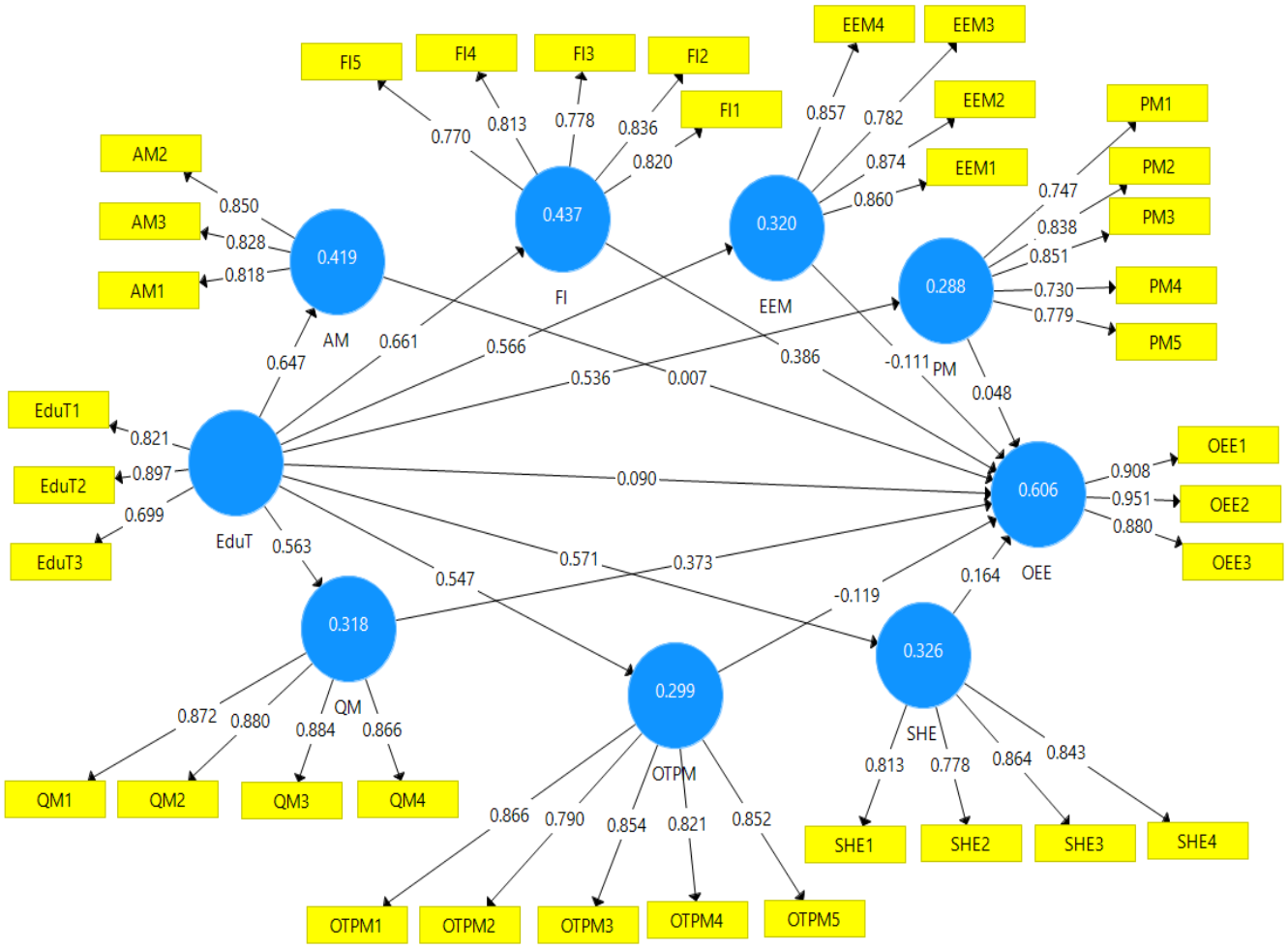


Figure 4. 17: The PLS-SEM Factor loadings, correlations and R^2 values of TPM Pillars and OEE

Source: Created by the author

4.9.5.2 Internal Consistency

The most common measurement used for internal consistency is Cronbach's alpha and composite reliability, in which it measures the reliability based on the interrelationship of the observed items. In PLS-SEM, the values are organized according to their indicator's individual reliability (Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, 2017). The values range from 0 to 1, where a higher value indicates higher reliability level. Cronbach's Alpha and composite reliability value >0.70 is acceptable (Cronbach, 1951; Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, 2017; Jum C. Nunnally, 1978). As shown in Table 4.29. Cronbach's Alpha values for all constructs are >0.70

and the composite reliability (CR) of all variables are >0.70 showing the internal consistency of the measurement items.

4.9.5.3 Convergent Validity

Convergent validity is the assessment to measure the level of correlation of multiple indicators of the same construct that are in agreement. To establish convergent validity, the factor loading of the indicator, composite reliability (CR) and the average variance extracted (AVE) have to be considered (Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, 2017). The value ranges from 0 to 1. AVE value should exceed 0.50, Composite Reliability (CR) and the indicator's outer loadings should be higher than 0.708 so that it is adequate for convergent validity (Ab Hamid et al., 2017; Henseler et al., 2009; Joseph F. Hair et al., 2013). As shown in Table 4.29 all values of AVE are greater than 0.5. The factor loading and Composite Reliability (CR) values are >0.708 showing the convergent validity of the measurement model.

4.9.5.4 Discriminant Validity

Discriminant validity ensures a construct is distinct from others empirically. The Fornell-Larcker criterion, a conservative method, assesses this by comparing the square root of a construct's AVE with its highest correlation with any other construct. The AVE should exceed the squared correlation with other constructs, reinforcing that a construct shares more variance with its indicators than with any other construct (Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, 2017; Joseph F. Hair et al., 2013). As shown in Table 4.30: The diagonal bold values are $\sqrt{AVE}$ and the other values are correlations. The square root of each construct's AVE is greater than its highest correlation with any other construct. Therefore, discriminate validity criteria are fulfilled.

Table 4. 30: Discriminant Validity. The diagonal (bold) values are $\sqrt{\boldsymbol{AVE}}$

	AM	EEM	EduT	FI	OEE	OTPM	PM	QM	SHE
AM	**0.832**								
EEM	0.493	**0.844**							
EduT	0.647	0.567	**0.810**						
FI	0.568	0.803	0.660	**0.804**					
OEE	0.473	0.548	0.547	0.698	**0.913**				
OTPM	0.504	0.551	0.546	0.665	0.500	**0.837**			

PM	0.372	0.584	0.535	0.684	0.603	0.573	**0.790**		
QM	0.524	0.688	0.565	0.754	0.719	0.658	0.704	**0.876**	
SHE	0.550	0.467	0.571	0.634	0.654	0.599	0.684	0.753	**0.825**

Source: Created by the author

4.9.6. Assessment of structural model

The structural model is evaluated by examining at its predictive capabilities as well as the relationships between the constructs. The significance of the path coefficients, level of R^2 values, f^2 effect size, predictive relevance Q^2 are the key criteria for evaluating the structural model in PLS-SEM. According to (Joseph F. Hair et al., 2013) assessment of structural model has five steps including: assessment of structural model for collinearity issues, assessment of the significance and relevance of the structural model relationships using structural model path coefficients, assessment of the level of R^2, assessment of the effect sizes f^2, assessment of the predictive relevance Q^2.

4.9.6.1 Collinearity Assessment

Before conducting the analyses, the structural model must be examined for collinearity. The path coefficients might be biased if the estimation involves significant levels of collinearity among the predictor constructs. If the level of collinearity is extremely high as indicated by a Variance Inflation Factor (VIF) value of 5 or higher, one should consider removing one of the corresponding indicators (Joseph F. Hair et al., 2013). As shown in Table 4.29 all constructs have a VIF value of less than 5 showing there is no collinearity issue. OEE2 has a relatively highest value of VIF (4.480) but still within the limit.

4.9.6.2 Structural Model Path Coefficients

After running the PLS-SEM algorithm, estimates are obtained for the structural model relationships, which represent the hypothesized relationships among the constructs. The bootstrapping result shows that except the two paths (EEM→OEE and OTPM→OEE), all paths have a positive relationship with their dependent variable; however, not all variables are statistically significant (See Figure 4.18 and Table 4.31). As indicated by the bootstrapping results of PLS-SEM in Table 4.31: The direct effect of the 5 pillars of TPM namely AM, EEM, PM,

OTPM, and SHE was not significant. The total indirect effect of EduT pillar on OEE was found to be significant. Moreover, the direct effect of two pillars of TPM namely FI and QM were found to have a significant direct effect on OEE. The hypotheses H2, H5, H8b, H8c, H8d, H8e, H8f, H8g, H8h and H9 were accepted and H1, H3, H4, H6, H7, and H8a were rejected (See Table 4.31).

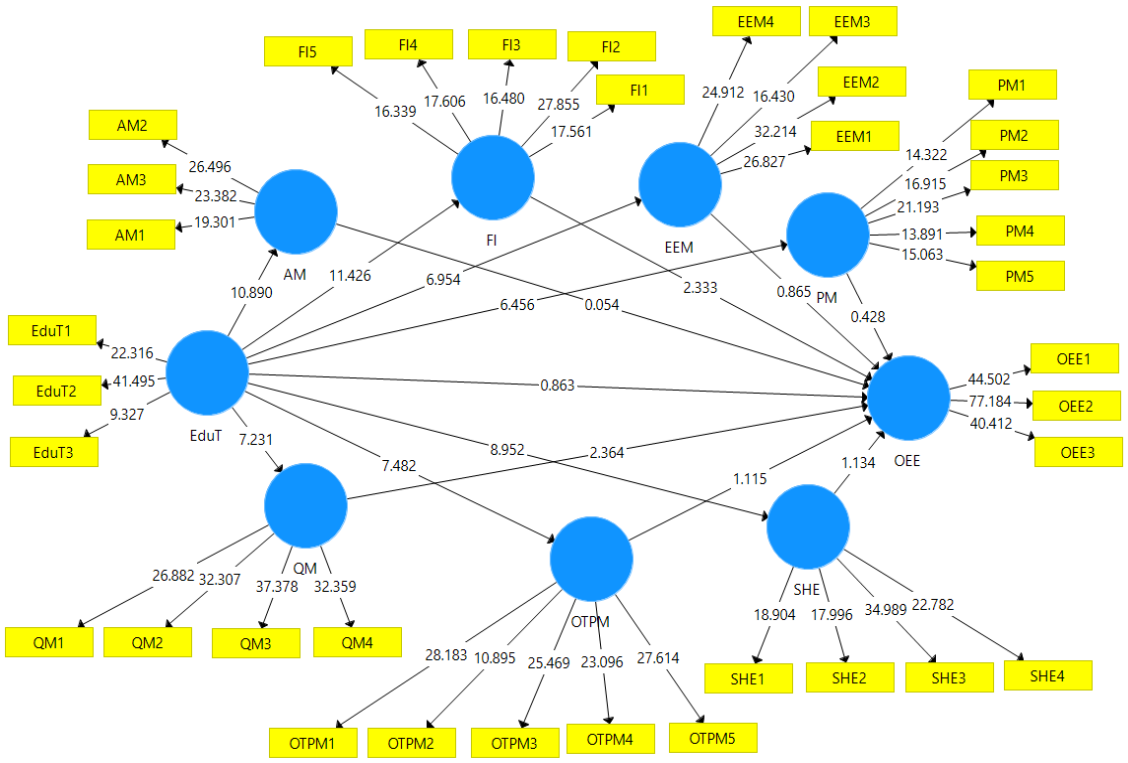


Figure 4. 18: Bootstrapping for TPM Pillars and OEE (t-values)

Source: Created by authors

Table 4. 31: Path analysis result: direct Effects

Hypothesis	Path	Path Coefficient	Standard Deviation	T Statistics	P Values	Decisions
H1	AM→OEE	0.040	0.079	0.501	**0. 616**	Rejected
H2	FI →OEE	0.409	0.154	2. 645	**0.000**	Accepted
H3	EEM→OEE	-0.104	0.128	0.813	**0.416**	Rejected
H4	PM→OEE	0.059	0.107	0.553	**0.580**	Rejected
H5	QM→OEE	0.364	0.153	2.380	**0.017**	Accepted
H6	OTPM→OEE	-0.112	0.104	1.079	**0.281**	Rejected
H7	SHE→OEE	0.174	0.139	1.248	**0.212**	Rejected
H8a	EduT→ OEE	0.090	0.105	0.863	**0.388**	Rejected
H8b	EduT→AM	0.647	0.059	10.953	**0.000**	Accepted
H8c	EduT→EEM	0.567	0.082	6.949	**0.000**	Accepted

H8d	EduT→FI	0. 660	0.058	11.434	**0.000**	Accepted
H8e	EduT→OTPM	0.546	0.074	7.377	**0.000**	Accepted
H8f	EduT→PM	0.535	0.084	6.361	**0.000**	Accepted
H8g	EduT→QM	0.565	0.078	7.214	**0.000**	Accepted
H8h	EduT→SHE	0.571	0.065	8.736	**0.000**	Accepted

Source: Created by the authors

As shown in Table 4.31 the direct effect of EduT on OEE is not significant. Accordingly, hypotheses 8a was rejected. But the total indirect effect of EduT on OEE as mediated by AM, EEM, FI, OTPM, PM, QM, and SHE is positive and significant supporting hypothesis H9 (See Table 4.32).

Table 4. 32: Path analysis result: Total Indirect Effects

Hypothesis	Path	Path Coefficient	Standard Deviation	T Statistics	P Values	Decisions
H9	EduT→OEE	0.512	0.065	7.838	0.000	Accepted

Source: Created by the author

4.9.6.3 Coefficient of Determination (R^2 Value)

The R^2 value ranges from 0 to 1 with higher levels indicating higher levels of predictive accuracy. In general, R^2 values of 0.75, 0.50, or 0.25 for the endogenous constructs can be described as respectively substantial, moderate, and weak (Hair et al., 2021; Henseler et al., 2009; Joseph F. Hair et al., 2013) Table 4.33 shows the R^2 values for all endogenous variables. The TPM pillars collectively explain 60.2% of the variance of OEE, while the remaining 39.8% is explained by some other variable, according to the OEE's significant R^2 value (0.602). Similar to AM, EEM, FI, QM, and SHE all have R^2 values that are near to moderate (0.320, 0.437, 0.318, and 0.326 respectively). The R^2 values for OTPM (0.299) and PM (0.288) are weak. These results demonstrate that the Education and Training (EduT) pillar of TPM may predict differences in 41.9% of AM, 32.20% of EEM, 43.7% of FI, 31.8% of QM, 32.6% of SHE, 29.9% of OTPM, and 28.8% of PM. Other factors are responsible for the remaining percentages for each TPM pillar.

Table 4. 33: R^2 and R^2_adjusted results

Latent Variable	R^2	R^2 Adjusted
AM	0.419	0.412
EEM	0.320	0.315

FI	0.437	0.430
OEE	0.606	0.571
OTPM	0.299	0.290
PM	0.288	0.279
QM	0.318	0.312
SHE	0.326	0.319

Source: Created by the author

4.9.6.4 Effect Size f^2

The change in the R^2 value when a certain exogenous construct is excluded from the model can be used to assess if the excluded construct has a significant impact on the endogenous constructs in addition to analyzing the R^2 values of all endogenous constructs. The f^2 effect size is the name given to this metric. According to guidelines for calculating f^2, values of 0.02, 0.15, and 0.35, respectively, correspond to the minor, medium, and large effects of the exogenous latent variable (Salkind, 2012).

The f^2 values of AM→OEE (0.002), EEM→OEE (0.008), OTPM→OEE (0.016), PM→OEE (0.003) are less than 0.02 showing the small effect of these pillars if we remove them from the model. The f^2 values of QM→OEE (0.086), and SHE→OEE (0.024) shows the variables have medium effect on OEE. The f^2 value of EduT→AM (0.719), EduT→EEM (0.474), EduT→FI (0.772), EduT→OTPM (0.425), EduT→PM (0.402), EduT→QM (0.468), and EduT→ SHE (0.484) shows that EduT will have large effect on the endogenous corresponding variables if removed from the model (See Table 4.34).

Table 4. 34: f^2 values

	AM	EEM	EduT	FI	OEE	OTPM	PM	QM	SHE
AM					0.002				
EEM					0.008				
EduT	0.719	0.474		0.772		0.425	0.402	0.468	0.484
FI					0.097				
OEE									
OTPM					0.016				
PM					0.003				
QM					0.086				
SHE					0.024				

Source: Created by the author

4.9.6.5 Blindfolding and Predictive Relevance Q^2

Researchers should look at Stone-Geisser's Q^2 value in addition to the size of the R^2 values when determining the predictive accuracy (Geisser, 1974). The predictive relevance of the model is indicated by this metric. The external constructs have predictive relevance for the endogenous construct under examination, as indicated by Q^2 values larger than 0. As a relative measure of predictive importance, the values of 0.02, 0.15, and 0.35, respectively, imply that an external construct has a minor, medium, or strong predictive relevance for a certain endogenous construct (Q^2)(Geisser, 1974; Joseph F. Hair et al., 2013). Table 4.35 shows that all variables have medium predictive relevance.

Table 4. 35: Q^2 values

	AM	EEM	EduT	FI	OEE	OTPM	PM	QM	SHE
Q^2	0.274	0.215		0.265	0.474	0.199	0.169	0.236	0.214

Source: Created by the author

The key constructs that are most relevant to explaining the endogenous latent variable(s) in the structural model can be determined by interpreting these findings. As a result, Table 5.35 shows that AM, EEM, FI, OTPM, PM, QM, and SHE have medium relevance to the endogenous variable OEE.

4.10 Summary of Chapter Four

This chapter analyzed Ethiopia's performance and positioning in the global leather market by drawing on trade statistics, comparative advantage indicators, and expert perspectives. Using FAO Stat (2023) and ITC UN COMTRADE (2023) data, this study applies Revealed Comparative Advantage (RCA) and Constant Market Share (CMS) analysis to assess EMF-in-LS comparative advantages and competitiveness in the global leather market.

It also examined key structural constraints and emerging opportunities that highlight the urgent need for business model transformation within Ethiopian manufacturing firms in the leather sector (EMF-in-LS). The analysis reveals a decline in export competitiveness for raw hides and skins, moderate progress in leather articles, and inconsistent performance in footwear exports. These patterns emphasize the strategic importance of adopting innovation, pursuing value addition, and

integrating sustainability principles, core components in the development of a relevant and robust SBMI framework.

Ethiopia demonstrates significant potential in leather sector, supported by its vast livestock population, the largest in Africa and fifth globally. An analysis of Ethiopia's Revealed Comparative Advantage (RCA) in RHS & FL exports places the country ahead of other major exporters. However, this advantage has declined over time. In contrast, Ethiopia's revealed comparative advantage in value-added leather products, such as leather articles, has been strengthening. Meanwhile, its revealed comparative advantage in footwear exports remains inconsistent, experiencing fluctuations over time.

The study shows that the world's import value of RHS & FL is declining, while the import value of articles of leather and footwear is increasing indicating that the global demand in the leather market is shifting to value-added products. The market share analysis result shows Ethiopia's lowest market share in the global leather market as compared to the major players.

Ethiopia holds the lowest market share in the global leather market compared to major international players. CMS analysis from 2013 to 2022 indicates a positive overall change in Ethiopia's leather exports, primarily driven by global export growth. However, the decline in export value is largely attributed to the commodity effect; specifically, reduced exports of raw hides, skins (RHS), and finished leather (FL). The competitiveness effect is also negative, with the most significant losses stemming from footwear exports, followed by RHS & FL. In contrast, leather articles exhibit a positive competitiveness effect. Additionally, EMF-in-LS benefited from gains associated with the regional market effect.

The export destination analysis result shows that EMF-in-LS has captured and uncaptured markets in their export performance. While various factors can influence export performance, tapping into large importing markets is crucial for enhancing EMF-in-LS'S exports. Ethiopian exporting firms should explore opportunities in uncaptured markets globally, as well as within Africa, to maximize their export potential.

This study also uses thematic literature analysis, Porter's Diamond Model, semi structured interviews, and business model analysis using business model canvas tool to identify challenges and prospects in EMF-in-LS. It underscores the need for a robust, sustainable, and innovative

business model that integrates marketing, technology, and environmentally responsible practices. Importantly, environmental sustainability is considered not only as an organizational practice but also as a technological requirement—through cleaner production, better waste treatment, process improvements, circular use of resources, and energy efficiency.

This study identifies recurrent equipment failures caused by outdated machinery and insufficient e-commerce infrastructure as ongoing challenges for EMF-in-LS. These issues align with previous academic research and are confirmed by key informants within the sector. On the other hand, an emerging global digital transformation presents a significant opportunity for EMF-in-LS to enhance their digital platforms and improve their integration into the global market.

Given these critical challenges and opportunities, evaluating the maturity of Total Productive Maintenance (TPM) as a strategy for optimizing Equipment Overall Effectiveness (OEE) and achieving operational excellence is essential. This assessment provides valuable insights that contribute to the development of the SBMI framework, the central focus of this PhD dissertation.

This chapter examined how Total Productive Maintenance (TPM) contributes to improving internal efficiency and fostering innovation readiness in Ethiopian manufacturing firms in the leather sector (EMF-in-LS). It focuses on identifying the TPM pillars that significantly affect Overall Equipment Effectiveness (OEE) and, by extension, the operational performance necessary for effective SBMI implementation. The findings confirm that TPM serves as a key internal enabler of SBMI by improving resource utilization and building firm-level operational capability.

The main result of this study provides evidence to support the case companies' efforts to implement Total Productive Maintenance (TPM). Based on the findings from descriptive statistics and multivariate analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM), the study shows that TPM implementation at EMF-in-LS is still in its early phase. To achieve the level of Overall Equipment Effectiveness (OEE) required for world-class production, more effort is needed.

The study also identifies several challenges in implementing TPM within manufacturing firms. These include: lack of strong support from top management, weak organizational structure, limited training and development, poor coordination, lack of follow-up on TPM progress, and insufficient budget.

On the other hand, the study highlights key factors that contribute to TPM success. These include: long-term support from senior management, active involvement of all employees in TPM activities, full implementation of the 6S (5S + Safety) approach, clear preventive maintenance policies, and the promotion of teamwork within the organization.

Regarding the implementation of the eight TPM pillars and their effect on OEE Only three pillars namely: Focused Improvement (FI), Quality Maintenance (QM), and Education and Training (EduT) have significant effect on Overall Equipment Effectiveness of the selected companies. The other five TPM pillars including Autonomous maintenance (AM), Early Equipment Management (EEM), Planned Maintenance (PM), Office TPM (OTPM), and Safety, Health and Environment (SHE) had no appreciable impact on OEE. Although education and training have a small direct impact on OEE, it has a considerable indirect impact on OEE through the mediation of AM, FI, PM, EEM, QM, SHE, and OTPM. The fact that OEE's R^2=0.606 indicates that the total effect of TPM pillars accounts for 60.6% of OEE's explanation, with other variables accounting for the remaining 39.4%.

This study provides useful insights for developing the SBMI framework specifically designed for EMF-in-LS, which is the main goal of this PhD research by examining TPM practices, the critical success factors, and the barriers to TPM implementation within the context of EMF-in-LS.

By linking sectoral competitiveness patterns with firm-level operational capabilities, this chapter establishes the empirical foundation upon which the Sustainable Business Model Innovation (SBMI) framework is built, demonstrating its importance as a bridge between external market positioning and internal innovation readiness.

Although this chapter primarily examines the competitiveness of the Ethiopian leather sector through RCA, CMS, and Porter’s Diamond model, these findings are interpreted within the broader framework of Sustainable Business Model Innovation (SBMI). The sectoral challenges and opportunities identified here represent the contextual foundations upon which SBMI capabilities must be developed.

The analysis of TPM practices highlights operational excellence gaps. Within the SBMI lens, these gaps are not merely technical inefficiencies but barriers to building sustainable innovation capabilities that can enhance global competitiveness.

Thus, the competitiveness analysis in this chapter provides the empirical grounding for SBMI by identifying the structural and operational conditions that the framework must address in order to enable Ethiopian leather firms to compete internationally.

The originality of this study lies in its detailed analysis of the relationship between TPM pillars and Overall Equipment Effectiveness (OEE) in manufacturing firms, with a special focus on EMF-in-LS. It presents a new conceptual model that is significantly different from those used in previous studies and empirically tested.

This research fills gaps in previous studies by providing valuable data on the key success factors and challenges associated with TPM implementation. It further evaluates the extent to which each TPM pillar is effectively applied, highlighting both strong and weak areas within the EMF-in-LS context.

Total Productive Maintenance (TPM) is not a quick fix. It necessitates a change in both the company's and employee's attitude, and their values. Bringing about this change requires time, long-term planning, the dedication of top managers, as well as education and training. The management of the organizations should focus on:

- Eliminating the barriers of TPM implementation.
- Taping to critical success factors and facilitation of the implementation of the weak pillars.
- Maintaining and improving TPM pillars that have good implementation.
- Identifying the skill gaps and filling the gap through appropriate Education and Training programs.

While this chapter addressed internal operational capabilities, the next chapter shifts focus to external market factors; specifically, the behavioral patterns of Ethiopian consumers engaging with digital platforms, which can signal new channels for sustainable business model innovation tailored to EMF-in-LS.

Chapter 5

Empirical Study II: Understanding determinants of Ethiopian Consumers' Purchase Behavior within the Emerging Digital Business Model platforms

5.1 Introduction

While Chapter 4 examined internal production efficiencies, this chapter extends the lens to external market dynamics; specifically, the evolving digital purchasing behaviors of Ethiopian consumers. Understanding these behavioral drivers is vital for identifying emerging demand-side opportunities that leather manufacturers can integrate into their business model innovation strategies. By analyzing consumer behavior in digital marketplaces, this chapter provides critical demand-side insights that complement the supply-side findings of Chapter 4, thereby establishing a balanced foundation for the Sustainable Business Model Innovation (SBMI) framework.

As outlined in Chapter 4, Ethiopian manufacturing firms within the leather sector (EMF-in-LS) face significant challenges related to their limited online presence and weak international market integration, primarily due to underdeveloped e-commerce infrastructure. Effectively engaging potential online consumers necessitates a comprehensive understanding of the factors influencing Ethiopian consumers' purchase intentions on digital platforms.

Being a global platform for communication, the Internet is quickly evolving into a cutting-edge tool for promoting goods and services (Dwivedi *et al.*, 2021). Due to the increasing usage of technology and the Internet worldwide, online shopping is gaining popularity (Ofori & Appiah-Nimo, 2019). Over the past few decades, digital technology has emerged as the most transformative and disruptive force in all businesses and economies (Sewpersadh, 2023) (Hanna, 2020). Online digital market platforms offer significant advantages over traditional methods by enabling consumers to shop anytime, anywhere, within a global economy (Ofori & Appiah-Nimo, 2019).

Ethiopia is part of a broader global trend where consumers are rapidly adopting online marketplace platforms. For organizations currently investing in or planning to enter the online retail sector, understanding the key factors that influence consumer purchasing behavior is essential. This knowledge enables the development of targeted marketing strategies that effectively convert potential buyers into loyal customers while maintaining existing ones. On a global scale, businesses can improve their chances of success in the online market by gaining deeper insights into consumer preferences before launching their digital platforms.

Existing literature has predominantly focused on identifying the factors influencing online repurchase intentions among consumers in industrialized nations. However, research examining online shopping behaviors in developing countries remains scarce. To fully leverage Ethiopia's growing online market, firms must first develop a comprehensive understanding of Ethiopian consumers' preferences and decision-making processes. The scarcity of published studies on the key determinants of online purchase intention within this consumer segment highlights a significant conceptual gap in the literature, necessitating further exploration of the critical factors shaping their online shopping behaviors.

This study aims to fill the conceptual gap in the context of online market platform purchasing intention determinant variables by identifying the key factors influencing the technology-friendly Ethiopian consumers’ desire to purchase on online digital market platforms. The results of this study pave the road for practitioners and scholars to comprehend the critical factors that influence Ethiopian customers' desire to make a purchase on an online digital market platform.

This study investigated the determinant variables of Ethiopian consumers’ online purchase intention using a conceptual framework formulated based on the Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), and literature review.

The primary study technique used to collect relevant data was a close-ended 5-point Likert scale questionnaire. With the use of SPSS version 23 and Smart PLS version 3.0 software, the data were examined using descriptive statistics and the inferential Partial Least Square Structural Equation Modeling (PLS-SEM) technique. This study is guided by Research Question 2:

What factors shape Ethiopian consumers' purchase intentions on digital business model platforms, and how can these platforms support sustainable market growth for EMF-in-LS?

The findings advance this PhD dissertation's broader aim of developing sustainable business model innovation (SBMI) framework, offering actionable insights for market expansion through digitally driven strategies.

5.2 Hypotheses and conceptual model development

In this section, a detailed and comprehensive presentation of the related concepts, hypotheses, and the conceptual framework of this study is thoroughly presented.

5.2.1 Perceived Usefulness (PU)

Perceived usefulness, as defined by Fred Davis (Davis, 1989) refers to an individual's belief that using a particular system enhances job performance. In the context of online shopping, it influences behavioral intention, as users tend to adopt technologies, they find beneficial.

Studies (Aziz and Wahid, 2018) (Dewi *et al.*, 2020) (Nguyen *et al.*, 2022) consistently show that perceived usefulness (PU) significantly impacts online shopping behaviors, including purchase intentions, repurchase decisions, and consumer attitudes. (Davis, 1989) further demonstrated that usability and usefulness are key to customer retention.

Based on the Technology Acceptance Model (TAM) and supporting literature, the hypothesis proposed is:

H1: Perceived usefulness positively and significantly affects the online purchase intention of Ethiopian consumers.

5.2.2 Perceived Ease of Use (PEOU)

Perceived ease of use (PEOU), as described by (Davis, 1989), refers to how effortless a system is to use, influencing users' adoption of technology. In online shopping, consumers are more likely to purchase if they find the process simple and intuitive.

Davis established that PEOU impacts perceived usefulness (PU), which has been supported by various studies (Venkatesh and Davis, 2000)(Athapaththu and Kulathunga, 2018; Celik, 2014). Users tend to choose technologies that are easy to navigate, leading to greater utility. Further research (Aziz and Wahid, 2018) (Dewi *et al.*, 2020) (Nguyen *et al.*, 2022) confirms that PEOU significantly affects online purchase intention and has a strong correlation with PU.

Based on the Technology Acceptance Model (TAM) and empirical evidence, the following hypotheses are proposed:

H2: PEOU has a positive and significant effect on the online purchase intention of Ethiopian consumers.
H3: PEOU has a positive and significant effect on PU.

5.2.3 Subjective Norms (SN)

Subjective norms refer to the social pressures individuals experience from peers, family, and society regarding their behavior (Ajzen, 1991) (Woraphiphat and Roopsuwankun, 2023). According to the theory of planned behavior, subjective norms influence behavioral intention.

Studies (Dewi *et al.*, 2020) (Al-Masaeed *et al.*, 2021) (Nguyen *et al.*, 2022) confirm a significant relationship between subjective norms and online shopping behavior, including purchase intention and continued e-shopping engagement.

Based on empirical findings and the theory of planned behavior, the following hypotheses are proposed:

H4: Subjective norms positively and significantly affect the online purchase intentions of Ethiopian consumers.
H5: Subjective norms affect PU.

5.2.4 Trust

Trust is a fundamental element in commerce, especially in online marketplaces where transactions occur between buyers and sellers who have never met. It ensures smooth operations and long-term engagement. A lack of trust is a major reason consumers hesitate to make online purchases.

Researches (Santo and Marques, 2022) (García-Salirrosas *et al.*, 2022) (Jadil *et al.*, 2022) (Alvarez-Risco *et al.*, 2022) confirm that trust significantly influences online purchase intention, repurchase behavior, and perceived usefulness. Based on these findings, the following hypotheses are proposed:

H6: Trust positively and significantly affects Ethiopian consumers' online purchase intention.
H7: Trust has a positive and significant effect on PEOU.
H8: Trust has a positive and significant effect on PU.

5.2.5 Website (Platform) Design

A high-quality website, as the primary communication channel between online service providers and consumers, can enhance customer satisfaction and convert browsers into buyer. According to a study by (Afshardost, 2013), the point of view of customers about website quality is based on features in a website that meet customers' needs, and requirements, and attracted to the total excellence of that website.

Website design refers to the qualities and appearance of a website that fulfill and meet the expectations of online consumers (Hasanov and Khalid, 2015; Saoula *et al.*, 2023). The effect of site quality on PEOU is positive and significant (Al-Maghrabi and Dennis, 2011a; Yoo *et al.*, 2023, 2023). Based on the empirical evidence in the literature the following hypotheses have been formulated.

H9: Website Design has a positive and significant impact on Ethiopian consumers' perceived usefulness of the online platforms.
H10: Website Design has a positive and significant impact on Ethiopian consumers' perceived ease of usefulness of online platforms.

5.2.6 Online Purchase Intention (PI)

Purchase intention is a state that exists between a consumer and a seller when the customer is ready to enter into a transaction with the seller (Al-Adwan *et al.*, 2022; Zaheer *et al.*, 2024). Purchase

intention is described as a consumer's desire to purchase an item or service because the shopper has an intention to locate a certain item or benefit or has a favorable attitude toward, or even a favorable opinion of the product or service (Peña-García *et al.*, 2020). The purchase intention of the online shopper is the final stage, after various prompts of the online shopper (Athapaththu and Kulathunga, 2018). According to (Indiani and Fahik, 2020), the final stage of online transactions is the intention to use a website and purchase a product. As a result, online purchase intent is critical in determining online customer behavior.

5.2.7 Conceptual framework

Figure 5.1 depicts the conceptual research model created in this study. Based on prior literature, the theory of Technology Acceptance Model (TAM), and the Theory of Planned Behavior (TPB), this model hypothesized that consumers' online market platform Purchase Intention (PI) is influenced by Website Design (WD), Trust (TR), Subjective Norms (SN), Perceived Usefulness (PU), and Perceived Ease of Use (PEOU). In analyzing the link between dependent and independent factors, the dependent variable is Purchase Intention (PI) on the online platform, while the independent variables are WD, TR, SN, PU, and PEOU. Furthermore, WD and TR are exogenous factors, but SN, PU, and PEOU act as both endogenous and exogenous (See Figure 5.1).

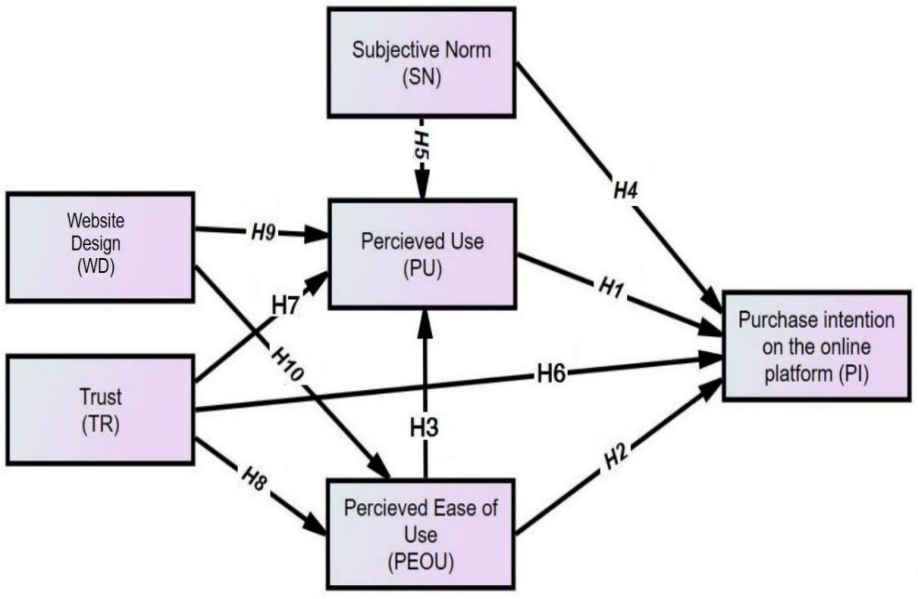


Figure 5. 1: Research conceptual framework

Source: The author

5.3 Descriptive statistics results

Table 5. 1: Profile of respondents

Profile		Number of Respondents	% of Respondents
Gender	Male	76	76.0
	Female	24	24.0
Sub-Total		***100***	***100.0***
Age	20-25	96	96.0
	26-30	3	3.0
	31-35	1	1.0
Sub-Total		***100***	***10.0***

As indicated in Table 5.1, the majority of respondents, 76 (76.0 %), were males, with the remaining 24 (24.0 %) females. The majority of respondents, 96 (96.0 %), were between the ages of 20 and 25, 3 (3.0 %) were between the ages of 26 and 30, and the remaining 1 (1.0 %) were between the ages of 31 and 35.

Table 5. 2: Descriptive Statistics ((N, Minimum, Maximum, Mean, Standard Deviation)

Variable	N	Minimum	Maximum	Mean	Std. Deviation
PU	100	1.00	5.00	4.3840	.59352
SN	100	2.33	5.00	3.8456	.60197
PEOU	100	2.22	5.00	3.7478	.61141
WD	100	2.60	5.00	4.1250	.58247
PI	100	3.00	5.00	4.0673	.53986
TR	100	2.10	5.00	3.9880	.54741
Valid N (listwise)	100				

As demonstrated in Table 5.2, the mean values for all variables are greater than the five-point Likert scale's midpoint of 3 and have modest standard deviations. This demonstrates the

respondents' high degree of agreement on the factors of consumers' purchase intention from online digital market platforms.

Table 5. 3: Correlations

		PU	SN	PEOU	WD	PI	TR
PU	Pearson Correlation						
	Sig. (2-tailed)						
	N						
SN	Pearson Correlation	.403**					
	Sig. (2-tailed)	.000					
	N	100					
PEOU	Pearson Correlation	.367**	.375**				
	Sig. (2-tailed)	.000	.000				
	N	100	100				
WD	Pearson Correlation	.403**	.287**	.463**			
	Sig. (2-tailed)	.000	.004	.000			
	N	100	100	100			
PI	Pearson Correlation	.508**	.575**	.669**	.395**		
	Sig. (2-tailed)	.000	.000	.000	.000		
	N	100	100	100	100		
TR	Pearson Correlation	.370**	.357**	.678**	.488**	.643**	
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	100	100	100	100	100	

**. Correlation is significant at the 0.01 level (2-tailed).

Table 5.3 shows that all of the correlations between the determinant factors and the consumers' online digital market platform purchase intention are significant at 0.01 level. This demonstrates that the determinant characteristics are effective predictors of consumers' online purchasing intentions.

5.4 Evaluation of measurement model

To assess the measurement model's internal consistency and convergent validity; composite reliability, individual indicator reliability, and Average Variance Extracted (AVE) were all employed. To measure discriminant validity, the Fornell-Larcker criteria and cross-loadings were utilized.

5.4.1 Indicator reliability

According to a common rule of thumb for indicator reliability, a latent variable should explain a significant part, usually at least 50%, of each indicator's variance (Joseph F. Hair et al., 2013). Therefore, the outer loading of an indicator should be more than 0.708, because that value squared $(0.708)^2$ equals 0.50. As shown in Table 5.4 Except for WD5 (0.657), TR1 (0.672), TR2 (0.651), SN5 (0.609), and SN6 (0.614) all the indicators for the constructs in this model were well above the minimum acceptable level for outer loadings.

Table 5. 4: Construct Reliability, Validity, and collinearity test result

Latent Variable	Indicators	Factor Loadings	Collinearity Statistics (VIF)	Construct Reliability Cronbach's Alpha (α)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Website Design	WD1	**0.778**	**1.654**	**0.841**	**0.887**	**0.613**
	WD3	**0.804**	**2.342**			
	WD4	**0.786**	**2.048**			
	WD5	**0.657**	**1.402**			
	WD6	**0.875**	**2.510**			
Perceived Usefulness	PU1	**0.792**	**2.653**	**0.920**	**0.924**	**0.668**
	PU3	**0.808**	**2.369**			
	PU4	**0.816**	**2.223**			
	PU5	**0.875**	**2.790**			
	PU6	**0.806**	**2.360**			
	PU7	**0.807**	**1.899**			
Perceived Ease of Use	PEOU2	**0712**	**1.656**	**0.824**	**0.876**	**0.586**
	PEOU3	**0.740**	**1.659**			
	PEOU6	**0.771**	**1.851**			
	PEOU7	**0.836**	**2.119**			
	PEOU8	**0.764**	**1.758**			
Trust	TR1	**0.672**	**1.216**	**0.815**	**0.870**	**0.575**
	TR2	**0.651**	**1.426**			
	TR3	**0.810**	**2.170**			
	TR4	**0.810**	**2.161**			
	TR5	**0.828**	**2.425**			
Subjective Norms	SN1	**0.706**	**1.942**	**0.768**	**0.840**	**0.516**

	SN2	0.779	2.100			
	SN3	0.852	2.122			
	SN5	0.609	2.628			
	SN6	0.614	3.110			
Purchase Intention	PI1	0.807	1.849	0.824	0.876	0.586
	PI2	0.801	1.816			
	PI3	0.813	1.960			
	PI5	0.741	1.706			
	PI6	0.760	1. 681			

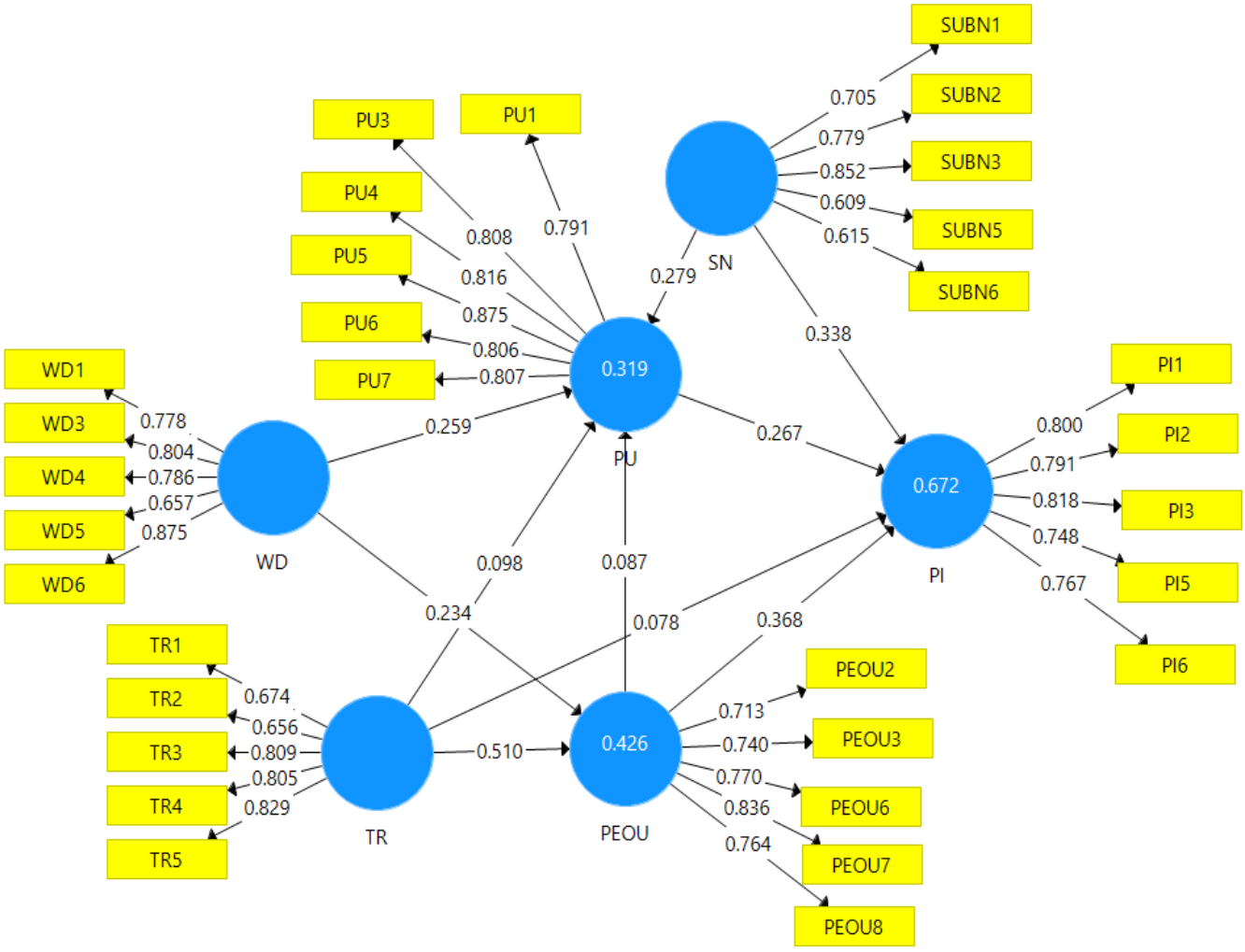


Figure 5. 2: PLS-SEM factor loadings, path coefficients, and R^2 values

Source: The author

5.4.2 Internal Consistency

The most common measurement used for internal consistency is Cronbach's alpha and composite reliability, which measures the reliability based on the interrelationship of the observed items variables. Cronbach's alpha and composite reliability value > 0.70 is acceptable(Cronbach, 1951; Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, 2017; Jum C. Nunnally, 1978).

As shown in Table 5.4, Cronbach's Alpha values for all constructs are > 0.70 and the composite reliability (CR) of all variables are > 0.70 showing the internal consistency of the measurement items.

5.4.3 Convergent Validity

To establish convergent validity, the factor loading of the indicator, composite reliability (CR), and the Average Variance Extracted (AVE) have to be considered (Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, 2017). The value ranges from 0 to 1. AVE value should exceed 0.50, Composite Reliability (CR) and the indicator's outer loadings should be higher than 0.708 so that it is adequate for convergent validity (Ab Hamid et al., 2017; Henseler et al., 2009; Joseph F. Hair et al., 2013). As shown in Table 5.4, the values of AVE are greater than 0.5. The factor loading and Composite Reliability (CR) values are >0.708 showing the convergent validity of the measurement model.

5.4.4 Discriminant Validity

The Fornell-Larcker criterion is a conservative approach to assessing discriminant validity. It compares the square root of the AVE values with the latent variable correlations. Specifically, the square root of each construct's AVE should be greater than its highest correlation with any other construct. This criterion can also be stated as the AVE should exceed the squared correlation with any other construct. The logic of this method is based on the idea that a construct shares more variance with its associated indicators than with any other construct (Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, 2017; Joseph F. Hair et al., 2013). As shown in Table 5.5, the diagonal bold values are $\sqrt{AVE}$ and the other values are correlations. The square root of each construct's AVE is greater than its highest correlation with any other construct. Therefore, discriminant validity criteria are fulfilled.

Table 5. 5: Discriminant Validity. The diagonal (bold) values are $\sqrt{\mathbf{AVE}}$

	PEOU	PI	PU	SN	TR	WD
PEOU	**0.766**					
PI	0.671	**0.785**				
PU	0.394	0.603	**0.818**			
SN	0.444	0.661	0.461	**0.718**		
TR	0.620	0.556	0.396	0.444	**0.758**	
WD	0.471	0.456	0.452	0.384	0.469	**0.783**

5.5 Assessment of structural model

The structural model is evaluated by examining its predictive capabilities as well as the relationships between the constructs. The significance of the path coefficients, level of R^2 values, f^2 effect size, predictive relevance, and Q^2 effect size are the key criteria for evaluating the structural model in PLS-SEM. According to (Joseph F. Hair et al., 2013) assessment of a structural model has five steps including the assessment of the structural model for collinearity issues, the assessment of the significance and relevance of the structural model relationships using structural model path coefficients, the assessment of the level of R^2, the assessment of the effect sizes f^2, the assessment of the predictive relevance Q^2.

5.5.1 Collinearity assessment

Before conducting the analyses, the structural model must be examined for collinearity. If the level of collinearity is extremely high as indicated by a Variance Inflation Factor (VIF) value of 5 or higher, one should consider removing one of the corresponding indicators (Joseph F. Hair et al., 2013). As shown in Table 5.4 all constructs have a VIF value of less than 5 showing there is no collinearity issue. SN6 has a relatively highest value of VIF (3.11) but is still within the limit.

5.5.2 Structural model path coefficients

The PLS-SEM algorithm estimates path coefficients, representing hypothesized relationships between constructs. These standardized coefficients range from -1 to +1, with values near +1 indicating strong positive relationships, while values close to 0 suggest weak or insignificant effects (Joseph F. Hair et al., 2013). Statistical significance depends on the standard error obtained through bootstrapping, with a critical value of 1.96 (significance level = 5%) used in this study.

Path analysis results indicate that all variables have positive relationships with their dependent variables, though not all are statistically significant. Based on bootstrapping, the direct effects of PU, PEOU, and SN on PI are significant, while TR's effect on PI is not. PEOU and TR have insignificant effects on PU, while SN and WD significantly influence PU. TR and WD also significantly affect PEOU (See Table 5.6).

Hypotheses H1, H2, H4, H5, H8, H9, and H10 are supported, whereas H3, H6, and H7 are not.

Table 5. 6: Path analysis result: Direct Effects

Hypothesis	Path	Path coefficient	t-statistics	p-values	Remark
H1	PU→PI	0.282	3.569	**0.000**	Accepted
H2	PEOU→PI	0.403	5.065	**0.000**	Accepted
H3	PEOU→PU	0.089	0.983	0.326	Rejected
H4	SN→PI	0.352	4.467	**0.000**	Accepted
H5	SN→PU	0.280	2.925	**0.004**	Accepted
H6	TR→PI	0.078	0.716	0.474	Rejected
H7	TR→PU	0.095	0.879	0.380	Rejected
H8	TR→PEOU	0.512	4.589	**0.000**	Accepted
H9	WD→PU	0.258	2.627	**0.009**	Accepted
H10	WD→PEOU	0.232	2.325	**0.020**	Accepted

As shown in Table 5.6 except H3(PEOU→PU, p=0.326), H6(TR→PI, p=0.474), and H7 (TR→PU, p=0.380) all the variables have a positive and significant direct effect on consumers' purchase intention supporting 7 of the 10 hypotheses H1, H2, H4, H5, H8, H9, and H10.

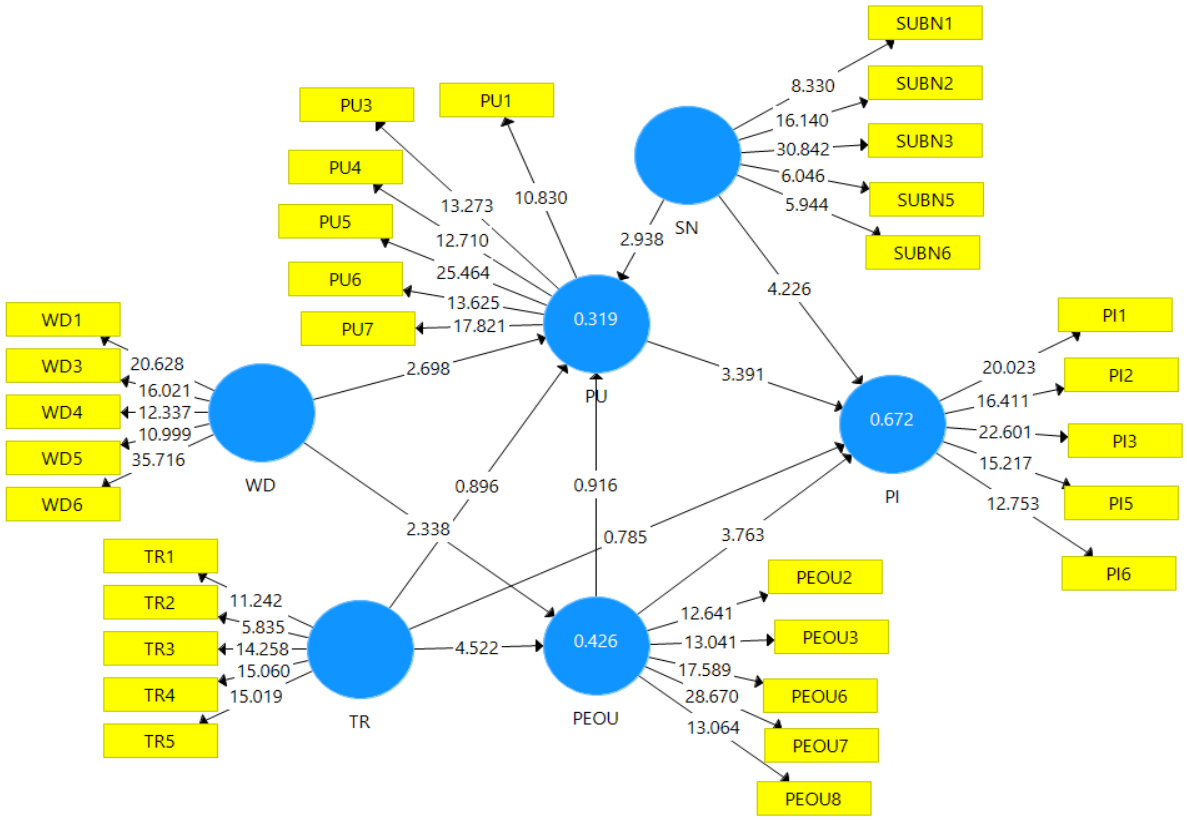


Figure 5. 3: Bootstrapping result for Determinants variables and consumers' online digital market platform purchase intention (t-values), path coefficients, and R^2 values.

Table 5. 7: Path Analysis result: Total Effects

Total Effect	t-statistics	p-values	Remark
PU on PI	3.236	**0.000**	Significant
PEOU on PI	3.750	**0.000**	Significant
PEOU on PU	0.928	0.354	Not Significant
SN on PI	4.865	**0.000**	Significant
SN on PU	2.780	**0.006**	Significant
TR on PI	2.587	**0.010**	Significant
TR on PU	1.089	0.277	Not Significant
TR on PEOU	4.286	**0.000**	Significant
WD on PU	2.815	**0.005**	Significant
WD on PEOU	2.298	**0.022**	Significant
WD on PI	2.831	**0.005**	Significant

As shown in Table 5.7, except for the total effects of PEOU on PU (p=0.354) and TR on PU (p=0.277) which are not significant, all the other total effects are significant.

Table 5. 8: Path analysis results, Total indirect effect

Path	t-statistics	p-values	Remark
PEOU→PU→PI	0.820	**0.413**	Insignificant effect
SN→PU→PI	1.899	**0.058**	Insignificant effect
TR→PEOU→PI, TR→PEOU→PU→PI, TR→PU→PI	3.00	**0.003**	Significant effect
TR→PEOU→PU	0.813	0.417	Insignificant effect
WD→PEOU→PI, WD→PU→PI	2.831	**0.005**	Significant
WD→PEOU→PU	0.859	**0.391**	Insignificant effect

As shown in Table 5.8 the variables that have a positive and significant total indirect effect on consumers' online digital market platform purchase intention are only Trust (TR) and Website design (WD).

Table 5. 9: Special indirect effects

Path	t-statistics	p-values	Remark
WD→PEOU→PI	1.883	**0.060**	Insignificant
SN→PU→PI	1.899	0.058	Insignificant
TR→PEOU→PU	0.813	**0.417**	Insignificant
TR→PU→PI	0.589	**0.556**	Insignificant
WD→PEOU→PU	0.859	**0.391**	Insignificant
WD→PU→PI	2.454	**0.014**	Significant
TR→PEOU→PI	3.275	**0.001**	Significant
PEOU→PU→PI	0.820	0.413	Insignificant
WD→PEOU→PU→PI	0.746	**0.456**	Insignificant
TR→PEOU→PU→PI	0.726	**0.468**	Insignificant

As shown in Table 5.9, among the variables only Website Design (WD) and Trust (TR) have positive and significant special indirect effects on consumer's online purchase intention as mediated by Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) respectively.

5.5.3 Coefficient of Determination (R^2 Value)

The R^2 value ranges from 0 to 1 with higher levels indicating higher levels of predictive accuracy. In general, R^2 values of 0.75, 0.50, or 0.25 for the endogenous constructs can be described as

respectively substantial, moderate, and weak (Hair et al., 2021; Henseler et al., 2009; Joseph F. Hair et al., 2013). Table 5.10 shows the R^2 values for all endogenous variables. The Purchase Intention (PI) has a substantial R^2 value (0.676) that is 67.6 % of the variance of PI is predicted by the cumulative effect of exogenous variables and the remaining 32.4 % is explained by some other unknown variables. Similarly; PEOU (0.426), PU (0.317) have close to moderate R^2 values.

Table 5. 10: R^2 and R^2 adjusted results

Latent Variable	R^2	R^2 Adjusted
PEOU	0.426	0.414
PI	0.676	0.662
PU	0.317	0.288

5.5.4 Effect size f^2

Guidelines for assessing f^2 are those values of 0.02, 0.15, and 0.35, respectively, representing small, medium, and large effects (Salkind, 2012) of the exogenous latent variable.

As shown in Table 5.11 if they will be removed from the model: the f^2 values of PEOU→PI (0.234), PU→PI (0.155), SN→PI (0.237), and TR→PEOU (0.356) will have a large effect; the f^2 values of SN→PU (0.083), WD→PEOU (0.075), and WD→PU (0.070) will have a medium effect, and the f^2 values of PEOU→PU (0.006), TR→PI (0.011), and TR→PU (0.008) will have a small effect on the endogenous corresponding variables.

Table 5. 11: f^2 values

	PEOU	PI	PU	SN	TR	WD
PEOU		0.234	0.006			
PI						
PU		0.155				
SN		0.237	0.083			

TR	0.356	0.011	0.008
WD	0.075		0.070

5.5.5 Blindfolding and Predictive Relevance Q^2

The Q^2 values that are greater than 0 indicate that the exogenous constructs have predictive relevance for the endogenous construct under consideration. The values of 0.02, 0.15, and 0.35, respectively, imply that an exogenous construct has a small, medium, or large predictive relevance for a given endogenous construct as a relative measure of predictive relevance (Q^2)(Geisser, 1974)(Joseph F. Hair et al., 2013).

Table 5. 12: Q^2 values

PEOU	0.234
PI	0.398
PU	0.180
SN	
TR	
WD	

As shown in Table 5.12, the study identifies key constructs influencing Ethiopian consumers' online shopping behaviors. PI (0.398) and PEOU (0.234) have high relevance, while PU (0.180) has medium relevance.

Using TAM and TPB, the study confirms that PU, PEOU, and SN significantly shape online purchase intention. Additionally, WD and TR have significant indirect effects on PI.

The study revealed two unexpected findings. First, trust was hypothesized to directly influence Ethiopian consumers' online purchase intention but was found insignificant, contrary to prior studies (Alvarez-Risco *et al.*, 2022; García-Salirrosas *et al.*, 2022; Santo and Marques, 2022). However, its total indirect effect was significant.

Second, the direct impact of PEOU on PU was found insignificant, differing from studies by (Nguyen Thi *et al.*, 2022) (Moslehpour *et al.*, 2018). This may be due to young, tech-savvy consumers prioritizing innovation over trust and complexity, warranting further investigation.

According to the path analysis result the direct effect of trust on perceived usefulness was found insignificant against the research result of (Al-Maghrabi & Dennis, 2011). The direct effect of Perceived Usefulness on Purchase Intention, PU→PI (β=0.282, p=0.000) was significant in line with TAM and the findings of (Al-Debei et al., 2015) (Dewi et al., 2020) (Al-Maghrabi & Dennis, 2011) (Oly Ndubisi et al., 2011) (Aziz & Wahid, 2018) (Nguyen et al., 2022) (Moslehpour et al., 2018). The direct effect of Perceived Ease of Use on Purchase Intention, PEOU→PI (β=0.403, p=0.000) is significant and positive complementing TAM and the study of (Dewi *et al.*, 2020) (Aziz and Wahid, 2018) (Nguyen *et al.*, 2022) (Moslehpour *et al.*, 2018). The direct effect of Subjective Norms on Purchase Intention, SN→PI (β=0.352, p=0.000) was significantly positive supporting TPB and the findings of (Dewi *et al.*, 2020) (Al-Masaeed *et al.*, 2021) (Nguyen *et al.*, 2022). The direct effect of Subjective Norms on Perceived Usefulness, SN→PU (β=0.280, p=0.004) was positive and significant. The direct effect of Trust on Perceived Ease of Use, TR→PEOU (β=0.512, p=0.000) was positively significant. The direct effect of Website Design on Perceived Usefulness, WD→PU (β=0.258, p=0.009) was also significant in support to the finding of (Al-Maghrabi & Dennis, 2011). The effect of Website Design on Perceived Ease of Usefulness, WD→PEOU (β=0.232, p=0.020) was positive and significant complementing the result of the study by (Al-Maghrabi & Dennis, 2011).

Refereeing the direct effect of determinant variables on consumers' purchase intention from Table 5.6, the effect of Perceived Ease of Usefulness on Purchase Intention, PEOU→PI (β=0.403, p=0.000) was found to be the most significant followed by the effect of Subjective Norms on Purchase Intention, SN→PI (β=0.352, p=0.000) and the effect of Perceived Usefulness on Purchase Intention, PU→PI (β=0.282, p=0.000) consecutively.

Among the 10 hypotheses made in the research framework, the results supported 7 (H1, H2, H4, H5, H8, H9, and H10) hypotheses and rejected 3 (H3, H6, and H7) (See Table 5.6). The most commonly used measure to evaluate the structural model is the coefficient of determination (R^2 value). R^2 values of 0.75, 0.50, or 0.25 for the endogenous constructs can be described as

respectively substantial, moderate, and weak (Joseph F. Hair et al., 2013)(Hair et al., 2021; Henseler et al., 2009). Table 5.10 shows the R^2 values for all endogenous variables. Referring to the table, the Purchase Intention (PI) has a substantial R^2 value (0.676) that is 67.6 % of the variance of PI is predicted by the cumulative effect of exogenous variables in the developed structural model and the remaining 32.4 % is explained by some other unknown variables. Similarly; PEOU (0.426) and PU (0.317) have close to moderate R^2 values.

This study indicated that Ease of use, peer influence, and usefulness are key to driving online purchases. Trust and website design play important indirect roles by improving perceptions of usability. Therefore, marketers and developers should prioritize user-friendly interfaces and responsive design; build trust via transparent policies, secure systems, and reliable customer service; leverage social proof and peer influence in digital marketing strategies.

5.6 Summary of Chapter Five

This chapter explores the online purchasing behavior of Ethiopian consumers leveraging the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB). Using descriptive statistics and Partial Least Squares Structural Equation Modeling (PLS-SEM), the research identifies critical determinants of online purchase intentions, addressing a conceptual gap in understanding consumers behavior in developing nations, particularly Ethiopia. It examines how digital engagement affects consumer access, behavioral intention, and the broader innovation prospects for Ethiopian manufacturing firms in the leather sector (EMF-in-LS).

By uncovering demand-side dynamics in digital marketplaces, this chapter provides essential insights that directly inform the Sustainable Business Model Innovation (SBMI) framework, ensuring that consumer behavior is embedded as a core dimension of sustainable competitiveness. This chapter explores consumer digital behavior using TAM and TPB models. These insights are directly relevant to SBMI, as consumer trust, digital adoption, and behavioral drivers inform the design of sustainable value propositions within innovative business models. From an SBMI perspective, digital engagement is not only a marketing issue but a critical enabler of sustainable business model innovation. The behavioral patterns identified here provide demand side inputs for SBMI development. By linking consumer behavior to SBMI dimensions, this chapter ensures that the framework incorporates both supply side competitiveness factors and demand side

sustainability drivers, thereby strengthening its relevance to Ethiopian leather firms. The insights gained serve as a vital input for designing the digital dimension of sustainable business models.

Data analysis revealed that Perceived Ease of Use (PEOU), Subjective Norms (SN), Perceived Usefulness (PU), Website Design (WD), and Trust (TR) significantly shape purchase intentions of Ethiopian consumers. The proposed model explained 67.6% of the variance in purchase intention ($R^2 = 0.676$), demonstrating strong predictive power. Notably, Trust showed no direct significant impact on purchase intention, a finding contrasting prior studies (Santo and Marques, 2022)(García-Salirrosas *et al.*, 2022). Additionally, PEOU did not influence PU in this context, deviating from studies by (Nguyen Thi *et al.*, 2022) (Moslehpour *et al.*, 2018).

These findings emphasize the growing importance of digital readiness and customer-centered platform design in supporting the adoption of sustainable and adaptive business models by EMF-in-LS. Consumer behavior on digital platforms not only reflects market readiness, but also illuminates critical capabilities firms must build.

By integrating TAM, Theory of Planned Behavior (TPB), and existing literature, this study advances theoretical frameworks for online consumer behavior in the context of developing nations specifically focusing on Ethiopian consumer's behavior. It offers the following practical insights for businesses:

- Websites should focus on easy-to-use navigation, clear details about products, and honest customer reviews to help build user trust and satisfaction.
- Encouraging positive word-of-mouth and leveraging social networks can amplify purchase intentions, as peer recommendations strongly influence Ethiopian consumers.
- Retaining customers requires platforms to deliver consistent usefulness and enjoyment, minimizing the need for costly reacquisition strategies.

The findings emphasize Ethiopia's unique market dynamics. As internet access grows, businesses must adapt to shifting preferences toward convenience and digital solutions. Tailoring platforms to local needs, such as offering localized discounts, could enhance adoption.

This research enriches understanding of online consumer behavior in understudied nations like Ethiopia. The unexpected insignificance of the direct effects of Trust on PI and PEOU on PU

relationship invites further exploration, particularly in cross-cultural contexts. For policymakers and EMF-in-LS, these insights underscore the importance of aligning digital strategies with consumer priorities to foster sustainable growth in emerging markets.

The findings of this study also make a significant contribution to the overarching objective of this PhD research, developing a Sustainable Business Model Innovation (SBMI) framework for EMF-in-LS. By identifying key determinants of Ethiopian consumers' behavior in digital marketplaces, these insights serve as valuable empirical inputs in developing the SBMI framework aiming at supporting the formulation of strategies that enhance digital market platform engagement and sustainable business practices.

The dissertation deliberately adopts a multi-level analytical approach. Sector-level indicators such as RCA and global competitiveness measures in chapter 4 are used to capture Ethiopia's external positioning, while firm-level data provide insights into operational practices and consumer engagement strategies. This design is justified because the sector's global competitiveness can only be fully understood by linking macro-level trade performance with micro-level firm practices.

Having examined the sectoral and operational baselines in Chapter 4, alongside Ethiopian online market platform consumer behavior in the current chapter, the next chapter shifts focus to the broader organizational and environmental conditions that either facilitate or constrain the adoption of Sustainable Business Model Innovation (SBMI). This diagnostic exploration lays the foundation for constructing a practical and context-specific SBMI framework tailored to Ethiopian Manufacturing Firms in the Leather Sector (EMF-in-LS). Additionally, the chapter investigates key enablers of Business Model Innovation (BMI) and evaluates its impact on firm performance within the EMF-in-LS context.

Chapter 6

Empirical Study III: Pathways to Sustainable Business Model Innovation (SBMI); Insights into Success Factors, Barriers, and Firm Performance

6.1 Introduction

Informed by the sectoral and operational realities and market behaviors explored in the preceding chapters, this chapter focuses on the systemic enablers and constraints that influence the adoption of sustainable business model innovation offering a diagnostic foundation for the strategic design of SBMI pathways. By identifying success factors, barriers, and their impact on firm performance, this chapter provides the critical organizational and environmental insights necessary for embedding SBMI into Ethiopian leather manufacturing firms, thereby positioning it as a cornerstone for the framework developed in this dissertation.

To effectively create sustainable business models, organizations must first identify the key elements that support their success and the challenges they might face during development (Benz, 2022). This understanding allows firms to adjust their approaches, address barriers in implementation, and greatly improve their chances of innovating sustainable business models. Therefore, this study primarily focuses on identifying the critical success factors and barriers of SBMI.

This study explores the key factors that support and hinder sustainable business model innovation (SBMI) by reviewing and analyzing a wide range of existing research. It identifies eleven main success factors and ten major challenges, and presents a comprehensive framework that reflects the complex and multi-dimensional nature of SBMI. By combining these findings, the study offers new and thorough insights that can guide both academic research and real-world practice. Its value lies in bringing together fragmented knowledge in a clear and organized way, providing a strong basis for this PhD study, future research, and practitioners' strategic planning in sustainable business innovation.

This study is guided by Research Question 3 of this PhD dissertation:

> *What are the critical success factors and barriers in the pathways of Sustainable Business Model Innovation (SBMI), and how do these elements influence firm performance?*

Furthermore, the findings align with Specific Objective 3, which aims to identify the key factors enabling and hindering the successful implementation of SBMI. This study also lays ground for the SBMI framework development effort tailored to EMF-in-LS.

6.2 Critical Success factors of SBMI

Based on the systematic literature review (SLR), this study examines the critical success factors (CSFs) and barriers related to Sustainable Business Model Innovation (SBMI). The findings show that successful SBMI implementation depends on 11 key success factors (1. Collaboration and Stakeholder Engagement; 2. Innovation and Vision; 3. Sustainability and Responsibility; 4. Market and Customer Focus; 5. Circular Economy and Sustainable Practice; 6. Resource Development and Organizational Learning; 7. Digitalization and Technology; 8. Dynamic Capabilities; 9. Mindset and Organizational Learning; 10. Government and Policy Support; 11. Performance Metrics), further grouped into four themes (1. Collaboration and Innovation culture; 2. Strategic Direction; 3. Capacity building; 4. External support). Table 6.1 lists these 4 main themes and the 11 critical success factors, which are further explained in the following sections.

Table 6. 1: Critical Success factors of SBMI based on the reviewed documents.

S/N	Main Themes	Sub-Themes- Level 1	Sub-Themes-Level 2
1	***Collaboration and innovation Culture***	**Collaboration and Stakeholder Engagement**	• Collaboration • Collaborative innovation • Collaborative approaches and stakeholder interaction • Networks and ecosystems • Value co-creation • Proximity and long-term partnership • Collaboration, networks, partners • Social climate of coworking spaces

			• Balancing shareholder and stakeholder value • Multilevel perspective • Stakeholder engagement • Collaborations and a strong business case • Balancing share holder and stake holder value
		Innovation and Vision	• Continual innovation • Clear narrative and vision • Strategic focus on SBMI • A clear and compelling vision of sustainability • A creative and experimental mindset • Space creativity of coworking spaces • Strategic focus on SBMI • Enabling innovation structure • Long-term vision • Top management commitment • Realization of uncaptured value • Business innovative activities
2	***Strategic Direction***	**Sustainability and Responsibility**	• Sustainable foundation • Valuing business sustainability • Business resilience • Corporate sustainability • Regulatory push • Valuing natural resources • Sustainable value creation as a business responsibility • Environmental responsibility • Change of industry's acceptance of Sustainable Business • Environmental value proposition • Environmental responsibility • Increasing awareness of the environmental problems • Valuing business sustainability • Strategic focus on SBMI
			• Profitability

		Market and Customer Focus	• Business plan and profitability • Market intelligence • Long-term customer satisfaction • Changing customer demands • New technological opportunity • Increasing market demand of SBM • Presumed beneficial consequences of SBMI • Business growth • Cost reduction • Sensitivity to market change • Emerging markets and social needs • Business case drivers • value co-creation
		Circular Economy and Sustainable Practices	• Upcycling • Recycling • Vegan • Sweatshop free • Locally sourced • Second hand • Fashion library • Sustainable raw materials • Zero waste • Wearable technology • Slow fashion
3	***Capacity Building***	**Technology and Digitalization**	• Digital technologies • Data collection and analysis technologies • Knowledge and skills • Digitalization • New technologies • Technology advancement and innovation • Data management
		Resource Development and	• People capability development • Human resource development • Employees' knowledge sharing and awareness of SBMI

		Organizational learning	• Organizational change and learning • Knowledge management • Resource mobilization • People capability development
		Mindset and Organizational Culture	• Hope • Optimism • Self-Efficacy • Mindset change • Company's green culture and consistent awareness • Entrepreneur's acceptance of SBMI practices
		Dynamic Capabilities	• Opportunity recognition • Developing dynamic capabilities for SBMI • Experimentation • System thinking • Organization's R&D on new technology and product • Resource mobilization • Organizational change and learning • Experimenting with new business models that balance economic, social, and environmental value
4	***External Support***	**Government and Policy Support**	• Governmental support and knowledge transfer • Government grants/fiscal incentives for SBMI • Carbon emission reduction/energy use reduction rewards • Public consciousness on sustainability • Public laws for energy transition and waste separation • Laws pushing professionals to change • Public regulation • Financial support • Governmental support and knowledge transfer • Legal compliance
			• Success measurement

		Performance and Metrics	• Performance metrics for sustainability • Performance expectancy • Facilitating conditions • Effort expectancy • Potential higher return-on-investment • Opportunistic external events financial support • Financing capacity

Source: Author's own creation based on the reviewed documents

6.2.1 Collaboration and stakeholder engagement

Sustainable business model innovation (SBMI) can support sustainability, but its success depends on working with key stakeholders. This includes employees, customers, suppliers, NGOs, regulators, and governments (Ullah *et al.*, 2024). Their involvement brings useful knowledge and resources (Siems *et al.*, 2023). Engaging stakeholders helps create business models that are both sustainable and inclusive, encouraging innovation, responsibility, and the balance of environmental, social, and economic goals (Cano et al., 2023).

6.2.2 Innovation and Vision

Innovation and a clear vision are key to creating sustainable business models. Innovation helps businesses solve problems and adapt to changing markets and environmental needs (Garrido-Moreno *et al.*, 2024). A strong vision guides strategy and encourages teams to include social and environmental goals in their work (Iqbal *et al.*, 2020). Together, innovation and vision drive sustainable business model innovation by aligning values and supporting new, balanced solutions (Ketprapakorn and Kantabutra, 2022).

6.2.3 Sustainability and Responsibility

Sustainability means creating positive environmental and social impacts, while responsibility involves ethical practices and accountability (Purvis *et al.*, 2019). Both are key to sustainable business model innovation (SBMI). Organizations should follow sustainability principles and take responsibility for creating long-term value (Boruchowitch and Fritz, 2022). This includes adding environmental and social goals to their strategies and decisions (Cici and D'Isanto, 2020). Focusing on these values supports business success, benefits society and the environment, and encourages ethical and innovative practices (Stahl *et al.*, 2020).

6.2.4 Market and Customer Focus

A strong focus on the market and customers is important for SBMI (Karuppiah *et al.*, 2023). Organizations need to understand customer needs, market trends, and new technologies to support sustainability efforts (Cici and D'Isanto, 2020; Lee and Fu, 2024). Customers influence SBMI through their choices and can push companies to adopt sustainable practices (Lopes *et al.*, 2023). Involving customers and encouraging innovation help businesses move toward more sustainable models (Stremersch *et al.*, 2024).

6.2.5 Human Resource Development (HRD)

Human resource development (HRD) plays a key role in advancing sustainable business model innovation (SBMI) by encouraging employee involvement in sustainability efforts. Including sustainability in HR practices helps build a responsible and innovative workplace (Fei and Wang, 2022). Working with employees, partners, customers, and other groups improves SBMI through shared knowledge and resources (Fei and Wang, 2022; Muñoz-Pascual *et al.*, 2021).

HRD is vital for SBMI as it strengthens employee skills, supports knowledge exchange, and drives organizational learning, all of which boost innovation (Blaique *et al.*, 2024; Dani *et al.*, 2023). Companies should invest in training to equip employees with the skills and attitudes needed to address sustainability issues and opportunities effectively (Schiuma *et al.*, 2024).

6.2.6 Technology and Digitalization

Digital technologies improve sustainability by streamlining work processes, improving market access through online platforms, managing resources effectively, and supporting innovation (Fuerst *et al.*, 2023; Zare and Persaud, 2024b). They enable data-driven decisions, support teamwork, and spark creative solutions for sustainable practices (Fleith de Medeiros *et al.*, 2022; Li *et al.*, 2020; Martínez-Peláez *et al.*, 2023; Robertsone and Lapiņa, 2023).

Digital tools that allow groups to share knowledge and ideas also help businesses achieve sustainable goals through collaboration (Wegner *et al.*, 2024).

6.2.7 Government and Policy Support

Government support and policies are vital for advancing sustainable business model innovation. Rules, incentives, and collaborative efforts between governments, businesses, and communities

create opportunities for adopting eco-friendly practices, solving environmental challenges, and driving systemic change (Samans and Nelson, 2022; Varriale *et al.*, 2024). Policies that reward green practices motivate companies to develop sustainable products and address environmental issues collectively (Fleith de Medeiros *et al.*, 2022). Public regulations also strongly shape sustainable progress and guide how businesses approach innovation (Xu *et al.*, 2022).

6.2.8 Performance and Metrics

Environment, society, and government (ESG) metrics help guide Sustainable Business Model Innovation (SBMI) by tracking resource use, emissions reduction, social impact, and ethical practices (Molina-Castillo *et al.*, 2021). Monitoring performance is key to SBMI, as metrics highlight progress, pinpoint areas for improvement, and support informed decisions (Gebara *et al.*, 2024).

6.2.9 Mindset and Organizational Culture

Building a workplace culture focused on sustainability is key to driving sustainable business innovation (Ademi *et al.*, 2024; Assoratgoon and Kantabutra, 2023). Encouraging creative thinking and allowing employees to test new ideas helps push sustainability efforts forward (Saxena *et al.*, 2024). Taking smart risks supports experimentation and innovation (Li *et al.*, 2021).

A diverse workplace that values different perspectives boosts innovation. Partnering with external experts and focusing on sustainability can create a culture of learning and teamwork (Yun et al., 2020). Linking rewards and evaluations to sustainability goals reinforces their importance in the organization (Ademi *et al.*, 2024).

6.2.10 Circular Economy and Sustainable Practices

Adopting circular economy ideas helps create sustainable business models by designing long-lasting, repairable products and promoting reuse to reduce waste and environmental harm (Fontana *et al.*, 2021). Sharing services or renting products instead of selling them encourages resource efficiency and supports circular practices like refurbishing items (Chabowski et al., 2023).

Businesses can innovate by focusing on reusing materials, cutting waste, and turning waste into new products, which aligns with sustainability goals (Yun et al., 2020).These practices not only

support worldwide sustainability targets but also help companies build adaptable, eco-friendly business models (Oliveira Neto *et al.*, 2024).

6.2.11 Dynamic Capabilities (DC)

Dynamic capabilities (DC) are critical for SBMI, enabling organizations to sense opportunities, seize them, and adapt to changes. Developing DC in areas like system thinking, R&D, resource mobilization, and organizational learning helps companies innovate and implement sustainable business models (SBMs) effectively (Oliveira-Dias *et al.*, 2022).

DC can be classified into sensing, seizing, and transforming (Teece, 2012). Sensing identifies opportunities, seizing mobilizes resources, and transforming ensures continuous renewal. DC help organizations monitor the environment for opportunities and threats, spot emerging trends, and adjust strategies accordingly.

When opportunities arise, DC enable quick action, such as investing in sustainable technologies, launching eco-friendly products, reconfiguring resources to align with sustainability goals, like reallocating finances and retraining staff (Liang *et al.*, 2022). Fostering a culture of experimentation and innovation, DC encourage new concepts and refining strategies over time (Oliveira-Dias *et al.*, 2022).

6.3 Barriers of SBMI

Based on the thematic analysis of the reviewed documents, the 10 barriers to SBMI (1. Technical and Technological Barriers; 2. Regulatory and Policy Barriers; 3. Market and Customer Barriers; 4. Organizational Inertia; 5. Resource Scarcity; 6. Cultural and Mindset Barriers; 7. Lack of Collaboration; 8. Complexity and Uncertainty; 9. Lack of Awareness and Knowledge; 10. Absence of Appropriate Performance Metrics) are further organized into four themes (1. External challenges; 2. Internal obstacles; 3. Collaboration gaps; 4. Knowledge and awareness gaps), as shown in Table 6.2. These clusters provide a structured understanding of the barriers to SBMI, emphasizing the various dimensions and challenges organizations may face when pursuing SBMI. Detailed discussions of each of the 10 barriers are provided below in Table 6.2.

Table 6. 2: Barriers of sustainable business Model innovation based on the reviewed documents

S/N	Main Themes	Sub Themes level 1	Sub-Themes level 2
1	***External Challenges***	**Regulatory and Policy Barriers**	• Lack of strict legislative pressure • Lack of legislative support • Restrictive product regulations • Uncertainty about legislation in SBMI field • Regulatory and administrative barriers • Non sustainability oriented public procurement policies
		Market and Customer Barriers	• Lack of consumer/customer acceptance • Unclear market demand • Difficulty securing funding • Taking time to build new partnerships and mutual trust • Reluctance to involve external stakeholders • Cannibalization concerns • Special product design requirements • Low tolerance for uncertain business changes • Lack of customer demand • Consumer education • Consumer expectations • Market and Institutional Barriers
		Technical & Technological Barriers	• Technical trade-offs • Lack of technologies • Technical barriers • Technological Barriers

2	**Internal Obstacles**	**Organizational Inertia**	• Resistance to change and inertia • Lack of leadership towards the circular economy • Lack of experience with the new circular business model • Difficulties in coordinating the value network • Operational uncertainty • Immature reverse logistics systems • Traceability and trust challenges • Lack of internal competencies or knowledge • Difficulty attaining management buy-in • Narrow focus of existing sustainability strategies • Siloed and fragmented approach • Organizational inertia • Fixed resource planned and allocation • Organizational ambidexterity • Organizational transformation challenges • Organization Barriers • Strategic barriers • Resource Allocation Barrier • a strong incumbent industry
		Financial & non-financial resource Barriers	• Lack of economic incentives for sustainability • Lack of incentives from the government • Difficulty securing funding • Lack of suitable investors • Fiscal constraints • Performance metric focus on financial • Short-term investor mindset • Lack of resources • Resource allocation barrier • Financial risk avoidance • Financial uncertainty

			• Pre-existing investments • Financial Barriers • Resource barriers • lack of resources
		Cultural and Mindset Barriers	• Attitudes and values • Short-termism • Cognitive barriers • Focus on maximizing shareholder value • Incentive system focused on short-termism • Lack of understanding and awareness • Lack of social awareness • Short-term profit maximization • Dominant logic focuses on exploitation • Restriction by traditional value creation activities • Institutional inertia • short-term investor mind-set
3	**Collaboration Gaps**	**Collaboration and Stakeholder Engagement Barriers**	• Lack of collaboration and stakeholder engagement • Lack of support from wider actors and systems • Difficulty in coordinating the value network • Time taking to build new partnerships and mutual trust • Lack of knowledge or competencies in value chain • Problems related to principal-agent relationships • Lack of international agreement
		Complexity and Uncertainty Barriers	• Complexity and uncertainty of the sustainability context • Uncertainty avoidance • Market uncertainties • Lack of SBMI tools • Affordability vs. sustainability

			• Difficulty in maintaining continuous training • Uncertainty
4	**Knowledge & Awareness Gaps**	**Knowledge and Awareness Barriers**	• Lack of awareness and understanding • Lack of knowledge or competencies in value chain • Lack of common definitions and frameworks for SBMI • Lack of internal competencies or knowledge • The lack of a clear and shared definition of SBMI • Lack of common definitions and frameworks for SBMI
		Measurement and Performance Barriers	• Lack of standardization • Prices not reflecting true costs • Lack of transparency (challenging supply chain control in the global environment) • Financial performance metrics

Source: Author's own creation based on reviewed documents

6.3.1 Regulatory and Policy Barriers

Support for sustainable initiatives is crucial for driving SBMI however, Regulatory and policy barriers, such as insufficient legislative pressure, inadequate support, and restrictive regulations limit innovation and the adoption of sustainable practices (Hina *et al.*, 2022).

To promote SBMI, governments and regulatory bodies should establish supportive frameworks and policies, including clear and consistent regulations, sustainability incentives, and a favorable business environment (Achmad *et al.*, 2023).

Addressing regulatory and policy barriers enables organizations to drive positive change, foster innovation, and promote economic growth (Bocken and Geradts, 2020).

6.3.2 Market and Customer Barriers

Consumer preferences drive SBMI, but obstacles arising from market dynamics and customer perceptions impede their adoption (Hansson et al., 2023). It is well recognized that market failures

not only prevent the market from operating properly, but they also have an impact on sustainability and the transition to sustainability (Biely and van Passel, 2022).

Market and customer barriers include consumer acceptance, unclear demand, funding difficulties (Takacs *et al.*, 2022; Vehmas *et al.*, 2024), customer demand uncertainty, regulatory changes, and market dynamics related to sustainability (Biely and van Passel, 2022). Additionally, challenges arise when corporate buyers neglect circularity, misunderstand SBMI, or perceive them as costly due to a lack of understanding (Brändström *et al.*, 2024).

6.3.3 Organizational Inertia

The existing organizational culture can hinder sustainability adoption, impeding progress in SBMI (Bocken and Geradts, 2020). Resistance to change and inertia within the culture limit shifts toward sustainability, missing innovation opportunities (Moradi *et al.*, 2021). Rigid structures, resource constraints, and lack of autonomy further aggravates challenges, restricting experimentation and adaptation (Bocken and Geradts, 2020d; Teofilus *et al.*, 2022).

By prioritizing sustainability and allocating resources, organizations can empower employees, encouraging experimentation and collaboration across functions. Building sustainability expertise helps organizations navigate complexities, address internal barriers, achieve sustainability goals, and drive positive outcomes (Coffay and Bocken, 2023b; Moallemi *et al.*, 2020).

6.3.4 Resource Scarcity

Adopting sustainable practices necessitates initial investments in technology, infrastructure, and workforce training (Leal Filho *et al.*, 2022). However, businesses often prioritize short-term financial gains, leading to reluctance in investing in sustainability (Pham *et al.*, 2021). Financial barriers, such as the lack of economic incentives, government support, suitable investors, and resources, impose constraints and limit access to capital for SBMI (Ghisetti *et al.*, 2017).

To overcome financial barriers, a supportive ecosystem with economic incentives and policies is crucial, along with seeking access to suitable investors and alternative financing options (Clark *et al.*, 2018). Emphasizing long-term benefits and collaborating with governments and financial institutions facilitates the adoption and scaling of SBM (Bocken and Geradts, 2020).

6.3.5 Cultural and Mindset Barriers

Cultural and mindset barriers, including attitudes, values, short-termism, cognitive barriers, resistance to change, and organizational inertia, impact SBMI by shaping behavior and decision-making (Bocken and Geradts, 2020).

Overcoming these barriers requires a long-term approach, promoting sustainability-oriented mindsets, and empowering employees to drive SBMI (Wijethilake *et al.*, 2023). This involves shifting organizational culture to view sustainability as a value-creating opportunity and building trust for knowledge sharing and joint innovation (Kujala *et al.*, 2023).

6.3.6 Technological Barriers

Organizations without adequate infrastructure, tools, or skills may struggle to adopt sustainable business models (Abdul Basit et al., 2024). Risk avoidance, driven by fear of failure or disruption, may limit investment in sustainable innovations (Singh and Maheswaran, 2024). Transitioning from outdated systems to sustainable technologies often requires significant time and costs, while employee and stakeholder resistance can further delay adoption (Bos, 2013).

6.3.7 Lack of Collaboration

Conflicting priorities and poor communication among stakeholders hinder agreement on sustainable practices, while limited trust and resources weaken collaborative efforts (Velter *et al.*, 2020). Addressing these challenges requires improved communication, trust-building, and resource allocation. Engaging diverse stakeholders and forming cross-sector partnerships across the value chain are critical to advancing SBMI (Dhir et al., 2023).

6.3.8 Complexity and Uncertainty

A lack of awareness about sustainable market demand and effectiveness can hinder innovation and growth opportunities for businesses (Hansson et al., 2023). This can lead to hesitancy in investing in sustainable innovations due to uncertainties about future market conditions, regulatory changes, and implementation complexity across different business areas (Abadzhiev *et al.*, 2024). Additionally, organizations may face challenges in developing the dynamic capabilities needed to adapt to rapidly evolving sustainability requirements (Bocken and Geradts, 2020).

6.3.9 Limited Awareness & Knowledge

Many organizations lack awareness of the importance of SBMI, leading to a failure in prioritizing necessary innovative changes (Feeney *et al.*, 2023; Saxena *et al.*, 2024). Managers often do not grasp the market demand for sustainability-oriented products, hindering the development of sustainable business models (Torelli, 2021).

Uneven distribution of sustainability knowledge within organizations and among stakeholders further impedes collaboration and informed decision-making (Feeney *et al.*, 2023) (Huang and Wang, 2024). Promoting sustainability literacy, market awareness, and information sharing can bridge these knowledge gaps and accelerate SBMI (Li et al., 2022).

6.3.10 Lack of performance metrics

Limited resources for monitoring and evaluating sustainability performance can impede the continuous improvement of sustainable practices (Hansson et al., 2023). Organizations often lack clear metrics to measure sustainability performance. Without robust measurement tools, tracking progress and optimizing business models for sustainability is challenging, and misaligned performance metrics can hinder innovation (Tavanti, 2023).

Addressing measurement and performance barriers involves developing relevant metrics, aligning incentives, and balancing short-term gains with long-term sustainability (Gunarathne, 2019).

6.4 Conceptual Model

After conducting an in-depth systematic review of the existing literature, the author created a conceptual model that will assist researchers and practitioners within EMF-in-LS in grasping the crucial elements for success and barriers related to SBMI (see Figure 6.1).

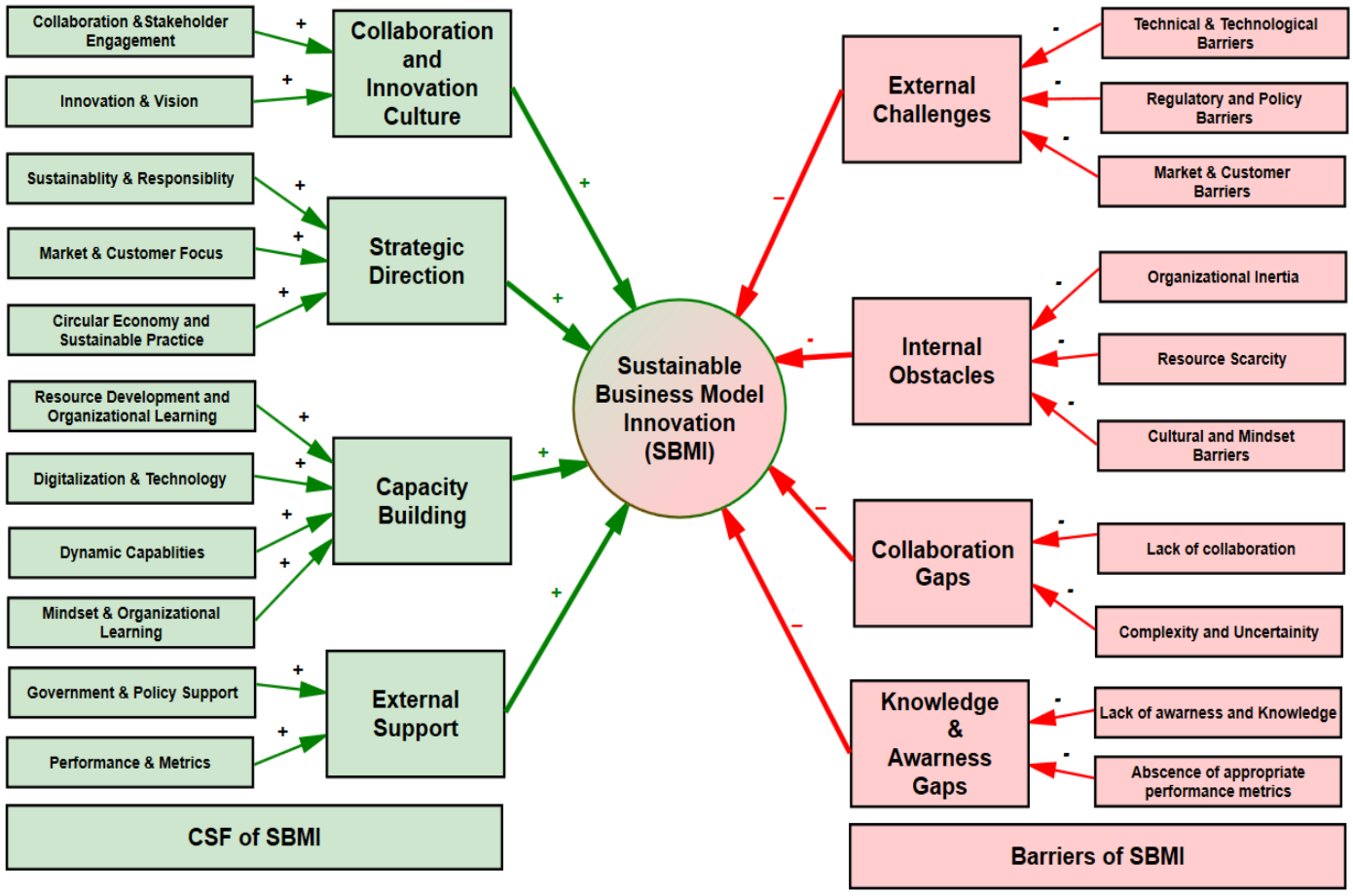


Figure 6. 1: Conceptual Model

Source: Author's own synthesis

6.5 Drivers of business model innovation (BMI) and the impact of (BMI) on firm performance within EMF-in-LS

While the previous section provided a grounded understanding of what enables or hinders SBMI adoption globally, this chapter investigates the dynamic interaction between BMI enablers and organizational outcomes. By empirically evaluating the influence of BMI enablers on firm performance metrics, this section clarifies how Ethiopian manufacturing firms can transform capability inputs into competitive outputs through BMI.

Business model innovation (BMI) is widely recognized as a key strategy for companies to strengthen their competitive edge and adapt to fast-changing markets (Xue *et al.*, 2019) (Ammirato *et al.*, 2022). Unlike innovations focused solely on products or services, BMI transforms how a company operates entirely from how it creates value to how it interacts with customers, and captures value from the potential customers (Bocken and Geradts, 2020; Franco et al., 2023). As a result, both businesses and researchers have grown increasingly interested in understanding BMI (Pucihar et al., 2019). As research on sustainable business models evolves, it is crucial to explore the organizational factors that facilitate innovative business models (Clauss *et al.*, 2021; Shahwan *et al.*, 2024).

However, research on BMI is still developing. While studies highlight its potential benefits, there is limited agreement on how BMI directly improves firm performance, and few studies explore the specific factors that drive successful BMI (Bhatti *et al.*, 2021) (Ammirato *et al.*, 2022). Previous research, particularly in manufacturing industries, often relies on single case studies, which limits broader generalizability and practical applications (Pucihar et al., 2019). To address these gaps, scholars like (Clauss *et al.*, 2021) call for more large-scale empirical studies that examine cause and effect relationships in BMI. This study responds to these gaps by focusing on Ethiopian manufacturing firms. The study is guided by the following two research questions:

What are the main drivers of Business Model Innovation (BMI) in EMF-in-LS?

How does BMI impact EMF-in-LS's performance and global competitiveness?

This research develops and evaluates a novel framework to identify the key drivers and outcomes of Business Model Innovation (BMI) on firms' performance, aiming to advance the academic discourse while delivering practical insights for businesses. The findings provide critical contributions toward the development of the Sustainable Business Model Innovation (SBMI) framework tailored to EMF-in-LS.

6.5.1 Hypotheses and conceptual model development

In this section, a detailed and comprehensive presentation of the related concepts, hypotheses, and the conceptual framework for this study is thoroughly provided.

6.5.1.1 Innovation capability (IC) and BMI

Innovation capability (IC) is an organization's ability to develop and implement novel ideas, products, or processes, enhancing adaptability and competitiveness (Malodia *et al.*, 2023; Sengura *et al.*, 2024; Zastempowski, 2022). It drives business model innovation and strategic growth in dynamic markets (Pino and Ortega, 2021).

IC facilitates continuous improvement and alternative business model exploration, strengthening firm performance (Aljuboori *et al.*, 2022; Olaleye *et al.*, 2024; Siahaan and Tan, 2020). Studies confirm its positive impact on BMI and competitiveness (Narayan and Hungund, 2022; Tang *et al.*, 2023). Drawing on RBV theory, IC is a crucial intangible resource fostering business model innovation and sustainable success. Based on these insights, the following hypotheses are proposed:

H1: IC significantly and positively impacts BMI of EMF-in-LS.

H2: IC significantly and positively impacts the performance of EMF-in-LS.

6.5.1.2 Business Environment (BE) and BMI

The business environment, comprising internal and external factors, influences company operations and decisions (Saukkonen and Kirjavainen, 2019). Driven by technology, customer demands, regulations, and competition, it necessitates continuous BMI adaptation for survival and success (Dong, 2023; Dubey et al., 2020; Peñarroya-Farell and Miralles, 2021).

Stakeholder expectations, market dynamics, and ICT opportunities play a crucial role in shaping business strategies (Pucihar et al., 2019). Studies confirm that ongoing BMI innovation fosters long-term competitiveness (Bachmann and Jodlbauer, 2023; Franco *et al.*, 2023). Based on the literature, the following hypotheses are proposed:

H3: BE significantly and positively impacts BMI of EMF-in-LS.

H4: BE significantly and positively impacts performance of EMF-in-LS.

6.5.1.3 Dynamic capabilities (DC) and BMI

Dynamic Capabilities (DC) enable firms to adapt to changing market conditions by optimizing resources and skills (Priyono and Hidayat, 2022; Soluk *et al.*, 2023). They are crucial for innovation and sustaining superior performance (Wilden *et al.*, 2013)(Teece, 2018). DC: sensing,

seizing, and transforming, contribute to BMI (Bitetti and Gibbert, 2022) and positively impact organizational performance (Wilden *et al.*, 2013). Based on DC theory and literature, the following hypotheses are proposed:

H5: DC significantly and positively impacts BMI of EMF-in-LS.

H6: DC significantly and positively impacts the performance of EMF-in-LS.

6.5.1.4 Digital Capability (DigC) and BMI

Digital technologies are reshaping business models (Mancuso *et al.*, 2023), with advancements like Industry 4.0, IoT, cloud computing, big data, and blockchain transforming value creation, delivery, and capture (Ancillai *et al.*, 2023). Digitalization drives BMI, fostering innovation and business growth (Merín-Rodrigáñez *et al.*, 2024; Wang *et al.*, 2023).

Rapid technological shifts can render business models obsolete, disrupting markets and necessitating BMI (Lamperti *et al.*, 2024). Increased digitalization enhances cooperation, product offerings, and customer relationships (Rachinger *et al.*, 2019; Zhang *et al.*, 2023), leading to new business models.

Studies (Dung and Dung, 2024; Liu *et al.*, 2024; Veiga *et al.*, 2024; Wang *et al.*, 2023; Zhang *et al.*, 2023) confirm DigC's significant positive impact on BMI and firm performance. Based on RBV theory and literature, the following hypotheses are proposed:

H7: DigC significantly and positively impacts BMI of EMF-in-LS.

H8: DigC significantly and positively impacts performance of EMF-in-LS.

6.5.1.5 Strategic Agility (SA) and BMI

Strategic Agility (SA) enables organizations to dynamically adapt their strategies in response to external business environment changes while maintaining flexibility and focus (Ahammad *et al.*, 2020; Arsawan *et al.*, 2022). It encompasses adjusting strategic direction, fostering innovation, and sensing environmental shifts to seize market opportunities (Alkandi and Helmi, 2024; Clauss et al., 2021; Shams et al., 2021).

Unlike dynamic capability, which focuses on the mechanisms facilitating agility, SA represents a broader organizational ability to navigate change effectively (Ferraris *et al.*, 2022; Hutter *et al.*, 2023). Research highlights SA's crucial role in enabling business model innovation (BMI) and

organizational transformation (Hutter *et al.*, 2023; Vrontis *et al.*, 2023). Studies confirm the strong positive relationship between SA and BMI, demonstrating its impact on firms' ability to swiftly adapt and capitalize on dynamic markets (Clauss *et al.*, 2021; Elali, 2021). Furthermore, SA significantly enhances firm performance, as supported by research findings (Alkandi and Helmi, 2024b; Kale *et al.*, 2019). Based on existing literature, the following hypotheses are formulated:

H9: SA has a significant and positive impact on BMI in Ethiopian manufacturing firms.

H10: SA has a significant and positive impact on firm performance in Ethiopian manufacturing firms.

6.5.1.6 The effect of Business Model Innovation (BMI) on Firm Performance (FP)

Business Model Innovation (BMI) drives success by transforming new technology into commercial value, generating significantly higher revenue growth than product or service innovations (Liu *et al.*, 2016). It fosters competitive advantage, resilience, and business growth in dynamic markets (Bashir et al., 2023; Yan et al., 2022).

Firm performance, a key focus in strategic management research, is often studied as a dependent variable (Taouab and Issor, 2019). Empirical evidence confirms BMI's positive influence on firm performance (Bashir *et al.*, 2023b; Nunes and Pereira, 2021; Salfore *et al.*, 2023). By enhancing customer value, BMI simultaneously strengthens business success (Lamperti *et al.*, 2024). Research further identifies BMI as a strong predictor of firm performance and strategic flexibility (Bashir and Verma, 2019). Based on existing studies, the following hypothesis is proposed:

H11: BMI has a significant and positive impact on firm performance in the context of EMF-in-LS.

6.5.1.7 Conceptual framework

Based on theories and the related literature review the conceptual research framework has been developed (See Figure 6.2)

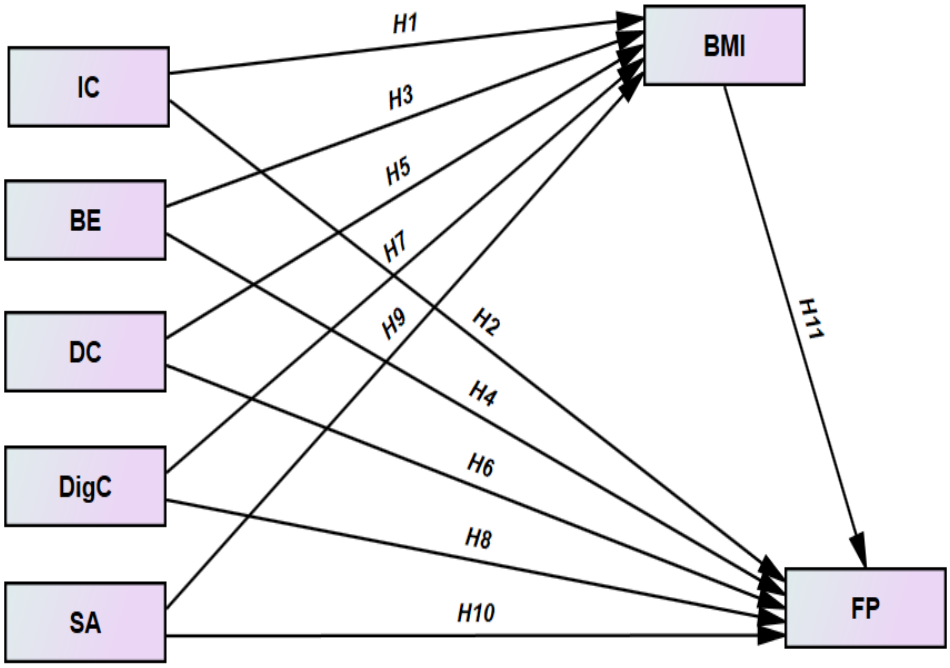


Figure 6. 2: Conceptual framework of the study

Source: The Author

6.5.2 Descriptive statistics results

6.5.2.1 Profile of the key informants and Firms

Table 6. 3: Profile of the key informants

S/N	Description		Frequency	%
1	Gender	Male	127	77.4
		Female	37	22.6
	Total		*164*	*100.0*
2	Age	25-34	60	36.6
		35-44	65	39.6
		45-54	39	23.6
	Total		*100.0*	*100.0*
3	Education	Diploma or Equivalent	7	4.3
		Bachelor's Degree	91	55.5
		Master's Degree	63	38.4
		Doctoral Degree	3	1.8
	Total		*164*	*100.0*

4	Position	Owner/Entrepreneur	27	16.5
		Top Manager/Executive	82	50.0
		Middle level Manager	50	30.5
		Consultant/Advisor	5	3.0
	Total		*164*	*100.0*
5	Experience	<1 year	5	3.0
		1-5 years	25	15.2
		6-10 years	63	38.4
		11-15 years	10	6.1
		>15 years	61	37.2
	Total		*164*	*100.0*
6	Firm Size	Small	40	24.4
		Medium	64	39.0
		Large	60	36.6
	Total		*164*	*100.0*
7	Firm Age	<5 years	5	3.0
		5-10 years	57	34.8
		11-20 years	42	25.6
		21-30 years	10	6.1
		>30 years	50	30.5
	Total		*164*	*100.0*

Table 6.3 summarizes the characteristics of 164 survey participants. Most were male (77.4%), with 22.6% female. Age groups were distributed as follows: 35-44 years (39.6%), 25-34 years (36.6%), and 45-54 years (23.6%). Educationally, 55.5% held a Bachelor's, 38.4% a Master's, 4.3% a Doctorate, and 1.8% a Diploma.

Occupational roles included top-level management (50.0%), owners/entrepreneurs (16.5%), middle-level positions (30.5%), and consultants/advisors (3.0%). Work experience varied, with 38.4% having 6-10 years, 37.2% over 15 years, 6.1% between 11-15 years, and 3.0% less than one year.

Regarding company size, 39.0% represented medium firms, 36.6% large firms, and 24.4% small firms. Firms' ages ranged from 5-10 years (34.8%), over 30 years (30.5%), 11-20 years (25.6%), 21-30 years (6.1%), and under 5 years (3.0%).

6.5.2.2 Mean and standard deviation

Table 6. 4: Descriptive statistics (N, Mean, and St. Deviation)

	N	Mean	Std. Deviation

SA	164	3.92	0.79
BE	164	3.88	0.69
BMI	164	3.73	0.64
DigC	164	3.65	0.75
DC	164	3.64	0.62
FP	164	3.59	0.71
IC	164	3.56	0.81
Valid N (listwise)	164		

Table 6.4 displays the mean values of all variables, surpassing the threshold of the medium level (3) on the five-point Likert scale. This observation implies that the majority of respondents expressed agreement with the proposed indicators for these variables.

Examining Table 6.4, it is evident that Strategic Agility (SA) exhibited the highest mean value (3.92), followed closely by Business Environment (BE) (3.88), Business Model Innovation (BMI) (3.73), Digital Capability (DigC) (3.65), Dynamic Capability (DC) (3.64), Firm Performance (FP) (3.59), and Innovation Capability (IC) (3.56), arranged in descending order.

These findings highlight the favorable perception of the respondents towards the variables, as evidenced by the consistently high mean values across all factors.

6.5.2.3 Correlations

The correlations of the proposed variables are indicated in Table 6.5

Table 6. 5: Correlations

		BMI	FP	DC	BE	IC	SA	DigC
BMI	Pearson Correlation	1						
	Sig. (2-tailed)							
	N	164						
FP	Pearson Correlation	.635**	1					
	Sig. (2-tailed)	.000						
	N	164	164					
DC	Pearson Correlation	.848**	.677**	1				

	Sig. (2-tailed)	.000	.000					
	N	164	164	164				
BE	Pearson Correlation	.340**	.194*	.367**	1			
	Sig. (2-tailed)	.000	.013	.000				
	N	164	164	164	164			
IC	Pearson Correlation	.692**	.352**	.699**	.194*	1		
	Sig. (2-tailed)	.000	.000	.000	.013			
	N	164	164	164	164	164		
SA	Pearson Correlation	.811**	.433**	.776**	.462**	.749**	1	
	Sig. (2-tailed)	.000	.000	.000	.000	.000		
	N	164	164	164	164	164	164	
DigC	Pearson Correlation	.819**	.534**	.785**	.196*	.856**	.840**	1
	Sig. (2-tailed)	.000	.000	.000	.012	.000	.000	
	N	164	164	164	164	164	164	164

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The results displayed in Table 6.5 reveal that all correlations between the latent variables are statistically significant. These findings indicate the presence of strong relationships not only between the hypothesized dependent and independent variables but also among the independent variables themselves.

6.5.3 Evaluation of measurement model

In the initial stage of PLS-SEM analysis, the measurement model, which depicts the relationship between observed indicators and latent variables, is evaluated by assessing reliability and validity using criteria such as composite reliability (CR), individual indicator reliability, average variance extracted (AVE), Fornell-Larcker criterion, and cross-loadings (Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, 2017).

6.5.3.1 Indicator reliability

The commonly accepted threshold for outer loadings is typically set at 0.70 or higher (Russo and Stol, 2021) , although some researchers argue that a threshold of 0.708 (the square root of shared variance) is more appropriate (Hair et al., 2021). In this study, as depicted in Table 6.6, all indicators for the constructs met this criterion except for BMI6, which had an outer loading of 0.674. Removing this item did not enhance the predictive power of the model, leading us to retain the item. Hence, the indicators for the constructs in this study demonstrated satisfactory reliability.

Table 6. 6: Construct Reliability, Validity, and collinearity Test results

Latent Variable	Indicators	Outer loadings	Collinearity Statistics (VIF)	Cronbach's Alpha (α)	Composite Reliability (CR)	Average Variance Extracted (AVE)
BE	**BE1**	**0.837**	**2.013**	**0.834**	**0.879**	**0.647**
	BE2	**0.909**	**2.144**			
	BE3	**0.714**	**1.871**			
	BE4	**0.744**	**1.858**			
	BMI2	**0.758**	**2.542**	**0.896**	**0.915**	**0.547**
	BMI3	**0.755**	**2.463**			
	BMI4	**0.782**	**2.894**			
	BMI5	**0.710**	**1.861**			
	BMI6	**0.674**	**2.125**			
	BMI7	**0.718**	**2.732**			
	BMI8	**0.776**	**2.363**			
	BMI9	**0.712**	**2.153**			
	BMI10	**0.761**	**2.439**			
DC	**DC1**	**0.781**	**1.680**	**0.819**	**0.880**	**0.647**
	DC3	**0.797**	**1.756**			
	DC4	**0.768**	**1.948**			
	DC5	**0.868**	**2.334**			
DigC	**DigC1**	**0.823**	**1.775**	**0.819**	**0.879**	**0.645**
	DigC2	**0.845**	**2.094**			
	DigC3	**0.754**	**1.818**			
	DigC4	**0.788**	**1.522**			
FP	**FP1**	**0.739**	**2.062**			

	FP2	**0.799**	**2.173**	**0.847**	**0.891**	**0.621**
	FP3	**0.792**	**2.017**			
	FP4	**0.779**	**2.124**			
	FP5	**0.828**	**1.950**			
IC	**IC1**	**0.775**	**2.067**	**0.865**	**0.900**	**0.693**
	IC2	**0.831**	**2.074**			
	IC3	**0.822**	**2.567**			
	IC4	**0.896**	**1.832**			
SA	**SA1**	**0.717**	**1.471**	**0.860**	**0.905**	**0.705**
	SA2	**0.892**	**2.866**			
	SA3	**0.842**	**2.396**			
	SA4	**0.896**	**2.557**			

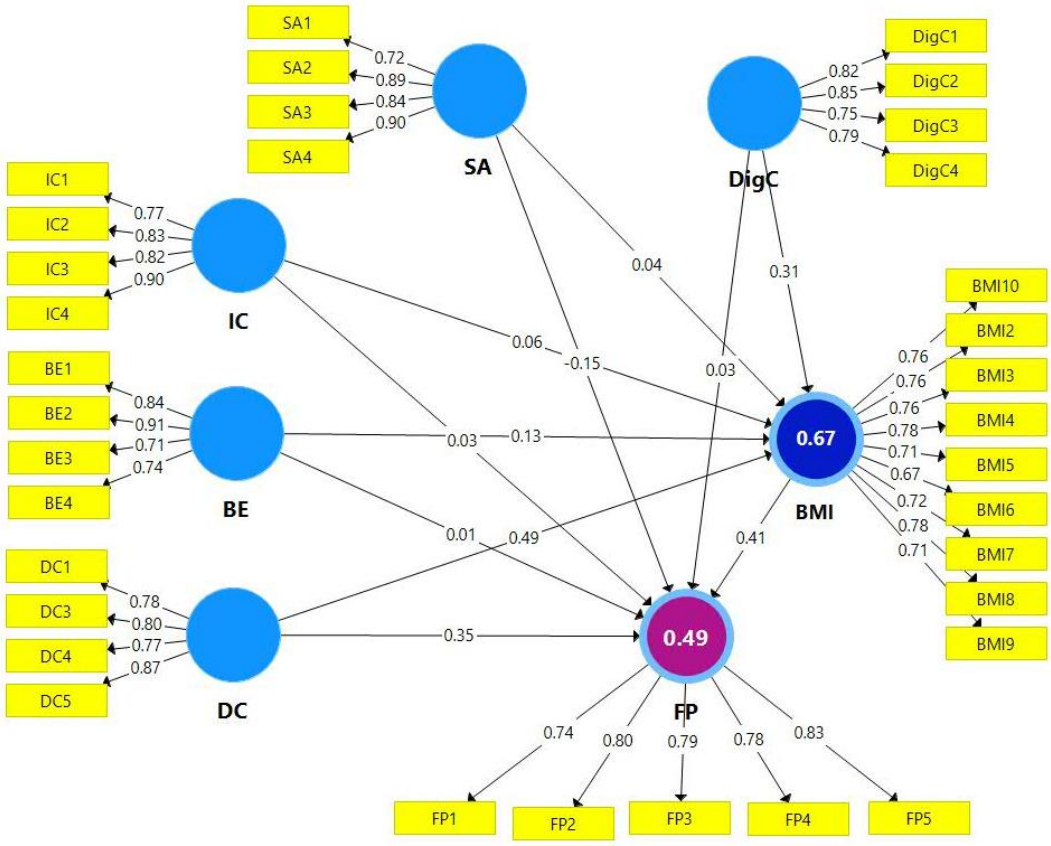


Figure 6. 3: The PLS Algorithm path modelling result: outer model (factor loadings), inner model (path coefficients), and constructs (R^2 values).

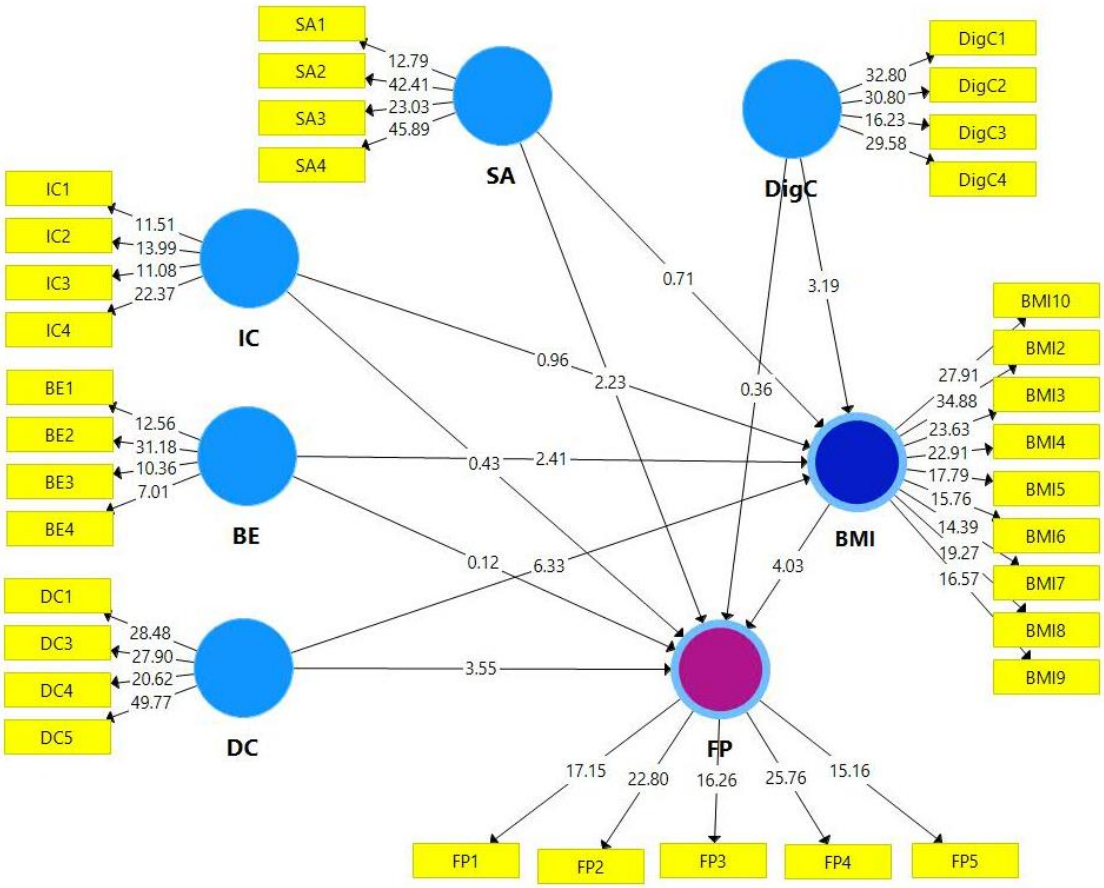


Figure 6. 4: Bootstrapping result (t-values)

Note: Subsamples=5000, Test Type=2-tailed, Significance level=0.05

6.5.3.2 Internal Consistency

Internal consistency in PLS-SEM is commonly assessed using Cronbach's alpha and composite reliability, which evaluate the interrelationship among observed items (Sarstedt *et al.*, 2020). For both measures, a value exceeding 0.70 is deemed acceptable (Cronbach, 1951; Sarstedt *et al.*, 2020). As indicated in Table 6.6, all constructs in this study exhibited Cronbach's alpha and composite reliability values surpassing 0.70, thereby demonstrating satisfactory internal consistency of the measurement items.

6.5.3.3 Convergent Validity

In order to establish convergent validity, three criteria must be taken into account: the indicator's factor loading, composite reliability (CR), and average variance extracted (AVE) (F. Hair Jr *et al.*, 2014; Sarstedt *et al.*, 2020). Adequate convergent validity is indicated by an AVE value exceeding 0.50, and CR and indicator's outer loading values surpassing 0.708 (F. Hair Jr *et al.*, 2014; Sarstedt *et al.*, 2020). As depicted in Table 6.6 all AVE, CR, and outer loading values for the constructs in this study were above these thresholds, demonstrating the satisfactory convergent validity of the measurement model.

6.5.3.4 Discriminant Validity

The Fornell-Larcker criterion, a stringent approach to evaluating discriminant validity, involves comparing the square root of the average variance extracted (AVE) values with the latent variable correlations, requiring that the square root of each construct's AVE surpass its highest correlation with any other construct (F. Hair Jr *et al.*, 2014; Sarstedt *et al.*, 2020). As presented in Table 6.7, the diagonal bold values represent the square roots of the AVE values, while the other values denote the correlations. A closer examination of the table reveals that the square root of each construct's AVE exceeds its highest correlation with any other construct, thereby satisfying the discriminant validity criteria.

Table 6. 7: Discriminant Validity (Fornell-Larcker Criterion), The diagonal (bold) values are $\sqrt{\boldsymbol{AVE}}$

	BE	**BMI**	**DC**	**DigC**	**FP**	**IC**	**SA**
BE	**0.804**						
BMI	0.388	**0.739**					
DC	0.371	0.763	**0.805**				
DigC	0.213	0.679	0.619	**0.803**			
FP	0.242	0.652	0.641	0.484	**0.788**		
IC	-0.076	0.364	0.354	0.421	0.270	**0.832**	
SA	0.411	0.423	0.378	0.403	0.181	0.307	**0.840**

6.5.3.5 Common Method Bias (CMB) Test

Common Method Bias (CMB) is a potential issue in research that arises when the same data collection method influences both the independent and dependent variables, resulting in distorted

relationships (Kock *et al.*, 2021). As self-report surveys were employed as the method to measure both the independent and dependent variables, it was crucial to assess whether this common method introduced systematic errors. Hence, the researcher conducted the CMB test using Harman's single factor test and analyzed the Variance Inflation Factor (VIF) to identify the presence of CMB.

To mitigate the potential problem of CMB, the author took several measures. First, pre-tested and validated items utilized in questionnaires to minimize ambiguity, complexity, and respondent fatigue. Additionally, the purpose of the study clearly defined for respondents. To ensure the reliability of measures, pilot tests with a small sample of respondents and sought input from professionals in the field. Finally, statistical methods employes to control for CMB effects.

The results of the CMB test, using Harman's single factor test, indicated that the maximum percentage of total variance explained by a single factor was 33.37%. Since this value is below the threshold of 50%, and all VIF values for the items were less than 3.37(Kock, 2017) (Kock *et al.*, 2021), we can conclude that our research is free from the issue of CMB (See Table 6.6) for VIF values).

6.5.4 Assessment of structural model

The evaluation of the structural model in PLS-SEM encompasses key criteria such as path coefficients, R-square values, f-square effect size, predictive relevance (Q^2) where the assessment involves addressing collinearity concerns, testing the significance and relevance of relationships through path coefficients, assessing R-square levels, evaluating f-square effect sizes, and examining predictive relevance (Q^2) (F. Hair Jr *et al.*, 2014).

6.5.4.1 Collinearity Assessment

To identify collinearity, a widely used guideline is the variance inflation factor (VIF). Typically, a VIF value of 5 or above suggests a significant level of collinearity, necessitating the removal of one of the associated constructs (F. Hair Jr *et al.*, 2014; Sarstedt *et al.*, 2020). In this study, as depicted in Table 6.6, all constructs exhibited VIF values lower than 5, indicating the absence of collinearity issues.

6.5.4.2 Structural Model Path Coefficients

Table 6. 8: Path Coefficients: Direct effects (Mean, STDEV, T-Values, P-Values)

Path	Hypothesis	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Decision
IC -> BMI	H1	0.059	0.066	0.063	0.942	0.346	Rejected
IC -> FP	H2	0.029	0.031	0.067	0.427	0.669	Rejected
BE -> BMI	H3	0.129	0.137	0.054	2.375	0.018	Accepted
BE -> FP	H4	0.009	0.013	0.080	0.116	0.907	Rejected
DC -> BMI	H5	0.488	0.484	0.074	6.584	0.000	Accepted
DC -> FP	H6	0.348	0.357	0.099	3.506	0.000	Accepted
DigC -> BMI	H7	0.306	0.306	0.095	3.235	0.001	Accepted
DigC -> FP	H8	0.035	0.034	0.091	0.378	0.706	Rejected
SA -> BMI	H9	0.044	0.040	0.061	0.713	0.476	Rejected
SA -> FP	H10	-0.152	-0.155	0.070	2.164	0.031	Accepted
BMI -> FP	H11	0.414	0.404	0.098	4.225	0.000	Accepted

Table 6. 9: Total Indirect Effects (Mean, STDEV, T-Values, P-Values)

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
BE -> BMI					
BE -> FP	0.053	0.056	0.028	1.912	0.056
BMI -> FP					
DC -> BMI					
DC -> FP	0.202	0.194	0.053	3.784	0.000
DigC -> BMI					
DigC -> FP	0.127	0.123	0.047	2.690	0.007
IC -> BMI					
IC -> FP	0.024	0.028	0.028	0.888	0.374
SA -> BMI					
SA -> FP	0.018	0.017	0.026	0.682	0.495

Table 6. 10: Specific Indirect effects (Mean, STDEV, T-Values, P-Values)

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
BE -> BMI -> FP	0.053	0.056	0.028	1.912	**0.056**
DC -> BMI -> FP	0.202	0.194	0.053	3.784	**0.000**
DigC -> BMI -> FP	0.127	0.123	0.047	2.690	**0.007**
IC -> BMI -> FP	0.024	0.028	0.028	0.888	**0.374**
SA -> BMI -> FP	0.018	0.017	0.026	0.682	**0.495**

Table 6. 11: Total Effects (Mean, STDEV, T-Values, P-Values)

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
BE -> BMI	0.129	0.137	0.054	2.375	**0.018**
BE -> FP	0.063	0.069	0.085	0.738	**0.460**
BMI -> FP	0.414	0.404	0.098	4.225	**0.000**
DC -> BMI	0.488	0.484	0.074	6.584	**0.000**
DC -> FP	0.550	0.552	0.087	6.288	**0.000**
DigC -> BMI	0.306	0.306	0.095	3.235	**0.001**
DigC -> FP	0.161	0.156	0.099	1.626	**0.104**
IC -> BMI	0.059	0.066	0.063	0.942	**0.346**
IC -> FP	0.053	0.060	0.076	0.698	**0.485**
SA -> BMI	0.044	0.040	0.061	0.713	**0.476**
SA -> FP	-0.134	-0.138	0.077	1.731	**0.084**

6.5.4.3 Coefficient of Determination (R Square)

Table 6. 12: R Square

	R Square	R Square Adjusted
BMI	0.670	0.660
FP	0.492	0.473

6.5.4.4 Effect size (f Square)

Table 6. 13: f Square

	BE	BMI	DC	DigC	FP	IC	SA
BE		0.035			**0.000**		
BMI					0.111		
DC		**0.386**			0.092		
DigC		**0.156**			**0.001**		
FP							
IC		**0.008**			**0.001**		
SA		**0.004**			0.031		

6.5.4.5 Blindfolding and Predictive Relevance (Q^2)

Table 6. 14: Q Square

	SSO	SSE	Q^2 (=1-SSE/SSO)
BE	656.000	376.490	0.426
BMI	1476.000	856.270	0.420
DC	656.000	384.057	0.415
DigC	656.000	390.431	0.405
FP	820.000	471.286	0.425
IC	656.000	344.531	0.475
SA	656.000	321.519	0.510

SSE= sum of square of errors, SSO=Sum of Squares of Observations

This study utilized PLS-SEM technique to examine the combined effects of various driver variables on BMI and on Firm performance. Upon executing the PLS-SEM, PLS algorithm and bootstrapping estimates are derived for the relationships within the structural model, reflecting the proposed associations among the constructs. The PLS-SEM findings revealed that several variables, including IC, DigC, DC, BE, SA, exhibited a positive impact on BMI. However, only DC, DigC, and BE emerged as significant enablers of BMI, with DC having the largest share, while IC and SA did not demonstrate significant influence.

Table 6.8 shows that the direct effects of DC -> BMI (β=0.488, p=0.000), BMI -> FP (β=0.414, p=0.000), DC -> FP (β=0.348, p=0.000), DigC -> BMI (β=0.306, p=0.001), and BE -> BMI

(β=0.018, p=0.000) were found to be positively significant in descending order of significance, supporting hypotheses H5, H11, H6, H7, and H3 consecutively.

On the other hand, the direct effects of IC -> BMI (β=0.059, p=0.348), SA -> BMI (β=0.044, p=0.476), DigC -> FP (β=0.035, p=0.706), IC -> FP (β=0.029, p=0.669), and BE -> FP (β=0.009, p=0.907) were found to be positive but insignificant, rejecting hypotheses H1, H9, H8, H2, and H4 consecutively. The effect of SA -> FP (β=-0.152, p=0.031) was significant but negative rejecting hypothesis H10. The findings of this research supported five of the 11 hypotheses (H5, H11, H6, H7, and H3) and rejected the remaining six hypotheses (H1, H9, H8, H2, H4, and H10).

This study found a surprising negative relationship between Strategic Agility (SA) and Firm Performance (FP), contradicting previous research (Clauss *et al.*, 2021). This outcome may be specific to Ethiopian manufacturing firms in the leather sector, where factors like market conditions, regulations, and organizational dynamics could influence SA differently. Further research is needed to understand and explain this unexpected finding.

The effect of DC on BMI was significantly positive, supporting the theory of Dynamic Capability and the findings of (Wilden *et al.*, 2013). The effect of BMI on FP was positive and significant, in line with the findings of (Bashir et al., 2023; Nunes and Pereira, 2021; Salfore et al., 2023). The effect of DC on FP was significantly positive, supporting the theory of Dynamic Capabilities and the findings of (Wilden *et al.*, 2013). The effect of DigC on BMI was significantly positive, supporting the Resource-Based View (RBV) theory and the findings of (Liu *et al.*, 2024; Rachinger *et al.*, 2019; Wang *et al.*, 2023; Zhang *et al.*, 2023).

The effect of BE on BMI was significantly positive, supporting the findings of (Pucihar et al., 2019). However, the effect of IC on BMI was positive but insignificant, contrary to the findings of (Narayan and Hungund, 2022). Similarly, the effect of SA on BMI was positive but insignificant, contradicting the findings of (Clauss *et al.*, 2021). The effect of DigC on FP was also positive and insignificant, going against the Resource-Based View theory and the findings of (Liu *et al.*, 2024; Rachinger *et al.*, 2019; Zhang *et al.*, 2023). The effect of IC on FP was positive but insignificant, contrary to the Resource-Based View theory and the findings of (Tang *et al.*, 2023). Additionally, the effect of BE on firm performance was positive but insignificant, contradicting the findings of (Pucihar et al., 2019).

Table 6.9 shows the significant total indirect effects of DC on FP (DC -> FP) and DigC on FP (DigC -> FP), both mediated by BMI. Conversely, the total indirect effects of BE on FP (BE -> FP), IC on FP (IC -> FP), and SA on FP (SA -> FP), also mediated by BMI, were found to be insignificant.
Table 6.11 shows the total effects of BE -> BMI, BMI -> FP, DC -> BMI, DC -> FP, and DigC -> BMI are significant whereas the total effects of BE -> FP, DigC -> FP, IC -> BMI, IC -> FP, SA -> BMI, and SA -> BMI are insignificant.

The coefficient of determination (R squared) is a widely used measure for assessing the quality of a structural model (F. Hair Jr *et al.*, 2014). It provides insights into the extent to which the model effectively explains the observed data. In this context, R squared values of 0.75, 0.50, and 0.25 for the endogenous constructs can be characterized as substantial, moderate, and weak, respectively (F. Hair Jr *et al.*, 2014; Sarstedt *et al.*, 2020).

Table 6.12 shows that BMI has a moderate predictive power, with an R^2 value of 0.670, meaning 67% of its variance is explained by exogenous variables, while 33% remains unaccounted for. Similarly, FP has an R^2 of 0.492, indicating that 49.2% of its variance is explained by BMI, leaving 50.8% attributed to other factors. These findings suggest the structural model captures a significant portion of variance in BMI and FP, though some influencing factors remain unidentified.

Following f-square guidelines (Salkind, 2012), DC → BMI (0.386) and DigC → BMI (0.156) have large effects, while BMI → FP (0.111), DC → FP (0.092), and SA → FP (0.031) show medium effects. BE → FP, DigC → FP, IC → BMI, IC → FP, and SA → BMI have low effects (Table 6.13). All variables demonstrate strong predictive relevance (Geisser, 1974) (F. Hair Jr *et al.*, 2014) see Table 6.14.

6.5.5 Summary of Chapter Six

This study provides a comprehensive synthesis of the critical success factors and barriers associated with sustainable business model innovation. The findings underscore that the effective implementation of sustainable business models relies on several key success factors including: Collaboration and Stakeholder Engagement; Innovation and Vision; Sustainability and Responsibility; Market and Customer Focus; Circular Economy and Sustainable Practices; Technology and Digitalization; Resource Development and Organizational learning; Mindset and

Organizational Culture; Dynamic Capabilities; Government and Policy Support; and Performance and Metrics..

Conversely, the researcher identified ten major barriers including: Regulatory and Policy Barriers; Market and Customer Barriers; Technical & Technological Barriers; Organizational Inertia; Financial & non-financial resource Barriers; Cultural and Mindset Barriers; Collaboration and Stakeholder Engagement Barriers; Complexity and Uncertainty Barriers; Knowledge and Awareness Barriers; and Measurement and Performance Barriers.

This study synthesizes existing literature to clarify critical success factors and barriers, providing a theoretical framework for future research. Beyond theoretical contributions, the study strengthens the foundation of this PhD dissertation, aiming to develop an SBMI framework for EMF-in-LS. It offers practical insights for businesses seeking to implement SBMI by mapping out success factors and barriers, guiding organizations in navigating the complexities of sustainable business model innovation. By systematically analyzing enablers and constraints, this chapter provides the organizational and environmental evidence essential for constructing a contextualized SBMI framework, thereby ensuring that the framework is both theoretically rigorous and practically applicable to Ethiopian leather manufacturing firms.

For businesses, this research highlights priority success factors to optimize strategies while identifying obstacles that require mitigation. Policymakers can also use these insights to create a favorable regulatory environment that encourages sustainable business practices. This study serves as a valuable resource for advancing SBMI research and promoting sustainable and responsible business practices.

This study highlights dynamic capabilities (DC), digital capabilities (DigC), and the business environment (BE) as key drivers of business model innovation (BMI) within Ethiopian leather manufacturing firms in the leather sector, enhancing firm performance (FP) and supporting sustainable growth. While BMI, DC, and BE significantly boost FP, Strategic Agility (SA) unexpectedly has a negative impact, requiring further investigation. Additionally, Innovation Capability (IC) and DigC show positive but weak effects, suggesting firms should strengthen them to improve performance.

Integrating dynamic capability theory and the Resource-Based View (RBV), the study confirms DC and DigC as central to BMI. EMF-in-LS should prioritize these capabilities while adapting strategies to Ethiopia's evolving business environment, including regulations, market demands, and technological shifts.

The study makes significant theoretical contributions to dynamic capability theory, RBV, SBMI literature, and firm performance research, focusing on BMI in manufacturing firms in developing nations specific in EMF-in-LS. It expands existing theories by establishing DC and DigC as major drivers of both BMI and firm performance while highlighting BE's positive impact on both.

For managers, prioritizing DC and DigC is essential for driving BMI and improving FP. Firms must also consider BE factors such as: technology, customer demands, regulations, and market challenges that shape their operating environment and influence business model innovation (BMI).

Although IC and DigC positively impact FP, their effects are statistically weak, suggesting a need for further development to enhance firm performance. Additionally, SA's significant negative effect on FP calls for further research and corrective actions to mitigate its adverse impact.

This study contributes to the development of the SBMI framework, the central objective of this PhD dissertation, by identifying key variables that influence Ethiopian digital platform consumers' behavior.

The empirical connection between enablers and firm performance provides a strong foundation for developing a contextualized SBMI framework that incorporates insights across strategic, operational, and market dimensions. Following the completion of this study, the researcher synthesized the findings from all the three interrelated studies on EMF-in-LS to construct a comprehensive Sustainable Business Model Innovation (SBMI) framework. This framework offers a structured and actionable basis for advancing SBMI efforts within the EMF-in-LS context. Chapter 7 of this dissertation presents the resulting EMF-in-LS SBMI framework.

Chapter 7

Sustainable Business Model Innovation Framework Development and Validation

7.1 Introduction

This chapter presents a comprehensive SBMI framework tailored for Ethiopian manufacturing firms in the leather sector synthesizing insights from the three empirical studies in this dissertation. Designed to enhance the sustainable business model innovation (SBMI) capabilities of manufacturing firms in the Ethiopian leather sector (EMF-in-LS), the framework promotes sustainability, competitiveness, and innovation by integrating key findings across the studies.

To ensure both theoretical contribution and practical relevance, the framework is primarily pivoted on the empirical findings from the three studies and has undergone a comprehensive validation process, including focused group discussions, expert evaluations and peer reviews. This SBMI framework contributes significantly to the EMF-in-LS by providing a systematic pathway for firms to:

- Diagnose their current business models.
- Develop capabilities for sustainable business model innovation.
- Implement and measure performance improvements.
- Ensure continuous sustainable business model innovation and long-term sustainability.

Serving as a practical guide for businesses, policymakers, and industry stakeholders, this framework aims to drive the long-term sustainable transformation of Ethiopia's leather sector. This chapter fulfills the overarching objective of this PhD dissertation by synthesizing the findings of the three empirical studies into a comprehensive and operationalizable framework for sustainable business model innovation (SBMI). Each study systematically addressed specific research objectives that collectively contribute to the development of the SBMI framework, the main objective of this PhD research. The three empirical studies are recaptured as follows.

- Empirical Study I: Sectoral and Operational Insights within Ethiopian Manufacturing firms in the Leather Sector.

- Empirical Study II: Understanding determinants of Ethiopian Consumers' Purchase Behavior within Digital Business Model platforms.
- Empirical Study III: Pathways to Sustainable Business Model Innovation; Insights into Success Factors, Barriers, and Firm Performance.

The insights derived from these studies informed the development of the SBMI framework, with key findings from each study systematically incorporated to facilitate comprehension of the theoretical and empirical foundations underpinning the SBMI framework. This integrative approach enhances the practical relevance and academic rigor of the proposed SBMI framework, ultimately advancing the gap on sustainable business model innovation within the Ethiopian leather manufacturing sector. Furthermore, the SBMI framework serves as a strategic tool for businesses, policymakers, and industry stakeholders, offering a structured pathway for fostering long-term sustainable business model transformation within Ethiopian Manufacturing Firms in the Leather Sector (EMF-in-LS).

7.1 Versions of the generic SBMI framework

The Sustainable Business Model Innovation (SBMI) framework was developed through an iterative process, evolving from foundational concepts to more detailed configurations, as illustrated in Figures 7.1 to 7.3.

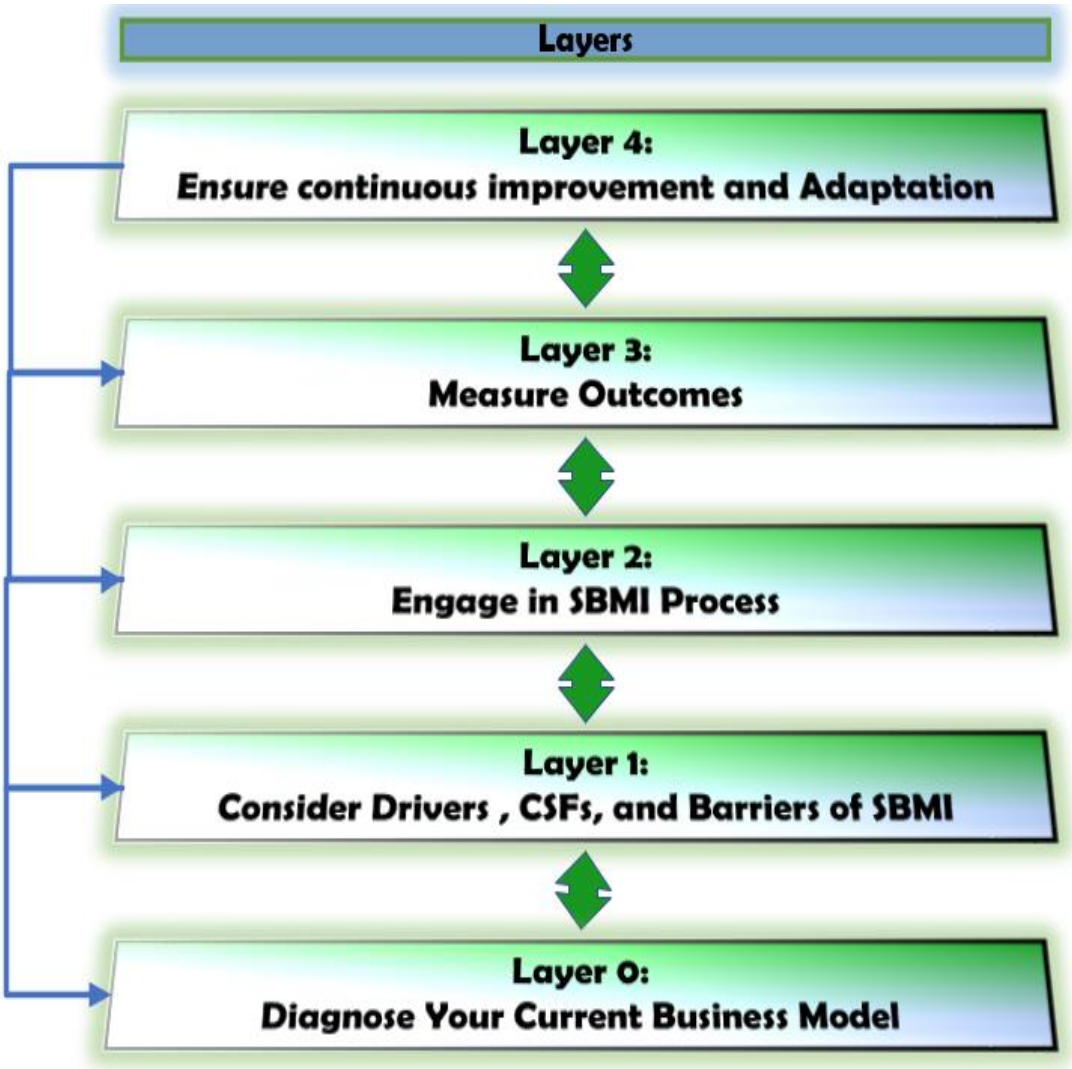


Figure 7. 1:The EMF-in-LS generic SBMI framework (Version 1)

Source: The Author

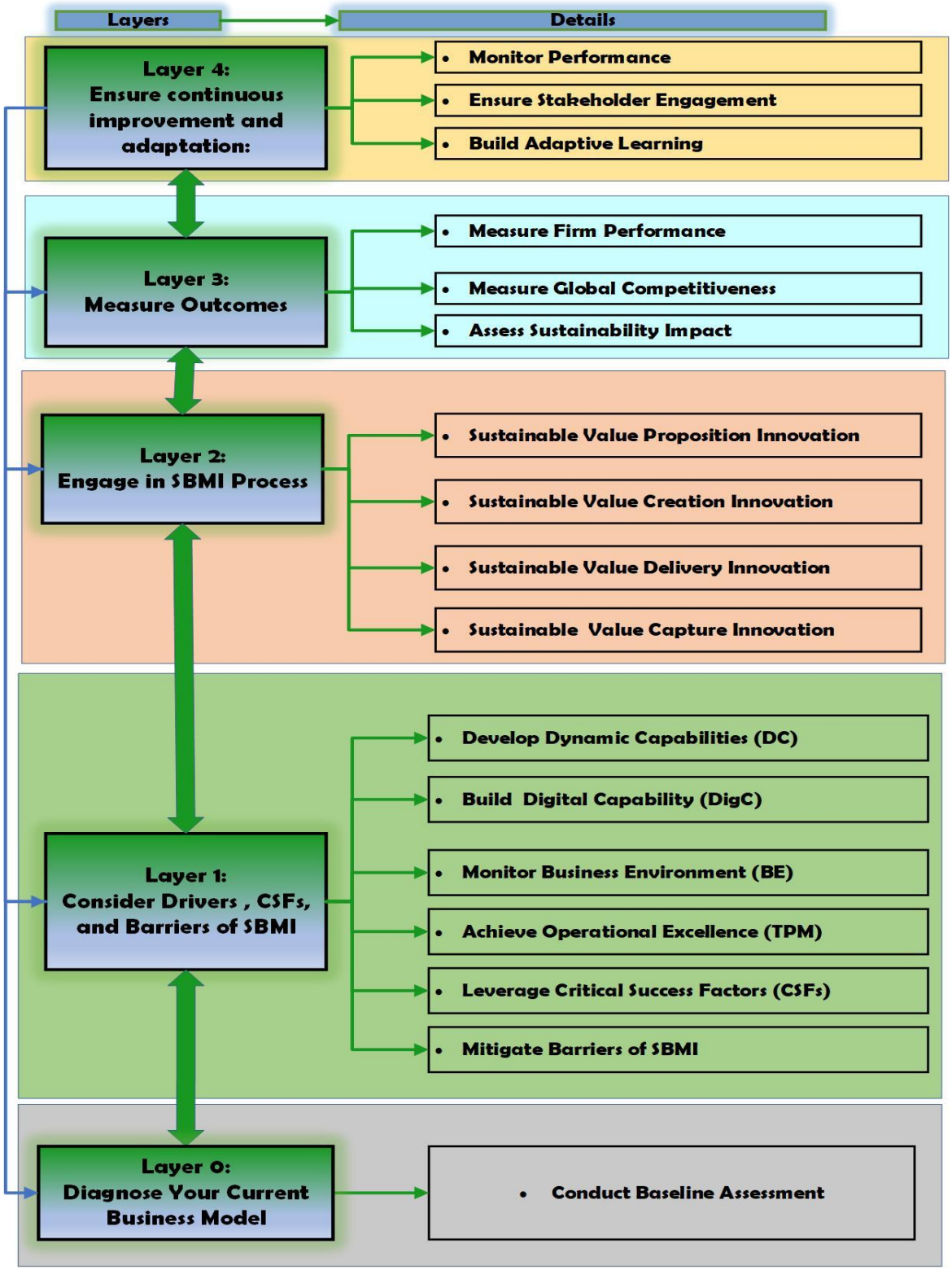


Figure 7. 2: The EMF-in-LS generic SBMI framework (Version 2)

Source: The Author

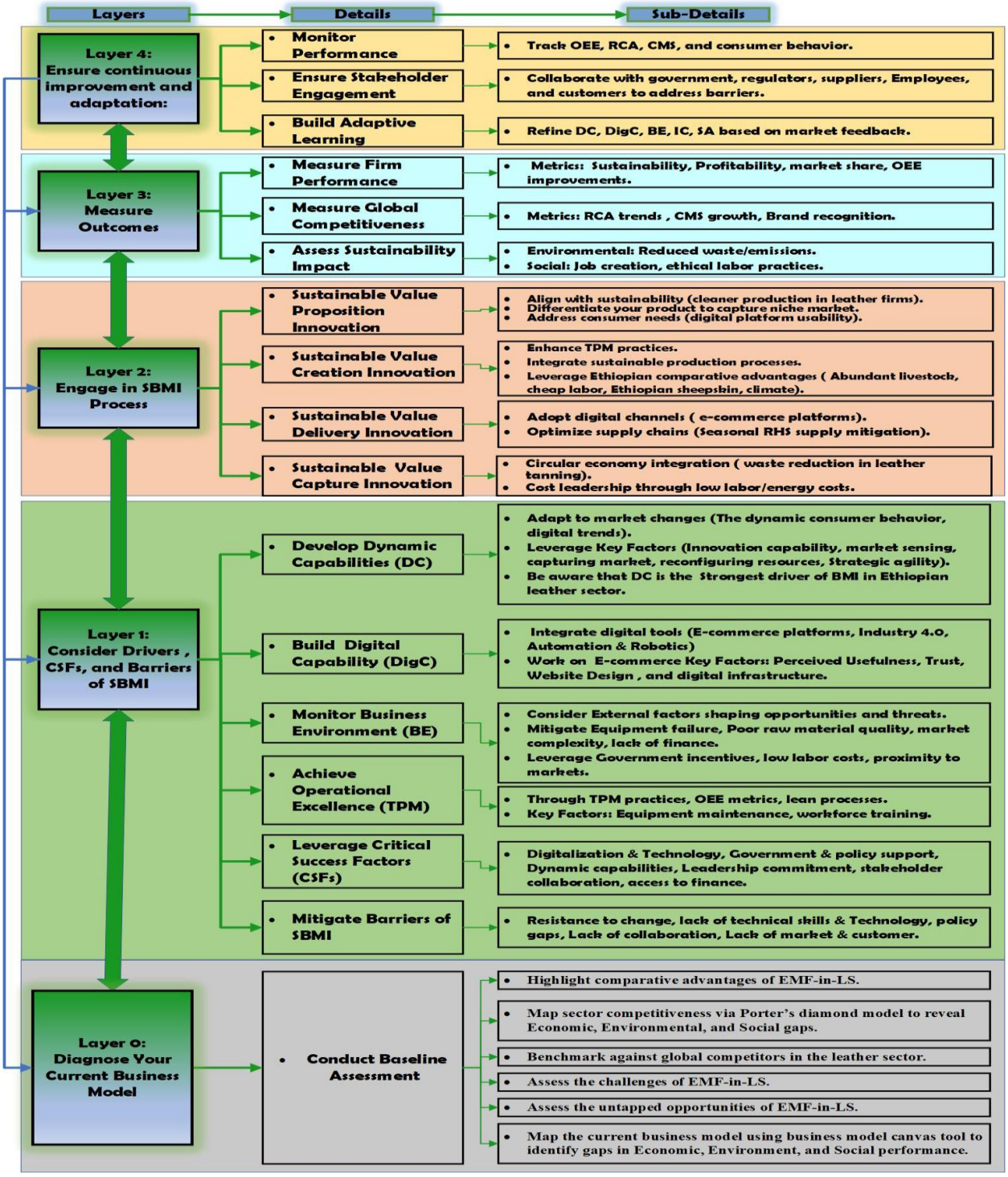


Figure 7. 3: The EMF-in-LS generic SBMI framework (Final Version)

Source: The Author

7.2 Key Layers of the SBMI Framework

The framework is structured into five interconnected layers (Layer 0- Layer 4), each representing a critical phase in the sustainable business mode innovation process.

Layer 0: Diagnose the Current Business Model

0.1 Highlight comparative advantages of Ethiopia in the leather sector (Abundant livestock, Ethiopian highland sheep skin, Trainable cheap labor, favorable climate for animal husbandry, Ethiopian unique craftmanship, proximity to the regional market) *(Based on insights from Study I).*

0.2 Benchmark against global competitors (China, Viet Nam, Italy, Germany, USA) leather industries *(Based on insights from Study I).*

0.3 Map the competitiveness of the sector using Porter's diamond model to identify gaps in economic, environment, and social performance in the sector *(Based on insights from Study I).*

0.4 Assess the challenges of the Ethiopian leather sector such as: Frequent Equipment failure, lack of online presence and market linkage, poor quality of RHS, chrome tanning, infrastructure gaps *(Based on insights from Study I).*

0.5 Assess the opportunities of EMF-in-LS (such as: RHS abundance, trainable cheap labor, Ethiopian highland sheep skin, government support, emerging digital platforms for e-commerce *(Based on insights from Study I).*

0.6 Map the current business model using business model canvas tool to identify gaps in economic, environment, and social performance *(Based on insights from Study I).*

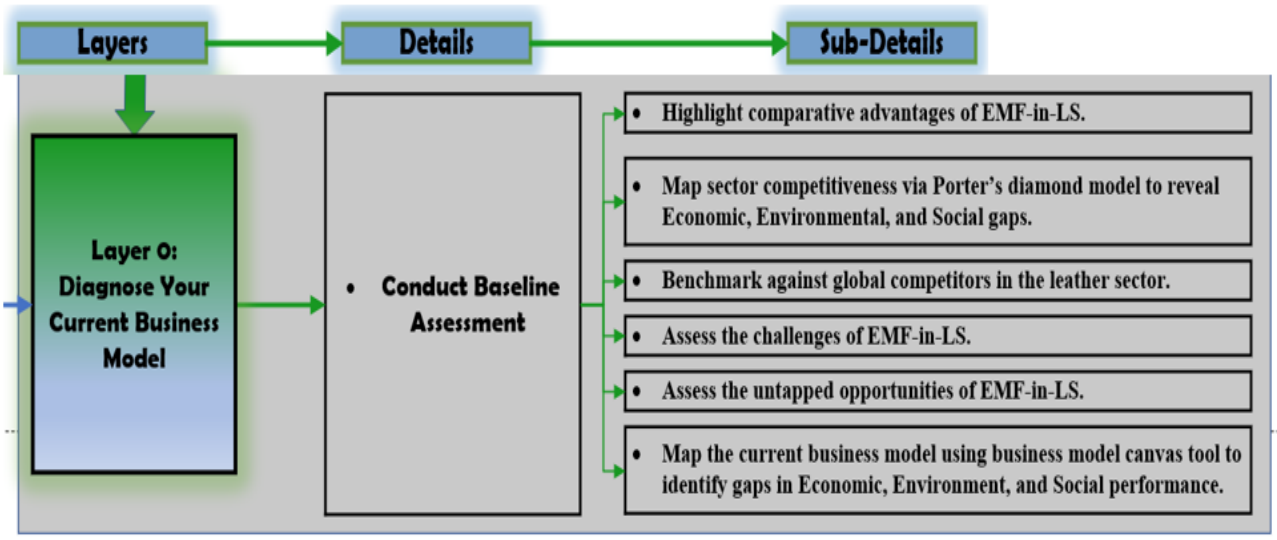


Figure 7. 4: Layer 0 of the EMF-in-LS generic SBMI framework

Source: The author

Layer 1: Consider the Drivers of business model innovation; Critical Success Factors, and Barriers of Sustainable Business Model Innovation

1.1. Develop Dynamic Capabilities (DC)

1.1.1. Adapt to market changes (Sustainablity conscious buyers, Dynamic changes in buyer behavior, digital trends) *(Based on Insights from studies II & III)*

1.1.2. Leverage Key Enablers: Innovation capability, market sensing, Strategic agility *(Based on insights from Study III).*

1.1.3. Be aware that DC is the strongest enabler of BMI in Ethiopian leather sector *(Based on insights from Study III).*

1.2. Build Digital Capability (DigC)

1.2.1. Integrate digital tools like E-commerce platforms *(Based on insights from study II&III).*

1.2.2. Enhancing E-Commerce Capabilities *(Based on insights from study III).*

1.2.3. Optimizing Website Design *(Based on insights from study II).*

1.2.4. Leveraging Digital Marketing for Sustainability *(Based on insights from study II & III).*

1.2.5. Work on Perceived usefulness, trust, website design, and digital infrastructure to build effective online market platform and ensure online presence *(Based on insights from study II)*

1.2.6. Ensure data protection and build consumer trust in online transactions *(Based on insights from study II).*

1.3. Monitor Business Environment (BE)

1.3.1. Identify internal and external factors shaping opportunities and threats *(Based on insights from studies I&III)*

1.3.2. Mitigate poor quality of raw material, market complexity, lack of finance *(Based on insights from studies I&III).*

1.3.3. Leverage Government incentives, low labor costs, proximity to markets *(Based on insights from studies I&III).*

1.3.4. Monitor evolving laws on waste management, emissions, and chemical usage *(Based on insights from studies I&III).*

1.3.5. Ensure fair wages, safe working conditions, and responsible supply chain practices *(Based on insights from studies I&III).*

1.3.6. Explore advancements in chrome-free and bio-based tanning methods *(Based on insights from studies I&III).*

1.3.7. Investigate innovations in leather recycling and waste reduction *(Based on insights from study III).*

1.3.8. Collaborate with vendors committed to responsible leather production *(Based on insights from studies I&III).*

1.3.9. Identify grants, subsidies, and ESG-focused investment funds *(Based on insights from studies I&III).*

1.4. Achieve Operational excellence through TPM

1.4.1. Adopt TPM practice, OEE metrics, lean manufacturing processes *(Based on insights from study I).*

1.4.2. Perform appropriate equipment maintenance, workforce training to achieve world class manufacturing *(Based on insights from study I).*

1.5. Leverage Critical Success Factors (CSFs)

1.5.1. Leverage the 11 identified critical success factors of SBMI including: Collaboration and stakeholder engagement; innovation and vision; sustainability and responsibility; market and customer focus; circular economy and sustainable practice; resource development and organizational learning; Digitalization and technology; dynamic capabilities; mindset and organizational learning; government and policy support; performance metrics *(Based on insights from study III).*

1.6. Mitigate Barriers of SBMI

1.6.1. Mitigate the 10 identified Barriers of SBMI including: Technical and technological barriers; regulatory and policy barriers; market and customer barriers; organizational inertia; resource scarcity; cultural and mindset barriers; lack of collaboration; complexity and uncertainty; lack of awareness and knowledge; absence of appropriate performance metrics *(Based on insights from study III).*

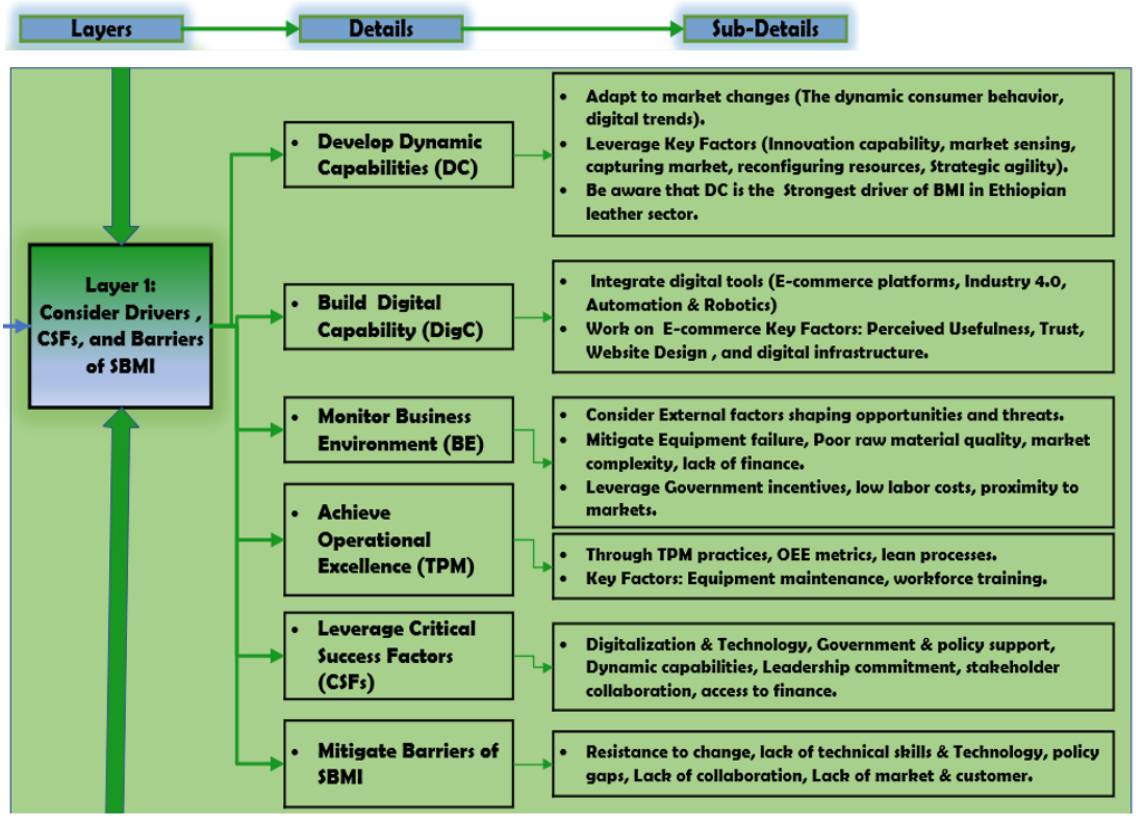


Figure 7. 5: Layer 1 of the EMF-in-LS generic SBMI framework

Source: The author

Layer 2:

2. Engage in Sustainable Business Model Innovation process

2.1. Value Proposition Innovation

2.1.1. Adopt chrome-free tanning and other eco-friendly chemical treatments to reduce pollution *(Based on insights from studies I & III).*

2.1.2. Upholding ethical working conditions, fair wages, and community engagement *(Based on insights from studies I & III).*

2.1.3. Design high-quality leather products that reduce waste by extending their lifecycle *(Based on insights from studies I & III).*

2.1.4. Implement advanced technologies to lower resource consumption and improve sustainability *(Based on insights from studies I & III).*

2.1.5. Provide clear sustainability metrics and third-party certifications to build consumer trust *(Based on insights from studies I & III).*

2.1.6. Leverage sustainable design and digital tools to create personalized, eco-conscious products *(Based on insights from studies I & III).*

2.1.7. Ensure traceability and responsible procurement of raw materials *(Based on insights from studies I & III).*

2.1.8. Address consumer needs (digital platform usability) *(Based on insights from study II).*

2.1.9. Redefine value offerings to align with sustainability goals and customer needs *(Based on insights from study I).*

2.1.10. Differentiate your product to capture niche market *(Based on insights from study I).*

2.1.11. Focus on value added products (finished leather, articles of leather, footwear) over raw hides and skins (RHS) *(Based on insights from study I).*

2.2. Value Creation Innovation

2.2.1. Procure traceable RHS *(Based on insights from study I).*

2.2.2. Implement water-saving technologies, renewable energy solutions, and non-toxic tanning methods *(Based on insights from study I).*

2.2.3. Design products for durability, recyclability, and upcycling to reduce waste and extend product life cycles *(Based on insights from study I).*

2.2.4. Leveraging digital tools *(Based on insights from studies I, II, and III).*

2.2.5. Ensure fair wages, safe working conditions, and skill development programs for employees *(Based on insights from study I).*

2.2.6. Provide clear sustainability metrics, traceability, and third-party certifications to build trust *(Based on insights from study I&III).*

2.2.7. Work with sustainable fashion brands, NGOs, and research institutions to drive sustainable business innovation *(Based on insights from study I).*

2.2.8. Aligning with global sustainability standards and environmental, social, and governance (ESG) frameworks *(Based on insights from study I).*

2.2.9. Integrate sustainable production processes, ethical sourcing, and circular economy principles *(Based on insights from study I).*

2.2.10. Enhance TPM practices *(Based on insights from study I).*

2.2.11. Leverage comparative advantages of Ethiopia in the leather sector (abundant livestock, cheap labor, favorable climate for livestock husbandry, Ethiopian highland sheep skin) *(Based on insights from study I).*

2.3. Value Delivery Innovation

2.3.1. Leverage online platforms to enhance accessibility, reduce waste, and streamline sustainable product delivery *(Based on insights from study II).*

2.3.2. Adopt digital channels (E-commerce platforms) *(Based on insights from studies I, II, and III).*

2.3.3. Establish traceable sourcing of raw materials and optimizing logistics for minimal environmental impact *(Based on insights from studies I & II).*

2.3.4. Utilize biodegradable or recyclable packaging and adopting carbon-neutral transportation methods *(Based on insights from study I).*

2.3.5. Collaborate with sustainable fashion brands, retailers, and industry stakeholders to scale impact *(Based on insights from study I).*

2.3.6. Adhere to environmental, social, and governance (ESG) standards to meet global sustainability benchmarks *(Based on insights from study I).*

2.4. Value Capture Innovation

2.4.1. Premium Pricing for Sustainable Products *(Based on insights from study I).*

2.4.2. Circular Economy Revenue Streams *(Based on insights from studies I & III).*

2.4.3. Attract sustainability impact investors and conscious consumers *(Based on insights from studies I & III).*

2.4.4. Brand Differentiation & Consumer Loyalty (Building trust through transparency, traceability, and ethical labor practices to enhance customer retention) *(Based on insights from studies I & III).*

2.4.5. Build Strategic Partnerships & Collaborations with sustainable fashion brands, NGOs, and research institutions to drive innovation and market expansion) *(Based on insights from studies I & III).*

2.4.6. Cost leadership through low labor/energy costs *(Based on insights from study I).*

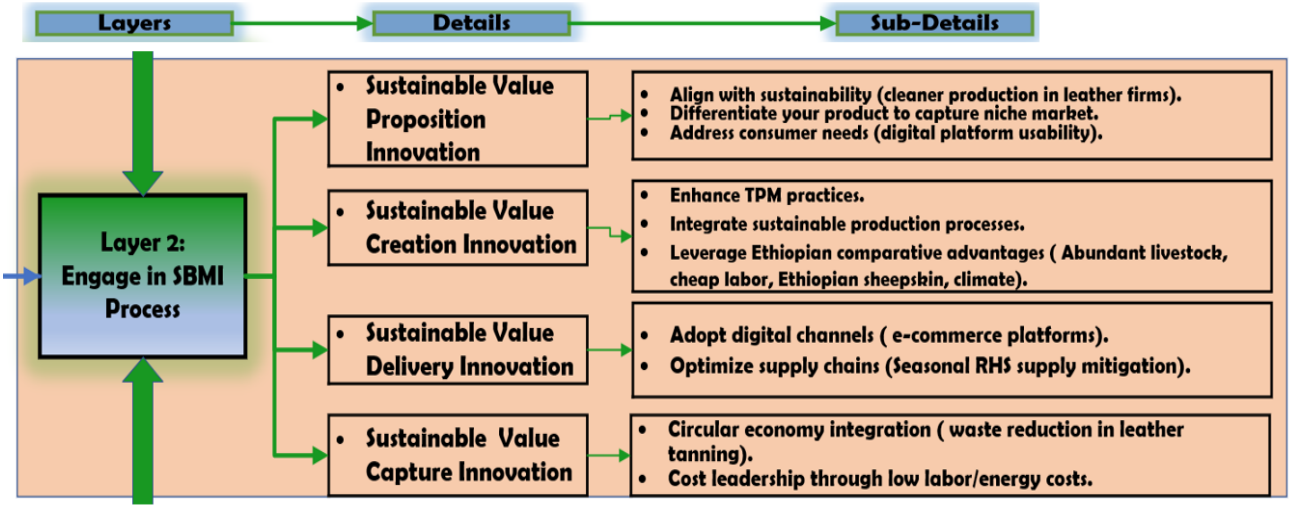


Figure 7. 6: Layer 2 of the EMF-in-LS generic SBMI framework

Source: The author

Layer 3:

3. Measure Outcomes

3.1. Assess improvements in firm performance (Sustainability, efficiency, profitability, and market position).

3.1.1. Measure firm performance using metrics like: profitability, market share, OEE improvements *(Based on insights from studies I & III).*

3.1.2. Measure Global Competitiveness using metrics like: RCA trends, CMS growth, brand recognition *(Based on insights from study I).*

3.2. Evaluate global competitiveness by benchmarking against international best practices *(Based on insights from study I).*

3.3. Assess the impact of e-commerce and digital marketing on sustainable leather sales *(Based on insights from study II).*

3.4. Measure the sustainability impact across economic, environmental, and social dimensions *(Based on insights from study III).*

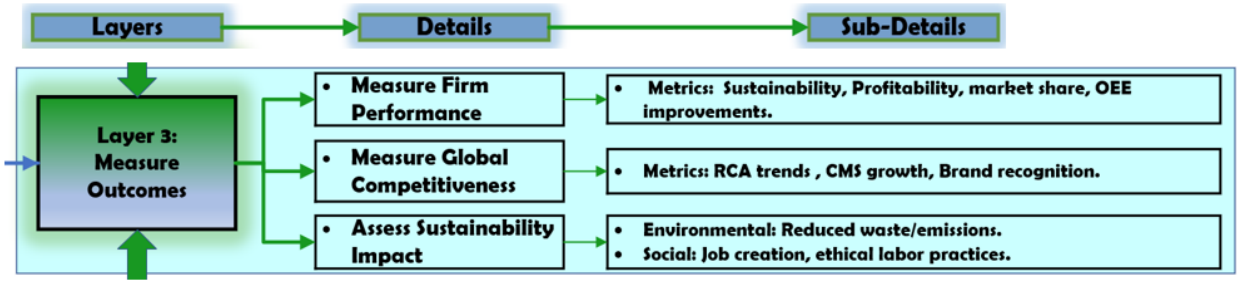


Figure 7. 7: Layer 3 of the EMF-in-LS generic SBMI framework

Source: The author

Layer 4:

4. Ensure Continuous Improvement and Adaptation

4.1. Monitor Performance

4.1.1. Track OEE, RCA, and the dynamic consumer behavior *(Based on insights from studies I&II).*

4.2. Ensure Stakeholder Engagement

4.2.1. Collaborate with government, suppliers, and consumers to address barriers *(Based on insights from studies I&III).*

4.3. Build Adaptive Learning

4.3.1. Refine dynamic capabilities, Digital Capability, Business Environment, Innovation capabilities, and strategic Agility based on market feedback *(Based on insights from study III).*

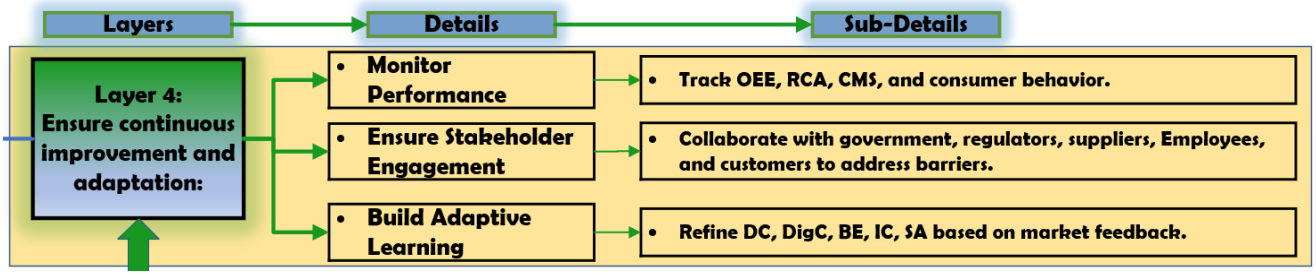


Figure 7. 8: Layer 4 of the EMF-in-LS generic SBMI framework

Source: The author

This EMF-in-LS generic SBMI Framework provides Ethiopian manufacturing firms in the leather sector (EMF-in-LS) a comprehensive procedure towards innovating their sustainable business model and enhance their global competitiveness to quickly respond to the dynamic business environment nowadays.

By systematically assessing their current business models, addressing key barriers, leveraging enablers, and continuously innovating, firms can strengthen their competitiveness and long-term viability.

This validated framework strengthens EMF-in-LS firms' capacity for sustainable business model innovation, ultimately empowering them to achieve long-term viability, global competitiveness, and industry sustainability.

7.3 The EMF-in-LS generic SBMI framework validation

The generic Sustainable Business Model Innovation (SBMI) framework, developed to enhance the SBMI capabilities of Ethiopian manufacturing firms in the leather sector (EMF-in-LS), was primarily developed based on insights synthesized from the three previously discussed empirical studies. To ensure further validation, semi-structured interviews were conducted with sustainability experts, industry practitioners, and academic professionals.

To refine the framework and establish consensus regarding its components and relational structures, a Delphi study was subsequently undertaken. This involved multiple iterative rounds of

structured surveys administered to a panel of subject matter experts, facilitating convergence of expert opinion.

Furthermore, the proposed SBMI framework was benchmarked against existing models in the literature to critically identify enhancements, comparative advantages, and potential gaps, thereby reinforcing its practical and conceptual contributions to the sector.

7.4 Summary of Chapter Seven

This chapter introduced the proposed Sustainable Business Model Innovation (SBMI) framework, developed by integrating key findings from the empirical analyses thoroughly discussed in the preceding chapters. It draws on insights from global competitiveness assessments, operational performance, consumer behavior in digital platforms, critical success factors and barriers, as well as the influence of BMI enablers on firm performance. These multiple perspectives are brought together to inform a holistic and context-specific SBMI framework for Ethiopian manufacturing firms in the leather sector (EMF-in-LS).

The resulting generic SBMI framework is organized into four interrelated layers including: Baseline assessment; sectoral, operational, digital, and behavioral insights; SBMI process; outcome measurement; and continuous improvement; each grounded in empirical evidence and aligned with the unique challenges and opportunities of EMF-in-LS. This SBMI framework offers a practical and adaptable pathway to guide firms in enhancing their SBMI capacity and achieving long-term, sustainable competitiveness in the global leather markets.

With the development of the SBMI framework grounded in empirical evidence and contextual realities in this chapter, the following final chapter offers key conclusions, the study's main contributions, actionable recommendations, and directions for future research and practice seeking to strengthen sustainable industrial development in Ethiopia.

.

Chapter 8

Conclusions and Recommendations

8.1 Conclusions

Adopting Sustainable Business Model Innovation (SBMI) capabilities enables firms to achieve higher levels of competitiveness, foster economic growth, enhance social well-being, and uphold environmental stewardship. For Ethiopian manufacturing firms in the leather sector (EMF-in-LS), embracing SBMI capabilities offers a pathway to continuous evolution; challenging conventional approaches, unlocking novel revenue streams, and maintaining strategic agility in dynamic market environments.

This PhD dissertation accomplishes its main objective by developing a comprehensive Sustainable Business Model Innovation (SBMI) framework tailored for Ethiopian manufacturing firms in the leather sector (EMF-in-LS). The framework integrates insights from the three interrelated empirical studies to enhance these firms' capacity for sustainable business model innovation and improve their global competitiveness. Based on the insights derived from the three empirical studies and subjected to rigorous validation process by peers, subject matter experts, industry practitioners, and key stakeholders, the SBMI framework offers strategic, evidence-based approaches for aligning sustainability with business growth, thereby fostering long-term resilience in the dynamic international leather market. The framework seeks to leverage the sector's comparative advantages, capitalize on untapped opportunities, and address prevailing challenges to support long-term sustainable competitiveness of EMF-in-LS.

The findings of this PhD dissertation show that Ethiopia holds strong potential in the global leather market due to its vast livestock population, providing an abundant supply of raw hides and skins (RHS). However, its advantage in RHS and finished leather (FL) exports is declining as global markets shift toward value-added and sustainable leather products. Ethiopia has seen its competitiveness weaken since 2018 in its foot wear export even if there is a slight increase in articles of leather export. To reverse this trend, the sector must prioritize high-value, eco-friendly products, enhance sustainable production methods, integrate digital tools, improve online presence

and international market linkage, strengthen partnerships, and implement supportive policies. Without these reforms, Ethiopia risks losing ground, but embracing Sustainable Business Model Innovation (SBMI) can secure its leather industry's future.

Ethiopia's leather sector faces persistent sustainability challenges including: conventional chrome tanning methods; Socially poor working condition including unsafe work environments, low wages, and inadequate worker protections; outdated machinery; poor-quality of raw hides and skins (RHS); limited market linkage; financial constraints; and weak infrastructure. Despite the challenges the EMF-in-LS also holds transformative potential. The country's abundant raw material source from the large livestock population; the Ethiopian highland sheep skin; strategic government incentives; the expanding industrial parks; the favorable climate for animal husbandry; provides fertile ground for sustainable growth. International technical support from organizations like UNIDO, the rise of global digital e-commerce platforms, and increasing global demand for value-added, eco-conscious leather products further reinforce this potential. Building sustainable business model innovation capabilities can catalyze a shift toward a competitive, resilient, and environmentally responsible leather industry.

This study also examines Ethiopian consumers' online purchase intentions and their impact on sustainable business model innovation in the leather sector. It identifies Perceived Ease of Use (PEOU), Perceived Usefulness (PU), and Subjective Norms (SN) as the key drivers of purchase intentions. While Website Design (WD) and Trust (TR) play indirect roles, the study underscores the need for user-friendly platforms, accurate product information, and localized digital strategies. Aligning online retail with Ethiopia's demographic needs supports customer retention and national initiatives like Digital Ethiopia 2025.

This PhD study highlights key success factors of SBMI including: collaboration, strategic focus, capacity building, and external support while identifying barriers like: external challenges, internal obstacles, and knowledge gaps. Overcoming these requires stakeholder engagement, knowledge sharing, and supportive policies, with strategies such as partnerships, employee training, technology adoption, and sustainability integration.

This PhD study also highlights dynamic capabilities (DC), digital capabilities (DigC), and business environment (BE) as essential for business model innovation (BMI) with in EMF-in-LS. While

BMI, DC, and BE improve firm performance (FP), Strategic Agility (SA) unexpectedly shows a negative effect, requiring further research. Strengthening innovation capability and digital integration is key to maximizing competitiveness.

This dissertation has positioned Sustainable Business Model Innovation (SBMI) as a multi layered construct that bridges theory, empirical analysis, and managerial practice. SBMI has served as the theoretical framework guiding the study, integrating sustainability and business model innovation theories to explain how Ethiopian leather firms can enhance global competitiveness. It has also functioned as a conceptual lens, structuring the interpretation of empirical findings across competitiveness analysis, consumer behavior, and innovation drivers. Finally, SBMI has been synthesized into a practical managerial framework, providing actionable guidance for managers to build SBMI capabilities in the Ethiopian leather sector. By unifying these roles, the dissertation ensures consistency across chapters and demonstrates how SBMI can be both academically rigorous and practically transformative.

8.1.1 Theoretical Implications and Contributions

This dissertation presents a novel and context-specific SBMI framework that synthesizes sustainability, competitiveness, innovation, and digital transformation. It fills a critical gap in the SBMI literature by offering a comprehensive SBMI framework tailored to the realities of developing nations specifically Ethiopian manufacturing firms in the leather sector (EMF-in-LS). This framework serves as a theoretical and practical foundation for future research, policy formulation, and strategic implementation in sustainability-oriented industrial development.

Moreover, this PhD dissertation advances the theoretical understanding of Ethiopia's trade dynamics and global competitiveness in the leather sector through the application of Revealed Comparative Advantage (RCA) and Constant Market Share (CMS) techniques. These tools offer valuable insights into the country's export performance and competitiveness, reinforcing their relevance for developing economies. By adapting Porter's Diamond Model to Ethiopia's context, the study identifies key macroeconomic and institutional factors influencing the sector's global positioning.

Methodologically, the research integrates macro-level competitiveness frameworks with firm-level insights by combining: Porter's Diamond Model analysis, Thematic analysis and semi-

structured interviews, Business Model Canvas (BMC) for firm-level business model exploration. This multi-level approach bridges strategic theory with operational realities, offering a holistic lens for understanding and enhancing competitiveness.

The study extends the Resource-Based View (RBV) by positioning sustainability compliance and business model innovation as strategic resources that contribute to long-term competitive advantage. It emphasizes that sustainability is not merely a compliance issue but a core capability that can differentiate firms in global markets.

In exploring Ethiopian consumers' digital behavior, the dissertation validates the Technology Acceptance Model (TAM) and the Theories of Reasoned Action and Planned Behavior, confirming the influence of Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Subjective Norms (SN). These findings expand digital market research in Ethiopia and provide a theoretical foundation for future studies on e-commerce adoption and consumer behavior.

The dissertation also contributes to the theoretical development of Sustainable Business Model Innovation (SBMI) by identifying and structuring Critical Success Factors (CSFs) and barriers that can be leveraged and mitigated by Ethiopian manufacturing firms in the leather sector (EMF-in-LS). It proposes a conceptual framework that simplifies the understanding of SBMI dynamics for both academic researchers and industry practitioners, and calls for its empirical validation in future studies.

Further contributions include enriching the literature on: Dynamic Capabilities (DC), Digital Capabilities (DigC), and Business Environment (BE). These elements are identified as key enablers of Business Model Innovation (BMI) and firm performance in the context of developing nations specific in EMF-in-LS. The study highlights how the interplay between these capabilities supports strategic renewal and sustainability integration.

8.1.2 Practical Implications and Contributions

This dissertation highlights Ethiopia's strategic potential in the global leather trade, emphasizing the urgent need for sustainability-oriented investments in production and export capabilities. With abundant raw materials, trainable cost-effective labor, and high growth prospects, Ethiopian manufacturing firms in the leather sector (EMF-in-LS) and policymakers must adopt SBMI

principles to navigate fluctuating competitiveness, particularly in footwear exports, and reposition the sector toward long-term resilience.

To enhance global competitiveness, EMF-in-LS should prioritize innovation, sustainability, and productivity by investing in: Eco-friendly production technologies and cleaner manufacturing practices; Targeted digital marketing and e-commerce platforms; International trade linkages and niche markets focused on environmentally conscious consumers; Expanding digital commerce and improving global visibility through online platforms can unlock new revenue streams and reinforce Ethiopia's presence in the sustainable leather value chain.

For practitioners, the study underscores the operational relevance of Total Productive Maintenance (TPM) specifically the pillars of Focused Improvement (FI), Quality Maintenance (QM), and Education & Training (EduT) as critical enablers of Overall Equipment Effectiveness (OEE). These pillars support resource optimization and operational excellence, particularly in resource-constrained environments.

The dissertation also provides a strategic roadmap for implementing SBMI, identifying Critical Success Factors (CSFs) and barriers that EMF-in-LS must address. By leveraging CSFs, such as strategic collaboration, capacity building, and external support, firms can overcome internal inefficiencies and external uncertainties, thereby optimizing sustainability efforts.

Moreover, the study emphasizes the importance of digital transformation and the role of key capabilities in driving Sustainable Business Model Innovation (SBMI), including: Dynamic Capabilities (DC) for strategic responsiveness, Digital Capabilities (DigC) for technology integration, Business Environment (BE) for contextual alignment. By integrating these capabilities with customer expectations and regulatory frameworks, firms can sustain competitive advantage and foster innovation.

8.2 Recommendations

Based on the findings of this PhD study, the researcher has put forward several recommendations. These are intended to provide practical guidance for key practitioners, policymakers, and government officials, as well as future researchers, to enhance the global competitiveness of Ethiopian manufacturing firms in the leather sector (EMF-in-LS).

8.2.1 For practitioners (Export oriented EMF-in-LS)

- Incorporate sustainable practices into core business processes to reduce environmental impact and enhance brand reputation.
- Enhance Product Value Addition & Diversification.
- Improve product quality to meet international standards.
- Prioritize FI, QM, and EduT to drive immediate OEE gains and then Operational excellence through TPM.
- Identify the skill gaps and fill the gap through appropriate Education and Training programs.
- Leverage Digitalization and Technology to improve efficiency and drive innovation in sustainability efforts.
- Leverage Ethiopia's Comparative Advantages (abundant source of RHS, trainable cheap labor, Ethiopian highland sheep skin, favorable climate)
- Address Declining RCA in RHS & FL and the fluctuating RCA in footwear export.
- Continuously track RCA trends, global demand shifts, and competitor strategies using analytics.
- Explore uncaptured global markets, expand into African markets, and collaborate with international e-commerce platforms, distributors, and merchants.
- Work closely with stakeholders to enhance the quality of raw hides and skins (RHS).
- Adopt Modern Technology & Innovation
- Develop partnerships with local suppliers of chemicals, accessories, and spare parts.
- Develop user-friendly, intuitive, and visually appealing digital market platforms that require minimal technical knowledge to navigate.
- Prioritize Dynamic and Digital Capabilities (DC & DigC).
- Proactively address BE factors (technology, regulations, customer demands) to foster SBMI resilience.
- Monitor Strategic Agility (SA) Practices.
- Strengthen Innovation Capability (IC).

8.2.2 For the Government

- Invest in raising awareness about the importance of sustainable practices to shift societal behavior and attitudes.
- Provide Financial and Technical Resources to support EMF-in-LS to overcome resource scarcity and technical barriers in their SBMI efforts.
- Support research-industry linkages to pilot innovative TPM practice in the leather sector, Fund and implement Education and training programs in maintenance skills, lean manufacturing, and equipment management for workers.
- Establish and support leather processing plants to ensure that raw hides and skins (RHS) are processed locally, reducing reliance on low-value exports.
- Strengthen technical training programs in leather processing, design, and manufacturing to elevate the sector's skill level.
- Implement targeted strategies to reverse Ethiopia's declining comparative advantage in footwear exports.
- Enforce environmental regulations to minimize pollution and health risks.
- Establish a comprehensive e-commerce roadmap to guide businesses, policymakers, and investors in growing the sector.
- Fund programs to enhance Dynamic capabilities (DC) and Digital capabilities (DigC)
- Boost Innovation Capabilities (IC) through R&D incentives.
- Establish innovation hubs linking universities, research centers, and firms to support SBMI efforts of EMF-in-LS.

8.2.3 For the policy makers

- Address Regulatory Barriers by aligning policies with international sustainability standards.
- Incorporate Sustainability Metrics in policy.
- Design industry-wide TPM guidelines tailored to Ethiopia's manufacturing sector, emphasizing Focused Improvement (FI), Quality Maintenance (QM), and Education & Training (EduT).

- Develop and implement policies that incentivize value-added production and discourage excessive raw material exports.
- Introduce and enforce environmental and social compliance standards to help firms meet international sustainability requirements.
- Encourage digital transformation in the leather sector by supporting firms in adopting e-commerce and digital marketing strategies.
- Establish consumer protection laws, digital payment regulations, and cybersecurity policies to enhance trust in online transactions.

8.2.4 For the academia

- Conduct research on the cultural and mindset challenges businesses face when transitioning to innovative sustainable business models.
- Conduct studies to analyze the performance of Ethiopian leather firms in the domestic market, identifying gaps and opportunities.
- Explore strategies to enhance Ethiopia's sustainable global competitiveness in the leather sector.
- Investigate how digital trade, e-commerce, online platforms, and technology adoption can improve Ethiopia's leather sector performance.
- Explore Additional Determinants of Online Purchase Behavior and compare Ethiopian Consumers with Other African Markets.
- Analyze the Role of AI & Personalization in E-commerce.
- Investigate contextual factors causing strategic agility (SA) to harm firm performance (FP) in EMF-in-LS.
- Conduct Longitudinal Studies.
- Replicate the study in non-manufacturing sectors and other developing economies.

8.3 Limitations of the study and future research directions

Despite the efforts to uphold the quality of this study, it is not without limitations. The first limitation is its exclusive focus on Export oriented Ethiopian manufacturing firms in the leather sector, which restricts its generalizability to other industries. Future research should explore additional sectors to provide a more comprehensive understanding. The second limitation is the

study's cross-sectional design during the empirical studies conducted, which offers only a snapshot in time. Future studies could adopt a longitudinal approach to better capture trends and evolving dynamics over time.

References

Ab Hamid, M.R., Sami, W. and Mohmad Sidek, M.H. (2017), "Discriminant Validity Assessment: Use of Fornell & Larcker criterion versus HTMT Criterion", *Journal of Physics: Conference Series*, Vol. 890 No. 1, doi: 10.1088/1742-6596/890/1/012163.

Abadzhiev, A., Sukhov, A. and Johnson, M. (2024), "Business model innovation for reducing uncertainty in sustainability transitions: A case study of the wood construction industry", *Creativity and Innovation Management*, John Wiley and Sons Inc, doi: 10.1111/caim.12622.

Abate, T.A., Desta, A.F. and Love, N.G. (2021), "Evaluating tannery wastewater treatment performance based on physicochemical and microbiological characteristics: An Ethiopian case study", *Water Environment Research*, John Wiley and Sons Inc, Vol. 93 No. 5, pp. 658–669, doi: 10.1002/wer.1364.

Abbas, S. and Waheed, A. (2017), "Trade competitiveness of Pakistan: evidence from the revealed comparative advantage approach", *Competitiveness Review*, Emerald Group Publishing Ltd., Vol. 27 No. 5, pp. 462–475, doi: 10.1108/CR-12-2015-0092.

Abdul Basit, S., Gharleghi, B., Batool, K., Hassan, S.S., Jahanshahi, A.A. and Kliem, M.E. (2024), "Review of enablers and barriers of sustainable business practices in SMEs", *Journal of Economy and Technology*, Vol. 2, pp. 79–94, doi: https://doi.org/10.1016/j.ject.2024.03.005.

Achmad, G.N., Yudaruddin, R., Nugroho, B.A., Fitrian, Z., Suharsono, S., Adi, A.S., Hafsari, P., *et al.* (2023), "Government support, eco-regulation and eco-innovation adoption in SMEs: The mediating role of eco-environmental", *Journal of Open Innovation: Technology, Market, and Complexity*, Elsevier B.V., Vol. 9 No. 4, doi: 10.1016/j.joitmc.2023.100158.

Addis, S., Dvivedi, A. and Beshah, B. (2018), "Determinants of job satisfaction in Ethiopia: evidence from the leather industry", *African Journal of Economic and Management Studies*, Emerald Group Holdings Ltd., Vol. 9 No. 4, pp. 410–429, doi: 10.1108/AJEMS-09-2017-0222.

Adem, M. (2019), "Production of hide and skin in Ethiopia; marketing opportunities and constraints: A review paper", *Cogent Food and Agriculture*, Informa Healthcare, doi: 10.1080/23311932.2019.1565078.

Ademi, B., Sætre, A.S. and Klungseth, N.J. (2024), "Advancing the understanding of sustainable business models through organizational learning", *Business Strategy and the Environment*, John Wiley and Sons Ltd, doi: 10.1002/bse.3746.

Adesta, E.Y.T., Prabowo, H.A. and Agusman, D. (2018), "Evaluating 8 pillars of Total Productive Maintenance (TPM) implementation and their contribution to manufacturing performance", *IOP Conference Series: Materials Science and Engineering*, Vol. 290 No. 1, doi: 10.1088/1757-899X/290/1/012024.

Adetumi Adewumi, Somto Emmanuel Ewim, Ngodoo Joy Sam-Bulya and Olajumoke Bolatito Ajani. (2024), "Strategic innovation in business models: Leveraging emerging technologies to gain a competitive advantage", *International Journal of Management & Entrepreneurship Research*, Vol. 6 No. 10, pp. 3372–3398, doi: 10.51594/ijmer.v6i10.1639.

Afshardost, M. (2013), "Linking trust, perceived website quality, privacy protection, gender and online purchase intentions", *IOSR Journal of Business and Management*, Vol. 13 No. 4, pp. 63–72, doi: 10.9790/487x-1346372.

Agazu, B.G. and Kero, C.A. (2024), "Innovation strategy and firm competitiveness: a systematic literature review", *Journal of Innovation and Entrepreneurship*, Springer Science and Business Media Deutschland GmbH, 1 December, doi: 10.1186/s13731-024-00381-9.

Agoraki, K.K., Deirmentzoglou, G.A. and Triantopoulos, C. (2024), "Cultural Values as Catalysts of Technological Innovation for a Sustainable Future", *Sustainability (Switzerland)* , Multidisciplinary Digital Publishing Institute (MDPI), Vol. 16 No. 5, doi: 10.3390/su16052064.

Agrawal, R., Samadhiya, A., Banaitis, A. and Kumar, A. (2024), "Entrepreneurial barriers in achieving sustainable business and cultivation of innovation: a resource-based view theory perspective", *Management Decision*, Emerald Publishing, doi: 10.1108/MD-11-2023-2032.

Agung, F.Y. and Siahaan, A. (2020), "Overall Equipment Effectiveness (Oee) Through Total Productive Maintenance (Tpm) Practices: a Case Study in Chemical Industry", *Emerging Markets : Business and Management Studies Journal*, Vol. 7 No. 1, pp. 23–36, doi: 10.33555/ijembm.v7i1.124.

Ahammad, M.F., Glaister, K.W. and Gomes, E. (2020), "Strategic agility and human resource management", *Human Resource Management Review*, Elsevier Ltd, Vol. 30 No. 1, doi: 10.1016/j.hrmr.2019.100700.

Ahmad, B., Anwar, M., Badar, H., Mehdi, M. and Tanwir, F. (2021), "Analyzing export competitiveness of major fruits and vegetables of pakistan: An application of revealed comparative advantage indices", *Pakistan Journal of Agricultural Sciences*, University of Agriculture, Vol. 58 No. 2, pp. 719–730, doi: 10.21162/PAKJAS/21.952.

Ahmad, S., Xin, C., Ullah, E. and Siyal, S. (2023), "Managers' leadership competencies and sustainable development goals in turbulent markets: the enabling role of resource commitment", *Environmental Science and Pollution Research International*, Vol. 30 No. 56, pp. 119134–119150, doi: 10.1007/s11356-023-30733-z.

Ahmad Wani, T. and Wajid Ali, S. (2016), *Determinants of Online Purchase Intentions: A Study of Indian Buyers*, *Amity Journal of Management Research AJMR Amity Journal of Management Research*, Vol. 1.

Ahmed, A., Nazeer, N., Zahid, G.R. and Nawaz, F. (2023), "Does revealed comparative advantage matter in the gravity of FTAs?", *Journal of International Logistics and Trade*, Jungseok Research Institute of International Logistics and Trade, Vol. 21 No. 2, pp. 84–107, doi: 10.1108/JILT-06-2022-0018.

Ahuja, I.P.S. and Khamba, J.S. (2008), "Total productive maintenance: Literature review and directions", *International Journal of Quality and Reliability Management*, Vol. 25 No. 7, pp. 709–756, doi: 10.1108/02656710810890890.

Ajzen, I. (1991), "The theory of planned behavior", *Organizational Behavior and Human Decision Processes*, Vol. 50 No. 2, pp. 179–211, doi: https://doi.org/10.1016/0749-5978(91)90020-T.

Ajzen, I. and Fishbein, M. (1980), "Understanding Attitudes and Predicting Social Behavior".

Akhtar, N., Zakir, N. and Ghani, E. (2008), *Changing Revealed Comparative Advantage: A Case Study of Footwear Industry of Pakistan*, Vol. 47, doi: https://doi.org/10.30541/v47i4%20IIpp.pp.695-709.

Al-Adwan, A.S., Alrousan, M.K., Yaseen, H., Alkufahy, A.M. and Alsoud, M. (2022), "Boosting Online Purchase Intention in High-Uncertainty-Avoidance Societies: A Signaling Theory Approach", *Journal of Open Innovation: Technology, Market, and Complexity*, Vol. 8 No. 3, p. 136, doi: https://doi.org/10.3390/joitmc8030136.

Al-Debei, M.M., Akroush, M.N. and Ashouri, M.I. (2015), "Consumer attitudes towards online shopping: The effects of trust, perceived benefits, and perceived web quality", *Internet Research*, Emerald Group Holdings Ltd., Vol. 25 No. 5, pp. 707–733, doi: 10.1108/IntR-05-2014-0146.

Algieri, B., Aquino, A. and Succurro, M. (2022), "Trade Specialisation and Changing Patterns of Comparative Advantages in Manufactured Goods", *Italian Economic Journal*, Springer Science and Business Media Deutschland GmbH, Vol. 8 No. 3, pp. 607–667, doi: 10.1007/s40797-022-00185-4.

Aljuboori, Z.M., Singh, H., Haddad, H., Al-Ramahi, N.M. and Ali, M.A. (2022), "Intellectual Capital and Firm Performance Correlation: The Mediation Role of Innovation Capability in Malaysian Manufacturing SMEs Perspective", *Sustainability (Switzerland)*, MDPI, Vol. 14 No. 1, doi: 10.3390/su14010154.

Alkandi, I. and Helmi, M.A. (2024), "The impact of strategic agility on organizational performance: the mediating role of market orientation and innovation capabilities in emerging industrial sector", *Cogent Business and Management*, Cogent OA, Vol. 11 No. 1, doi: 10.1080/23311975.2024.2396528.

Al-Maghrabi, T. and Dennis, C. (2011), "What drives consumers' continuance intention to e-shopping?: Conceptual framework and managerial implications in the case of Saudi Arabia", *International Journal of Retail and Distribution Management*, Vol. 39 No. 12, pp. 899–926, doi: 10.1108/09590551111183308.

Al-Masaeed, S., Abdeljaber, O., Ab Yajid, M.S., Shukri, S.M., Al-Adwan, A.S. and Tham, J. (2021), "Determinants of Online Purchase Behavior of Malaysian University Student: The Mediating Role of Subjective Norms", *INTERNATIONAL JOURNAL OF EBUSINESS AND EGOVERNMENT STUDIES*, APA, Vol. 13 No. 2, p. 2021, doi: 10.34109/ijebeg.

Al-refaie, A., Lepkova, N. and Camlibel, M.E. (2022), "The Relationships between the Pillars of TPM and TQM and Manufacturing Performance Using Structural Equation Modeling", *Sustainability (Switzerland)*, MDPI, Vol. 14 No. 3, doi: 10.3390/su14031497.

Alubel Abtew, M. (2015), "Revealed Comparative Advantage of Ethiopian Leather Industry with Selected African Economies", *International Journal of Business and Economics Research*, Science Publishing Group, Vol. 4 No. 5, p. 229, doi: 10.11648/j.ijber.20150405.11.

Alvarez-Risco, A., Quipuzco-Chicata, L. and Escudero-Cipriani, C. (2022), "Determinants of Online Repurchase Intention in Covid-19 Times: Evidence From an Emerging Economy", *Lecturas de Economia*, Universidad de Antioquia, No. 96, pp. 101–143, doi: 10.17533/udea.le.n96a342638.

Amde, B. (2017), "Major Factors Affecting Hide and Skin Production, Quality and the Tanning Industry in Ethiopia", *Advances in Biological Research*, Vol. 11 No. 3, pp. 116–125, doi: 10.5829/idosi.abr.2017.116.125.

Ammirato, S., Linzalone, R. and Felicetti, A.M. (2022), "Business model innovation drivers as antecedents of performance", *Measuring Business Excellence*, Emerald Group Holdings Ltd., Vol. 26 No. 1, pp. 6–22, doi: 10.1108/MBE-01-2021-0012.

Ancillai, C., Sabatini, A., Gatti, M. and Perna, A. (2023), "Digital technology and business model innovation: A systematic literature review and future research agenda", *Technological Forecasting and Social Change*, Elsevier Inc., Vol. 188, doi: 10.1016/j.techfore.2022.122307.

Anitha, K. (2024), "Emerging Trends in Sustainability: A Conceptual Exploration", in Kulkarni, S. and Haghi, A.K. (Eds.), *Global Sustainability: Trends, Challenges & Case Studies*, Springer Nature Switzerland, Cham, pp. 19–35, doi: 10.1007/978-3-031-57456-6_2.

Arsawan, I.W.E., Hariyanti, N.K.D., Atmaja, I.M.A.D.S., Suhartanto, D. and Koval, V. (2022), "Developing Organizational Agility in SMEs: An Investigation of Innovation's Roles and Strategic Flexibility", *Journal of Open Innovation: Technology, Market, and Complexity*, Multidisciplinary Digital Publishing Institute (MDPI), Vol. 8 No. 3, doi: 10.3390/joitmc8030149.

Arshad. (2024), "The Future of Ethiopian Leather Industry: Challenges, Innovations, and Sustainability - Leather News", available at: https://leathernews.org/the-future-of-ethiopian-leather-industry-challenges-innovations-and-sustainability/ (accessed 20 December 2024).

Assoratgoon, W. and Kantabutra, S. (2023), "Toward a sustainability organizational culture model", *Journal of Cleaner Production*, Elsevier Ltd, 10 May, doi: 10.1016/j.jclepro.2023.136666.

Athapaththu, J.C. and Kulathunga, D. (2018), "Factors Affecting Online Purchase Intention: Effects of Technology and Social Commerce", *International Business Research*, Vol. 11 No. 10, p. 111, doi: 10.5539/ibr.v11n10p111.

Awulachew, M.T. (2021), *Citation: Awulachew MT (2021) A Review of Pollution Prevention Technology in Leather Industry*, *Environ Pollut Climate Change*, Vol. 5.

Ayele, A. (2019), "Journal of Marketing and Consumer Research www.iiste.org ISSN", Vol. 59, doi: 10.7176/JMCR.

Aziz, N.N.A. and Wahid, N.A. (2018), "Factors Influencing Online Purchase Intention among University Students", *International Journal of Academic Research in Business and Social Sciences*, Human Resources Management Academic Research Society (HRMARS), Vol. 8 No. 7, doi: 10.6007/ijarbss/v8-i7/4413.

B., A., T., G. and J., T. (2018), "Assesment of quality and marketing of hide and skin in Adamitulu Jidokombolcha and Bora Woreda in East Shewa Zone of Oromia Regional State, Ethiopia", *International Journal of Livestock Production*, Academic Journals, Vol. 9 No. 10, pp. 269–279, doi: 10.5897/ijlp2017.0372.

Bachmann, N. and Jodlbauer, H. (2023), "Iterative business model innovation: A conceptual process model and tools for incumbents", *Journal of Business Research*, Elsevier Inc., Vol. 168, doi: 10.1016/j.jbusres.2023.114177.

Balassa. (1965), *Trade Liberalisation and "Revealed" Comparative Advantage'*, The Manchester School, doi: https://doi.org/10.1111/j.1467-9957.1965.tb00050.x.

Bashir, M., Alfalih, A. and Pradhan, S. (2022), "Sustainable business model innovation: Scale development, validation and proof of performance", *Journal of Innovation and Knowledge*, Elsevier B.V., Vol. 7 No. 4, doi: 10.1016/j.jik.2022.100243.

Bashir, M., Alfalih, A. and Pradhan, S. (2023), "Managerial ties, business model innovation & SME performance: Moderating role of environmental turbulence", *Journal of Innovation & Knowledge*, Elsevier BV, Vol. 8 No. 1, p. 100329, doi: 10.1016/j.jik.2023.100329.

Bashir, M. and Verma, R. (2019), "Internal factors & consequences of business model innovation", *Management Decision*, Emerald Group Holdings Ltd., 8 January, doi: 10.1108/MD-11-2016-0784.

Basuki, C. (2023), "Business Model Canvas and SWOT Analysis as a Development Strategy Frozen Food Culinary Industry", *Journal of Business, Management, and Social Studies*, Yayasan Appsikon Wedyatama Indonesia, Vol. 3 No. 3, pp. 131–145, doi: 10.53748/jbms.v3i3.60.

Batista, J.C. (2008), "Competition between Brazil and other exporting countries in the US import market: A new extension of constant-market-shares analysis", *Applied Economics*, Vol. 40 No. 19, pp. 2477–2487, doi: 10.1080/00036840600970203.

Bell, R. (2022), "Innovating to survive in competitive markets: business model innovation of Chinese digital businesses", *International Journal of Innovation Science*, Emerald Publishing, doi: 10.1108/IJIS-09-2022-0189.

Benz, L.A. (2022), "Critical Success Factors for Circular Business Model Innovation from the Perspective of the Sustainable Development Goals", *Sustainability (Switzerland)*, MDPI, Vol. 14 No. 10, doi: 10.3390/su14105816.

Berends, H., Smits, A., Reymen, I. and Podoynitsyna, K. (2016), "Learning while (re)configuring: Business model innovation processes in established firms", *Strategic Organization*, SAGE Publications Ltd, Vol. 14 No. 3, pp. 181–219, doi: 10.1177/1476127016632758.

Bereznoy, A. (2019), "Changing Competitive Landscape Through Business Model Innovation: the New Imperative for Corporate Market Strategy", *Journal of the Knowledge Economy*, Vol. 10 No. 4, pp. 1362–1383, doi: 10.1007/s13132-015-0324-x.

Berkesa, T., Gellynck, X., De Steur, H. and de Barcellos, M.D. (2024), "Green Supply Chain Management: Practices and Drivers in the Ethiopian Leather and Leather Product Industry", *Journal of the Knowledge Economy*, doi: 10.1007/s13132-024-02180-9.

Bernal-Torres, C.A., Amaya, N., Gómez-Santos, L., Mojica-Macias, J.P. and Sierra-Parra, D. (2023), "Interrelation Between the Dynamic Capabilities of Knowledge Management, Learning, Adaptation, with Innovation in Medium and Large Companies in an Emerging Economy in Times of Pandemic", *Global Business Review*, Sage Publications India Pvt. Ltd, doi: 10.1177/09721509221146412.

Bertram, M. (2016), "Theoretical foundation: The resource-based view (RBV) of the firm", in Bertram, M. (Ed.), *The Strategic Role of Software Customization: Managing Customization-Enabled Software Product Development*, Springer Fachmedien Wiesbaden, Wiesbaden, pp. 67–102, doi: 10.1007/978-3-658-14858-4_3.

Bhatti, S.H., Santoro, G., Khan, J. and Rizzato, F. (2021), "Antecedents and consequences of business model innovation in the IT industry", *Journal of Business Research*, Elsevier Inc., Vol. 123, pp. 389–400, doi: 10.1016/j.jbusres.2020.10.003.

Biely, K. and van Passel, S. (2022), "Market power and sustainability: a new research agenda", *Discover Sustainability*, Springer Nature, Vol. 3 No. 1, doi: 10.1007/s43621-022-00073-y.

Bitetti, L. and Gibbert, M. (2022), "The ROAD to continuous business model innovation: A longitudinal study unveiling patterns of cognitive sensing dynamic capabilities", *Creativity and Innovation Management*, Life Science Publishing Co. Ltd, Vol. 31 No. 1, pp. 123–140, doi: 10.1111/caim.12477.

Blaique, L., Abu Salim, T. and Mir, F.A. (2024), "Does human capital mediate the relationship between digital competence and service innovation capability? Evidence from the UAE during covid-19 pandemic", *International Journal of Innovation Science*, Emerald Publishing Limited, Vol. 16 No. 4, pp. 709–730, doi: 10.1108/IJIS-11-2022-0214.

Bocken, N., Boons, F. and Baldassarre, B. (2019), "Sustainable business model experimentation by understanding ecologies of business models", *Journal of Cleaner Production*, Elsevier Ltd, Vol. 208, pp. 1498–1512, doi: 10.1016/j.jclepro.2018.10.159.

Bocken, N.M.P. and Geradts, T.H.J. (2020), "Barriers and drivers to sustainable business model innovation: Organization design and dynamic capabilities", *Long Range Planning*, Elsevier Ltd, Vol. 53 No. 4, doi: 10.1016/j.lrp.2019.101950.

Bocken, N.M.P., Short, S.W., Rana, P. and Evans, S. (2014), "A literature and practice review to develop sustainable business model archetypes", *Journal of Cleaner Production*, 15 February, doi: 10.1016/j.jclepro.2013.11.039.

Bonanno, G. (2016), "Constant Market Share Analysis: A Note A note: Constant Market Share Analysis".

Boruchowitch, F. and Fritz, M.M.C. (2022), "Who in the firm can create sustainable value and for whom? A single case-study on sustainable procurement and supply chain stakeholders", *Journal of Cleaner Production*, Vol. 363, p. 132619, doi: https://doi.org/10.1016/j.jclepro.2022.132619.

Bos, A.P. (2013), "Nurturing Technologies for Sustainability Transitions", *Foundations of Science*, Vol. 18 No. 2, pp. 367–372, doi: 10.1007/s10699-011-9271-6.

BouAbid, H., Dhouib, K. and Gharbi, A. (2024), "Production/Preventive Maintenance Comprehensive Approach for Manufacturing Systems Susceptible to Quality Degradation", *Arabian Journal for Science and Engineering*, Springer Nature, doi: 10.1007/s13369-024-09496-3.

Brändström, J., Jazairy, A. and Roos Lindgreen, E. (2024), "Barriers to adopting circular business models: A cross-sectoral analysis", *Business Strategy and the Environment*, John Wiley and Sons Ltd, doi: 10.1002/bse.3653.

Brenner, B. and Drdla, D. (2023), "Business Model Innovation toward Sustainability and Circularity—A Systematic Review of Innovation Types", *Sustainability (Switzerland)*, Multidisciplinary Digital Publishing Institute (MDPI), 1 August, doi: 10.3390/su151511625.

Brown, A., Aristides, M., FitzGerald, P., Davey, P., Bhalla, S. and Kielhorn, A. (2002), "Pcn19 Examining Preferences and Timetrade-Off Utility for Gemcitabine Plus Cisplatin in the Treatment of Bladder Cancer:a Survey Using Discrete Choice Conjoint Analysis in the Uk", *Value in Health*, International Society for Pharmacoeconomics and Outcomes Research (ISPOR), Vol. 5 No. 6, pp. 543–544, doi: 10.1016/s1098-3015(10)61435-0.

Brun, A. and Ciccullo, F. (2022), "Factors affecting sustainability-oriented innovation in the leather supply chain", *Strategic Change*, John Wiley and Sons Inc, Vol. 31 No. 3, pp. 305–321, doi: 10.1002/jsc.2500.

Buonocore, F., Annosi, M.C., de Gennaro, D. and Riemma, F. (2024), "Digital transformation and social change: Leadership strategies for responsible innovation", *Journal of Engineering and Technology Management*, Vol. 74, p. 101843, doi: https://doi.org/10.1016/j.jengtecman.2024.101843.

Cano, J.A., Londoño-Pineda, A.A., Campo, E.A. and Fernández, S.A. (2023), "Sustainable business models of e-marketplaces: An analysis from the consumer perspective", *Journal of Open Innovation: Technology, Market, and Complexity*, Elsevier B.V., Vol. 9 No. 3, doi: 10.1016/j.joitmc.2023.100121.

Cavusgil, S.T. and Deligonul, S.Z. (2024), "Dynamic capabilities framework and its transformative contributions", *Journal of International Business Studies*, Palgrave Macmillan, doi: 10.1057/s41267-024-00758-8.

Celik, H. (2016). (2014), "Customer online shopping anxiety within the Unified Theory of Acceptance and Use Technology (UTAUT) framework. Asia Pacific Journal of Marketing and Logistics.", Vol. 2008 No. March, pp. 1–7.

Chabowski, B.R., Gabrielsson, P., Hult, G.T.M. and Morgeson, F. V. (2023a), "Sustainable international business model innovations for a globalizing circular economy: a review and synthesis, integrative framework, and opportunities for future research", *Journal of International Business Studies*, Palgrave Macmillan, doi: 10.1057/s41267-023-00652-9.

Chala Dandessa. (2023), "The Rise of E-commerce in Ethiopia: Opportunities and Challenges | ETHIOPIANS TODAY", available at: https://ethiopianstoday.com/2023/11/27/business-trends-in-ethiopia/ (accessed 26 May 2025).

Chaurey, S., Kalpande, S.D., Gupta, R.C. and Toke, L.K. (2023), "A review on the identification of total productive maintenance critical success factors for effective implementation in the manufacturing sector", *Journal of Quality in Maintenance Engineering*, Emerald Publishing, 7 March, doi: 10.1108/JQME-11-2020-0118.

Chen, X., Xu, L., Ren, Z., Jia, F. and Yu, Y. (2023), "Sustainable supply chain management in the leather industry: a systematic literature review", *International Journal of Logistics Research and Applications*, Taylor & Francis, Vol. 26 No. 12, pp. 1663–1703, doi: 10.1080/13675567.2022.2104233.

Cho, D.S., Moon, H.C. and Kim, M.Y. (2009), "Does one size fit all A dual double diamond approach to country-specific advantages", *Asian Business and Management*, Vol. 8 No. 1, pp. 83–102, doi: 10.1057/abm.2008.27.

Cici, C. and D'Isanto, D. (2020), "Integrating Sustainability into Core Business", *Symphonya. Emerging Issues in Management*, Niccolo Cusano University-Rome Symphonya Emerging Issues in Management, No. 1, pp. 50–65, doi: 10.4468/2017.1.05cici.disanto.

Clark, R., Reed, J. and Sunderland, T. (2018), "Bridging funding gaps for climate and sustainable development: Pitfalls, progress and potential of private finance", *Land Use Policy*, Elsevier Ltd, Vol. 71, pp. 335–346, doi: 10.1016/j.landusepol.2017.12.013.

Clauss, T., Abebe, M., Tangpong, C. and Hock, M. (2021), "Strategic Agility, Business Model Innovation, and Firm Performance: An Empirical Investigation", *IEEE Transactions on Engineering Management*, Institute of Electrical and Electronics Engineers Inc., Vol. 68 No. 3, pp. 767–784, doi: 10.1109/TEM.2019.2910381.

Codini, A.P., Abbate, T. and Messeni Petruzzelli, A. (2023), "Business Model Innovation and exaptation: A new way of innovating in SMEs", *Technovation*, Vol. 119, p. 102548, doi: https://doi.org/10.1016/j.technovation.2022.102548.

Coffay, M. and Bocken, N. (2023), "Sustainable by design: An organizational design tool for sustainable business model innovation", *Journal of Cleaner Production*, Elsevier Ltd, Vol. 427, doi: 10.1016/j.jclepro.2023.139294.

Cozzolino, A. and Verona, G. (2024), "Decision tree for adaptation after radical changes: linking dynamic capabilities, ambidexterity, and strategic alliances", *Journal of Management and Governance*, Springer, Vol. 28 No. 3, pp. 745–769, doi: 10.1007/s10997-024-09702-2.

Cronbach, L.J. (1951), "Coefficient alpha and the internal structure of tests", *Psychometrika*, Vol. 16 No. 3, pp. 297–334, doi: 10.1007/BF02310555.

Custom Market Insight. (2024), "Global Leather Goods Market Size, Trends, Share 2033 - CMI", available at: https://www.custommarketinsights.com/report/leather-goods-market/ (accessed 30 September 2024).

D'Adamo, I., Gagliarducci, M., Iannilli, M. and Mangani, V. (2024), "Fashion Wears Sustainable Leather: A Social and Strategic Analysis Toward Sustainable Production and Consumption Goals", *Sustainability (Switzerland)*, Multidisciplinary Digital Publishing Institute (MDPI), Vol. 16 No. 22, doi: 10.3390/su16229971.

Dahle, Y., Dybvik, H. and Steinert, M. (2019), "A dynamic and a static approach to the business model - Investigating the potential difference in business model focus", *Proceedings - 2019 IEEE International Conference on Engineering, Technology and Innovation, ICE/ITMC 2019*, No. Ci, doi: 10.1109/ICE.2019.8792598.

Dani, M.V., Gandhi, A.V. and Sharma, A. (2023), "Understanding drivers of innovation in information technology companies using a grounded theory approach", *International Journal of Innovation Science*, Emerald Publishing Limited, Vol. 15 No. 5, pp. 817–838, doi: 10.1108/IJIS-07-2022-0119.

Danna-Buitrago, J.P. and Stellian, R. (2022), "A New Class of Revealed Comparative Advantage Indexes", *Open Economies Review*, Springer, Vol. 33 No. 3, pp. 477–503, doi: 10.1007/s11079-021-09636-4.

Dasilva, C.M. (2021), "From One Context to Another: How Business Models Emerge", *Journal of Business Models*, Vol. 9 No. 1, pp. 8–12.

Davis, F.D. (1989), "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology", *MIS Quarterly*, Management Information Systems Research Center, University of Minnesota, Vol. 13 No. 3, pp. 319–340, doi: 10.2307/249008.

Dawut, A. and Tian, Y. (2021), "Competitiveness of Xinjiang's mutton industry based on diamond model", *PLoS ONE*, Public Library of Science, Vol. 16 No. 10 October, doi: 10.1371/journal.pone.0257669.

Dewi, C.K., Mohaidin, Z. and Murshid, M.A. (2020), "Determinants of online purchase intention: a PLS-SEM approach: evidence from Indonesia", *Journal of Asia Business Studies*, Emerald Group Holdings Ltd., Vol. 14 No. 3, pp. 281–306, doi: 10.1108/JABS-03-2019-0086.

Dhir, A., Khan, S.J., Islam, N., Ractham, P. and Meenakshi, N. (2023), "Drivers of sustainable business model innovations. An upper echelon theory perspective", *Technological Forecasting and Social Change*, Elsevier Inc., Vol. 191, doi: 10.1016/j.techfore.2023.122409.

Dong, B. (2023), "How Transformational Leadership Affects Firm Innovation Performance - A Perspective Based on Environmental Dynamism and Business Model Innovation", *Journal of Chinese Human Resource Management*, World Scientific Publishing House Ltd, Vol. 14 No. 2, pp. 38–50, doi: 10.47297/wspchrmWSP2040-800503.20231402.

Donner, M., Verniquet, A., Broeze, J., Kayser, K. and De Vries, H. (2021), "Critical success and risk factors for circular business models valorising agricultural waste and by-products", *Resources, Conservation and Recycling*, Elsevier B.V., Vol. 165, doi: 10.1016/j.resconrec.2020.105236.

Dubey, R., Gunasekaran, A., Childe, S.J., Bryde, D.J., Giannakis, M., Foropon, C., Roubaud, D., *et al.* (2020), "Big data analytics and artificial intelligence pathway to operational performance under the effects of entrepreneurial orientation and environmental dynamism: A study of manufacturing organisations", *International Journal of Production Economics*, Vol. 226, p. 107599, doi: https://doi.org/10.1016/j.ijpe.2019.107599.

Dung, L.T. and Dung, T.T.H. (2024), "Businesses model innovation: a key role in the internationalisation of SMEs in the era of digitalisation", *Journal of Innovation and Entrepreneurship*, Springer Science and Business Media Deutschland GmbH, Vol. 13 No. 1, doi: 10.1186/s13731-024-00391-7.

Dvivedi, A. and Beshah, B. (2017), *Identifying and Prioritising Operational Performance Indicators of the Ethiopian Leather Industry*, *Int. J. Productivity and Quality Management*, Vol. 22.

Dwivedi, Y.K., Ismagilova, E., Hughes, D.L., Carlson, J., Filieri, R., Jacobson, J., Jain, V., *et al.* (2021), "Setting the future of digital and social media marketing research: Perspectives and research propositions", *International Journal of Information Management*, Elsevier, Vol. 59 No. June, p. 102168, doi: 10.1016/j.ijinfomgt.2020.102168.

Dymitrowski, A. and Mielcarek, P. (2023), "Innovation Business Model Based on New Technologies and Company Relationships", *Journal of the Knowledge Economy*, Springer, doi: 10.1007/s13132-023-01251-7.

EBR. (2025), "Leather Struggles, but Hopeful – Ethiopian Business Review", available at: https://ethiopianbusinessreview.net/leather-struggles-but-hopeful/ (accessed 26 May 2025).

ECA. (2024), "Ethiopian leather industry actors discuss AfCFTA opportunities | United Nations Economic Commission for Africa", *ECA*, available at: https://www.uneca.org/stories/ethiopian-leather-industry-actors-discuss-afcfta-opportunities (accessed 7 October 2024).

Edwards-Schachter, M. (2018), "The nature and variety of innovation", *International Journal of Innovation Studies*, Vol. 2 No. 2, pp. 65–79, doi: https://doi.org/10.1016/j.ijis.2018.08.004.

Elali, W. (2021), "The Importance of Strategic Agility to Business Survival During Corona Crisis and Beyond", *International Journal of Business Ethics and Governance*, EuroMid Academy of Business and Technology, pp. 1–8, doi: 10.51325/ijbeg.v4i2.64.

Elisabet, N. (2019), "Enhancing Maintenance Performance through TPM concept":, p. 125.

Elmehdi, E., Saad, L. and Bert, J. (2024), "Adapting Global Business Models to Disruptive Innovation and Market Dynamics: A Framework for Modern Times", *IBIMA Business Review*, IBIMA Publishing, Vol. 2025, doi: 10.5171/2025.223981.

Erboz, G. (2020), "A qualitative study on industry 4.0 competitiveness in Turkey using porter diamond model", *Journal of Industrial Engineering and Management*, Universitat Politecnica de Catalunya, Vol. 13 No. 2, pp. 266–282, doi: 10.3926/jiem.2915.

Ethiopian Monitor. (2024), "Leather Industry Stakeholders Explore Opportunities Emerging from AfCFTA – Ethiopian Monitor", *Ethiopian Monitor*, available at: https://ethiopianmonitor.com/2023/11/27/leather-industry-stakeholders-explore-opportunities-emerging-from-afcfta/ (accessed 7 October 2024).

Evans, S., Vladimirova, D., Holgado, M., Van Fossen, K., Yang, M., Silva, E.A. and Barlow, C.Y. (2017), "Business Model Innovation for Sustainability: Towards a Unified Perspective for Creation of Sustainable Business Models", *Business Strategy and the Environment*, John Wiley and Sons Ltd, Vol. 26 No. 5, pp. 597–608, doi: 10.1002/bse.1939.

F. Hair Jr, J., Sarstedt, M., Hopkins, L. and G. Kuppelwieser, V. (2014), "Partial least squares structural equation modeling (PLS-SEM)", *European Business Review*, Emerald Group Publishing Limited, Vol. 26 No. 2, pp. 106–121, doi: 10.1108/EBR-10-2013-0128.

Fagerberg, J. and Sollie, G. (1987), "The method of constant market shares analysis reconsidered", *Applied Economics*, Vol. 19 No. 12, pp. 1571–1583, doi: 10.1080/00036848700000084.

Fallis, A.G. (2019), *World Economic Situation and Prospects 2019*, *Journal of Chemical Information and Modeling*, Vol. 53.

Famielec, S. (2020), "Chromium concentrate recovery from solid tannery waste in a thermal process", *Materials*, MDPI AG, Vol. 13 No. 7, doi: 10.3390/ma13071533.

de Faria, V.F., Santos, V.P. and Zaidan, F.H. (2021), "The business model innovation and lean startup process supporting startup sustainability", *Procedia Computer Science*, Vol. 181, Elsevier B.V., pp. 93–101, doi: 10.1016/j.procs.2021.01.106.

Faus Onbargi, A. (2022), "The climate change–inequality nexus: towards environmental and socio-ecological inequalities with a focus on human capabilities", *Journal of Integrative Environmental Sciences*, Taylor and Francis Ltd., Vol. 19 No. 1, pp. 163–170, doi: 10.1080/1943815X.2022.2131828.

Faye, G. and Sibali, L.L. (2025), "A Review on Characterization, Treatment, and Impact of Tannery Wastewater in Ethiopia", *Environmental Quality Management*, John Wiley and Sons Inc, 1 March, doi: 10.1002/tqem.70015.

Feeney, M., Grohnert, T., Gijselaers, W. and Martens, P. (2023), "Organizations, Learning, and Sustainability: A Cross-Disciplinary Review and Research Agenda", *Journal of Business Ethics*, Vol. 184 No. 1, pp. 217–235, doi: 10.1007/s10551-022-05072-7.

Fei, X. and Wang, J. (2022), "Sustainable Human Resource Management and Innovation", in Chan, H.K., Liu, M.J., Wang, J. and Zhang, T. (Eds.), *Responsible Innovation Management*, Springer Nature Singapore, Singapore, pp. 187–208, doi: 10.1007/978-981-19-4480-2_10.

Feleke, A., Kuma, A. and Assefa, F. (2016), "Assessment of the Status of Hides and Skins Production, Opportunities and Constraints in Wolaita Zone, Southern Ethiopia", Vol. 53, doi: 10.13140/RG.2.1.3053.3364.

Fellnhofer, K. (2017), "Drivers of innovation success in sustainable businesses", *Journal of Cleaner Production*, Elsevier Ltd, Vol. 167, pp. 1534–1545, doi: 10.1016/j.jclepro.2017.08.197.

Ferlito, R. and Faraci, R. (2022), "Business model innovation for sustainability: a new framework", *Innovation and Management Review*, Emerald Group Holdings Ltd., Vol. 19 No. 3, pp. 222–236, doi: 10.1108/INMR-07-2021-0125.

Ferraris, A., Degbey, W.Y., Singh, S.K., Bresciani, S., Castellano, S., Fiano, F. and Couturier, J. (2022), "Microfoundations of Strategic Agility in Emerging Markets: Empirical Evidence of Italian MNEs in India", *Journal of World Business*, Elsevier Inc., Vol. 57 No. 2, doi: 10.1016/j.jwb.2021.101272.

Filketu, S.A. and Negash, Y.T. (2023), "Developing a quality function deployment model for the Ethiopian leather industry: Requirements and solutions under linguistic variables", *Journal of Industrial and Production Engineering*, Taylor and Francis Ltd., Vol. 40 No. 2, pp. 126–142, doi: 10.1080/21681015.2022.2116117.

Firdos Jahan, K. and Quazi, T.Z. (2014), "Implementation of Kobetsu Kaizen pillar in Improving Overall Equipment Effectiveness of Machine", *International Journal of Engineering Sciences & Research Technology*, Vol. 3 No. 7, pp. 562–570.

Fleith de Medeiros, J., Bisognin Garlet, T., Duarte Ribeiro, J.L. and Nogueira Cortimiglia, M. (2022), "Success factors for environmentally sustainable product innovation: An updated review", *Journal of Cleaner Production*, Vol. 345, p. 131039, doi: https://doi.org/10.1016/j.jclepro.2022.131039.

FMI. (2024), "Leather Goods Market Demand, Sales, Trends & Forecast 2033 | FMI", available at: https://www.futuremarketinsights.com/reports/leather-goods-market (accessed 30 September 2024).

Fontana, A., Barni, A., Leone, D., Spirito, M., Tringale, A., Ferraris, M., Reis, J., *et al.* (2021), "Circular economy strategies for equipment lifetime extension: A systematic review", *Sustainability (Switzerland)*, MDPI, 1 February, doi: 10.3390/su13031117.

Fontoura, M.P. and Serôdio, P. (2017), "The Export Performance of the 2004 EU Enlargement Economies since the 1990s: a Constant Market Share Analysis", *International Advances in Economic Research*, Vol. 23 No. 2, pp. 161–174, doi: 10.1007/s11294-017-9630-3.

Franco, M., Minatogawa, V. and Quadros, R. (2023), "How Transformative Business Model Renewal Leads to Sustained Exploratory Business Model Innovation in Incumbents: Insights from a System Dynamics Analysis of Case Studies", *Systems*, MDPI, Vol. 11 No. 2, doi: 10.3390/systems11020060.

Fuerst, S., Sanchez-Dominguez, O. and Rodriguez-Montes, M.A. (2023), "The Role of Digital Technology within the Business Model of Sustainable Entrepreneurship", *Sustainability (Switzerland)*, Multidisciplinary Digital Publishing Institute (MDPI), Vol. 15 No. 14, doi: 10.3390/su151410923.

Galvez, D., Camargo, M., Rodriguez, J. and Morel, L. (2013), "PII- potential innovation index: A tool to benchmark innovation capabilities in international context", *Journal of Technology Management and Innovation*, Vol. 8 No. 4, pp. 36–45, doi: 10.4067/s0718-27242013000500003.

García-Salirrosas, E.E., Acevedo-Duque, Á., Marin Chaves, V., Mejía Henao, P.A. and Olaya Molano, J.C. (2022), "Purchase Intention and Satisfaction of Online Shop Users in Developing Countries during the COVID-19 Pandemic", *Sustainability (Switzerland)*, MDPI, Vol. 14 No. 10, doi: 10.3390/su14106302.

Garrido-Moreno, A., Martín-Rojas, R. and García-Morales, V.J. (2024), "The key role of innovation and organizational resilience in improving business performance: A mixed-methods approach", *International Journal of Information Management*, Elsevier Ltd, Vol. 77, doi: 10.1016/j.ijinfomgt.2024.102777.

Gebara, C.H., Thammaraksa, C., Hauschild, M. and Laurent, A. (2024), "Selecting indicators for measuring progress towards sustainable development goals at the global, national and corporate levels", *Sustainable Production and Consumption*, Elsevier B.V., Vol. 44, pp. 151–165, doi: 10.1016/j.spc.2023.12.004.

Gebrewahid, G.G. and Wald, A. (2017), "Export Barriers and Competitiveness of Developing Economies: The Case of the Ethiopian Leather Footwear Industry", *Journal of African Business*, Routledge, Vol. 18 No. 4, pp. 396–416, doi: 10.1080/15228916.2017.1329475.

Geissdoerfer, M. (2019), "Sustainable business model innovation: Process, challenges and implementation", doi: 10.17863/CAM.39596.

Geissdoerfer, M., Santa-Maria, T., Kirchherr, J. and Pelzeter, C. (2023), "Drivers and barriers for circular business model innovation", *Business Strategy and the Environment*, John Wiley and Sons Ltd, Vol. 32 No. 6, pp. 3814–3832, doi: 10.1002/bse.3339.

Geissdoerfer, M., Savaget, P. and Evans, S. (2017), "The Cambridge Business Model Innovation Process", *Procedia Manufacturing*, Vol. 8, pp. 262–269, doi: https://doi.org/10.1016/j.promfg.2017.02.033.

Geissdoerfer, M., Vladimirova, D. and Evans, S. (2018), "Sustainable business model innovation: A review", *Journal of Cleaner Production*, Elsevier Ltd, 10 October, doi: 10.1016/j.jclepro.2018.06.240.

Geisser, S. (1974), "A predictive approach to the random effect model", *Biometrika*, Vol. 61 No. 1, pp. 101–107, doi: 10.1093/biomet/61.1.101.

Getahun Abebe, M. (2020), *CORPORATE SOCIAL RESPONSIBILITY AND FINANCIAL PERFORMANCE: EVIDENCE FROM THE ETHIOPIAN LEATHER INDUSTRY*.

Ghaly, M., Essa, M.A., Ali, H.E., Nasr, A.I. and Ghaly, M.S. (2022), *An Eco-Friendly Tanning by Aromatic Sulphonic Acids for Enhancing Chrome Absorption and Reducing the Negative Impact on Environment*, *Journal of Agricultural Research V. (47) No*.

Ghisetti, C., Mancinelli, S., Mazzanti, M. and Zoli, M. (2017), "Financial barriers and environmental innovations: evidence from EU manufacturing firms", *Climate Policy*, Taylor and Francis Ltd., Vol. 17, pp. S131–S147, doi: 10.1080/14693062.2016.1242057.

Gilbert, J. (2017), *Constant Market Shares Analysis Part I Decomposition of Values Capacity Building Workshop "Enhancing Capacity on Trade Policies and Negotiations in Laos"*.

Girma, L., Oduro, S., Cucari, N. and Cristofaro, M. (2025), "Venturing green: the impact of sustainable business model innovation on corporate environmental performance in social enterprises", *Management Research Review*, Emerald Publishing Limited, Vol. 48 No. 13, pp. 20–44, doi: 10.1108/MRR-07-2024-0534.

Grumiller, J. (2021), "Analyzing industrial policy regimes within global production networks: The Ethiopian leather industry", *Journal of Economic Geography*, Oxford University Press, Vol. 21 No. 3, pp. 433–457, doi: 10.1093/jeg/lbaa021.

Grumiller, J.; and Raza, W.G. (2019), *The Ethiopian Leather and Leather Products Sector: An Assessment of Export Potentials to Europe and Austria Publication/the-Ethiopian-Leather-and-Leather-Products-Sector-an-Assessment-of-Export-Potentials-to-Europe-and-Austria*, Vienna.

Gunarathne, N. (2019), "Sustainable Innovation Measurement: Approaches and Challenges", in Bocken, N., Ritala, P., Albareda, L. and Verburg, R. (Eds.), *Innovation for Sustainability: Business Transformations Towards a Better World*, Springer International Publishing, Cham, pp. 233–251, doi: 10.1007/978-3-319-97385-2_13.

Gunawan, C.M., Rahmania, L. and Kenang, I.H. (2023), "Celine Miyuki Gunawan, Laili Rahmania, Irantha Hendrika Kenang / The Influence of Social Influence and Peer Influence on Intention to Purchase in E-Commerce THE INFLUENCE OF SOCIAL INFLUENCE AND PEER INFLUENCE ON INTENTION TO PURCHASE IN E-COMMERCE", *Review of Management and Entrepreneurship*, Vol. 07, p. 1.

Gupta, S., Tewari, P.C. and Sharma, A.K. (2016), "TPM concept and implementation approach", *Quality*, No. 679, pp. 1–18.

Hacklin, F., Björkdahl, J. and Wallin, M.W. (2018), "Strategies for business model innovation: How firms reel in migrating value", *Long Range Planning*, Vol. 51 No. 1, pp. 82–110, doi: 10.1016/j.lrp.2017.06.009.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017), "A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Thousand Oaks", *Sage*, p. 165.

Hair, J.F., Hult, G.T.M., Ringle, C., Sarstedt, M., Danks, N. and Ray, S. (2021a), *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook*, *Springer*.

Hair, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M., Danks, N.P. and Ray, S. (2021b), "Evaluation of Reflective Measurement Models", in Hair Jr., J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M., Danks, N.P. and Ray, S. (Eds.), *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook*, Springer International Publishing, Cham, pp. 75–90, doi: 10.1007/978-3-030-80519-7_4.

Hanna, N.K. (2020), "Assessing the digital economy: aims, frameworks, pilots, results, and lessons", *Journal of Innovation and Entrepreneurship*, Springer, Vol. 9 No. 1, doi: 10.1186/s13731-020-00129-1.

Hansson, A.M., Pedersen, E., Karlsson, N.P.E. and Weisner, S.E.B. (2023), "Barriers and drivers for sustainable business model innovation based on a radical farmland change scenario", *Environment, Development and Sustainability*, Springer Science and Business Media B.V., Vol. 25 No. 8, pp. 8083–8106, doi: 10.1007/s10668-022-02389-1.

Hardy, V. and Hauge, J. (2019), "Labour challenges in Ethiopia's textile and leather industries: No voice, no loyalty, no exit?", *African Affairs*, Oxford University Press, Vol. 118 No. 473, pp. 712–736, doi: 10.1093/afraf/adz001.

Hasanov, J. and Khalid, H. (2015), "The Impact of Website Quality on Online Purchase Intention of Organic Food in Malaysia: A WebQual Model Approach", *Procedia Computer Science*, Elsevier Masson SAS, Vol. 72, pp. 382–389, doi: 10.1016/j.procs.2015.12.153.

Hassan, A.B. (2020), "Assessment of Total Productive Maintenance (TPM) Implementation in Industrial Environment".

He, J. and Ortiz, J. (2021), "Sustainable business modeling: The need for innovative design thinking", *Journal of Cleaner Production*, Elsevier Ltd, Vol. 298, doi: 10.1016/j.jclepro.2021.126751.

Henseler, J., Ringle, C.M. and Sinkovics, R.R. (2009), "The use of partial least squares path modeling in international marketing", *Advances in International Marketing*, Vol. 20 No. 2009, pp. 277–319, doi: 10.1108/S1474-7979(2009)0000020014.

Heriyanto, A.L. and Weli. (2023), "The Determinantof Company Value Creation Based on Resource-Based View Theory Perspective", *Quality - Access to Success*, SRAC - Romanian Society for Quality, Vol. 24 No. 196, pp. 133–139, doi: 10.47750/QAS/24.196.18.

Hermundsdottir, F. and Aspelund, A. (2021), "Sustainability innovations and firm competitiveness: A review", *Journal of Cleaner Production*, Vol. 280, p. 124715, doi: https://doi.org/10.1016/j.jclepro.2020.124715.

Hina, M., Chauhan, C., Kaur, P., Kraus, S. and Dhir, A. (2022), "Drivers and barriers of circular economy business models: Where we are now, and where we are heading", *Journal of Cleaner Production*, Elsevier Ltd, Vol. 333, doi: 10.1016/j.jclepro.2021.130049.

Huang, H. and Wang, Q. (2024), "Within digital collaborative teams, how can leaders promote productive knowledge sharing among members with diverse settings?", *Digital Economy and Sustainable Development*, Vol. 2 No. 1, p. 2, doi: 10.1007/s44265-023-00027-w.

Huang, W. and Ichikohji, T. (2023), "A review and analysis of the business model innovation literature", *Heliyon*, Vol. 9 No. 7, p. e17895, doi: https://doi.org/10.1016/j.heliyon.2023.e17895.

Hutter, K., Brendgens, F.M., Gauster, S.P. and Matzler, K. (2023), "Scaling organizational agility: key insights from an incumbent firm's agile transformation", *Management Decision*, Emerald Publishing, doi: 10.1108/MD-05-2022-0650.

Indiani, N.L.P. and Fahik, G.A. (2020), "Conversion of online purchase intention into actual purchase: The moderating role of transaction security and convenience", *Business: Theory and Practice*, Vol. 21 No. 1, pp. 18–29, doi: 10.3846/btp.2020.11346.

"Innovation and Global Competitiveness". (2017), *Innovation and Global Competitiveness*, No. March 2019, doi: 10.4324/9781315675954.

Iqbal, Q., Ahmad, N.H. and Halim, H.A. (2020), "How Does Sustainable Leadership Influence Sustainable Performance? Empirical Evidence From Selected ASEAN Countries", *SAGE Open*, SAGE Publications Inc., Vol. 10 No. 4, doi: 10.1177/2158244020969394.

J., K., Panda, R.C. and M., V.K. (2020), "Trends and advancements in sustainable leather processing: Future directions and challenges—A review", *Journal of Environmental Chemical Engineering*, Vol. 8 No. 5, p. 104379, doi: https://doi.org/10.1016/j.jece.2020.104379.

Jadil, Y., Rana, N.P. and Dwivedi, Y.K. (2022), "Understanding the drivers of online trust and intention to buy on a website: An emerging market perspective", *International Journal of Information Management Data Insights*, Elsevier Ltd, Vol. 2 No. 1, doi: 10.1016/j.jjimei.2022.100065.

Jaffari, Z.H., Hong, J. and Park, K.Y. (2024), "A systematic review of innovations in tannery solid waste treatment: A viable solution for the circular economy", *Science of The Total Environment*, Vol. 948, p. 174848, doi: https://doi.org/10.1016/j.scitotenv.2024.174848.

Jagani, S., Deng, X., Hong, P.C. and Mashhadi Nejad, N. (2024), "Adopting sustainability business models for value creation and delivery: an empirical investigation of manufacturing firms", *Journal of Manufacturing Technology Management*, Emerald Publishing, Vol. 35 No. 2, pp. 360–382, doi: 10.1108/JMTM-03-2023-0099.

Jia, Z., Jiao, Y., Zhang, W. and Chen, Z. (2022), "Rural Tourism Competitiveness and Development Mode, a Case Study from Chinese Township Scale Using Integrated Multi-Source Data", *Sustainability (Switzerland)*, MDPI, Vol. 14 No. 7, doi: 10.3390/su14074147.

Joseph F. Hair et al. (2013), *A Primer on Partial Least Squares Structural Equation Modeling*, *Long Range Planning*, Vol. 46, doi: 10.1016/j.lrp.2013.01.002.

Joyce, A. and Paquin, R.L. (2016), "The triple layered business model canvas: A tool to design more sustainable business models", *Journal of Cleaner Production*, Elsevier Ltd, Vol. 135, pp. 1474–1486, doi: 10.1016/j.jclepro.2016.06.067.

Jum C. Nunnally. (1978), "Psychometric Theory", *Agile Project Management with Azure DevOps*, pp. 37–66.

Jung, Y.J. and Kim, Y. (2023), "Research trends of sustainability and marketing research, 2010–2020: Topic modeling analysis", *Heliyon*, Elsevier Ltd, Vol. 9 No. 3, doi: 10.1016/j.heliyon.2023.e14208.

Kahsay, T., Negash, G., Hagos, Y. and Hadush, B. (2015), "Pre-slaughter, slaughter and post-slaughter defects of skins and hides at the Sheba Tannery and Leather Industry, Tigray region, northern Ethiopia", *Onderstepoort Journal of Veterinary Research*, AOSIS (pty) Ltd, Vol. 82 No. 1, doi: 10.4102/OJVR.V82I1.931.

Kale, E., Aknar, A. and Başar, Ö. (2019), "Absorptive capacity and firm performance: The mediating role of strategic agility", *International Journal of Hospitality Management*, Vol. 78, pp. 276–283, doi: https://doi.org/10.1016/j.ijhm.2018.09.010.

Kalpande, S.D. and Toke, L.K. (2023), "Reliability analysis and hypothesis testing of critical success factors of total productive maintenance", *International Journal of Quality and Reliability Management*, Emerald Publishing, Vol. 40 No. 1, pp. 238–266, doi: 10.1108/IJQRM-03-2021-0068.

Karuppiah, K., Sankaranarayanan, B. and Ali, S.M. (2023), "A systematic review of sustainable business models: Opportunities, challenges, and future research directions", *Decision Analytics Journal*, Elsevier Inc., Vol. 8, doi: 10.1016/j.dajour.2023.100272.

Kelly, A.E. and Palaniappan, S. (2023), "Using a technology acceptance model to determine factors influencing continued usage of mobile money service transactions in Ghana", *Journal of Innovation and Entrepreneurship*, Springer Science and Business Media Deutschland GmbH, Vol. 12 No. 1, doi: 10.1186/s13731-023-00301-3.

Kelly, S., Baesler, F.F., Moraga, M., Ramis, F.J., Hawkins, L., Veena, T.R., Prabhushankar, G. V, *et al.* (2002), "Business management", *HVP High Volume Printing*, Vol. 2 No. 2, p. 22, doi: 10.4324/9781003075066-9.

Ketprapakorn, N. and Kantabutra, S. (2022), "Toward an organizational theory of sustainability culture", *Sustainable Production and Consumption*, Elsevier B.V., 1 July, doi: 10.1016/j.spc.2022.05.020.

Khamba, J.S. (2008), "Strategies and success factors for overcoming challenges in TPM implementation in Indian manufacturing industry", doi: 10.1108/13552510810877647.

Kharub, M. and Sharma, R. (2017), "Comparative analyses of competitive advantage using Porter diamond model (the case of MSMEs in Himachal Pradesh)", *Competitiveness Review*, Emerald Group Publishing Ltd., Vol. 27 No. 2, pp. 132–160, doi: 10.1108/CR-02-2016-0007.

Kock, F., Berbekova, A. and Assaf, A.G. (2021), "Understanding and managing the threat of common method bias: Detection, prevention and control", *Tourism Management*, Vol. 86, p. 104330, doi: https://doi.org/10.1016/j.tourman.2021.104330.

Kock, N. (2017), "Common method bias: A full collinearity assessmentmethod for PLS-SEM", *Partial Least Squares Path Modeling: Basic Concepts, Methodological Issues and Applications*, Springer International Publishing, pp. 245–257, doi: 10.1007/978-3-319-64069-3_11.

Kostoska, O. and Hristoski, I. (2018), "Trade dynamics, revealed comparative advantage, and international competitiveness: Evidence from Macedonia", *Economic Annals*, University of Belgrade, Vol. 63 No. 218, pp. 23–58, doi: 10.2298/EKA1818023K.

Kujala, J., Heikkinen, A. and Blomberg, A. (2023), *Stakeholder Engagement in a Sustainable Circular Economy: Theoretical and Practical Perspectives*, *Stakeholder Engagement in a Sustainable Circular Economy: Theoretical and Practical Perspectives*, Springer International Publishing, doi: 10.1007/978-3-031-31937-2.

Kuo, T.-N. (2020), "Business Model of Competitive Advantage", *Journal of Advanced Management Science*, Vol. 9 No. 1, pp. 11–16, doi: 10.18178/joams.9.1.11-16.

Kwasi Sampene, A., Agyeman, F.O. and Aziz, F. (2023), "Barriers and Drivers of Sustainable Business Model Innovation: Present and Future Research Perspectives", *Macro Management & Public Policies*, Bilingual Publishing Group, Vol. 5 No. 1, pp. 1–25, doi: 10.30564/mmpp.v5i1.5424.

Labiyi, F.G. (2019), "The Implementation of Total Productive Maintenance (TPM) In Manufacturing Company A Case Study of XYZ Plastics Manufacturing Company in Nigerian", *Henrik Ringsberg Publishers*, pp. 1–46.

Lamperti, S., Cavallo, A. and Sassanelli, C. (2024), "Digital Servitization and Business Model Innovation in SMEs: A Model to Escape From Market Disruption", *IEEE Transactions on Engineering Management*, Institute of Electrical and Electronics Engineers Inc., Vol. 71, pp. 4619–4633, doi: 10.1109/TEM.2022.3233132.

Latan, D. (2024), *INNOVATIONS IN SUSTAINABLE BUSINESS MODELS: REDEFINING SUCCESS BEYOND PROFITABILITY*, *Journal of International Business Research*, Vol. 23.

Leal Filho, W., Vidal, D.G., Chen, C., Petrova, M., Dinis, M.A.P., Yang, P., Rogers, S., *et al.* (2022), "An assessment of requirements in investments, new technologies, and infrastructures to achieve the SDGs", *Environmental Sciences Europe*, Vol. 34 No. 1, p. 58, doi: 10.1186/s12302-022-00629-9.

Lee, C.-W. and Fu, M.-W. (2024), "Conceptualizing Sustainable Business Models Aligning with Corporate Responsibility", *Sustainability*, MDPI AG, Vol. 16 No. 12, p. 5015, doi: 10.3390/su16125015.

Lee, J. and Karpova, E. (2018), "Revisiting the competitiveness theory in the new global environment: review and analysis of the competitiveness definition", *International Journal of Competitiveness*, Inderscience Publishers, Vol. 1 No. 3, p. 189, doi: 10.1504/ijc.2018.091474.

Lee, S.M. and Trimi, S. (2018a), "Innovation for creating a smart future", *Journal of Innovation and Knowledge*, Journal of Innovation & Knowledge, Vol. 3 No. 1, pp. 1–8, doi: 10.1016/j.jik.2016.11.001.

Li, J., Wu, N. and Xiong, S. (2021), "Sustainable innovation in the context of organizational cultural diversity: The role of cultural intelligence and knowledge sharing", *PLoS ONE*, Public Library of Science, Vol. 16 No. 5 May, doi: 10.1371/journal.pone.0250878.

Li, X., Qiang, Q., Huang, L. and Huang, C. (2022), "How Knowledge Sharing Affects Business Model Innovation: An Empirical Study from the Perspective of Ambidextrous Organizational Learning", *Sustainability (Switzerland)*, MDPI, Vol. 14 No. 10, doi: 10.3390/su14106157.

Li, Y., Dai, J. and Cui, L. (2020), "The impact of digital technologies on economic and environmental performance in the context of industry 4.0: A moderated mediation model", *International Journal of Production Economics*, Vol. 229, p. 107777, doi: https://doi.org/10.1016/j.ijpe.2020.107777.

Li, Z., Rasool, S., Cavus, M.F. and Shahid, W. (2024), "Sustaining the future: How green capabilities and digitalization drive sustainability in modern business", *Heliyon*, Elsevier Ltd, Vol. 10 No. 1, doi: 10.1016/j.heliyon.2024.e24158.

Li, Z.P., Kamkankaew, P. and Limpiaongkhanan, P. (2023), "An Empirical Study on the Technology Acceptance Model (TAM) of Meituan Application in Kunming, China", *International Journal of Sociologies and Anthropologies Science Reviews*, Dr. Ken Institute of Academic Development and Promotion, Vol. 3 No. 4, pp. 183–194, doi: 10.60027/ijsasr.2023.2980.

Liang, Y., Lee, M.J. and Jung, J.S. (2022), "Dynamic Capabilities and an ESG Strategy for Sustainable Management Performance", *Frontiers in Psychology*, Frontiers Media S.A., Vol. 13, doi: 10.3389/fpsyg.2022.887776.

Liu, G., Li, K., Zhao, D., Asce, A.M. and Mao, C. (2016), "Business Model Innovation and Its Drivers in the Chinese Construction Industry during the Shift to Modular Prefabrication", *Journal of Management in Engineering*, Vol. 33 No. 3, doi: 10.1061/(ASCE)ME.1943-5479.

Liu, L., Cui, L., Han, Q. and Zhang, C. (2024), "The impact of digital capabilities and dynamic capabilities on business model innovation: the moderating effect of organizational inertia", *Humanities and Social Sciences Communications*, Springer Nature, Vol. 11 No. 1, doi: 10.1057/s41599-024-02910-z.

Liu, Y., Shi, X. and Laurenceson, J. (2020), "Dynamics of Australia's LNG export performance: A modified constant market shares analysis", *Energy Economics*, Elsevier B.V., Vol. 89, doi: 10.1016/j.eneco.2020.104808.

Long, T.B., Looijen, A. and Blok, V. (2018), "Critical success factors for the transition to business models for sustainability in the food and beverage industry in the Netherlands", *Journal of Cleaner Production*, Elsevier Ltd, Vol. 175, pp. 82–95, doi: 10.1016/j.jclepro.2017.11.067.

Lopes, J.M., Pinho, M. and Gomes, S. (2023), "Green to gold: consumer circular choices may boost circular business models", *Environment, Development and Sustainability*, Springer Science and Business Media B.V., doi: 10.1007/s10668-023-03930-6.

Mahajan, V., Nauriyal, D.K. and Singh, S.P. (2015), "Trade performance and revealed comparative advantage of Indian pharmaceutical industry in new IPR regime", *International Journal of Pharmaceutical and Healthcare Marketing*, Emerald Group Holdings Ltd., Vol. 9 No. 1, pp. 56–73, doi: 10.1108/IJPHM-05-2013-0030.

Maina, P., Ollengo, M.A. and Nthiga, E.W. (2019), "Trends in leather processing: A Review", *International Journal of Scientific and Research Publications (IJSRP)*, International Journal of Scientific and Research Publications (IJSRP), Vol. 9 No. 12, p. p9626, doi: 10.29322/ijsrp.9.12.2019.p9626.

Majidli, F. (2020), "International comparative and competitive advantage of post-soviet countries in tourism", *Research in World Economy*, Sciedu Press, Vol. 11 No. 5, pp. 369–379, doi: 10.5430/RWE.V11N5P369.

Makalesi, A., Article, R., Bir Analiz Alper Sönmez, A. and Rahman Amirzai Assoc, F. (2023), "Factors Impacting on Product and Process Innovation Capability: An Empirical Analysis on Manufacturing Firms in Turkey", *JOURNAL OF EMERGING ECONOMIES AND POLICY 2023*, Vol. 8 No. 2, pp. 348–357.

Malatji, W.R., van Eck, R. and Zuva, T. (2020), "Understanding the usage, modifications, limitations and criticisms of technology acceptance model (TAM)", *Advances in Science, Technology and Engineering Systems*, ASTES Publishers, Vol. 5 No. 6, pp. 113–117, doi: 10.25046/aj050612.

Malodia, S., Dhir, A., Alshibani, S.M. and Christofi, M. (2023), "Born global: antecedents and consequences of innovation capabilities", *Asia Pacific Journal of Management*, Springer, doi: 10.1007/s10490-023-09909-1.

Mamo, S. (2019), "Enhancing Manufacturing Process through Prioritizing Total Productive Maintenance Pillars Case: Nile sole Factory".

Mancuso, I., Messeni Petruzzelli, A. and Panniello, U. (2023), "Digital business model innovation in metaverse: How to approach virtual economy opportunities", *Information Processing and Management*, Elsevier Ltd, Vol. 60 No. 5, doi: 10.1016/j.ipm.2023.103457.

Martínez-Peláez, R., Ochoa-Brust, A., Rivera, S., Félix, V.G., Ostos, R., Brito, H., Félix, R.A., *et al.* (2023), "Role of Digital Transformation for Achieving Sustainability: Mediated Role of Stakeholders, Key Capabilities, and Technology", *Sustainability (Switzerland)*, Multidisciplinary Digital Publishing Institute (MDPI), Vol. 15 No. 14, doi: 10.3390/su151411221.

Mata, M., Ancheta, R., Batucan, G. and Gonzales, G.G. (2024), "Exploring technology acceptance model with system characteristics to investigate sustainable building information modeling adoption in the architecture, engineering, and construction industry: The case of the Philippines", *Social Sciences & Humanities Open*, Vol. 10, p. 100967, doi: https://doi.org/10.1016/j.ssaho.2024.100967.

McKone, K.E., Schroeder, R.G. and Cua, K.O. (2001), "Impact of total productive maintenance practices on manufacturing performance", *Journal of Operations Management*, Vol. 19 No. 1, pp. 39–58, doi: 10.1016/S0272-6963(00)00030-9.

Merín-Rodrigáñez, J., Dasí, À. and Alegre, J. (2024), "Digital transformation and firm performance in innovative SMEs: The mediating role of business model innovation", *Technovation*, Vol. 134, p. 103027, doi: https://doi.org/10.1016/j.technovation.2024.103027.

Milana, C. (1988), "Constant-market-shares analysis and index number theory", *European Journal of Political Economy*, Vol. 4 No. 4, pp. 453–478, doi: https://doi.org/10.1016/0176-2680(88)90011-0.

Minatogawa, V., Franco, M., Rampasso, I.S., Holgado, M., Garrido, D., Pinto, H. and Quadros, R. (2022), "Towards Systematic Sustainable Business Model Innovation: What Can We Learn from Business Model Innovation", *Sustainability (Switzerland)*, MDPI, 1 March, doi: 10.3390/su14052939.

Moallemi, E.A., Malekpour, S., Hadjikakou, M., Raven, R., Szetey, K., Ningrum, D., Dhiaulhaq, A., *et al.* (2020), "Achieving the Sustainable Development Goals Requires Transdisciplinary Innovation at the Local Scale", *One Earth*, Cell Press, 18 September, doi: 10.1016/j.oneear.2020.08.006.

Mohammad Obaidullah, A., Maria Sultana Moon, M., Tayeba, S., Abdullah, M. and Binte Arju, S. (2025), "The Role of Sustainable Business Practices in Enhancing Brand Loyalty and Consumer Trust", *International Journal of Novel Research in Marketing Management and Economics*, Vol. 12, pp. 40–47, doi: 10.5281/zenodo.15039414.

Molina-Castillo, F.J., Sinkovics, N. and Sinkovics, R.R. (2021), "Sustainable business model innovation: Review, analysis and impact on society", *Sustainability (Switzerland)*, MDPI AG, 2 August, doi: 10.3390/su13168906.

Monira, U. and Mostafa, M.G. (2023), "Leather industrial effluent and environmental concerns: a review", *Sustainable Water Resources Management*, Springer Science and Business Media Deutschland GmbH, Vol. 9 No. 6, doi: 10.1007/s40899-023-00969-1.

Montenegro, J.F., Contreras, P.A. and Saenz, F. (2021), "Hybridization of the Kano model and business model canvas: aeronautical and metalworking industry in Bogota, Colombia", *Heliyon*, Elsevier Ltd, Vol. 7 No. 10, doi: 10.1016/j.heliyon.2021.e08097.

Moradi, E., Jafari, S.M., Doorbash, Z.M. and Mirzaei, A. (2021), "Impact of organizational inertia on business model innovation, open innovation and corporate performance", *Asia Pacific Management Review*, National Cheng Kung University, Vol. 26 No. 4, pp. 171–179, doi: 10.1016/j.apmrv.2021.01.003.

Moslehpour, M., Thanh, H.L.T. and van Kien, P. (2018), "Technology perception, personality traits and online purchase intention of taiwanese consumers", *Studies in Computational Intelligence*, Vol. 753, Springer Verlag, pp. 392–407, doi: 10.1007/978-3-319-70942-0_28.

Muñoz-Pascual, L., Galende, J. and Curado, C. (2021), "Contributions to sustainability in smes: Human resources, sustainable product innovation performance and the mediating role of employee creativity", *Sustainability (Switzerland)*, MDPI AG, Vol. 13 No. 4, pp. 1–20, doi: 10.3390/su13042008.

Musa, H.G., Fatmawati, I., Nuryakin, N. and Suyanto, M. (2024), "Marketing research trends using technology acceptance model (TAM): a comprehensive review of researches (2002–2022)", *Cogent Business & Management*, Cogent OA, Vol. 11 No. 1, p. 2329375, doi: 10.1080/23311975.2024.2329375.

Najafi-Tavani, Z., Zantidou, E., Leonidou, C.N. and Zeriti, A. (2023), "Business model innovation and export performance", *Journal of International Business Studies*, doi: 10.1057/s41267-023-00645-8.

Narayan, A. and Hungund, S. (2022), "Enhancing Firm Performance Through Adoption of Innovation: an Empirical Evidence from Indian Biotechnological Firms", *Journal of the Knowledge Economy*, Springer, Vol. 13 No. 3, pp. 2431–2456, doi: 10.1007/s13132-021-00821-x.

Navarro, D., Wu, J., Lin, W., Fullana-i-Palmer, P. and Puig, R. (2020), "Life cycle assessment and leather production", *Journal of Leather Science and Engineering*, Springer, Vol. 2 No. 1, doi: 10.1186/s42825-020-00035-y.

Negussie, R. and Jayaprakash, J. (2019), "Inbound multi-echelon inventory supply network model in ethiopian leather industry: A simulation study", *Lecture Notes of the Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering, LNICST*, Vol. 274, Springer Verlag, pp. 418–428, doi: 10.1007/978-3-030-15357-1_35.

Ngaich, P.R. and Malviya, P.K. (2015), "Study and Improvement of Manufacturing performance By Implementation of TPM", Vol. 3 No. 7, pp. 3285–3288.

Nguyen Thi, B., Tran, T.L.A., Tran, T.T.H., Le, T.T., Tran, P.N.H. and Nguyen, M.H. (2022), "Factors influencing continuance intention of online shopping of generation Y and Z during the new normal in Vietnam", *Cogent Business and Management*, Cogent OA, Vol. 9 No. 1, doi: 10.1080/23311975.2022.2143016.

Nguyen, T.M.A., Nguyen, T.H. and Le, H.H. (2022), "Online Shopping in Relationship with Perception, Attitude, and Subjective Norm during COVID-19 Outbreak: The Case of Vietnam", *Sustainability (Switzerland)*, MDPI, Vol. 14 No. 22, doi: 10.3390/su142215009.

Nunes, M.P. and Pereira, R.D.O.V.A.L. (2021), "BUSINESS MODEL INNOVATION and BUSINESS PERFORMANCE in AN INNOVATIVE ENVIRONMENT", *International Journal of Innovation Management*, World Scientific, Vol. 25 No. 3, doi: 10.1142/S1363919621500365.

OECD. (2004), "Patents and Innovation: Trends and Policy Challenges", *Organisation for Economic Co-Operation and Development*, No. 12, p. 32.

Ofori, D. and Appiah-Nimo, C. (2019), "Determinants of online shopping among tertiary students in Ghana: An extended technology acceptance model", *Cogent Business and Management*, Cogent OA, Vol. 6 No. 1, doi: 10.1080/23311975.2019.1644715.

Olaleye, B.R., Lekunze, J.N., Sekhampu, T.J., Khumalo, N. and Ayeni, A.A.W. (2024), "Leveraging Innovation Capability and Organizational Resilience for Business Sustainability Among Small and Medium Enterprises: A

PLS-SEM Approach", *Sustainability (Switzerland)*, Multidisciplinary Digital Publishing Institute (MDPI), Vol. 16 No. 21, doi: 10.3390/su16219201.

Oliveira, M., Miguel, M., van Langen, S.K., Ncube, A., Zucaro, A., Fiorentino, G., Passaro, R., *et al.* (2021), "Circular Economy and the Transition to a Sustainable Society: Integrated Assessment Methods for a New Paradigm", *Circular Economy and Sustainability*, Springer Nature, Vol. 1 No. 1, pp. 99–113, doi: 10.1007/s43615-021-00019-y.

Oliveira Neto, G.C. de, Santos, R.A.R., Pinto, L.F.R., Flausino, F.R., Oliveira, D.E.P. de and Seri, M.N. (2024), "Innovative circular practices integrating business model for textile industry", *Journal of Engineered Fibers and Fabrics*, SAGE Publications Ltd, 1 January, doi: 10.1177/15589250241226481.

Oliveira-Dias, D., Kneipp, J.M., Bichueti, R.S. and Gomes, C.M. (2022), "Fostering business model innovation for sustainability: a dynamic capabilities perspective", *Management Decision*, Emerald Group Holdings Ltd., Vol. 60 No. 13, pp. 105–129, doi: 10.1108/MD-05-2021-0590.

Omoloso, O., Mortimer, K., Wise, W.R. and Jraisat, L. (2021), "Sustainability research in the leather industry: A critical review of progress and opportunities for future research", *Journal of Cleaner Production*, Vol. 285, p. 125441, doi: https://doi.org/10.1016/j.jclepro.2020.125441.

Osman, A.M. and Liu, Y.S. (2022), "Critical Determinants of the Competitiveness of the Ghanaian Construction Industry", *Journal of Construction in Developing Countries*, Penerbit Universiti Sains Malaysia, doi: 10.21315/jcdc-07-21-0110.

Osman, A.M. and Sheng, L.Y. (2023), "Critical Determinants of the Competitiveness of the Ghanaian Construction Industry", *Journal of Construction in Developing Countries*, Penerbit Universiti Sains Malaysia, Vol. 28 No. 1, pp. 267–291, doi: 10.21315/jcdc-07-21-0110.

Osterwalder Pigneur, Yves,, Clark, Tim., Alexander. (2010), *Business Model Generation : A Handbook for Visionaries, Game Changers, and Challengers*, Wiley, Hoboken, NJ.

Osterwalder, A. (2014), "Value proposition design : how to create products and services customers want : get started with", *How to Create Products and Services Customers Want*, p. 290.

Osterwalder, A., & P.Y. (2010). (2010), *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*, Vol. 1, John Wiley & Sons.

Othman, N., Tahir, M.S. and Joremi, L. (2022), "On the duration of trade competitiveness: the case of the Malaysian palm-based oleochemical industry", *Heliyon*, Elsevier Ltd, Vol. 8 No. 11, doi: 10.1016/j.heliyon.2022.e11903.

Pan, L., Xu, Z. and Skare, M. (2023), "Sustainable business model innovation literature: a bibliometrics analysis", *Review of Managerial Science*, Springer Science and Business Media Deutschland GmbH, 1 April, doi: 10.1007/s11846-022-00548-2.

Panneerselvam, M.K. (2012), "TPM implementation to invigorate manufacturing performance : an Indian industrial rubric", *International Journal of Scientific & Engineering Research*, Vol. 3 No. 6, pp. 1–10.

Patil, A., Soni, G., Prakash, A. and Karwasra, K. (2022), "Maintenance strategy selection: a comprehensive review of current paradigms and solution approaches", *International Journal of Quality & Reliability Management*, Emerald Publishing Limited, Vol. 39 No. 3, pp. 675–703, doi: 10.1108/IJQRM-04-2021-0105.

Pavani, C., Rao, P.A., Vishnu, P., Raja, H., Sriram and Sirisha, N. (2024), "Vegan Leather from Agricultural Waste: Exploring Sustainable and Cruelty-Free Alternatives", in Arya, R.K., Verros, G.D., Verma, O.P. and Hussain, C.M. (Eds.), *From Waste to Wealth*, Springer Nature Singapore, Singapore, pp. 951–964, doi: 10.1007/978-981-99-7552-5_42.

Peña-García, N., Gil-Saura, I., Rodríguez-Orejuela, A. and Siqueira-Junior, J.R. (2020), "Purchase intention and purchase behavior online: A cross-cultural approach", *Heliyon*, Vol. 6 No. 6, p. e04284, doi: https://doi.org/10.1016/j.heliyon.2020.e04284.

Peñarroya-Farell, M. and Miralles, F. (2021), "Business model dynamics from interaction with open innovation", *Journal of Open Innovation: Technology, Market, and Complexity*, Multidisciplinary Digital Publishing Institute (MDPI), Vol. 7 No. 1, doi: 10.3390/JOITMC7010081.

Pengchao, W., Chenglin, L., Mian, L. and Bhaumik, A. (2023), *Sustainable Business Practices: Integrating Environmental AND Social Responsibility INTO Corporate Strategy*.

peopleinneed. (2024), "Transforming the leather sector in Ethiopia - People in Need", available at: https://www.peopleinneed.net/transforming-the-leather-sector-in-ethiopia-11731gp (accessed 20 December 2024).

Pérez Estébanez, R. and Sevillano Martín, F.J. (2025), "Business Sustainability and Its Effect on Performance Measures: A Comprehensive Analysis", *Sustainability (Switzerland)*, Multidisciplinary Digital Publishing Institute (MDPI), 1 January, doi: 10.3390/su17010297.

Pfajfar, G., Shoham, A., Małecka, A. and Zalaznik, M. (2022), "Value of corporate social responsibility for multiple stakeholders and social impact – Relationship marketing perspective", *Journal of Business Research*, Vol. 143, pp. 46–61, doi: https://doi.org/10.1016/j.jbusres.2022.01.051.

Pham, D.C., Do, T.N.A., Doan, T.N., Nguyen, T.X.H. and Pham, T.K.Y. (2021), "The impact of sustainability practices on financial performance: empirical evidence from Sweden", *Cogent Business and Management*, Cogent OA, Vol. 8 No. 1, doi: 10.1080/23311975.2021.1912526.

Pies, I. and Valentinov, V. (2024), "Trade-offs in stakeholder theory: an ordonomic perspective", *Social Responsibility Journal*, Emerald Publishing, Vol. 20 No. 5, pp. 975–997, doi: 10.1108/SRJ-06-2023-0321.

Pino, R.M. and Ortega, A. (2021), "Innovation systems performance drivers and outputs: a systematic literature review and directions for future research", *International Journal of Business Innovation and Research*, Inderscience Publishers, Vol. 1 No. 1, p. 1, doi: 10.1504/ijbir.2021.10041373.

Porter, M.E. (2011), *Competitive Advantage of Nations: Creating and Sustaining Superior Performance*, simon and schuster.

Prabowo, H.A., Suprapto, Y.B. and Farida, F. (2018), "the Evaluation of Eight Pillars Total Productive Maintenance (Tpm) Implementation and Their Impact on Overall Equipment Effectiveness (Oee) and Waste", *Sinergi*, Vol. 22 No. 1, p. 13, doi: 10.22441/sinergi.2018.1.003.

Prakash, J., Ong, K.S. and Cheah, C.K. (2019), "Overall equipment effectiveness (OEE): a review and development of an integrated improvement framework", *International Journal of Productivity and Quality Management*, Inderscience Publishers, Vol. 1 No. 1, p. 1, doi: 10.1504/ijpqm.2019.10020889.

Prasad, S., Yadav, K.K., Kumar, S., Gupta, N., Cabral-Pinto, M.M.S., Rezania, S., Radwan, N., *et al.* (2021), "Chromium contamination and effect on environmental health and its remediation: A sustainable approaches", *Journal of Environmental Management*, Vol. 285, p. 112174, doi: https://doi.org/10.1016/j.jenvman.2021.112174.

Priyono, A. and Hidayat, A. (2022), "Dynamic Capabilities for Open Innovation: A Typology of Pathways toward Aligning Resources, Strategies and Capabilities", *Journal of Open Innovation: Technology, Market, and Complexity*, Vol. 8 No. 4, p. 206, doi: https://doi.org/10.3390/joitmc8040206.

Pucihar, A., Lenart, G., Borštnar, M.K., Vidmar, D. and Marolt, M. (2019), "Drivers and outcomes of business model innovation-micro, small and medium-sized enterprises perspective", *Sustainability (Switzerland)*, MDPI, Vol. 11 No. 2, doi: 10.3390/su11020344.

Purvis, B., Mao, Y. and Robinson, D. (2019), "Three pillars of sustainability: in search of conceptual origins", *Sustainability Science*, Vol. 14 No. 3, pp. 681–695, doi: 10.1007/s11625-018-0627-5.

Purwono, R., Sugiharti, L., Handoyo, R.D. and Esquivias, M.A. (2022), "Trade Liberalization and Comparative Advantage: Evidence from Indonesia and Asian Trade Partners", *Economies*, MDPI, Vol. 10 No. 4, doi: 10.3390/economies10040080.

Rachinger, M., Rauter, R., Müller, C., Vorraber, W. and Schirgi, E. (2019), "Digitalization and its influence on business model innovation", *Journal of Manufacturing Technology Management*, Emerald Group Holdings Ltd., Vol. 30 No. 8, pp. 1143–1160, doi: 10.1108/JMTM-01-2018-0020.

Rajapathirana, R.P.J. and Hui, Y. (2018), "Relationship between innovation capability, innovation type, and firm performance", *Journal of Innovation and Knowledge*, Journal of Innovation & Knowledge, Vol. 3 No. 1, pp. 44–55, doi: 10.1016/j.jik.2017.06.002.

Ramadhani, T.N. and Santoso, R.P. (2019), "Competitiveness analyses of Indonesian and Malaysian palm oil exports", *Economic Journal of Emerging Markets*, Universitas Islam Indonesia (Islamic University of Indonesia), Vol. 11 No. 1, pp. 46–58, doi: 10.20885/ejem.vol11.iss1.art5.

Ramdani, B., Binsaif, A. and Boukrami, E. (2019), "Business model innovation: a review and research agenda", *New England Journal of Entrepreneurship*, Emerald Group Holdings Ltd., 13 November, doi: 10.1108/NEJE-06-2019-0030.

Randhawa, K., Wilden, R. and Gudergan, S. (2021), "How to innovate toward an ambidextrous business model? The role of dynamic capabilities and market orientation", *Journal of Business Research*, Vol. 130, pp. 618–634, doi: https://doi.org/10.1016/j.jbusres.2020.05.046.

Richardson, J. (2008), "The business model: an integrative framework for strategy execution", *Strategic Change*, Wiley, Vol. 17 No. 5–6, pp. 133–144, doi: 10.1002/jsc.821.

Richardson, J.D. (1971), "Constant-market-shares analysis of export growth", *Journal of International Economics*, Vol. 1 No. 2, pp. 227–239, doi: https://doi.org/10.1016/0022-1996(71)90058-4.

Robertsone, G. and Lapiņa, I. (2023), "Digital transformation as a catalyst for sustainability and open innovation", *Journal of Open Innovation: Technology, Market, and Complexity*, Elsevier B.V., Vol. 9 No. 1, doi: 10.1016/j.joitmc.2023.100017.

Rosati, F., Rodrigues, V.P., Cosenz, F. and Li-Ying, J. (2023), "Business model innovation for the Sustainable Development Goals", *Business Strategy and the Environment*, John Wiley and Sons Ltd, Vol. 32 No. 6, pp. 3752–3765, doi: 10.1002/bse.3334.

Roukanas, S. (2023), "Measuring the Trade Performance of States", in Persiani, N., Vannini, I.E., Giusti, M., Karasavvoglou, A. and Polychronidou, P. (Eds.), *Global, Regional and Local Perspectives on the Economies of Southeastern Europe*, Springer Nature Switzerland, Cham, pp. 49–73.

Russo, D. and Stol, K.J. (2021), "PLS-SEM for software engineering research: An introduction and survey", *ACM Computing Surveys*, Association for Computing Machinery, 1 July, doi: 10.1145/3447580.

Safeer, A.A., He, Y., Abrar, M. and Ullah, A. (2019), "Diagnostics of the challenges and potential solutions to improve export competitiveness in international markets: The case of pakistani readymade garments industry", *Journal of Competitiveness*, Tomas Bata University in Zlín, Vol. 11 No. 3, pp. 128–143, doi: 10.7441/joc.2019.03.08.

Salfore, N., Ensermu, M. and Kinde, Z. (2023), "Business model innovation and firm performance: Evidence from manufacturing SMEs", *Heliyon*, Elsevier Ltd, Vol. 9 No. 6, doi: 10.1016/j.heliyon.2023.e16384.

Salkind, N. (2012a), *Statistical Power Analysis for the Behavioral Sciences*, *Encyclopedia of Research Design*, doi: 10.4135/9781412961288.n443.

Salkind, N.J. (2012b), *Exploring Research*, Pearson.

Salvato, C. and Vassolo, R. (2018), "The sources of dynamism in dynamic capabilities", *Strategic Management Journal*, John Wiley and Sons Ltd, Vol. 39 No. 6, pp. 1728–1752, doi: 10.1002/smj.2703.

Samans, R. and Nelson, J. (2022), "Corporate Partnerships and Systemic Change", in Samans, R. and Nelson, J. (Eds.), *Sustainable Enterprise Value Creation: Implementing Stakeholder Capitalism through Full ESG Integration*, Springer International Publishing, Cham, pp. 219–251, doi: 10.1007/978-3-030-93560-3_7.

Santiago. (2021), "technologies new future Thank you for your interest in".

Santo, P.E. and Marques, A.M.A. (2022), "Determinants of the online purchase intention: hedonic motivations, prices, information and trust", *Baltic Journal of Management*, Emerald Group Holdings Ltd., Vol. 17 No. 1, pp. 56–71, doi: 10.1108/BJM-04-2021-0140.

Saoula, O., Shamim, A., Mohd Suki, N., Ahmad, M.J., Abid, M.F., Patwary, A.K. and Abbasi, A.Z. (2023), "Building e-trust and e-retention in online shopping: the role of website design, reliability and perceived ease of use", *Spanish Journal of Marketing - ESIC*, Emerald Publishing, Vol. 27 No. 2, pp. 178–201, doi: 10.1108/SJME-07-2022-0159.

Sardana, G.D. (2016), "Innovation and Growth", *South Asian Journal of Business and Management Cases*, Vol. 5 No. 1, pp. vii–xi, doi: 10.1177/2277977916634255.

Sarstedt, M., Ringle, C.M. and Hair, J.F. (2020), "Partial Least Squares Structural Equation Modeling", in Homburg, C., Klarmann, M. and Vomberg, A.E. (Eds.), *Handbook of Market Research*, Springer International Publishing, Cham, pp. 1–47, doi: 10.1007/978-3-319-05542-8_15-2.

Saukkonen, N. and Kirjavainen, J. (2019), "Business Environment: Emerging External and Internal Pressures for Sustainable Production", in Leal, W., Azul, A.M., Brandli, L., Özuyar, P.G. and Wall, T. (Eds.), *Responsible Consumption and Production*, Springer International Publishing, Cham, pp. 1–11, doi: 10.1007/978-3-319-71062-4_1-1.

Saxena, P.K., Seetharaman, A. and Shawarikar, G. (2024), "Factors That Influence Sustainable Innovation in Organizations: A Systematic Literature Review", *Sustainability*, MDPI AG, Vol. 16 No. 12, p. 4978, doi: 10.3390/su16124978.

Schaller, A.A. and Vatananan-Thesenvitz, R. (2019), "Business model innovation (BMI) process: A systematic literature review with bibliometric analysis", *PICMET 2019 - Portland International Conference on Management of Engineering and Technology: Technology Management in the World of Intelligent Systems, Proceedings*, No. September, doi: 10.23919/PICMET.2019.8893797.

Schaltegger, S., Lüdeke-Freund, F. and Hansen, E.G. (2012), "Business cases for sustainability: The role of business model innovation for corporate sustainability", *International Journal of Innovation and Sustainable Development*, Inderscience Publishers, Vol. 6 No. 2, pp. 95–119, doi: 10.1504/IJISD.2012.046944.

Schiavon, O.P., May, M.R. and Mendonça, A.T.B.B. de. (2022), "Dynamic capabilities and business model innovation in sustainable family farming", *Innovation and Management Review*, Emerald Group Holdings Ltd., Vol. 19 No. 3, pp. 252–265, doi: 10.1108/INMR-07-2021-0136.

Schiuma, G., Santarsiero, F., Carlucci, D. and Jarrar, Y. (2024), "Transformative leadership competencies for organizational digital transformation", *Business Horizons*, Elsevier Ltd, doi: 10.1016/j.bushor.2024.04.004.

Schlüter, L., Kørnøv, L., Mortensen, L., Løkke, S., Storrs, K., Lyhne, I. and Nors, B. (2023), "Sustainable business model innovation: Design guidelines for integrating systems thinking principles in tools for early-stage sustainability assessment", *Journal of Cleaner Production*, Elsevier Ltd, Vol. 387, doi: 10.1016/j.jclepro.2022.135776.

Schmidpeter, R.R. (2025), "Fostering sustainability through a new management paradigm", *Journal of Sustainable Business*, Vol. 10 No. 1, p. 3, doi: 10.1186/s40991-025-00108-3.

Sener, S. and Delican, D. (2019), "The causal relationship between innovation, competitiveness and foreign trade in developed and developing countries", *Procedia Computer Science*, Elsevier B.V., Vol. 158, pp. 533–540, doi: 10.1016/j.procs.2019.09.085.

Sengura, J.D., Mu, R. and Zhang, J. (2024), "Towards Frugal Innovation Capability in Emerging Markets within the Digitalization Epoch: Exploring the Role of Strategic Orientation and Organizational Ambidexterity", *Journal of Theoretical and Applied Electronic Commerce Research*, MDPI AG, Vol. 19 No. 3, pp. 2000–2029, doi: 10.3390/jtaer19030098.

Sewpersadh, N.S. (2023), "Disruptive business value models in the digital era", *Journal of Innovation and Entrepreneurship*, Springer Science and Business Media Deutschland GmbH, 1 December, doi: 10.1186/s13731-022-00252-1.

Shabbir, M.S. (2015), "Innovation and Competitiveness Lead to Industrial Trade", *SSRN Electronic Journal*, No. October, doi: 10.2139/ssrn.2659847.

Shachak, A., Kuziemsky, C. and Petersen, C. (2019), "Beyond TAM and UTAUT: Future directions for HIT implementation research", *Journal of Biomedical Informatics*, Vol. 100, p. 103315, doi: https://doi.org/10.1016/j.jbi.2019.103315.

Shahwan, R., An-Najjar, M., Nour, A. and Zaman, T. (2024), "Antecedents and Consequences of Business Model Innovation: A Theoretical Model", in Musleh Al-Sartawi, A.M.A., Al-Qudah, A.A. and Shihadeh, F. (Eds.), *Artificial Intelligence-Augmented Digital Twins: Transforming Industrial Operations for Innovation and Sustainability*, Springer Nature Switzerland, Cham, pp. 25–35, doi: 10.1007/978-3-031-43490-7_3.

Shams, R., Vrontis, D., Belyaeva, Z., Ferraris, A. and Czinkota, M.R. (2021), "Strategic agility in international business: A conceptual framework for 'agile' multinationals", *Journal of International Management*, Elsevier Inc., Vol. 27 No. 1, doi: 10.1016/j.intman.2020.100737.

Sharma, K., Gera, G., Kumar, R., Chaudhary, H.K. and Gupta, S.K. (2012), "An Empirical Study Approach on TPM Implementation in Manufacturing Industry", *International Journal on Emerging Technology*, Vol. 3 No. 1, pp. 18–23.

Sharma, R.K., Kumar, D. and Kumar, P. (2006), "Manufacturing excellence through TPM implementation: A practical analysis", *Industrial Management and Data Systems*, Vol. 106 No. 2, pp. 256–280, doi: 10.1108/02635570610649899.

Shaul, J., Ingram, A., Department for Business Innovation and Skills, Wenger-Trayner, B., Hamari, J., Shernoff, D.J., Rowe, E., *et al.* (2014), "Business Model | Business Model Canvas | ارائه و بسط مدل یحارط", *Handbook of Sustainable Development: Second Edition*, Vol. 2010 No. August, pp. 1–27.

Shayan, N.F., Mohabbati-Kalejahi, N., Alavi, S. and Zahed, M.A. (2022), "Sustainable Development Goals (SDGs) as a Framework for Corporate Social Responsibility (CSR)", *Sustainability (Switzerland)*, MDPI, Vol. 14 No. 3, doi: 10.3390/su14031222.

Siahaan, D.T. and Tan, C.S.L. (2020), "Antecedents of innovation capability and firm performance of indonesian ict smes", *Asian Journal of Business Research*, Asia Business Research Corporation, Vol. 10 No. 2, pp. 45–71, doi: 10.14707/ajbr.200083.

Siems, E., Seuring, S. and Schilling, L. (2023), "Stakeholder roles in sustainable supply chain management: a literature review", *Journal of Business Economics*, Springer Science and Business Media Deutschland GmbH, Vol. 93 No. 4, pp. 747–775, doi: 10.1007/s11573-022-01117-5.

Siggel, E. (2006), "International competitiveness and comparative advantage: A survey and a proposal for measurement", *Journal of Industry, Competition and Trade*, Vol. 6 No. 2, pp. 137–159, doi: 10.1007/s10842-006-8430-x.

Silva, V.F.M. (2021), "Overview of the Leather Industry and Pollution Impact", *U.Porto Journal of Engineering*, Universidade do Porto - Faculdade de Engenharia, Vol. 7 No. 4, pp. 1–15, doi: 10.24840/2183-6493_007.004_0001.

Singh, P.K. and Maheswaran, R. (2024), "Analysis of social barriers to sustainable innovation and digitisation in supply chain", *Environment, Development and Sustainability*, Vol. 26 No. 2, pp. 5223–5248, doi: 10.1007/s10668-023-02931-9.

Singh, R., Gohil, A.M., Shah, D.B. and Desai, S. (2013), "Total productive maintenance (TPM) implementation in a machine shop: A case study", *Procedia Engineering*, Elsevier B.V., Vol. 51 No. NUiCONE 2012, pp. 592–599, doi: 10.1016/j.proeng.2013.01.084.

Sinkovics, N., Gunaratne, D., Sinkovics, R.R. and Molina-Castillo, F.J. (2021), "Sustainable business model innovation: An umbrella review", *Sustainability (Switzerland)*, MDPI AG, 1 July, doi: 10.3390/su13137266.

Sjödin, D., Parida, V., Jovanovic, M. and Visnjic, I. (2020), *Value Creation and Value Capture Alignment in Business Model Innovation: A Process View on Outcome-Based Business Models*, *Journal of Product Innovation Management*, Vol. 37, doi: 10.1111/jpim.12516.

Slávik, Š. and Bednár, R. (2014), "Analysis of Business Models", *Journal of Competitiveness*, Vol. 6 No. 4, pp. 19–40, doi: 10.7441/joc.2014.04.02.

Sofrankova, B., Kiselakova, D. and Cabinova, V. (2017), "Innovation as a source of country's global competitiveness growth", *SHS Web of Conferences*, Vol. 39, p. 01026, doi: 10.1051/shsconf/20173901026.

Soluk, J., Decker-Lange, C. and Hack, A. (2023), "Small steps for the big hit: A dynamic capabilities perspective on business networks and non-disruptive digital technologies in SMEs", *Technological Forecasting and Social Change*, Vol. 191, p. 122490, doi: https://doi.org/10.1016/j.techfore.2023.122490.

Somale, M. (2021), "American Economic Association Comparative Advantage in Innovation and Production", *Journal: Macroeconomics*, Vol. 13 No. 3, pp. 357–396, doi: 10.2307/27087269.

Spieth, P., Breitenmoser, P. and Röth, T. (2023), "Business model innovation: Integrative review, framework, and agenda for future innovation management research", *Journal of Product Innovation Management*, John Wiley and Sons Inc, doi: 10.1111/jpim.12704.

Stahl, G.K., Brewster, C.J., Collings, D.G. and Hajro, A. (2020), "Enhancing the role of human resource management in corporate sustainability and social responsibility: A multi-stakeholder, multidimensional approach to HRM", *Human Resource Management Review*, Vol. 30 No. 3, p. 100708, doi: https://doi.org/10.1016/j.hrmr.2019.100708.

Startienė, G. and Remeikienė, R. (2014), "Evaluation of Revealed Comparative Advantage of Lithuanian Industry in Global Markets", *Procedia - Social and Behavioral Sciences*, Elsevier BV, Vol. 110, pp. 428–438, doi: 10.1016/j.sbspro.2013.12.887.

Stellian, R. and Danna-Buitrago, J.P. (2022), "Revealed Comparative Advantage and Contribution-to-the-Trade-Balance indexes", *International Economics*, Elsevier B.V., Vol. 170, pp. 129–155, doi: 10.1016/j.inteco.2022.02.007.

Stremersch, S., Cabooter, E., Guitart, I.A. and Camacho, N. (2024), "Customer insights for innovation: A framework and research agenda for marketing", *Journal of the Academy of Marketing Science*, doi: 10.1007/s11747-024-01051-8.

Sudolska, A. and Łapińska, J. (2020), "Exploring determinants of innovation capability in manufacturing companies operating in Poland", *Sustainability (Switzerland)*, MDPI, Vol. 12 No. 17, doi: 10.3390/su12177101.

Sukardi, Rusdiawan and Wardana, L.A. (2019), "The competitiveness of Master of Education Graduates: Porter's diamond analysis", *International Journal of Emerging Technologies in Learning*, Kassel University Press GmbH, Vol. 14 No. 19, pp. 179–187, doi: 10.3991/ijet.v14i19.10767.

Takacs, F., Brunner, D. and Frankenberger, K. (2022), "Barriers to a circular economy in small- and medium-sized enterprises and their integration in a sustainable strategic management framework", *Journal of Cleaner Production*, Elsevier Ltd, Vol. 362, doi: 10.1016/j.jclepro.2022.132227.

Tang, X., Wang, M. and Li, H. (2023), "Understanding the effects of service innovation capability on firm performance in AEC industry: mediating role of business model", *Engineering, Construction and Architectural Management*, Emerald Publishing, doi: 10.1108/ECAM-06-2022-0573.

Taouab, O. and Issor, Z. (2019), "Firm Performance: Definition and Measurement Models", *European Scientific Journal ESJ*, European Scientific Institute, ESI, Vol. 15 No. 1, doi: 10.19044/esj.2019.v15n1p93.

Tarihoran, A.D.B., Hubeis, M., Jahroh, S. and Zulbainarni, N. (2023), "Competitiveness of and Barriers to Indonesia's Exports of Ornamental Fish", *Sustainability (Switzerland)*, MDPI, Vol. 15 No. 11, doi: 10.3390/su15118711.

Tavanti, M. (2023), "Assessing and Measuring Sustainability Impact", in Tavanti, M. (Ed.), *Developing Sustainability in Organizations: A Values-Based Approach*, Springer International Publishing, Cham, pp. 453–473, doi: 10.1007/978-3-031-36907-0_17.

Taylor, S.P. (2017), "What Is Innovation? A Study of the Definitions, Academic Models and Applicability of Innovation to an Example of Social Housing in England", *Open Journal of Social Sciences*, Scientific Research Publishing, Inc, Vol. 05 No. 11, pp. 128–146, doi: 10.4236/jss.2017.511010.

Teece, D.J. (2012), "Dynamic Capabilities: Routines versus Entrepreneurial Action", *Journal of Management Studies*, December, doi: 10.1111/j.1467-6486.2012.01080.x.

Teece, D.J. (2018), "Business models and dynamic capabilities", *Long Range Planning*, Elsevier Ltd, Vol. 51 No. 1, pp. 40–49, doi: 10.1016/j.lrp.2017.06.007.

Teece, D.J. and Linden, G. (2017), "Business models, value capture, and the digital enterprise", *Journal of Organization Design*, Springer, Vol. 6 No. 1, doi: 10.1186/s41469-017-0018-x.

Teece, D.J., Pisano, G. and Shuen, A. (1997), "Dynamic Capabilities and Strategic Management", *Strategic Management Journal*, Wiley, Vol. 18 No. 7, pp. 509–533.

Teece, D.J., Pisano, G. and Shuen, A. (2008), "MANAGEMENT", Vol. 18 No. 7, pp. 509–533.

Tekletsadik, S.E. (2023), "Selection of best leather item using a FAHP method to launch new leather industry in Ethiopia: A case study", *Journal of Future Sustainability*, Growing Science, Vol. 3 No. 2, pp. 85–96, doi: 10.5267/j.jfs.2022.11.008.

Teofilus, T., Ardyan, E., Sutrisno, T.F.C.W., Sabar, S. and Sutanto, V. (2022), "Managing Organizational Inertia: Indonesian Family Business Perspective", *Frontiers in Psychology*, Frontiers Media S.A., Vol. 13, doi: 10.3389/fpsyg.2022.839266.

Tewari, S., Reshamwala, S.M.S., Bhatt, L. and Kale, R.D. (2024), "Vegan leather: a sustainable reality or a marketing gimmick?", *Environmental Science and Pollution Research International*, 1 January, doi: 10.1007/s11356-023-31491-8.

Thelia Sari, E. and Rochelle Divinagracia, M.G. (2021), *Revealed Comparative Advantage and Constant Market Share Analysis of Indonesian Cinnamon in the World Market*, *Int. J. Economic Policy in Emerging Economies*, Vol. 14.

Tilahun, M., Berhan, E. and Tesfaye, G. (2023), "Determinants of consumers' purchase intention on digital business model platform: evidence from Ethiopia using partial least square structural equation model (PLS-SEM) technique", *Journal of Innovation and Entrepreneurship*, Vol. 12 No. 1, p. 50, doi: 10.1186/s13731-023-00323-x.

Torelli, R. (2021), "Sustainability, responsibility and ethics: different concepts for a single path", *Social Responsibility Journal*, Emerald Group Holdings Ltd., Vol. 17 No. 5, pp. 719–739, doi: 10.1108/SRJ-03-2020-0081.

Trutkowski, C. (2016), "TRAINING NEEDS ANALYSIS and NATIONAL TRAINING STRATEGIES How to ensure the right training at the right time to the right people?"

Tsai, P.H., Chen, C.J. and Yang, H.C. (2021), "Using Porter's Diamond Model to Assess the Competitiveness of Taiwan's Solar Photovoltaic Industry", *SAGE Open*, SAGE Publications Inc., Vol. 11 No. 1, doi: 10.1177/2158244020988286.

Tsang, A.H.C. and Chan, P.K. (2000), "TPM implementation in China: A case study", *International Journal of Quality and Reliability Management*, Vol. 17 No. 2, pp. 144–157, doi: 10.1108/02656710010304555.

Tsega, T.T., Thoben, K.-D., Nageswara Rao, D.K. and Haile, B. (2022), "Leather and textile industries-strategic sectors for Ethiopia to gain capability of manufacturing for global market competitiveness: A literature review",

Ethiopian Journal of Science and Technology, African Journals Online (AJOL), Vol. 15 No. 1, pp. 9–30, doi: 10.4314/ejst.v15i1.2.

Tsega, T.T., Thoben, K.-D., Rao, D.K.N., Haile, B. and Dar, B. (2023), "Challenges of supplying raw material to the locally established leather and leather products manufacturing industry", *J. Sci. & Technol*, Vol. 16 No. 1, pp. 13–28, doi: 10.4314/ejst.v16i1.2.

Tyagi, A.S., Baag, D., Jailkhani, H., Poulose, J. and Patel, J. (2009), "Identification of the Success Factors for the Implementation of Total Productive Maintenance in an Organisation Using Interpretive Structural Modeling (ISM)".

Ullah, S., Ahmad, T., Lyu, B., Sami, A., Kukreti, M. and Yvaz, A. (2024), "Integrating external stakeholders for improvement in green innovation performance: role of green knowledge integration capability and regulatory pressure", *International Journal of Innovation Science*, Emerald Publishing Limited, Vol. 16 No. 4, pp. 640–657, doi: 10.1108/IJIS-12-2022-0237.

Ursavaş, Ö.F. (2022), "Technology Acceptance Model: History, Theory, and Application", in Ursavaş, Ö.F. (Ed.), *Conducting Technology Acceptance Research in Education : Theory, Models, Implementation, and Analysis*, Springer International Publishing, Cham, pp. 57–91, doi: 10.1007/978-3-031-10846-4_4.

Utaminingsih, A., Widowati, S.Y. and Witjaksono, E.H. (2023), "Sustainable business model innovation: external and internal factors on SMEs", *International Journal of Innovation Science*, Emerald Publishing, doi: 10.1108/IJIS-04-2022-0061.

Valentinov, V. and Chia, R. (2022), "Stakeholder theory: A process-ontological perspective", *Business Ethics, Environment and Responsibility*, John Wiley and Sons Inc, Vol. 31 No. 3, pp. 762–776, doi: 10.1111/beer.12441.

Vanhaverbeke, W. (2017), *A Dynamic View of Business Model Innovation*, *Managing Open Innovation in SMEs*, doi: 10.1017/9781139680981.004.

Varriale, V., Cammarano, A., Michelino, F. and Caputo, M. (2024), "The role of digital technologies in production systems for achieving sustainable development goals", *Sustainable Production and Consumption*, Elsevier B.V., 1 June, doi: 10.1016/j.spc.2024.03.035.

Vehmas, K., Bocken, N. and Tuovila, H. (2024), "Understanding Consumer Attitudes Towards Sustainable Business Models—A Qualitative Study with Finnish Consumers", *Circular Economy and Sustainability*, Springer Nature, doi: 10.1007/s43615-023-00338-2.

Veiga, P.M., Marnoto, S., Guerra-Mota, M. and Rexhepi, G. (2024), "Building new business models in MSMEs: digital capabilities, global value chains integration and the moderating role of entrepreneurial failure", *Journal of Small Business and Enterprise Development*, Emerald Publishing, doi: 10.1108/JSBED-10-2023-0501.

Velter, M.G.E., Bitzer, V., Bocken, N.M.P. and Kemp, R. (2020), "Sustainable business model innovation: The role of boundary work for multi-stakeholder alignment", *Journal of Cleaner Production*, Elsevier Ltd, Vol. 247, doi: 10.1016/j.jclepro.2019.119497.

Venkatesh, V. and Davis, F.D. (2000), "Theoretical extension of the Technology Acceptance Model: Four longitudinal field studies", *Management Science*, Vol. 46 No. 2, pp. 186–204, doi: 10.1287/mnsc.46.2.186.11926.

Verhoef, P.C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi Dong, J., Fabian, N. and Haenlein, M. (2021), "Digital transformation: A multidisciplinary reflection and research agenda", *Journal of Business Research*, Elsevier Inc., Vol. 122, pp. 889–901, doi: 10.1016/j.jbusres.2019.09.022.

Verma, B. (2020), *Global Perspectives on Marketing and Promotion Strategies in Leather Industry*.

Vinayan, G., Jayashree, S. and Marthandan, G. (2012), "Critical Success Factors of Sustainable Competitive Advantage: A Study in Malaysian Manufacturing Industries", *International Journal of Business and Management*, Canadian Center of Science and Education, Vol. 7 No. 22, doi: 10.5539/ijbm.v7n22p29.

Vlados, C. (2019), "Porter's Diamond Approaches and the Competitiveness Web", *International Journal of Business Administration*, Sciedu Press, Vol. 10 No. 5, p. 33, doi: 10.5430/ijba.v10n5p33.

Vrontis, D., Belas, J., Thrassou, A., Santoro, G. and Christofi, M. (2023), "Strategic agility, openness and performance: a mixed method comparative analysis of firms operating in developed and emerging markets", *Review of Managerial Science*, Springer Science and Business Media Deutschland GmbH, Vol. 17 No. 4, pp. 1365–1398, doi: 10.1007/s11846-022-00562-4.

Wang, Z., Lin, S., Chen, Y., Lyulyov, O. and Pimonenko, T. (2023), "Digitalization Effect on Business Performance: Role of Business Model Innovation", *Sustainability (Switzerland)*, MDPI, Vol. 15 No. 11, doi: 10.3390/su15119020.

Wegner, D., da Silveira, A.B., Marconatto, D. and Mitrega, M. (2024), "A systematic review of collaborative digital platforms: structuring the domain and research agenda", *Review of Managerial Science*, Vol. 18 No. 9, pp. 2663–2695, doi: 10.1007/s11846-023-00695-0.

Were, M. and Odongo, M. (2023), "Competitiveness and diversification of services exports in sub-Saharan Africa", *World Economy*, John Wiley and Sons Inc, Vol. 46 No. 2, pp. 363–381, doi: 10.1111/twec.13367.

White, J. V, Markin, E., Marshall, D. and Gupta, V.K. (2022), "Exploring the boundaries of business model innovation and firm performance: A meta-analysis", *Long Range Planning*, Vol. 55 No. 5, p. 102242, doi: https://doi.org/10.1016/j.lrp.2022.102242.

Wijethilake, C., Upadhaya, B. and Lama, T. (2023), "The role of organisational culture in organisational change towards sustainability: evidence from the garment manufacturing industry", *Production Planning and Control*, Taylor and Francis Ltd., Vol. 34 No. 3, pp. 275–294, doi: 10.1080/09537287.2021.1913524.

Wilden, R., Gudergan, S.P., Nielsen, B.B. and Lings, I. (2013), "Dynamic Capabilities and Performance: Strategy, Structure and Environment", *Long Range Planning*, Vol. 46 No. 1–2, pp. 72–96, doi: 10.1016/j.lrp.2012.12.001.

Wolska, M., Gorewoda, T., Roszak, M. and Gajda, L. (2023), "Implementation and Improvement of the Total Productive Maintenance Concept in an Organization", *Encyclopedia*, MDPI AG, Vol. 3 No. 4, pp. 1537–1564, doi: 10.3390/encyclopedia3040110.

Woraphiphat, I. and Roopsuwankun, P. (2023), "The impact of online design thinking-based learning on entrepreneurial intention: the case of vocational college", *Journal of Innovation and Entrepreneurship*, Vol. 12 No. 1, p. 10, doi: 10.1186/s13731-023-00278-z.

World Economic Forum, Schwab, K. and Zahidi, S. (2020), *The Global Competitiveness Report Special Edition 2020*, World Economic Forum.

Wudu, A., Singh, K. and Kassahun, S. (2024), "Industry clusters and firm performance: Evidence from the leather product industry in Addis Ababa", *Heliyon*, Vol. 10 No. 20, p. e39486, doi: https://doi.org/10.1016/j.heliyon.2024.e39486.

Xu, Z., Liu, H. and Lin, S. (2022), "The Influence of Government Green Development Policy on a Firm's Disruptive Innovation", *Sustainability (Switzerland)*, MDPI, Vol. 14 No. 23, doi: 10.3390/su142316040.

Xue, S.-J., Hou, J. and Gao, P.-B. (2019), *Business Model Innovation and Firm Performance: A Meta-Analysis*.

Yan, J., Abd Rahman, A. and Tong, T. (2022), "Citation: Research on the Impact of BMI on Enterprise Performance Based on the Antecedence of Risk Perception", doi: 10.3390/su.

Yohannes, Z., Matebu, A. and Asrat, F. (2023), "Binary logistic regression analysis on determinants of capacity utilization in medium and large manufacturing industries in Ethiopia", *Asian Development Policy Review*, Asian Economic and Social Society, Vol. 11 No. 1, pp. 1–11, doi: 10.55493/5008.v11i1.4713.

Yoo, S., Lee, D.J. and Atamja, L. (2023), "Influence of Online Information Quality and Website Design on User Shopping Loyalty in the Context of E-Commerce Shopping Malls in Korea", *Sustainability (Switzerland)*, MDPI, Vol. 15 No. 4, doi: 10.3390/su15043560.

Yun, J.H.J., Zhao, X., Jung, K.H. and Yigitcanlar, T. (2020), "The culture for open innovation dynamics", *Sustainability (Switzerland)*, MDPI, 1 June, doi: 10.3390/su12125076.

Zaheer, M.A., Anwar, T.M., Iantovics, L.B., Raza, M.A. and Khan, Z. (2024), "Enticing attributes of consumers' purchase intention to use online food delivery applications (OFDAs) in a developing country", *Journal of Electronic Business & Digital Economics*, Emerald, doi: 10.1108/jebde-10-2023-0025.

Zare, J. and Persaud, A. (2024), "Digital transformation and business model innovation: a bibliometric analysis of existing research and future perspectives", *Management Review Quarterly*, Springer Nature, doi: 10.1007/s11301-024-00426-z.

Zastempowski, M. (2022), "What Shapes Innovation Capability in Micro-Enterprises? New-to-the-Market Product and Process Perspective", *Journal of Open Innovation: Technology, Market, and Complexity*, Multidisciplinary Digital Publishing Institute (MDPI), Vol. 8 No. 1, doi: 10.3390/joitmc8010059.

Zervoudi, E.K., Moschos, N. and Christopoulos, A.G. (2025), "From the Corporate Social Responsibility (CSR) and the Environmental, Social and Governance (ESG) Criteria to the Greenwashing Phenomenon: A Comprehensive Literature Review About the Causes, Consequences and Solutions of the Phenomenon with Specific Case Studies", *Sustainability (Switzerland)*, Multidisciplinary Digital Publishing Institute (MDPI), 1 March, doi: 10.3390/su17052222.

Zhang, P. and London, K. (2013), "Towards an internationalized sustainable industrial competitiveness model", *Competitiveness Review*, Emerald Group Publishing Ltd., Vol. 23 No. 2, pp. 95–113, doi: 10.1108/10595421311305325.

Zhang, Y., Ma, X., Pang, J., Xing, H. and Wang, J. (2023), "The impact of digital transformation of manufacturing on corporate performance — The mediating effect of business model innovation and the moderating effect of innovation capability", *Research in International Business and Finance*, Elsevier Ltd, Vol. 64, doi: 10.1016/j.ribaf.2023.101890.

Zhao, X. (2023), "Resource Constraints in the Dynamic Evolution of China's Comparative Advantages", in Yang, X. (Ed.), *China's Qualitative Economic Transformation*, Springer Nature Singapore, Singapore, pp. 37–59, doi: 10.1007/978-981-19-4437-6_2.

Zheng, L., Dong, Y., Chen, J., Li, Y., Li, W. and Su, M. (2022), "Impact of Crisis on Sustainable Business Model Innovation—The Role of Technology Innovation", *Sustainability (Switzerland)*, MDPI, Vol. 14 No. 18, doi: 10.3390/su141811596.

Zhou, S.S., Zhou, A.J., Feng, J. and Jiang, S. (2019), "Dynamic capabilities and organizational performance: The mediating role of innovation", *Journal of Management and Organization*, Cambridge University Press, Vol. 25 No. 5, pp. 731–747, doi: 10.1017/jmo.2017.20.

Zott, C. and Amit, R. (2010), "Business model design: An activity system perspective", *Long Range Planning*, Elsevier Ltd, Vol. 43 No. 2–3, pp. 216–226, doi: 10.1016/j.lrp.2009.07.004.

Zuhdi, D.A.F., Abdullah, M.F., Suliswanto, M.S.W. and Wahyudi, S.T. (2021), "The Competitiveness of Indonesian Crude Palm Oil in International Market", *Jurnal Ekonomi Pembangunan*, Faculty of Economics, Universitas Sriwijaya, Vol. 19 No. 1, pp. 111–124, doi: 10.29259/jep.v19i1.13193.

Major Achievements of the Author during the PhD Study

S/N	Category	Description	Quantity	Details
1	Publications	Published articles extracted from the dissertation	1	1. Determinants of consumers' purchase intention on digital business model platform: evidence from Ethiopia using partial least square structural equation model (PLS-SEM) technique | Journal of Innovation and Entrepreneurship | Full Text. Published in Journal of Innovation and Entrepreneurship, Springer DOI 10.1108/JQME-11-2022-0073 2. Assessment of critical success factors, barriers and initiatives of total productive maintenance (TPM) in selected Ethiopian manufacturing industries | Emerald Insight. Published in Journal of Quality in Maintenance Engineering, Emerald. doi.org/10.1186/s13731-023-00323-x 3. "Predicting Entrepreneurial Innovation in Ethiopia: A PLS-SEM Analysis of Prospective Engineers' Intentions." Accepted for publication in the Journal of Innovation and Entrepreneurship, Springer. doi.org/10.1186/s13731-025-00581-x
		Accepted manuscript extracted from dissertation	2	1. Enablers of Business Model Innovation in Manufacturing Firms: An Investigation of Empirical Insights Leveraging PLS-SEM Analysis Technique. Accepted for publication by Int. J. of Business Innovation and Research, Inder Science. DOI: 10.1504/IJBIR.2025.10072059
		Manuscripts under review process extracted from the dissertation		1. "An Investigation of the Comparative Advantages and Export performance of Ethiopian Manufacturing Firms in the Leather Industry". Under review in the Journal of African Business, Taylor & Francis.
2	Conference participation	In person international conference participations	2	1. Participated at the 5th AfricaLics international research conference (9th – 11th) Nov/2022, at Yaoundé, Cameroon. 2. Participated at the 6th AfricaLics international research conference (13th – 15th) Nov/2024, at Ilorin, Nigeria.

				3. Participated at the 1st EthiopiaLics International research conference (13th -14th) June/2025, at Addis Ababa, Ethiopia.
		Online participation	1	• Participated online at the RVTTI Annual International Conferences, Nairobi, Kenya
3	International PhD. research Visit	PhD short research visit for 3 months in Nuremberg, Germany	1	• A short PhD research visit in Nuremburg, Germany for three months (May 2024- August 2024) Sponsored by SIDA in collaboration with AAU.
4	International PhD. fellowship	AfricaLics PhD visiting fellowship 2022 program.	1	• Participated in the AfricaLics PhD visiting fellowship 2022 program in Nairobi, Kenya from June 1 – September 2022 for 4 months.
5	International PhD academy	In person 8th AfricaLics PhD Academy participation.	1	• Participated in the 8th AfricaLics PhD Academy (13th -24th) June /2022, for 12 days in Nairobi, Kenya.
6	Co-Advising	MSc. Students' thesis advising	3	The author co-advised 3 master theses and helped 3 MSc. Students to complete their study
7	Course Assist	Operation Research course	1 batch	
8	Course delivery	Entrepreneurship course for B.Sc. students at CTBE, AAU.	4 batches	
		Engineering Drawing course for B.Sc. students at CTBE, AAU.	2 batches	
9	Reviewer role for reputable Journals	Peer review works for the Journal of knowledge economy, Springer.	3 for 1 publication	See my ORCID: 0000-0003-3982-5889
		International Journal of Innovation Science	2 for one publication	
10	Peer reviewer role in the Industrial Engineering, SMiE, AAU.	Dissertation Mock	2	
		Dissertation Proposals	3	
		Course work	3	